BOARD MEETING DATE: December 7, 2018 AGENDA NO. 28

PROPOSAL: Certify Final Subsequent Environmental Assessment and Amend Rules 1146, 1146.1, 1146.2 and Adopt Rule 1100

SYNOPSIS: The adoption Resolution of the 2016 AQMP directed staff to achieve additional NOx emission reductions and to transition the RECLAIM program to a command-and-control regulatory structure as soon as practicable. Proposed Amended Rules 1146, 1146.1 and 1146.2 updates NOx emission limits for boilers, heaters, and steam generators applicable to these rules. The revised NOx emission limits represent BARCT and apply to RECLAIM and non-RECLAIM facilities. Proposed Rule 1100 establishes the compliance schedule for equipment at RECLAIM facilities that are subject to Proposed Amended Rules 1146 and 1146.1. PAR 1146.2 includes the compliance schedule for equipment regulated under this rule.

COMMITTEE: Stationary Source, April 20 and October 19, 2018, Reviewed

RECOMMENDED ACTIONS:
Adopt the attached Resolution:

1. Certifying the Final Subsequent Environmental Assessment for Proposed Amended Rules 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Proposed Rule 1100 - Implementation Schedule for NOx Facilities;
2. Amending Rules 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and

3. Adopting Rule 1100 - Implementation Schedule for NOx Facilities.

Wayne Nastri
Executive Officer

PMF:SN:MK:GQ:KC:SW:LG

Background

Regulation XX – Regional Clean Air Incentives Market (RECLAIM) program was adopted in October 1993 and is a market-based program for facilities with more than four tons per year of NOx or SOx emissions. During the adoption of the 2016 AQMP, the adopted Resolution directed staff to modify Control Measure CMB-05 to achieve an additional five tons per day NOx emission reductions as soon as feasible, but no later than 2025, and to transition the NOx RECLAIM program to a command-and-control regulatory structure requiring Best Available Retrofit Control Technology (BARCT) as soon as practicable. California State Assembly Bill (AB) 617, which was approved in July 2017, requires that BARCT be implemented for facilities in the state greenhouse gas cap and trade program by December 31, 2023.

Source-specific rules establishing BARCT emission limits are needed for equipment at RECLAIM facilities as they transition to a command-and-control regulatory program. The PAR 1146 series are "landing rules" for RECLAIM facilities with boilers, process heaters, and steam generators and are needed before facilities can transition out of RECLAIM. Proposed Amended Rules 1146, 1146.1 and 1146.2 (PARs 1146 series) update NOx emission limits for boilers, heaters, and steam generators. The revised NOx emission limits represent BARCT and apply to RECLAIM and non-RECLAIM facilities. Proposed Rule 1100 – Implementation Schedule for NOx Facilities (PR 1100) establishes the compliance schedule for Rule 1146 series facilities exiting the RECLAIM program and monitoring, reporting, and recordkeeping requirements for these RECLAIM facilities.

Public Process

Development of PARs 1146 series and PR 1100 was conducted through a public process. Staff has held seven working group meetings at the SCAQMD on November 30, 2017, January 16, 2018, March 7, 2018, April 12, 2018, August 2, 2018, August 29, 2018, and October 16, 2018. The Working Group is composed of representatives from the manufacturers, trade organizations, businesses, environmental groups, public agencies, consultants, and other interested parties. Two Public Workshops were held on February 14, 2018 and September 20, 2018. A CEQA scoping meeting, as required pursuant to Public Resources Code Section 21083.9(a)(2), was held in conjunction with the Public Workshop on February 14, 2018. Staff also provided summaries of the PARs 1146 series and PR 1100 to the RECLAIM Working Group on July 13, 2017,

September 14, 2017, October 12, 2017, January 11, 2018, February 8, 2018, March 8, 2018, April 12, 2018, May 9, 2018, June 14, 2018, July 12, 2018, and September 13, 2018. Meetings were also held with numerous individual stakeholders who will be impacted by this rulemaking.

Proposed Amendments

PARs 1146 and 1146.1 apply to boilers, process heaters, and steam generators that are greater than 2 million British Thermal Units per hour (MM Btu/hr). Based on the BARCT assessment, PAR 1146 and 1146.1 will lower the NOx emission limits from 9 ppmv to either 5 or 7 ppmv depending on the unit size and the existing unit's current NOx emission limit, and lower the NOx emission limit for thermal fluid heaters from 30 to 12 ppmv at 3 percent oxygen. The current NOx emission limit for the largest units that are over 75 MM Btu/hr will remain at 5 ppmv. PAR 1146 also adds a new ammonia slip requirement of 5 ppm for all units equipped with applicable control equipment. Under Proposed Rule 1100 the compliance date for RECLAIM equipment retrofitting units to meet the NOx emission limit is January 1, 2022. An additional year is allowed to encourage facilities to replace existing units with a new unit that meets Best Available Control Technology NOx limits. Any RECLAIM or non-RECLAIM equipment near the final emission limits is required to meet the lower NOx emission limit within 15 years after rule amendment or during burner replacement, whichever is earlier.

PAR 1146.2 applies to units between 400,000 and 2 MMBtu/hr and requires units to comply with the 30 ppm limit by December 31, 2023, if a technology assessment (to be completed by January 1, 2022) determines that the NOx emission limits specified in Rule 1146.2 still represent BARCT.

About 291 units located at 103 RECLAIM facilities and 1,807 units located at 824 non-RECLAIM facilities will be affected by the proposed rule amendments. Emission reductions are estimated to be about 0.27 tons per day of NOx by January 1, 2023 and an estimated additional reduction of 0.04 tons per day of NOx by 15 years after rule amendment.

During the rulemaking process, representatives from wastewater and landfill facilities commented on challenges that their industry has with meeting lower NOx emission limits for units regulated under Rule 1146 and 1146.1 as well as engines regulated under Rule 1110.2. To better address these challenges, staff has decided to address BARCT NOx emission limits for boilers, heaters, furnaces, and engines in two new industry specific rules for landfills and publicly owned treatment works. As a result, current NOx emission limits will not be revised in Rule 1146 and 1146.1 for units used at these two industry sectors.

Key Issues

Throughout the rulemaking process, staff has worked closely with key stakeholders from various industries and addressed most of their concerns. However, three key issues still remain: 1) Resolution of New Source Review (NSR) issues related to the transition of RECLAIM facilities before BARCT rules are adopted or amended; 2) The availability of burner retrofits that can achieve a NOx limit of 7 ppm; and 3) The cost associated with 7 ppm burner retrofits are higher than those of staff's estimates.

Resolve New Source Review Issues Prior to Adopting or Amending BARCT Rules

Regarding New Source Review, some industry stakeholders have requested that BARCT rule amendments should be suspended until NSR issues have been resolved. Staff believes that rulemaking should proceed while NSR issues are being addressed for the following reasons: 1) state law (AB 617) requires implementation of BARCT for facilities in the state greenhouse gas cap and trade program by December 31, 2023, and 2) RECLAIM facilities will be allowed to remain in RECLAIM so that they can more easily fulfill NSR requirements. Specifically, Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx) was amended on October 5, 2018 to provide an option for RECLAIM facilities to remain in the RECLAIM program, until future provisions in Regulation XIII – New Source Review pertaining to RECLAIM are adopted. If an NSR event is triggered while the facilities elected to remain in RECLAIM, the facility will be subject to NSR provisions under Rule 2005 – New Source Review for RECLAIM.

Availability of 7 PPM Burners

Some industry stakeholder have commented on the feasibility for ultra-low NOx burner (ULNB) retrofits that will be able to meet the proposed 7 ppm NOx concentration limit. Staff has confirmed that three equipment vendors have burner retrofits that can achieve 7 ppm. 708 units within the San Joaquin Air Quality Pollution Control District (SJVAPCD) are currently meeting a 7 ppm NOx emission limit. Staff has also reviewed over 740 source test results from both SCAQMD and SJVAPCD that support the feasibility of 7 ppm BARCT.

Cost of 7 PPM Burner Retrofitting

Some industry stakeholders have commented that the price quotations obtained from vendors for burner retrofits are higher than those of staff estimates. Staff's cost estimates are averages provided by five equipment vendors based on conventional equipment and standard installations. Facilities might experience higher than average costs if operators decide to stay with one specific vendor or retrofitting highly specialized units that would require specific engineering.

California Environmental Quality Act
PARs 1146 series and PR 1100 are considered a "project" as defined by the California Environmental Quality Act (CEQA), and the SCAQMD is the designated lead agency. Pursuant to CEQA Guidelines Sections 15252, 15162(b), and 15251(l) (codified in SCAQMD Rule 110), the SCAQMD has prepared a Final Subsequent Environmental Assessment (SEA) for PARs 1146 series and PR 1100 which relies on the March 2017 Final Program Environmental Impact Report (EIR) for the 2016 AQMP, the September 2008 Final Environmental Assessment (EA) for Rule 1146, the September 2008 Final EA for Rule 1146.1, and the May 2006 Final EA for Rule 1146.2. Staff has prepared a Statement of Overriding Considerations pursuant to CEQA Guidelines Section 15093, and a Mitigation, Monitoring, and Reporting Plan pursuant to Public Resources Code Section 21081.6 and CEQA Guidelines Section 15097, as required by CEQA, in Attachment F of this package.

Socioeconomic Analysis
There are 103 RECLAIM facilities with at least one boiler that are subject to the PAR 1146 series and PR 1100. Non-RECLAIM facilities are also subject to PAR 1146 but are not required to comply until 15 years after rule adoption or upon burner replacement (except those with thermal fluid heaters), whichever occurs first. The average annual cost of PAR 1146 series ranges from $5.6 to $6.8 million between 2020 and 2045. Annual costs of installing SCRs and ULNBs would result in approximately $4.1 million (74%) to $5.4 million (78%) of overall annual compliance costs. The largest share of compliance costs for the PAR 1146 series are in the food and beverage sector, textile mills, pipeline transportation, and paper products, while a smaller portion of costs spread across numerous other industries with boiler equipment.

The PAR 1146 series is projected to result in 57 to 72 jobs forgone annually, on average, between 2020 and 2045. The projected job impacts represent 0.0021 percent of the total employment in the four-county region.

Overall cost-effectiveness of PAR 1146 series is estimated at $26,500 per ton of NOx reduced across all groups in the PAR 1146 series. CEQA alternatives annual costs range between $4.1 million to $5.7 million with an estimated 39 to 63 average annual jobs foregone.

AQMP and Legal Mandates
Pursuant to Health & Safety Code Section 40460 (a), the SCAQMD is required to adopt an AQMP demonstrating compliance with all federal regulations and standards. The SCAQMD is required to adopt rules and regulations that carry out the objectives of the AQMP. PAR 1146 series is part of a control measure (CMB-05) in the 2016 AQMP and will reduce NOx emissions and facilitate the transition of the NOx RECLAIM program to a command-and-control regulatory structure.

Implementation of the PARs 1146 series is expected to reduce NOx emissions by 0.27 ton per day by January 1, 2023. State law (AB 617) requires implementation of BARCT for facilities in the state greenhouse gas cap and trade program by December 31, 2023.

Resource Impacts
Existing staff resources are adequate to implement the proposed amendments.

Attachments
A. Summary of Proposal
B. Key Issues and Responses
C. Rule Development Process
D. Key Contacts List
E. Resolution
F. Attachment 1 to the Resolution (Findings, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Plan)
G. Proposed Amended Rule 1146
H. Proposed Amended Rule 1146.1
I. Proposed Amended Rule 1146.2
J. Proposed Rule 1100
K. Final Staff Report
L. Final Socioeconomic Impact Assessment
M. Final Subsequent Environmental Assessment
N. Board Meeting Presentation

ATTACHMENT A
SUMMARY OF PROPOSAL

Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters and Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

Applicability

- Applies to boilers, steam generators, and process heaters of equal to or greater than 2 million Btu per hour rated heat input capacity used in all industrial, institutional, and commercial operations
- Applies to RECLAIM, non-RECLAIM, and former RECLAIM facilities

Emissions Limits

- Establishes NOx emission limits for industrial and commercial boilers, steam generators, and process heaters rated to ≥2 MMBtu/hr
- Establishes ammonia emission limits for units operating with an air pollution control equipment that results in ammonia emissions in the exhaust
- Establishes new emission limits for low use equipment at the time of burner replacement or 15 years after rule amendment, whichever occurs earlier
- Includes alternative compliance date for equipment near final emission limits
- Municipal sanitation service facilities are not subject to new proposed emission limits

Monitoring, Recordkeeping, and Reporting

- Establishes quarterly (annual after four consecutive passes) ammonia source test requirements for applicable equipment

Exemptions

- Provision included to exempt any unit at a RECLAIM or former RECLAIM facility from the provisions of this rule that is subject to a NOx emission limit in a different industry specific category as defined in Rule 1100
- Provision included for any unit at a municipal sanitation service facility that is subject to a NOx emission limit in a different Regulation XI rule
- Provision included for boilers used by electric utilities to generate electricity; or boilers and process heaters with a rated heat input capacity greater than 40 MMBtu/hr used in petroleum refineries; or sulfur plant reaction boilers (PAR 1146)

Proposed Amended Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters

Applicability

- Applies to large water heaters and small boilers and process heaters of equal to or less than 2 million BTU per hour rated heat input capacity used in all industrial, institutional, and commercial operations
- Applies to RECLAIM, non-RECLAIM and former RECLAIM facilities

Technology Assessment

- Conduct a BARCT technology assessment for applicable Rule 1146.2 units and report to the Board no later than January 2022

Exemptions

- Provision included for any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different industry specific category as defined in Rule 1100
- Provision included for any unit at a municipal sanitation service facility that is subject to a NOx emission limit in a different Regulation XI rule

Proposed Rule 1100 – Implementation Schedule for NOx Facilities

Applicability

- Applies to RECLAIM or former RECLAIM facilities that own or operate equipment that meets applicability provisions of Rule 1146 and Rule 1146.1

Implementation Schedule

- Establishes a compliance schedule for the owner or operator of a Rule 1146 unit or Rule 1146.1 unit at a RECLAIM or former RECLAIM facility:
    - Submit permit application on or before 12 months after rule adoption
    - Meet applicable NOx concentration limit for a minimum of 75% of the cumulative total heat input of all units on or before January 1, 2021; and remaining units to make up 100% on or before January 1, 2022
    - Operators that elect to replace an existing unit have until January 1, 2023

Monitoring, Reporting and Recordkeeping (MRR) for RECLAIM facilities

- Title V RECLAIM facilities will continue to comply with MRR requirements specified in Rule 2012; and Non-Title V RECLAIM facilities will comply with MRR requirements in the applicable rule(s) on the day the facilities become a former RECLAIM facility

ATTACHMENT B
Key Issues and Responses

Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters; Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Proposed Amended Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Proposed Rule 1100 – Implementation Schedule for NOx Facilities

Key Issue #1: Facilities should not exit and staff should not move forward with BARCT rule amendments until New Source Review (NSR) issues are resolved.

Response #1:

- State law (AB 617) requires implementation of BARCT for facilities in the state greenhouse gas cap and trade program by December 31, 2023
- Staff believes that rulemaking should proceed while NSR issues are being addressed
- Rule 2002 provides an option for facilities to remain in RECLAIM for a limited time to utilize RECLAIM NSR until future provisions in Regulation XIII pertaining to NSR are adopted

Key Issue #2: Stakeholders expressed concerns on the market availability of 7 ppm burner retrofits

Response #2:

- Staff has confirmed equipment vendors have burner retrofits that can achieve 7 ppm
- 708 units (between 5 to 300 MMBtu/hr) located in SJVAPCD are able to comply with 7 ppm limit without use of the mitigation fee option
- More than 740 source test results from both SCAQMD and SJVAPCD support the feasibility of 7 ppm BARCT

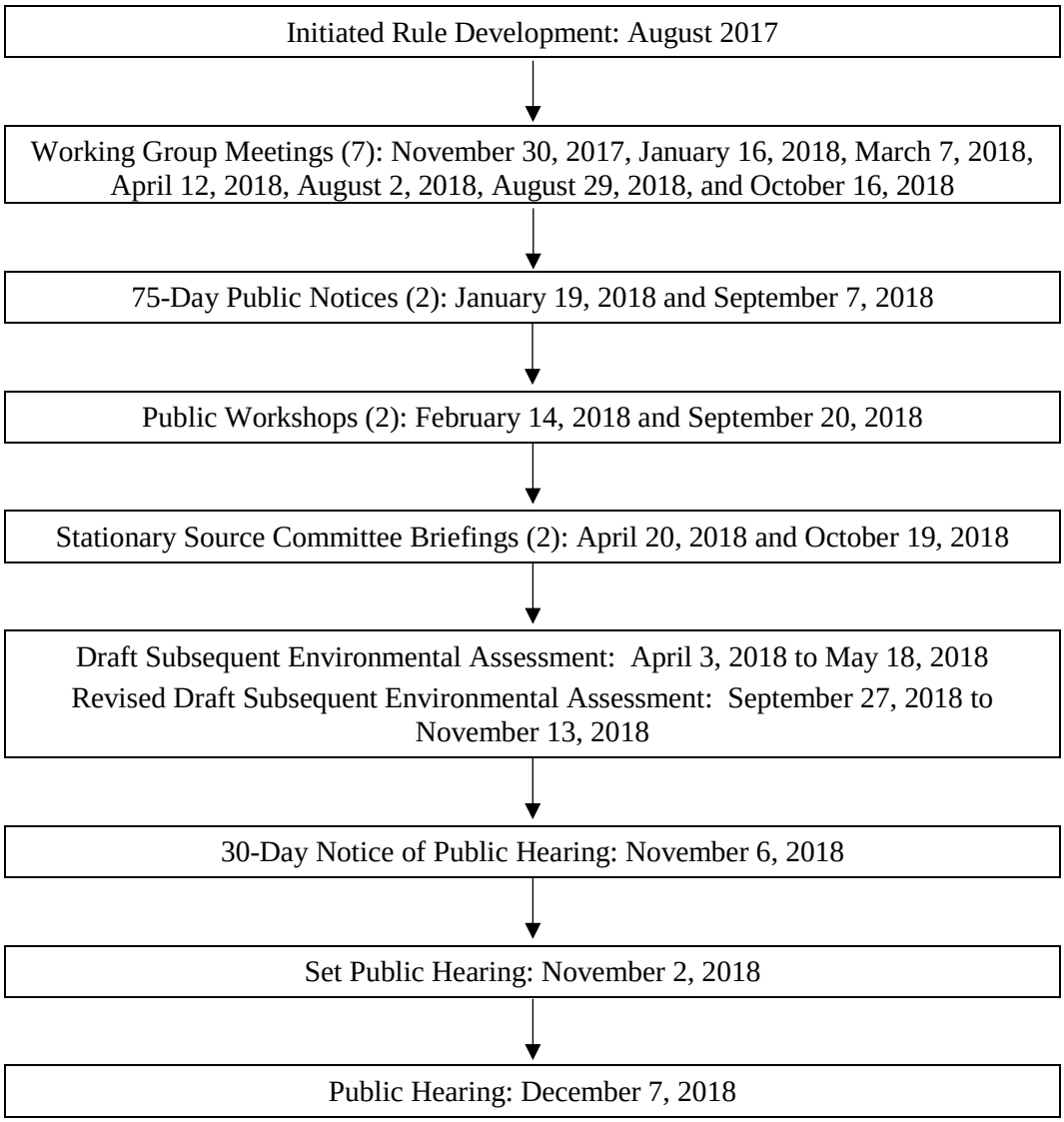
Key Issue #3: Stakeholders expressed that their cost quotations obtained are higher than those of staff estimates

Response #3:

- Staff cost estimates are averages provided by five equipment vendors based on conventional equipment and standard installations
- Facilities that might experience higher than average costs:
  - Operators that decide to stay with one specific vendor
  - Units that are highly specialized requiring specific engineering

ATTACHMENT C
RULE DEVELOPMENT PROCESS

Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters; Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Proposed Amended Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Proposed Rule 1100 – Implementation Schedule for NOx Facilities



Sixteen (16) months spent in rule development.

Two (2) Public Workshops.

Two (2) Stationary Source Committee Meetings.

Seven (7) Working Group Meetings.

ATTACHMENT D

KEY CONTACTS LIST

Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters; Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Proposed Amended Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Proposed Rule 1100 – Implementation Schedule for NOx Facilities

Alta Environmental
Boiler Dynamics, Inc
California Air Resources Board
California Boiler
Disneyland
Earthjustice
Eastern Municipal Water District
Heat Transfer Solutions
Kinder Morgan
Latham & Watkins LLP
Marathon Petroleum Corporation
Montrose Environmental
Nationwide Boiler Incorporated
Northrop Grumman
Orange County Sanitation District
Parker Boiler Company
Plains All American
Plains West Coast Terminals, LLC
Ramboll
RF MacDonald
Sacramento Metropolitan Air Quality Control District
San Joaquin Air Pollution Control District
Sanitation Districts of Los Angeles County
Sempra Utilities
Southern California Air Quality Alliance (SCAQA)
Southern California Alliance of Publicly Owned Treatment Works (SCAP)
The Boeing Company
US Borax
U.S. Environmental Protection Agency
Western States Petroleum Association (WSPA)
Yorke Engineering

ATTACHMENT E

RESOLUTION NO. 18-____

A Resolution of the Governing Board of the South Coast Air Quality Management District (SCAQMD) certifying the Final Subsequent Environmental Assessment (SEA) for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters; Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Proposed Amended Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Proposed Rule 1100 – Implementation Schedule for NOx Facilities.

WHEREAS, the SCAQMD Governing Board finds and determines with certainty that Proposed Amended Rules 1146, 1146, and 1146.2, and Proposed Rule 1100 are considered a "project" as defined by the California Environmental Quality Act (CEQA); and

WHEREAS, the SCAQMD has had its regulatory program certified pursuant to Public Resources Code Section 21080.5 and CEQA Guidelines Section 15251(l), and has conducted a CEQA review and analysis of Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 pursuant to such program (SCAQMD Rule 110); and

WHEREAS, the SCAQMD Governing Board has determined that the requirements for a Subsequent Environmental Impact Report have been triggered pursuant to its certified regulatory program and CEQA Guidelines Section 15162(b), and that a Subsequent Environmental Assessment (SEA), a substitute document allowed pursuant CEQA Guidelines Section 15252 and SCAQMD's certified regulatory program, is appropriate; and

WHEREAS, the SCAQMD has prepared a Draft SEA and a Revised Draft SEA pursuant to its certified regulatory program and CEQA Guidelines Sections 15251, 15252, and 15162, setting forth the potential environmental consequences of Proposed Amended Rules 1146, 1146.1, and 1146.1 and Proposed Rule 1100 and determined that the proposed project would have the potential to generate significant adverse environmental impacts for the topic of hazards and hazardous materials, after mitigation measures are applied; and

WHEREAS, the Draft SEA was circulated for a 45-day public review and comment period from April 3, 2018 to May 18, 2018 and four comment letters were received; and the Revised Draft SEA, which received no comment letter, but included the four comment letters and the responses relative to the Draft SEA, was circulated for a 45-day public review and comment period from September 27, 2018 to November 13, 2018; and

WHEREAS, the Revised Draft SEA has been revised so that it is now a Final SEA; and

WHEREAS, it is necessary that the SCAQMD Governing Board review the Final SEA prior to its certification, to determine that it provides adequate information on the potential adverse environmental impacts that may occur as a result of adopting Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100, including responses to comments; and

WHEREAS, pursuant to CEQA Guidelines Section 15252(a)(2)(A), significant adverse impacts were identified such that alternatives and mitigation measures are required for project approval; thus, a Mitigation Monitoring and Reporting Plan pursuant to Public Resources Code Section 21081.6 and CEQA Guidelines Section 15097, has been prepared; and

WHEREAS, no feasible mitigation measures were identified that would reduce or eliminate the significant adverse hazards and hazardous materials impacts to less than significant levels; and,

WHEREAS, it is necessary that the SCAQMD prepare Findings pursuant to CEQA Guidelines Section 15091, and a Statement of Overriding Considerations pursuant to CEQA Guidelines Section 15093, regarding potentially significant adverse environmental impacts that cannot be mitigated to less than significant levels; and

WHEREAS, Findings, a Statement of Overriding Considerations, and a Mitigation, Monitoring, and Reporting Plan have been prepared and are included in Attachment 1 to this Resolution, which is attached and incorporated herein by reference; and

WHEREAS, the SCAQMD Governing Board voting to adopt Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 has reviewed and considered the information contained in the Final SEA, including responses to comments, the Mitigation, Monitoring, and Reporting Plan, the Findings, the Statement of Overriding Considerations, and all other supporting documentation, prior to its certification, and has

determined that the Final SEA, including responses to comments received, has been completed in compliance with CEQA; and

WHEREAS, Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 and supporting documentation, including but not limited to, the Final SEA, the Final Staff Report, and the Socioeconomic Impact Assessment included in the Final Staff Report, were presented to the SCAQMD Governing Board and the SCAQMD Governing Board has reviewed and considered this information, as well as has taken and considered staff testimony and public comment prior to approving the project; and

WHEREAS, the Final SEA reflects the independent judgment of the SCAQMD; and

WHEREAS, the SCAQMD Governing Board finds and determines that all changes made in the Final SEA after the public notice of availability of the Revised Draft SEA, were not substantial revisions and do not constitute significant new information within the meaning of CEQA Guidelines Section 15073.5 or 15088.5, because no new or substantially increased significant effects were identified, and no new project conditions or mitigation measures were added, and all changes merely clarify, amplify, or make insignificant modifications to the Revised Draft SEA, and recirculation is therefore not required; and

WHEREAS, the SCAQMD Governing Board finds and determines, taking into consideration the factors in Section (d)(4)(D) of the Governing Board Procedures (codified as Section 30.5(4)(D)(i) of the Administrative Code), that the modifications to Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 since the notice of public hearing was published add clarity that meets the same air quality objective and are not so substantial as to significantly affect the meaning of the proposed amended rules and proposed rule within the meaning of Health and Safety Code Section 40726 because: (a) the changes do not impact emission reductions, (b) the changes do not affect the number or type of sources regulated by the rules, (c) the changes are consistent with the information contained in the notice of public hearing, and (d) the effects of Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 do not exceed the effects of the range of alternatives analyzed in the CEQA document; and

WHEREAS, Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 will be submitted for inclusion into the State Implementation Plan; and

WHEREAS, the SCAQMD staff conducted a combined Public Workshop and CEQA Scoping regarding Proposed Amended Rules 1146, 1146.1, and 1146.2 and

Proposed Rule 1100 on February 14, 2018 and a Public Workshop on September 20, 2018; and

WHEREAS, Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the Final Staff Report; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 are needed to continue with the transition of facilities in the RECLAIM program to a command-and-control regulatory structure by setting BARCT and transition schedule to meet the commitments of Control Measure CMB-05 of the Final 2016 Air Quality Management Plan; and

WHEREAS, the SCAQMD Governing Board obtains its authority to adopt, amend or repeal rules and regulations from Sections 39002, 40000, 40001, 40440, 40702, 40725 through 40728, and 41508 of the Health and Safety Code; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 are written or displayed so that the meaning can be easily understood by the persons directly affected by it; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 are in harmony with and not in conflict with or contradictory to, existing statutes, court decisions or state or federal regulations; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 will not impose the same requirements as any existing state or federal regulations. The amendments are necessary and proper to execute the powers and duties granted to, and imposed upon, SCAQMD; and

WHEREAS, the SCAQMD Governing Board, in amending Rules 1146, 1146.1, and 1146.2 and adopting Rule 1100, references the following statutes which the SCAQMD hereby implements, interprets, or makes specific: Assembly Bill 617, Health and Safety Code Sections 39002, 39616, 40001, 40702, 40440(a), and 40725 through 40728.5; and

WHEREAS, the SCAQMD Governing Board has determined that the Socioeconomic Impact Assessment of Proposed Amended Rule 1146 series is consistent with the March 17, 1989 Governing Board Socioeconomic Resolution for rule adoption; and

WHEREAS, the SCAQMD Governing Board has determined that the Socioeconomic Impact Assessment is consistent with the provisions of Health and Safety Code Sections 40440.8, 40728.5, and 40920.6; and

WHEREAS, the SCAQMD Governing Board finds that staff's proposed control options for PAR 1146 and 1146.1 is being adopted because they constitute BARCT, as required by AB 617, and that the other control options did not meet BARCT; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 1146 series will result in increased costs to the affected industries, yet are considered to be reasonable, with a total annualized cost as specified in the Socioeconomic Impact Assessment; and

WHEREAS, the SCAQMD Governing Board has actively considered the Socioeconomic Impact Assessment and has made a good faith effort to minimize such impacts; and

WHEREAS, the SCAQMD specifies that the Planning and Rules Manager of Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 is the custodian of the documents or other materials which constitute the record of proceedings upon which the adoption of these proposed amendments is based, which are located at the South Coast Air Quality Management District, 21865 Copley Drive, Diamond Bar, California; and

WHEREAS, a public hearing has been properly noticed in accordance with the provisions of Health and Safety Code Section 40725 and 40440.5; and

WHEREAS, the SCAQMD Governing Board has held a public hearing in accordance with all applicable provisions of state and federal law; and

WHEREAS, a technology assessment will be conducted to evaluate the feasibility of lowering the NOx concentration limit for units regulated under Rule 1146.2 no later than January 1, 2022

NOW, THEREFORE, BE IT RESOLVED, that the SCAQMD Governing Board does hereby certify that the Final SEA for Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100, including responses to comments, and other supporting documentation, was completed in compliance with CEQA and Rule 110

provisions; and finds that the Final SEA was presented to the Governing Board, whose members reviewed, considered, and approved the information therein prior to acting on Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 and finds that the Final SEA reflects the SCAQMD's independent judgment and analysis; and

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board does hereby adopt Findings pursuant to CEQA Guidelines Section 15091, a Statement of Overriding Considerations pursuant to CEQA Guidelines Section 15093, and a Mitigation, Monitoring, and Reporting Plan pursuant to Public Resources Code Section 21081.6 and CEQA Guidelines Section 15097, as required by CEQA and which are included as Attachment F (Attachment 1 to the Resolution) and incorporated herein by reference; and

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board does hereby adopt, pursuant to the authority granted by law, Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 as set forth in the attached, and incorporated herein by reference; and

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board requests that Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 be submitted into the State Implementation Plan; and

BE IT FURTHER RESOLVED, that the Executive Officer is hereby directed to forward a copy of this Resolution and Proposed Amended Rules 1146, 1146.1, and 1146.2 and Proposed Rule 1100 to the California Air Resources Board for approval and subsequent submittal to the U.S. Environmental Protection Agency for inclusion into the State Implementation Plan.

DATE: _____ _____

CLERK OF THE BOARDS

ATTACHMENT F

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Attachment 1 to the Governing Board Resolution for:
Final Subsequent Environmental Assessment for Proposed Amended Rules 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Proposed Rule 1100 – Implementation Schedule for NOx Facilities

Findings, Statement of Overriding Considerations, and Mitigation, Monitoring, and Reporting Plan

SCAQMD No. 04022018DT/200811127/070108BAR/032206BAR

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INTRODUCTION

As a result of control measure CMB-05 - Further NOx Reductions from RECLAIM Assessment, from the 2016 Air Quality Management Plan (AQMP), the South Coast Air Quality Management District (SCAQMD) Governing Board directed staff to begin the process of transitioning the current regulatory structure for facilities subject to SCAQMD Regulation XX – Regional Clean Air Incentives Market (RECLAIM) for emissions of oxides of nitrogen (NOx) from to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. SCAQMD staff conducted a programmatic analysis of the NOx RECLAIM equipment at each facility to determine if there are appropriate and up-to-date Best Available Retrofit Control Technology (BARCT) NOx limits within existing SCAQMD command-and-control rules for all RECLAIM equipment. This analysis concluded that command-and-control rules would need to be adopted and/or amended to reflect current BARCT and provide implementation timeframes for achieving BARCT. Consequently, SCAQMD staff determined that RECLAIM facilities should not exit RECLAIM unless their NOx emitting equipment is subject to an adopted BARCT rule.

Thus, SCAQMD has begun this transition process by proposing amendments to Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters. Proposed Amended Rules (PARs) 1146, 1146.1, and 1146.2 (collectively referred to herein as the PARs 1146 series) is one of the first set of rules to be amended to transition equipment from the NOx RECLAIM program to a command-and-control regulatory structure while achieving BARCT. As a result of the BARCT assessment conducted for PARs 1146 and 1146.1, some units at non-RECLAIM facilities will also be affected and will be required to meet BARCT NOx emissions equivalency according to the compliance schedule specified in PARs 1146 and 1146.1. Specifically, if adopted, PARs 1146 series would: 1) expand the applicability to include units at NOx RECLAIM facilities; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NOx concentration limits in Rules 1146 and 1146.1; 3) extend the compliance date for RECLAIM facilities replacing Rule 1146 or 1146.1 units and require a permit application submittal for unit(s) being replaced; 4) require RECLAIM facilities with Rule 1146.2 units to meet applicable NOx emission limits by December 31, 2023, unless a more stringent BARCT limit is subsequently adopted; 5) limit ammonia emissions on new or modified units with applicable air pollution control equipment and require quarterly or annual ammonia source tests if four consecutive quarterly source tests demonstrate compliance; 6) require certain units at non-RECLAIM facilities to meet new NOx emission limits according to the compliance schedules specified in Rules 1146 and 1146.1, whichever is earlier; and 7) allow units at municipal sanitation service facilities to maintain existing NOx emission limits until a Regulation XI rule is adopted or amended.

In addition, SCAQMD staff has developed Proposed Rule (PR 1100), an administrative rule which establishes the compliance schedule for the Rule 1146 and 1146.1 units at RECLAIM facilities. The compliance schedule for PARs 1146 and 1146.1 will be a two- to four-year period depending on the equipment size, number of affected units at each facility, and based on how the facility will meet the compliance schedule and NOx emission limits (e.g., burner retrofit, SCR system installation, or equipment replacement). Further, facilities with multiple units subject to multiple

source-specific landing rules (e.g., SCAQMD rules other than the PARs 1146 series) will also be taken into consideration.

NOx RECLAIM facilities with equipment subject to PARs 1146 and 1146.1 will be required to meet the NOx emission limits in these rules in accordance with the implementation schedule outlined in PR 1100. In addition, a subset of units at non-RECLAIM facilities will be required to meet new NOx emission limits according to the compliance schedule specified in PARs 1146 and 1146.1. Implementation of the proposed project is estimated to reduce NOx emissions by 0.27 ton per day by January 1, 2023.

PARs 1146 series and PR 1100 are considered a "project" as defined by the California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000 et seq.). The SCAQMD, as Lead Agency for the proposed project, prepared a Subsequent Environmental Assessment (SEA) which analyzes the potential adverse environmental impacts that could be generated as a result of the proposed project. Analysis of the proposed project in the SEA indicated that while the project will reduce NOx emissions, complying with PARs 1146 series and PR 1100 may cause some facility operators to make physical modifications to their equipment in order to achieve compliance, and these activities may create secondary adverse environmental impacts. For example, in order to comply with the proposed emission limits, owners/operators may need to retrofit existing equipment by installing selective catalytic reduction (SCR) systems and ultra-low NOx burners on the affected equipment units. The SEA identified and analyzed activities associated with installing new SCR systems or ultra-low NOx burners on the affected equipment units. Thus, the analysis in the SEA concluded that only the topic of hazards and hazardous materials due to the storage and use of aqueous ammonia was identified has having potentially significant adverse impacts if the project is implemented.

Pursuant to CEQA Guidelines Section 15252, mitigation measures are required to avoid or reduce any potential significant adverse impacts that a project might have on the environment. As such, mitigation measures were crafted to reduce the severity of the potentially significant adverse hazards and hazardous materials impacts. However, even after mitigation measures are applied, the potentially significant adverse environmental impacts cannot be fully mitigated to less than significant levels. In addition, because there are remaining significant impacts to the topic of hazards and hazardous materials after mitigation measures are applied, project alternatives are also required. An alternatives analysis was included in the Chapter 5 of the Final SEA; however, no project alternative was identified that would reduce these impacts to insignificance while achieving the project's goals and objectives. No other environmental topic areas were identified in the SEA as having potentially significant adverse impacts.

A Draft SEA was circulated for a 45-day public review and comment period from April 3, 2018 to May 18, 2018 (referred to herein as the original Draft SEA) and four comment letters were received. Because changes were made to the project description after the comment period for the original Draft SEA ended, SCAQMD staff revised the original Draft SEA and prepared a Revised Draft SEA which included a revised project description, a revised environmental analysis, the comment letters received relative to the original Draft SEA and responses to the comments. The Revised Draft SEA, which superseded the original Draft SEA, was circulated for a 45-day public review and comment period from September 27, 2018 to November 13, 2018; no comment letters were received relative to the Revised Draft SEA. The comment letters and responses relative to the original Draft SEA have been included in Appendix G of the Final SEA.

Subsequent to release of the Revised Draft SEA for public review and comment, minor modifications were made to PARs 1146 and PR 1100. Some of the revisions were made in response to verbal and written comments during the rule development process. The minor modifications include: 1) the addition, revision, and removal of definitions for clarification; 2) rewording and renumbering of rule language; 3) the addition of requirements to conduct either quarterly or annual source tests (after a facility demonstrates compliance with four consecutive quarterly source tests) to demonstrate compliance with the ammonia emissions limit for new or modified air pollution control devices using ammonia; and 4) allowing units at municipal sanitation service facilities to maintain existing NOx emission limits until a Regulation XI is adopted or amended.. Staff has reviewed the modifications to PARs 1146 series and PR 1100 and concluded that none of the revisions: 1) constitute significant new information; 2) constitute a substantial increase in the severity of an environmental impact; or 3) provide new information of substantial importance relative to the Revised Draft SEA. In addition, revisions to PARs 1146 series and PR 100 in response to verbal or written comments during the rule development process would not create new, avoidable significant effects. As a result, these revisions do not require recirculation of the Revised Draft SEA pursuant to CEQA Guidelines Sections 15073.5 and 15088.5. The Revised Draft SEA has been revised to include the aforementioned modifications such that it is now the Final SEA.

SIGNIFICANT ADVERSE IMPACTS WHICH CAN BE REDUCED BELOW A SIGNIFICANT LEVEL OR WERE CONCLUDED TO BE INSIGIFICANT

The Final SEA for PARs 1146 series and PR 1100 relies on the previous CEQA analyses in the September 2008 Final EA for Rule 1146, the September 2008 Final EA for Rule 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program Environmental Impact Report (EIR) for the 2016 AQMP[1]. As such, the Final SEA relies on the conclusions reached in these documents as evidence for environmental areas where impacts were found not to be significant. Each of these previous CEQA documents reviewed approximately 17 environmental topic areas and analyzed whether the respective projects would create potentially significant adverse impacts. While the analyses in the September 2008 Final EA for Rule 1146.1 and May 2006 Final EA for Rule 1146.2 identified no significant adverse environmental impacts for any environmental topic area, the analysis in the September 2008 Final EA for Rule 1146 identified two environmental topic areas as having significant adverse environmental impacts: 1) air quality; and 2) hazards and hazardous materials.

Also, the analysis in the March 2017 Final Program EIR for the 2016 AQMP concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measures for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: (a) increased flammability of solvents; (b)

[1] - September 2008 Final EA for Rule 1146: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146.pdf
- September 2008 Final EA for Rule 1146.1: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146-1.pdf
- May 2006 Final EA for Rule 1146.2: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2006/final-ea-for-proposed-amended-rule-1146-2.doc
- March 2017 Final Program EIR for the 2016 AQMP: http://www.aqmd.gov/home/research/documents-reports/lead-agency-scaqmd-projects/scaqmd-projects---year-2017

storage, accidental release and transportation of ammonia; (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. It is important to note, however, that for these environmental topic areas, not all of the conclusions of significance are applicable to this currently proposed project, PARs 1146 series and PR 1100. The following, Table 1, summarizes the significant and unavoidable adverse environmental impacts identified in the March 2017 Final Program EIR and identifies which topic areas apply to the currently proposed project, PARs 1146 series and PR 1100.

Table 1
Applicability of Significant Impacts Identified in the March 2017 Final Program EIR to the Currently Proposed Project (PARs 1146 series and PR 1100)

Environmental Topic Areas Concluded to have Significant Impacts in the March 2017 Final Program EIR	Applicable to/Significant for the Currently Proposed Project?	Explanation
Aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships	No	Neither catenary lines nor the use of bonnet technology for ships are applicable to boilers, process heaters, steam generators and water heaters and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems) subject to PARs 1146 series or PR 1100.
Construction air quality and GHGs	Yes	The impacts for this environmental topic area are analyzed in the Final SEA because construction activities are expected to occur if the proposed project is implemented.
Energy due to increased electricity demand	No	While the use of SCR systems for 55 boilers will require some electricity to operate, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1 have demonstrated that the amount of electricity that would be needed to operate SCR systems would be less than significant. Similarly, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1, and the March 2006 Final EA for Rule 1146.2 have also demonstrated that the amount of electricity that would be needed to replace burners with ultra-low NOx burners would also be less than significant.
Hazards and hazardous materials due the increased flammability of solvents	No	Boilers, process heaters, steam generators and water heaters, and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems) subject to PARs 1146 series or PR 1100 do not utilize solvents for their operation.
Hazards and hazardous materials due to the storage, accidental release and transportation of ammonia	Yes	The impacts for this environmental topic area are analyzed in the Final SEA because SCR systems utilize ammonia.

Table 1 (concluded)
Applicability of Significant Impacts Identified in the March 2017 Final Program EIR to the Currently Proposed Project (PARs 1146 series and PR 1100)

Environmental Topic Areas Concluded to have Significant Impacts in the March 2017 Final Program EIR	Applicable to/Significant for the Currently Proposed Project?	Explanation
Hazards and hazardous materials due to the storage and transportation of LNG	No	Boilers, process heaters, steam generators and water heaters, and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems) subject to PARs 1146 series or PR 1100 do not utilize LNG for their operation.
Hazards and hazardous materials due to proximity to schools	Yes	The impacts for this environmental topic area are analyzed in the Final SEA because some of the affected facilities that will install SCR systems or ultra-low NOx burners are located near schools.
Hydrology (water demand)	No	Boilers, process heaters, steam generators and water heaters, and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems) subject to PARs 1146 series or PR 1100 do not utilize water for their operation.
Construction noise and vibration	No	While the construction activities associated with installing SCR systems for 55 boilers may create some noise and vibration, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1 have demonstrated that the amount of electricity that would be needed to operate SCR systems would be less than significant. Similarly, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1, and the March 2006 Final EA for Rule 1146.2 have also demonstrated that the construction noise and vibration that may occur while replacing burners with ultra-low NOx burners would also be less than significant.
Solid construction waste and operational waste from vehicle and equipment scrapping	No	Vehicle scrapping is not applicable to boilers, process heaters, steam generators and water heaters and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems) subject to PARs 1146 series or PR 1100.
Transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors	No	Catenary lines and the associated transportation and traffic impacts on roadways and at the harbors are not applicable to boilers, process heaters, steam generators and water heaters and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems) subject to PARs 1146 series or PR 1100.

PAR 1146 is expected to have: 1) significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)); and 2) significant effects that were previously examined will be substantially more severe than what was discussed in the September 2008 Final

EA for Rule 1146 and the March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(B)). Similarly, PAR 1146.1 is also expected to have significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146.1 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)). However, PAR 1146.2 is not expected to create new significant effects that were not discussed in the previous May 2006 Final EA for Rule 1146.2 and the March 2017 Final Program EIR for the 2016 AQMP.

As summarized in Table 1, only the environmental topic areas of air quality during construction, and hazards and hazardous materials due to ammonia transportation, storage and use, and hazards and hazardous materials due to facility proximities to schools were identified as germane to the environmental analysis for PARs 1146 series and PR 1100. For this reason, only these three topic areas were analyzed in the Final SEA.

The analysis in the Final SEA concluded that construction air quality impacts can range from less than significant for all criteria air pollutants to significant levels for NOx, depending on the number of equipment under construction on a peak day, and whether the construction activities for multiple equipment overlap on a peak day. For example, while the initial construction of one SCR system would result in a temporary increase in construction emissions, the quantity of emissions would not exceed any of the air quality significance thresholds on a peak day and the same is true for the initial construction of one to 10 ultra-low NOx burners on a peak day. However, under the circumstance where the construction of five SCR systems overlap construction of 10 ultra-low NOx burners, the NOx emissions from these overlapping construction activities are shown to exceed the SCAQMD's significance threshold for NOx. However, these significant impacts will be reduced to less than significant levels by implementation of the proposed project, by design, because a concurrent operational air quality benefit would result due to the overall NOx emissions reductions of 0.20 ton per day (405 pounds per day) that are expected to occur by January 1, 2021, or 0.27 ton per day (540 pounds per day) that are expected to occur by January 1, 2023 as the installation of SCR systems and ultra-low NOx burners occur over time. For example, as construction is completed for each SCR system or ultra-low NOx burner, there will be immediate, corresponding NOx emission reductions from the operation of each new SCR system or ultra-low NOx burner, and these NOx emission reductions will continue to accumulate and are expected to substantially offset any significant increase of NOx emissions to less than significant levels in the event that there are overlapping construction activities of five SCR systems and 10 ultra-low NOx burners on a peak day. For these reasons, the Final SEA concluded that the construction air quality impacts would be reduced to less than significant levels from concurrent NOx emission reductions.

The Final SEA also concluded that the hazards and hazardous materials impacts due to the transportation of aqueous ammonia would be less than significant.

Finally, the analysis in the Final SEA concluded that the hazards and hazardous materials impacts due to facility proximities to schools was entirely dependent upon whether the affected facilities would be expected to install SCR systems, which in turn would require the storage and use of aqueous ammonia (the hazard of concern). Thus, if a SCR system is installed at a facility that is not located near a school or a sensitive receptor, then the Final SEA concluded that the hazards and hazardous materials impacts due to proximities to schools would be less than significant.

Aside from the topic of hazards and hazardous materials due to the storage and use of aqueous ammonia, the conclusions reached for the other environmental topic areas in the Final SEA are

consistent with the conclusions reached in the previously certified CEQA documents (e.g., the September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP) such that there would be no other significant adverse effects from the implementation of the proposed project. Thus, the proposed project would either have no impact or less than significant direct or indirect adverse effects on the following environmental topic areas:

- aesthetics
- air quality and greenhouse gases
- agriculture and forestry resources
- biological resources
- cultural resources
- energy
- geology and soils
- hydrology and water quality
- land use and planning
- mineral resources
- noise
- population and housing
- public services
- recreation
- solid and hazardous waste
- transportation and traffic

POTENTIAL SIGNIFICANT ADVERSE IMPACTS THAT CANNOT BE REDUCED BELOW A SIGNIFICANT LEVEL

The Final SEA identified the topic of hazards and hazardous materials due to the storage and use of aqueous ammonia resulting from the installation of SCR systems as the only area that may be significantly adversely affected by the proposed project. The analysis in the Final SEA also concluded that the hazards and hazardous materials impacts due to facility proximities to schools (as well as other sensitive receptors) was entirely dependent upon whether the affected facilities would be expected to install SCR systems. Further, the number of aqueous ammonia storage tanks to be installed per facility, the location of the tanks to be installed on each property relative to any nearby schools or other sensitive receptors, and the capacity of the storage tanks, all factor into the overarching conclusion of significant for hazards and hazardous materials due to the storage and use of aqueous ammonia needed for SCR systems. A facility could choose to replace their existing unit with a new unit that meets the NOx emission limits instead of installing SCR systems; thus, resulting in the elimination of the need to store and use aqueous ammonia.

If significant adverse environmental impacts are identified in a CEQA document, the CEQA document shall describe feasible measures that could minimize or eliminate the impacts of the proposed project. The only air pollution control equipment that is currently available on the market

that is capable of reducing NOx emissions to the levels prescribed in the PARs 1146 series is either SCR systems which requires the use of ammonia or ultra-low NOx burners, which do not require ammonia but may not be capable of achieving as many NOx emission reductions as a SCR system for all unit types. Thus, the Final SEA identified the topic of hazards and hazardous materials due to the storage and use of aqueous ammonia for SCR systems as having potentially significant adverse impacts that cannot be reduced below a significant level.

The Final SEA contains mitigation measures to address these potentially significant adverse impacts. While it is entirely possible that individual facilities installing a SCR system may find that implementing the prescribed mitigation measures will effectively reduce or eliminate the risk of offsite consequences of exposure to aqueous ammonia to less than significant levels at the facility level, because of the varying operational needs and locations of the affected facilities that may install SCR systems and their proximity to sensitive receptors as a result of the proposed project, the Final SEA could not conclusively determine for every facility that installs a SCR system that they would be able to fully eliminate or reduce the significant adverse hazards and hazardous materials impacts for the storage and use of aqueous ammonia to less than significant levels . For this reason, the Final SEA concluded that the hazards and hazardous materials impacts due to the storage and use of aqueous ammonia for SCR systems would remain significant if PARs 1146 series and PR 1100 is implemented, even after mitigation measures are applied.

FINDINGS

Public Resources Code Section 21081 and CEQA Guidelines Section 15091(a) state that no public agency shall approve or carry out a project for which a CEQA document has been completed which identifies one or more significant adverse environmental effects of the project unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. Additionally, the findings must be supported by substantial evidence in the record. CEQA Guidelines Section 15091(b)]. As stated in the Final SEA and summarized above, the proposed project has the potential to create significant adverse hazards and hazardous materials impacts for the storage and use of aqueous ammonia; therefore, findings are required. The SCAQMD Governing Board, therefore, makes the following findings regarding the proposed project. The findings are supported by substantial evidence in the record as explained in each finding. These findings will be included in the record of project approval and will also be noted in the Notice of Decision. The findings made by the SCAQMD Governing Board are based on the following significant adverse impact identified in the Final SEA.

Based on the analysis, the potential location(s) of the aqueous ammonia storage tanks at some facilities and their proximity to sensitive receptors could potentially have a significant impact from hazards and hazardous materials that cannot be mitigated to insignificance.

Finding and Explanation:

As explained earlier, PARs 1146 series and PR 1100 is concluded to result in significant adverse hazards and hazardous materials impacts for the storage and use of aqueous ammonia near the proximity of sensitive receptors. The Governing Board finds that mitigation measures have been identified, but there are no feasible mitigation measures that would eliminate or reduce the aforementioned significant adverse hazards and hazardous materials impacts to less than significant levels. No other feasible mitigation measures have been identified. CEQA defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of

time, taking into account economic, environmental, social, and technological factors." [Public Resources Code Section 21061.1 and CEQA Guidelines Section 15364].

The Governing Board finds further that the Final SEA considered alternatives pursuant to CEQA Guidelines Section 15126.6, but aside from the No Project Alternative (identified as Alternative A in Chapter 5 of the Final SEA) or having the facilities only install ultra-low NOx burners (identified Alternative D in Chapter 5), there are no other alternatives that would reduce to insignificant levels the significant hazards and hazardous materials impacts identified for the proposed project and still achieve the objectives of the proposed project because under Alternative A, no facilities would have equipment meeting BARCT level equivalency and under Alternative D, some facilities would have equipment meeting BARCT level equivalency, but less NOx emission reductions would be achieved overall.

Conclusion

The Governing Board finds that the findings required by CEQA Guidelines Section 15091(a) are supported by substantial evidence in the record. The administrative record for the CEQA document and adoption of PARs 1146 series and PR 1100 is maintained by the Office of Planning, Rule Development and Area Sources. The record of approval for this project may be found in the SCAQMD's Clerk of the Board's Office located at SCAQMD headquarters in Diamond Bar, California.

STATEMENT OF OVERRIDING CONSIDERATIONS

If significant adverse impacts of a proposed project remain after incorporating mitigation measures or no measures or alternatives to mitigate the significant adverse impacts are identified, the lead agency must make a determination that the benefits of the project outweigh the unavoidable adverse environmental effects if it is to approve the project. CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project. [CEQA Guidelines Section 15093(a)]. If the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable." [CEQA Guidelines Section 15093(a)]. Accordingly, a Statement of Overriding Considerations regarding the potentially significant adverse operational NOx air quality impacts resulting from the proposed project has been prepared. This Statement of Overriding Considerations is included as part of the record of the project approval for the proposed project. Pursuant to CEQA Guidelines Section 15093(c), the Statement of Overriding Considerations will also be noted in the Notice of Decision for the proposed project.

Despite incorporating mitigation measures into the proposed project, the mitigation measures cannot reduce or eliminate the potentially significant adverse hazards and hazardous material impacts to a level of insignificance; the SCAQMD's Governing Board finds that the following benefits and considerations outweigh the significant unavoidable adverse environmental impacts:

1. The analysis of potential adverse environmental impacts incorporates a "worst-case" approach. This entails the premise that whenever the analysis requires that assumptions be made, those assumptions that result in the greatest adverse impacts are typically chosen. The analysis in the Final SEA contained conservative assumptions that the implementation of PARs 1146

series and PR 1100 would result in multiple facilities installing one or more SCR systems with an accompanying ammonia storage tank even though each facility could consider other factors (e.g., age of the burner, cost, etc.) and instead replace an entire unit with new equipment that is capable of meeting the NOx emission limits without needing a SCR system. The analysis in the Final SEA also assumed that for any facility anticipated to install multiple SCR systems, one ammonia storage tank with a sufficient capacity to service all SCR systems would also be installed. Depending on the quantity of aqueous ammonia that may be needed for each SCR system, the locations of each SCR system and aqueous ammonia tank, the availability of space at each facility, and/or cost, multiple, smaller aqueous ammonia storage tanks could be installed instead of one large ammonia storage tank. However, to conduct a "worst-case" analysis of the potential for creating significant adverse hazards and hazardous materials impacts from the catastrophic failure of an aqueous ammonia storage tank, the largest sized aqueous ammonia tank and the distance of each aqueous ammonia tank to nearby sensitive receptors was relied upon to determine whether the toxic endpoint (calculated using EPA RMP*Comp) would create a significant offsite consequence. In the analysis, the EPA RMP*Comp model only has the capability of evaluating the hazard potential of 20 percent aqueous ammonia. Therefore, the potentially significant adverse impacts from the storage and use aqueous ammonia was evaluated based on the 20 percent aqueous ammonia. However, to minimize the hazards associated with using aqueous ammonia, it is the policy of the SCAQMD to require the use of 19 percent by volume aqueous ammonia in air pollution control equipment for the following reasons: 1) 19 percent aqueous ammonia does not travel as a dense gas like anhydrous ammonia; and 2) 19 percent aqueous ammonia is not on any acutely hazardous materials lists unlike anhydrous ammonia or aqueous ammonia at higher percentages. As such, SCAQMD staff does not issue permits for the use of anhydrous ammonia or aqueous ammonia in concentrations higher than 19 percent by volume for use in SCR systems. Thus, the offsite consequence analysis for an aqueous ammonia release at a 20 percent concentration likely overestimates the risk.

2. Although the prescribed mitigation measures may be able to reduce or eliminate the hazards and hazardous impacts to levels of insignificance at some individual facilities, because of the varying operational needs and locations of the affected facilities that may install SCR systems and their proximity to sensitive receptors as a result of the proposed project, the Final SEA could not conclusively determine for every facility that installs a SCR system that each one would be able to fully eliminate or reduce the significant adverse hazards and hazardous materials impacts for the storage and use of aqueous ammonia to less than significant levels. At the time each affected facility submits an application for a Permit to Construct for a SCR system and corresponding aqueous ammonia storage tank in response to the proposed project, SCAQMD staff will evaluate each facility-specific project to determine if the project is covered by the analysis in the Final SEA and whether the mitigation measures, or any other additional mitigation, could reduce or fully eliminate the hazards or hazardous materials impacts to less than significant levels. In the event that the evaluation of the application for a Permit to Construct for a SCR system and corresponding aqueous ammonia storage tank does not conform to the analysis in the Final SEA, an additional facility-specific CEQA analysis may be required.

3. Although the hazards and hazardous materials impacts are shown to be significant from the implementation of PARs 1146 series and PR 1100, only the use and storage of aqueous ammonia for SCR systems within the proximity of sensitive receptors is expected to be

significant. The Final SEA concluded that the potential impacts due to an accidental release of aqueous ammonia from transportation and delivery activities is less than significant.

4. Although the proposed project could result in significant adverse hazards and hazardous materials impacts from the storage and use of aqueous ammonia within the proximity of sensitive receptors, overall implementation of the proposed project will achieve substantial NOx emission reductions and improve air quality; thus, providing human health benefits by reducing population exposures to existing NOx emissions. Based on regional modeling analyses performed for the 2016 AQMP, implementing control measures contained in the 2016 AQMP, in addition to the air quality benefits of the existing rules, is anticipated to bring the District into attainment with all national and most state ambient air quality standards. The 2016 AQMP is also expected to achieve the ozone 8-hour standard by 2023.

5. The Governor approved Assembly Bill (AB) 617 on July 26, 2017, which addresses non-vehicular air pollution including criteria pollutants and TACs. AB 617 is a companion legislation to approved AB 398, which extends California's cap-and-trade program for reducing GHG emissions from stationary sources. AB 398 requires Air Districts to develop by January 1, 2019 an expedited schedule for the implementation of BARCT by December 31, 2023 for cap-and-trade facilities. A subset of the affected facilities will be subject to the requirements of ABs 617 and 398. The implementation of the proposed project would achieve BARCT level equivalency for these units.

The SCAQMD's Governing Board finds that the aforementioned considerations outweigh the unavoidable significant effects to the environment as a result of the proposed project.

MITIGATION, MONITORING, AND REPORTING PLAN

Pursuant to CEQA Guidelines Section 15252, mitigation measures are required to avoid or reduce any potential significant adverse impacts that a project might have on the environment. As such, mitigation measures were crafted to reduce the severity of the potentially significant adverse hazards and hazardous materials impacts. When making findings as required by Public Resources Code Section 21081 and CEQA Guidelines Section 15091, the lead agency must adopt a reporting or monitoring program for the changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. [Public Resources Code Section 21081.6 and CEQA Guidelines Section 15097(a)]. Although SCAQMD identified mitigation measures that may be effective in reducing or eliminating the significant adverse impacts from hazards and hazardous materials due to the storage and use of aqueous ammonia at individual facilities, because of the varying operational needs and locations of the affected facilities that may install SCR systems and their proximity to sensitive receptors as a result of the proposed project, the Final SEA could not conclusively determine for every facility that installs a SCR system that they would be able to fully eliminate or reduce the significant adverse hazards and hazardous materials impacts for the storage and use of aqueous ammonia to less than significant levels. For this reason, the Final SEA concluded that the hazards and hazardous materials impacts due to the storage and use of aqueous ammonia needed for operation of SCR systems would remain significant if PARs 1146 series and PR 1100 is implemented, even after mitigation measures are applied. Thus, a mitigation, monitoring, and reporting plan has been developed for PARs 1146 series and PR 1100.

In accordance with CEQA Guidelines Section 15097(a), the lead agency shall adopt a program for monitoring or reporting for the revisions to the project which it has required and the measures it has imposed to mitigate or avoid significant environmental effects. To fulfill this requirement, the SCAQMD has developed this Mitigation, Monitoring, and Reporting Plan to address the mitigation measures required for the significant adverse hazards and hazardous materials impacts that may result from implementing PARs 1146 series and PR 1100. Each operator of any facility required to comply with this Mitigation, Monitoring, and Reporting Plan shall keep records onsite of applicable compliance activities to demonstrate the steps taken to assure compliance with all of the mitigation measures, as applicable.

Hazards and Hazardous Materials Impacts Due to Storage and Use of Aqueous Ammonia

Impacts Summary: The ongoing storage and handling of aqueous ammonia at facilities affected by PARs 1146 series and PR 1100 could create a significant adverse hazards and hazardous materials impact to the public due to the possibility for an accidental spill and release of aqueous ammonia, which could create a potential risk for an offsite public and sensitive receptor exposure.

Ammonia, though not a carcinogen, is a chronic and acutely hazardous material. Located on the Material Safety Data Sheet (MSDS) for aqueous ammonia (19 percent by weight), the hazards ratings are as follows: health is rated 3 (highly hazardous), flammability is rated 1 (slight), and reactivity is rated 0 (none). Therefore, an increase in the use of aqueous ammonia in response to the proposed project may increase the current existing risk setting associated with deliveries (i.e., truck and road accidents) and onsite or offsite spills for each facility that currently uses, will begin to use, or will increase the use of ammonia. Exposure to a toxic gas cloud is the potential hazard associated with this type of control equipment. A toxic gas cloud is the release of a volatile chemical such as anhydrous ammonia that could form a cloud and migrate off-site, thus exposing individuals. Anhydrous ammonia is heavier than air such that when released into the atmosphere, it would form a cloud at ground level rather than be dispersed. "Worst-case" conditions tend to arise when very low wind speeds coincide with the accidental release, which can allow the chemicals to accumulate rather than disperse. However, affected facilities would be required to use aqueous ammonia which contains 19 percent by weight so would not form a volatile cloud or be as toxic as anhydrous ammonia release. If released, aqueous ammonia is likely to pool in liquid form and would be captured in a surrounding berm. Any remaining vapor form would be captured by a tertiary containment required under mitigation measure HZ-6. As such, the release impacts of an aqueous ammonia release are not as great as anhydrous ammonia release. In addition, the mitigation measures of secondary and tertiary containment will further reduce, if not eliminate, the exposure to off-site receptors. Possible sources of potential aqueous ammonia releases include aqueous ammonia delivery trucks and aqueous ammonia storage tanks.

In addition, the shipping, handling, storage, and disposal of hazardous materials inherently poses a certain risk of a release to the environment. Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of implementing the proposed project. Further, if a facility installs air pollution control technology that utilizes ammonia, such as SCR systems, the proposed project may alter the transportation modes for feedstock and products to/from the existing facilities such as aqueous ammonia and catalyst. It is important to note, however, that the Final SEA only identified the storage and use of

aqueous ammonia has having potentially significant adverse hazards and hazardous materials impacts requiring mitigation measures. Further, the Final SEA also concluded that the routine transport and disposal of hazardous materials would have less than significant hazards and hazardous materials impacts, such that mitigation measures were not required for this activity.

To the extent that a facility would need to install a new aqueous ammonia storage tank as part of the proposed project, the implementation of mitigation measures HZ-1 through HZ-6 would be expected to prevent a catastrophic release of aqueous ammonia from leaving a facility's property and exposing offsite sensitive receptors, thus, somewhat reducing a potential significant hazards and hazardous materials impact due to storage and use of aqueous ammonia. The analysis conducted in the Final SEA made a conservative assumption that some of the facilities' affected by the proposed project would likely retrofit their units with a SCR system which would require an ammonia storage tank for operation. However, a facility could instead choose to replace their boiler. Although the mitigation measures would reduce the potential impacts for hazards and hazardous materials for facilities choosing to install a SCR system with an accompanying aqueous ammonia storage tank, without knowing the exact location of each storage tank, number of ammonia storage tanks and/or corresponding size of the ammonia storage tank at each facility; it is still conservatively estimated that the proposed project will result in significant impacts of hazards and hazardous materials through the storage and use of aqueous ammonia.

Current SCAQMD practice typically does not allow the use of anhydrous ammonia for air pollution control equipment. Further, to minimize the hazards associated with using ammonia for air pollution control technology, it is the permitting practice of the SCAQMD to typically require the use of 19 percent by volume aqueous ammonia in air pollution control equipment for the following reasons: 1) 19 percent aqueous ammonia does not travel as a dense gas like anhydrous ammonia; and 2) 19 percent aqueous ammonia is not on any acutely hazardous material lists unlike anhydrous ammonia or aqueous ammonia at higher percentages. As such, SCAQMD staff does not typically issue permits for the use of anhydrous ammonia or aqueous ammonia in concentrations higher than 19 percent by volume for use in SCR systems. As a result, this impact summary focuses on the use of 19 percent by volume aqueous ammonia. Thus, because aqueous ammonia (at 19 percent by weight) would be typically required for any permits issued for the installation of air pollution control equipment that utilize ammonia and because MMHZ-1 requires the use of aqueous ammonia at a concentration less than or equal to 19 percent by volume, hazards from toxic clouds are expected to be lessened when compared to higher concentrations of ammonia. As a practical matter, the actual concentration that is typically utilized is a solution of 19 percent aqueous ammonia, which contains approximately 81 percent water. Due to the high water content, aqueous ammonia is not considered to be flammable. Thus, heat-related hazard impacts such as fires, explosions, and boiling liquid-expanding vapor explosion (BLEVE) are not expected to occur from the increased delivery, storage and use of aqueous ammonia as part of implementing the proposed project.

Further, the accidental release of ammonia from a delivery and use is a localized event (i.e., the release of ammonia would only affect the receptors that are within the zone of the toxic endpoint). The accidental release from offloading aqueous ammonia during a delivery would also be temporally limited in the fact that deliveries are not likely to be made at the same time in the same area and the safety devices required as part of MMHZ-2 further reduce the likelihood of an accidental release. Based on these limitations, it is assumed that an accidental

release would be limited to a single delivery at a single facility at a time. In addition, it is unlikely that an accidental release from both a delivery truck and the stationary storage tank would result in more than the amount evaluated in the catastrophic release of the storage tank because the level of ammonia in the storage tanks would be low or else the delivery trip would not be necessary. In addition, implementation of MMHZ-4 (grating covered trench) and MMHZ-5 (underground gravity drain) would further reduce the impact from an accidental release during the delivery and transfer of aqueous ammonia to the storage tank.

A hazard analysis is dependent on several parameters about the potential hazard such as the capacity of the aqueous ammonia storage tank, the concentration of the aqueous ammonia, meteorological conditions, location of nearest receptor, and the dimensions of secondary containment, if any. If a facility were to install a new aqueous ammonia tank to supply additional aqueous ammonia needed to support to a new SCR system and the effects of an offsite consequence from an accidental release of aqueous ammonia due to a tank rupture was analyzed using the EPA RMP*Comp (Version 1.07) model which did not result in a significant hazards impact to sensitive receptors, the facility operator would not be required to implement the following feasible mitigation measures. However, if the analysis were to determine a significant hazards impact to sensitive receptors (such as in this Final SEA), the facility operator would be required at a minimum to implement the following feasible mitigation measures to reduce the severity of the impacts and prevent a catastrophic release of aqueous ammonia from leaving a facility's property.

Mitigation Measures: Each facility submitting a permit application is required to assess its proximity to sensitive receptors. The following mitigation measures are required for any facility whose operators choose to install a new aqueous ammonia storage tank and the offsite consequence analysis indicates that any sensitive receptor will be located within the toxic endpoint distance. SCAQMD staff will conduct a CEQA evaluation of each facility-specific project proposed in response to the proposed project and determine if the project is covered by the analysis in this Final SEA. In addition, these mitigation measures will be included in a mitigation monitoring and reporting plan as part of issuing SCAQMD permits to construct for the facility-specific project. The mitigation measures will be enforceable by SCAQMD personnel.

<u>Hazards and Hazardous Materials</u>

HZ-1 Require the use of aqueous ammonia at concentrations less than or equal to 19 percent by volume for all facilities regulated by Rules 1146, 1146.1, or 1146.2.

HZ-2 Install safety devices, including but not limited to: continuous tank level monitors (e.g., high and low level), temperature and pressure monitors, leak monitoring and detection system, alarms, check valves, and emergency block valves.

HZ-3 Install secondary containment such as dikes and/or berms to capture 110 percent or more of the storage tank volume in the event of a spill.

HZ-4 Install a grating-covered trench around the perimeter of the delivery bay to passively contain potential spills from the tanker truck during the transfer of aqueous ammonia from the delivery truck to the storage tank.

HZ-5 Equip the truck loading/unloading area with an underground gravity drain that flows to a large on-site retention basin to provide sufficient ammonia dilution to the extent that no hazards impact is possible in the event of an accidental release during transfer of aqueous ammonia.

HZ-6 Install tertiary containment that is capable of evacuating 110 percent or more of the storage tank volume from the secondary containment area.

Implementing Parties: The SCAQMD's Governing Board finds that implementing the mitigation measures HZ-1 through HZ-6 is the responsibility of the owner, operator, or agent of each affected facility who submits a permit application to comply with the proposed project.

Implementation Mechanism: Mitigation measures HZ-1 through HZ-6 shall be included as a condition in the SCAQMD Permit to Construct and Permit to Operate. Further, all information required as part of this Mitigation, Monitoring, and Reporting Plan shall be provided by the owner, operator or agent of the affected facility at the time when an applicant submits a permit application.

Monitoring Agency: The SCAQMD's Governing Board finds that through its discretionary authority to issue and enforce permits for this project and to implement conditions to prevent an air pollution nuisance, the SCAQMD will ensure compliance with mitigation measures HZ-1 through HZ-6. Mitigation, monitoring, and reporting (MMR) will be accomplished as follows:

MMRHZ-1 All aqueous ammonia used and stored onsite shall be at a concentration of less than 19 percent by volume.

Each facility operator shall ensure the concentration of aqueous ammonia used and stored onsite is less than 19 percent by volume. The percent by volume of aqueous ammonia shall be posted on the aqueous ammonia tank at all times. The SCAQMD may conduct inspections of the site to verify compliance.

MMRHZ-2: Safety devices shall be installed on all equipment associated with the use and storage of aqueous ammonia, to the extent feasible.

At the time of submitting an application for a Permit to Construct for an aqueous ammonia storage tank each facility operator shall submit a list of all safety devices installed. Safety devices may include, but are not limited to: continuous tank level monitors (e.g., high and low level), temperature and pressure monitors, leak monitoring and detection system, alarms, check valves, and emergency block valves. Once the aqueous ammonia storage tank becomes operational, each facility operator shall ensure all safety devices are maintained and are functioning properly. All maintenance records shall be kept onsite from the initiation of operations.

MMRHZ-3: All facility operators shall install a secondary containment system such as a dike or berm to capture 110 percent or more of the aqueous ammonia storage tank volume in the event of a spill.

At the time of submitting an application for a Permit to Construct for an aqueous ammonia storage tank each facility operator shall submit plans for a secondary containment system

to capture 110 percent or more of the aqueous ammonia storage tank volume in the event of a spill. Secondary containment systems may include, but are not limited to: a dike or berm. Once the aqueous ammonia storage tank becomes operational, each facility operator shall ensure all secondary containment systems are maintained, free of detritus, and are functioning properly. All maintenance records shall be kept onsite from the initiation of operations.

MMRHZ-4: All facility operators shall install a grating-covered trench around the perimeter of the aqueous ammonia delivery bay to passively contain potential spills from the tanker truck during the transfer of aqueous ammonia from the delivery truck to the storage tank.

At the time of submitting an application for a Permit to Construct for an aqueous ammonia storage tank each facility operator shall submit plans for installation of a grating covered trench around the perimeter of the delivery bay to passively contain spills from the tanker truck during the transfer of aqueous ammonia from the delivery truck to the aqueous ammonia storage tank. Once the aqueous ammonia storage tank becomes operational, each facility operator shall ensure the grating-covered trench is maintained, free of detritus, and is functioning properly. All maintenance records shall be kept onsite from the initiation of operations.

MMRHZ-5: All facility operators shall equip the truck loading/unloading area with an underground gravity drain that flows to a large on-site retention basin to provide sufficient ammonia dilution to the extent that no hazards impact is possible in the event of an accidental release during transfer of aqueous ammonia.

At the time of submitting an application for a Permit to Construct for an aqueous ammonia storage tank each facility operator shall submit plans for installation of a an underground gravity drain that flows to a large on-site retention basin to provide sufficient ammonia dilution to the extent that no hazards impact is possible in the event of an accidental release during transfer of aqueous ammonia. Once the aqueous ammonia storage tank becomes operational, each facility operator shall ensure the underground gravity drain is maintained, free of detritus, and is functioning properly. All maintenance records shall be kept onsite from the initiation of operations.

MMRHZ-6: All facility operators shall install a tertiary containment system capable of evacuating 110 percent or more of the aqueous ammonia storage tank volume from the secondary containment area.

At the time of submitting an application for a Permit to Construct for an aqueous ammonia storage tank each facility operator shall submit plans for a tertiary containment system to capture 110 percent or more of the aqueous ammonia storage tank volume from the secondary containment area in the event of a spill. Once the aqueous ammonia storage tank becomes operational, each facility operator shall ensure all tertiary containment systems are maintained, free of detritus, and are functioning properly. All maintenance records shall be kept onsite from the initiation of operations.

CONCLUSION

Based on a "worst-case" analysis, the potential adverse hazards and hazardous materials impacts from the adoption and implementation of PARs 1146 series and PR 1100 are considered significant and unavoidable. Some feasible mitigation measures have been identified that would reduce the level of significant adverse hazards and hazardous materials impacts associated with implementing the PARs 1146 series and PR 1100; however, the mitigation measures cannot be sure to reduce the entire project to less than significant levels. Further, no project alternatives have been identified that would reduce these impacts to insignificance while achieving the project's goals and objectives of NOx emissions reductions and BARCT level equivalency.

(Adopted September 9, 1988)(Amended January 6, 1989)
(Amended May 13, 1994)(Amended June 16, 2000)
(Amended November 17, 2000)(Amended September 5, 2008)
(Amended November 1, 2013)(PAR December 7, 2018)

PROPOSED AMENDED RULE 1146. EMISSIONS OF OXIDES OF NITROGEN FROM INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS, AND PROCESS HEATERS

(a) Applicability

This rule applies to boilers, steam generators, and process heaters of equal to or greater than 5 million Btu per hour rated heat input capacity used in all industrial, institutional, and commercial operations. ~~with the exception of:~~

~~(1) boilers used by electric utilities to generate electricity; and~~

~~(2) boilers and process heaters with a rated heat input capacity greater than 40 million Btu per hour that are used in petroleum refineries; and~~

~~(3) sulfur plant reaction boilers.~~

~~(4) RECLAIM facilities (NOx emissions only)~~

(b) Definitions

(1) ADSORPTION CHILLER UNIT means any natural gas fired unit that captures and uses waste heat to provide cold water for air conditioning and other process requirements.

~~(2) ANNUAL CAPACITY FACTOR means the ratio of the amount of fuel burned by a unit in a calendar year to the amount of fuel it could have burned if it had operated at the rated heat input capacity for 100 percent of the time during the calendar year.~~

(~~3~~2) ANNUAL HEAT INPUT means the ~~actual amount of heat released by fuels burned in~~ total heat input to a unit during a calendar year.

(~~4~~3) ATMOSPHERIC UNIT means any natural gas fired unit with a heat input less than or equal to 10 million Btu per hour with a non-sealed combustion chamber in which natural draft is used to exhaust combustion gases.

(~~5~~4) BOILER or STEAM GENERATOR means any combustion equipment fired with liquid and/or gaseous (including landfill and digester gas) and/or solid fossil fuel and used to produce steam or to heat water, and that is not used exclusively to produce electricity for sale. Boiler or Steam Generator does not include any open heated tank, adsorption chiller unit, or waste heat

recovery boiler that is used to recover sensible heat from the exhaust of a combustion turbine or any unfired waste heat recovery boiler that is used to recover sensible heat from the exhaust of any combustion equipment.

(~~6~~5) BTU means British thermal unit(s).

(~~7~~6) COMMERCIAL OPERATION means any office building, lodging place, or similar location designed for tenancy by one or more business entities or residential occupants.

(7) FIRE-TUBE BOILER means any boiler that passes hot gases from a fire box through one or more tubes running through a sealed container of water. The heat of the gases is transferred through the walls of the tubes by thermal conduction, heating the water and ultimately creating steam.

(8) FORMER RECLAIM FACILITY means a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program.

(~~8~~9) GROUP I UNIT means any unit burning natural gas with a rated heat input capacity greater than or equal to 75 million Btu per hour, excluding thermal fluid heaters and units operated at schools and universities.

(~~9~~10) GROUP II UNIT means any unit burning gaseous fuels, excluding digester and landfill gases, with a rated heat input capacity less than 75 million Btu per hour down to and including 20 million Btu per hour, excluding thermal fluid heaters and units operated at schools and universities.

(~~10~~11) GROUP III UNIT means any unit burning gaseous fuels, excluding digester and landfill gases, ~~and thermal fluid heaters~~ with a rated heat input capacity less than 20 million Btu per hour down to and including 5 million Btu per hour, and all units operated at schools and universities greater than or equal to 5 million Btu per hour, excluding atmospheric units and thermal fluid heaters.

(~~11~~12) HEALTH FACILITY has the same meaning as defined in Section 1250 of the California Health and Safety Code.

(~~12~~13) HEAT INPUT means the chemical heat released due to ~~fuel~~ assumed complete combustion of fuel in a unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.

(~~13~~14) INDUSTRIAL OPERATION means any entity engaged in the production and/or provision of chemicals, foods, textiles, fabricated metal products, real estate, personal services or other kindred or allied products or services.

(~~14~~15) INSTITUTIONAL OPERATION means any public or private establishment constituted to provide medical, educational, governmental, or other similar services to promote safety, order, and welfare.

(16) MODIFICATION means any physical change that meets the criteria set forth in Rule 1302 – Definitions.

(17) MUNICIPAL SANITATION SERVICES means basic sanitation services provided to the residents of a municipality by sewage treatment plants and municipal solid waste landfills.

(18) NON-RECLAIM FACILITY means a facility, or any of its successors, that was not in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.

(~~15~~19) NOx EMISSIONS means the sum of nitric oxides and nitrogen dioxides ~~in the flue gas~~emitted, ~~collectively expressed~~calculated as nitrogen dioxide.

(~~16~~20) OPEN HEATED TANK means a non-pressurized self-heated tank that may include a cover or doors that can be opened or detached to put in or remove parts, components or other material for processing in the tank. Tanks heated solely by an electric heater, boiler, thermal fluid heater or heat recovered from another process using heat exchangers are excluded from this definition.

(~~17~~21) PROCESS HEATER means any combustion equipment fired with liquid and/or gaseous (including landfill and digester gas) and/or solid fossil fuel and which transfers heat from combustion gases to water or process streams. Process Heater does not include any kiln or oven used for drying, curing, baking, cooking, calcining, or vitrifying; or any unfired waste heat recovery heater that is used to recover sensible heat from the exhaust of any combustion equipment.

(~~18~~22) RATED HEAT INPUT CAPACITY means the heat input capacity as specified by the permit issued by the Executive Officer, or if not specified on the permit, as specified on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the new maximum heat input shall be considered as the rated heat input capacity.

(23) RECLAIM FACILITY means a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.

(~~19~~24) SCHOOL means any public or private school, including juvenile detention facilities with classrooms, used for purposes of the education of more than 12 children at the school, including in kindergarten and grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes. The term includes any building or structure, playground, athletic field, or other area of school property, but does not include unimproved school property.

~~(20) STANDBY BOILER is a boiler which operates as a temporary replacement for primary steam or hot water while the primary steam or hot water supply unit is out-of-service.~~

(~~21~~25) THERM means 100,000 Btu.

(~~22~~26) THERMAL FLUID HEATER means a natural gas fired process heater ~~PROCESS HEATER~~ in which a process stream is heated indirectly by a heated fluid other than water.

(~~23~~27) UNIT means any boiler, steam generator, or process heater as defined in paragraph (b)(~~5~~4) or (b)(~~17~~21) of this subdivision.

(c) Requirements

Notwithstanding the exemptions contained in Rule 2001 – Applicability, Table 1 – Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018, the owner or operator of any unit(s) subject to this rule shall not operate the unit in a manner that exceeds the applicable emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), and (c)(4).

(1) The owner or operator shall subject all of the units within the facility to the applicable NOx emission limits ~~and schedules~~ specified in Table 1146-1:

Table 1146-1 – ~~Standard~~ NOx Emission Limits and Compliance Schedule ~~Limits and Schedules~~

Rule Reference	**Category**	**Limit[1]**	**~~Submit Compliance Plan on or before~~**	**~~Submit Application for Permit to Construct on or before~~**	**~~Unit Shall be in Full Compliance on or before~~ Compliance Schedule for Non-RECLAIM Facilities**	**Compliance Schedule for RECLAIM and Former RECLAIM Facilities**
(c)(1)(A)	All Units Fired on Gaseous Fuels	30 ppm or for natural gas fired units 0.036 lbs/10^6 Btu	-	-	September 5, 2008	
(c)(1)(B)	Any Units Fired on Non-gaseous Fuels	40 ppm	-	-	September 5, 2008	

Table 1146-1 – ~~Standard~~ NOx Emission Limits and Compliance Schedule ~~Limits and Schedules~~

(c)(1)(C)	Any Units Fired on Landfill Gas	25 ppm	-	-	January 1, 2015	See Rule 1100 – Implementation Schedule for NOx Facilities
(c)(1)(D)	Any Units Fired on Digester Gas	15 ppm	-	-	January 1, 2015	
(c)(1)(E)	Atmospheric Units	12 ppm or 0.015 lbs/10^6 Btu	~~January 1, 2010~~	~~January 1, 2013~~	January 1, 2014	
(c)(1)(F)	Group I Units	5 ppm or 0.0062 lbs/10^6 Btu	-	~~January 1, 2012~~	January 1, 2013	
(c)(1)(G)	Group II Units (Fire-tube boilers with a previous NOx limit ≤less than or equal to 9~~12~~ ppm and ≥greater than 5 ppm prior to [*date of amendment*]) ~~75% or more of units (by heat input)~~	7 ppm or 0.0085 lbs/10^6 Btu ~~9 ppm or 0.011 lbs/10^6 Btu~~	~~January 1, 2010~~	~~January 1, 2011~~	~~January 1, 2012~~ See (c)(7)(A)	
(c)(1)(H)	Group II Units (All others with a previous NOx limit ≤less than or equal to12 ppm and ≥greater than 5 ppm prior to [*date of amendment*]) ~~100% of units (by heat input)~~	9 ppm or 0.011 lbs/10^6 Btu	~~January 1, 2010~~	~~January 1, 2013~~	January 1, 2014 ~~or See (c)(7)(A)~~	
(c)(1)(I)	Group II Units (All others)	5 ppm or 0.0062 lbs/10^6 Btu			*Date of amendment*	
(c)(1)(~~H~~J)	Group III Units (Fire-tube boilers, excluding units with a previous NOx limit less than or equal to 12 ppm and greater than 9 ppm prior to [*date of amendment*]~~only~~) ~~75% or more of units (by heat input)~~	7 ppm or 0.0085 lbs/10^6 Btu ~~9 ppm or 0.011 lbs/10^6 Btu~~	~~January 1, 2011~~	~~January 1, 2012~~	~~January 1, 2013~~ *Date of amendment* or See (c)(7)(B) for units with a previous NOx limit less than or equal to 9 ppm prior to [*date of amendment*]	
(c)(1)(~~I~~JK)	Group III Units (All others) ~~100% of units (by heat input)~~	9 ppm or 0.011 lbs/10^6 Btu	~~January 1, 2011~~	~~January 1, 2014~~	January 1, 2015 or See (c)~~(7)(B)~~(8) for units with a previous NOx limit less than or equal to 12 ppm prior to September 5, 2008	

Table 1146-1 – ~~Standard~~ NOx Emission Limits and Compliance Schedule ~~Limits and Schedules~~

(c)(1)(L)	Thermal Fluid Heaters	12 ppm or 0.015 lbs/10^6 Btu			*Date of amendment* or See (c)(7)(C) for units with a previous NOx limit ≤less than or equal to 20 ppm prior to [*date of amendment*] or See (e)(2) for units with a previous NOx limit >greater than 20 ppm prior to [*date of amendment*]	
[1] All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.						

~~(2) In lieu of complying with the NOx emission limits and schedules specified in paragraph (c)(1), the owner or operator may elect to subject all of the units within the facility to the requirements specified in Table 1146-2. The owner or operator that fails to submit a Compliance Plan or Application for Permit to Construct pursuant to the schedule specified in Table 1146-1 for any of the Group II units shall be subject to the NOx limits and schedule specified in Table 1146-2.~~

~~Table 1146-2 Enhanced Compliance Limits and Schedule~~

~~**Rule Reference**~~	~~**Category**~~	~~**Limit**~~	~~**Submit Compliance Plan on or before**~~	~~**Submit Application for Permit to Construct on or before**~~	~~**Unit Shall be in Full Compliance on or before**~~
~~(c)(2)(A)~~	~~Group II Units 75% or more of units (by heat input)~~	~~5 ppm or 0.0062 lbs/10^6 Btu~~	~~January 1, 2011~~	~~January 1, 2013~~	~~January 1, 2014~~
~~(c)(2)(B)~~	~~Group II Units 100% of units (by heat input)~~		~~January 1, 2011~~	~~January 1, 2015~~	~~January 1, 2016~~

(2) The owner or operator of any unit(s) operating with air pollution control equipment that results in ammonia emissions in the exhaust shall not discharge into the atmosphere ammonia emissions in excess of 5 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 60 consecutive minutes), except for units complying with paragraph (c)(~~8~~9).

(3) For dual fuel co-fired combustion units a weighted average emission limit calculated by Equation 1146-1 may be used in lieu of the emission limits of Table 1146-1 provided a totalizing fuel flow meter is installed pursuant to paragraph (c)(~~89~~10), for units burning a combination of both fuels.

$$\textbf{Weighted Limit} = \frac{(CL_A \times Q_A) + (CL_B \times Q_B)}{Q_A + Q_B} \qquad \textbf{Equation 1146-1}$$

Where:

CL_A = compliance limit for fuel A
CL_B = compliance limit for fuel B
Q_A = heat input from fuel A
Q_B = heat input from fuel B

(4) The owner or operator of any unit(s) with a rated heat input capacity greater than or equal to 5 million Btu per hour shall not discharge into the atmosphere carbon monoxide (CO) emissions in excess of 400 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) or for natural gas fired units 0.30 lbs/10^6 Btu.

(5) In lieu of complying with the applicable emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), ~~and~~ (c)(4), (e)(1), and (e)(2), the owner or operator of any unit(s) in operation prior to September 5, 2008 at non-RECLAIM facilities, or in operation prior to [*12 months after date of amendment*] at RECLAIM or former RECLAIM facilities with an annual~~n annual~~ heat input less than or equal to 9.0 x 10^9 Btu (90,000 therms) per year, shall:

(A) operate the unit(s) in a manner that maintains stack gas oxygen concentrations at less than or equal to 3 percent on a dry basis for any 15-consecutive-minute averaging period; or

(B) tune the unit(s) at least twice per year, (at intervals from 4 to 8 months apart) in accordance with the procedure described in Attachment 1 or the unit manufacturer's specified tune-up

procedure. If a different tune-up procedure from that described in Attachment 1 is used then a copy of this procedure shall be kept on site. The owner or operator of any unit(s) selecting the tune-up option shall maintain records for a rolling twenty four month period verifying that the required tune-ups have been performed. If the unit does not operate throughout a continuous six-month period within a twelve month period, only one tune-up is required for the twelve month period that includes the entire period of non-operation. For this case, the tune-up shall be conducted within thirty (30) days of start-up. No tune-up is required during a rolling twelve month period for any unit that is not operated during that rolling twelve month period; this unit may be test fired to verify availability of the unit for its intended use but once the test firing is completed the unit shall be shutdown. Records of test firings shall be maintained for a rolling twenty four month period, and shall be made accessible to an authorized District representative upon request.

(6) Notwithstanding the exemptions contained in Rule 2001 – Applicability, Table 1 – Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018, ~~A~~any unit(s) with a rated heat input capacity greater than or equal to 40 million Btu per hour and an annual heat input greater than 200 x 10^9 Btu per year shall have a continuous in-stack nitrogen oxides monitor or equivalent verification system in compliance with Rule 218, Rule 218.1, and 40 CFR ~~part~~ Part 60 Appendix B Specification 2. Maintenance and emission records shall be maintained and made accessible for a period of two years to the Executive Officer.

(7) Notwithstanding paragraph (c)(1), a~~A~~n owner or operator that has installed, modified, or has been issued a SCAQMD Permit to Construct or Permit to Operate for the following units prior to [*date of amendment*], at a non-RECLAIM facility, shall meet the NOx emission limit specified in Table 1146-1 by [*15 years after the date of amendment*] or when 50 percent or more of the unit's burners are replaced, whichever is earlier:~~a Group III natural gas fired unit prior to September 5, 2008 complying with the applicable BACT emission limit of 12 ppm or less of NOx may defer compliance with subparagraphs (c)(1)(I) or (c)(1)(J) until the unit's burner(s) replacement.~~

(A) Group II fire-tube boilers~~units~~ subject to subparagraph (c)(1)(G) ~~or (c)(1)(H)~~ complying with a previous NOx emission limit that is less than or equal to 9 ppm and greater than 5 ppm; or

(B) Group III fire-tube boilers~~units~~ subject to subparagraph (c)(1)(J) ~~or (c)(1)(K)~~ complying with a previous NOx emission limit that is less than or equal to 9~~12~~ ppm; or

(C) Thermal fluid heaters subject to subparagraph (c)(1)(L) complying with a previous NOx emission limit that is less than or equal to 20 ppm.

(8) Notwithstanding the NOx emission limit specified in Table 1146-1 of paragraph (c)(1), by [*15 years after the date of amendment*] or when 50 percent or more of the unit's burners are replaced, whichever is earlier, the owner or operator that has installed, modified, or has been issued a SCAQMD Permit to Operate prior to September 5, 2008 for a Group III natural gas fired unit complying with a previous NOx emission limit of 12 ppm or less and greater than 9 ppm shall not operate in a manner that discharges NOx emissions (reference at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of 9 ppm.

(~~8~~9) An owner or operator that has installed, ~~or~~ modified, or has been issued a SCAQMD Permit to Construct or Permit to Operate prior to [*date of amendment*]~~, at a non-RECLAIM facility~~ for any unit(s) operating with ~~an~~ air pollution control equipment that results in ammonia emissions in the exhaust complying with an ammonia emission limit greater than 5 ppm, ~~as specified in a SCAQMD Permit to Operate, shall meet the ammonia emission limit in (c)(2)~~ when the air pollution control equipment is replaced or modified, the owner or operator shall~~.~~:

(A) Meet the ammonia emission limit in specified in (c)(2); and

(B) During the first 12 months of operation, demonstrate compliance according to the schedule specified in paragraph (d)(3).

(~~8~~9~~10~~) Any owner or operator who chooses the pound per million Btu compliance option specified in paragraph(s) (c)(1) ~~(c)(2),~~ or (c)(4) or chooses the weighted average emission limit using Equation 1146-1 under paragraph (c)(3) shall install a non-resettable totalizing fuel meter to measure the total of each fuel used by each individual unit, as approved by the Executive Officer.

~~(9) The owner or operator of Group II or III units shall submit for the approval of the Executive Officer a compliance plan in accordance with the requirements of Rule 221 – Plans and Rule 306 – Plan Fees by the applicable date specified in Tables 1146-1 or 1146-2. The compliance plan shall include the following information:~~

~~(A) Owner/operator contact information (company name, AQMD facility identification number, contact name, phone number, address, e-mail address).~~

~~(B) Number and size (mmbtu/hr) of Group II and III units located at the facility.~~

~~(C) Selection of the Standard (Table 1146-1) or Enhanced (Table 1146-2) compliance schedule by Group II and III units.~~

~~(D) The owner or operator of more than one unit located within the same facility that have opted to divide the units by heat input for the purpose of separate compliance dates according to Tables 1146-1 or 1146-2 shall indicate which units are categorized 75 percent or more of the heat input and which units make up the remaining 100 percent of the heat input.~~

(~~10~~11) ~~On or after January 1, 2015, a~~An owner or operator of any landfill or digester gas (biogas) unit co-fired with natural gas shall not operate the unit in a manner that exceeds the emission concentration limits specified in subparagraphs (c)(1)(C) or (c)(1)(D), provided that the facility monthly average biogas usage by the biogas units is 90% or more, based on the higher heating value of the fuels used.

(A) The Executive Officer may approve the burning of more than 10% natural gas up to:

(i) 25% natural gas in a biogas fired unit at the 15 ppm (digester gas) or 25 ppm (landfill gas) NOx level, when it is necessary, if the only alternative to limiting natural gas to 10% would be shutting down the unit and flaring more biogas.

(ii) 50% natural gas in a digester gas-fired unit at the 15 ppm NOx level, when it is necessary as specified in clause (c)(~~10~~11)(A)(i) and for units installed on or after September 5, 2008 provided the unit has demonstrated compliance with the NOx limits in paragraph (c)(1) applicable to units fired exclusively on natural gas.

For units subject to this subparagraph, the percent natural gas usage shall be based on the facility monthly average biogas usage by the biogas units and the higher heating value of the fuels used.

(B) Any biogas-fired unit burning more than the approved percent natural gas as determined under subparagraph (c)(~~10~~11)(A) shall comply with the weighted average NOx limit specified in paragraph (c)(3).

(~~11~~12) Notwithstanding the NOx emission limits specified in Table 1146-1 of paragraph (c)(1) and paragraph (e)(3), and until a Regulation XI rule referenced in paragraph (f)(5) is adopted or amended and that rule compliance date occurs, an owner or operator shall not operate units at a municipal sanitation service facility in a manner that discharges NOx emissions (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of:

(A) 9 ppm for Group II and Group III units; or

(B) 9 ppm, upon burner replacement, for Group III units that were installed or modified prior to September 5, 2008 complying with a previous NOx emission limit of 12 ppm or less ~~shall~~; or

(C) 30 ppm for thermal fluid heaters; or

(D) 30 ppm, upon burner replacement, for any low-fuel use unit complying with paragraph (c)(5).

(d) Compliance Determination

The owner or operator of any unit(s) subject to this rule shall meet the following requirements for determining compliance:

(1) An owner or operator of any unit(s) shall have the option of complying with either the pound per million Btu or parts per million emission limits specified in paragraphs (c)(1), ~~(c)(2),~~ (c)(3), and (c)(4).

(2) All emission determinations shall be made in the as-found operating condition, except no compliance determination shall be established during start-up, shutdown, or under breakdown conditions. Start-up and shutdown intervals shall not last longer than is necessary to reach stable conditions. Compliance determination as specified in paragraph (d)(6) shall be conducted at least 250 operating hours, or at least thirty days subsequent to the tuning or servicing of any unit, unless it is an unscheduled repair.

~~(3) All parts per million emission limits specified in subdivision (c) are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.~~

(3) An owner or operator of a unit subject to the ammonia emission limit specified in paragraph (c)(2) shall:

(A) Conduct quarterly a source test to demonstrate compliance with the ammonia emission limit, according to the procedures in District Source Test Method 207.1 for Determination of Ammonia Emissions from Stationary Sources, during the first 12 months of unit operation and thereafter, except that source tests may be conducted annually within 12 months thereafter when four consecutive quarterly source tests demonstrate compliance with the ammonia emission limit. If an annual test is failed, four consecutive quarterly source tests must demonstrate compliance with the ammonia emissions limits prior to resuming annual source tests; or

(B) Utilize an ammonia Continuous Emissions Monitoring System (CEMS) certified under an approved SCAQMD protocol to demonstrate compliance with the ammonia emission limit.

(4) Compliance with the NO_x and CO emission requirements of paragraphs (c)(1), ~~(c)(2),~~ (c)(3), and (c)(4)~~–~~ and the stack-gas oxygen concentration requirement of subparagraph (c)(5)(A) shall be determined using a District approved contractor under the Laboratory Approval Program according to the following procedures:

(A) District Source Test Method 100.1 - Instrumental Analyzer Procedures for Continuous Gaseous Emission Sampling (March 1989), or

(B) District Source Test Method 7.1 - Determination of Nitrogen Oxide Emissions from Stationary Sources (March 1989) and District Source Test Method 10.1 - Carbon Monoxide and Carbon Dioxide by Gas Chromatograph/Non-Dispersive Infrared Detector (GC/NDIR) - Oxygen by Gas Chromatograph-Thermal Conductivity (GC/TCD) (March 1989); or

(C) United States Environmental Protection Agency Conditional Test Method CTM-030, Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions from Natural Gas-Fired Engines, Boilers and Process Heaters Using Portable Analyzers; or

(D) ASTM D6522-00(2005) Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers

(E) any other test method determined to be alternative and approved before the test in writing by the Executive Officers of the District and the California Air Resources Board and the Regional Administrator of the United States Environmental Protection Agency, Region IX; or

(F) a continuous in-stack nitrogen oxide monitor or equivalent verification system as specified in paragraph (c)(6).

Records of all source tests shall be made available to District personnel upon request. Emissions determined to exceed any limits established by this rule through the use of any of the above-referenced test methods shall constitute a violation of this rule.

(5) For any owner or operator who chooses the pound per million Btu of heat input compliance option of paragraph (c)(1), ~~(c)(2),~~ (c)(3), or (c)(4), NO_x emissions in pounds per million Btu of heat input shall be calculated using procedures in 40 CFR Part 60, Appendix A, Method 19, Sections 2 and 3 and CO emissions in pounds per million Btu of heat input shall be calculated according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1.

(6) Compliance determination with the NOx emission requirements in paragraph (d)(4) shall be conducted once:

(A) every three years for units with a rated heat input capacity greater than or equal to 10 million Btu per hour, except for units subject to paragraph (c)(6).

(B) every five years for units with a rated heat input capacity less than 10 million Btu per hour down to and including 5 million Btu per hour.

(7) Provided the emissions test is conducted within the same calendar year as the test required in paragraph (d)(6), an owner or operator may use the following emissions tests to comply with paragraph (d)(6):

(A) Periodic monitoring or testing of a unit as required in a Title V permit pursuant to Regulation XXX, or

(B) Relative accuracy testing for continuous emissions monitoring verification pursuant to Rule 218.1 or 40 CFR ~~part~~ Part 60 Appendix B Specification 2.

(8) Except for units subject to paragraph (c)(6), ~~Any~~ any owner or operator of units subject to this rule shall perform diagnostic emission checks of NOx emissions with a portable NOx, CO, and oxygen analyzer according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1 according to the following schedule:

(A) ~~On or after July 1, 2009, t~~The owner or operator of units subject to paragraphs (c)(1), ~~(c)(2),~~ (c)(3), ~~and~~ or (c)(4) shall check NOx emissions at least monthly or every 750 unit operating hours, whichever occurs later. If a unit is in compliance for three consecutive diagnostic emission checks, without any adjustments to the oxygen sensor set points, then the unit may be checked quarterly or every 2,000 unit operating hours, whichever occurs later, until the resulting diagnostic emission check ~~-~~exceeds the applicable limit specified in paragraphs (c)(1)~~, (c)(2),~~ or (c)(3).

(B) ~~On or after January 1, 2015 or during burner replacement, whichever occurs later, t~~The owner or operator of units subject to~~subject to~~~~complying with~~ the requirements specified in paragraph (c)(5) shall check NOx emissions according to the tune-up schedule specified in subparagraph (c)(5)(B).

(C) Records of all monitoring data required under subparagraphs (d)(8)(A) and (d)(8)(B) shall be maintained for a rolling twelve month period of two years (5 years for Title V facilities) and shall be made available to District personnel upon request.

(D) The portable analyzer diagnostic emission checks required under subparagraph (d)(8)(A) and (d)(8)(B) shall only be conducted by a person who has completed an appropriate District-approved training program in the operation of portable analyzers and has received a certification issued by the District.

(9) An owner or operator shall comply with the requirements as applied to CO emissions specified in paragraph (d)(8) ~~-~~and subparagraph:

(A) (d)(6)(A) for units greater than or equal to 10 million Btu per hour~~mmbtu/hr~~, or

(B) (d)(6)(B) for units less than 10 million Btu per hour~~mmbtu/hr~~.

(10) A diagnostic emission check conducted under the requirements specified in paragraph (d)(8) that finds emissions in excess of those allowed by this rule or a permit condition shall not constitute a violation of this rule if the owner or operator corrects the problem and demonstrate compliance with another emission check within 72 hours from the time the owner or operator knew of excess emissions, or reasonably should have known, or shut~~-~~down the unit by the end of an operating cycle, whichever is sooner.

(11) Notwithstanding the requirements specified in paragraph (d)(10) any diagnostic emission check conducted by District staff that finds emissions in excess of those allowed by this rule or a permit condition is a violation.

(12) An owner or operator may opt to lower the unit's rated heat input capacity. The lowered rated heat input capacity shall not be less than or equal to 2 million Btu per hour and shall be based on manufacturer's identification or rating plate or permit condition.

(e) Compliance Schedule

~~(1) An owner or operator of units subject to paragraph (c)(1) shall comply with the schedule specified in Table 1146-1.~~

~~(2) An owner or operator of units subject to paragraph (c)(2) shall comply with the schedule specified in Table 1146-2.~~

(1) The owner or operator of any unit(s) at a RECLAIM or former RECLAIM facility subject to paragraph (c)(1) shall meet the applicable NOx emission limit in Table 1146-1 in accordance with the schedule specified in Rule 1100 – Implementation Schedule for NOx Facilities.

(2) An owner or operator of a non-RECLAIM facility with any thermal fluid heaters with a NOx emission limit greater than 20 ppm shall:

(A) On or before [*12 months after date of amendment*], submit a complete SCAQMD permit application for each thermal fluid heater that does not currently meet the limit specified in subparagraph (c)(1)(L); and

(B) On or before January 1, 2022, meet the applicable NOx emission limit in Table 1146-1 for thermal fluid heaters subject to subparagraph (c)(1)(L).

(3) By ~~*On or after* January 1, 2015~~ [*15 years after the date of amendment*] or ~~during burner replacement~~when 50 percent or more of the unit's burners are replaced, whichever ~~occurs later~~is earlier, no person shall operate in the District any unit subject to~~subject to~~~~complying with~~ paragraph (c)(5) ~~which~~that discharges into the atmosphere NOx emissions in excess of 12 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes)~~does not meet the emissions limits specified in subparagraph (c)(1)(A) of Table 1146-1~~.

(4) ~~A~~any unit subject to~~subject to~~~~complying with~~ the requirements specified in paragraph (c)(5) that exceeds 90,000 therms of annual heat input from all fuels used ~~*in any twelve month period*~~ shall constitute a violation of this rule. In addition, the owners or operators shall:

(A) within 4 months after exceeding 90,000 therms of annual heat input ~~*in any twelve month period*~~, submit required applications for permits to construct and operate; and

(B) within 18 months after exceeding 90,000 therms of annual heat input ~~*in any twelve month period*~~, demonstrate and maintain compliance with all applicable requirements of paragraphs (c)(1), (c)(2), (c)(3), (c)(4), and (c)(6) for the life of the unit.

(5) The Executive Officer shall grant in writing a time extension to the full compliance date with the applicable NOx compliance limits specified in subparagraphs (c)(1)(E) through (c)(1)(~~J~~K) ~~and paragraph (c)(2)~~ for any health facility as defined ~~in writing~~ in Section 1250 of the California Health and Safety Code that can demonstrate that the Office of Statewide Health Planning and Development has approved an extension of time to comply with seismic safety requirements pursuant to Health and Safety Code Sections 130060 and 130061.5. The extension of time granted by the Executive Officer shall be consistent with the time extension granted pursuant to Health and Safety Code Section 130060 but not to exceed January 1, 2015 and shall be consistent with the time extension granted pursuant to Health and Safety Code Section 130061.5 but not to exceed January 1, 2020. Those health facilities granted a time extension shall

submit a compliance plan to the Executive Officer on or before January 1, 2010.

(f) Exemptions

The provisions of this rule shall not apply to:

(1) boilers used by electric utilities to generate electricity; or

(2) boilers and process heaters with a rated heat input capacity greater than 40 million Btu per hour that are used in petroleum refineries; or

(3) sulfur plant reaction boilers; or

(4) any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities; or

(5) any unit at a municipal sanitation service facility that is subject to a NOx emission limit in a ~~different~~ Regulation XI rule adopted or amended after [*date of amendment*].

ATTACHMENT 1

A. Equipment Tuning Procedure[1] for Forced-Draft Boilers, Steam Generators, and Process Heaters

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.
Should a different tuning procedure be used, a copy of this procedure should be kept with the unit records for two years and made available to the District personnel on request.

1. Operate the unit at the firing rate most typical of normal operation. If the unit experiences significant load variations during normal operation, operate it at its average firing rate.
2. At this firing rate, record stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke-spot number[2] (for liquid fuels), and observe flame conditions after unit operation stabilizes at the firing rate selected. If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values[3], and if CO emissions are low and there is not smoke, the unit is probably operating at near optimum efficiency - at this particular firing rate.

   However, complete the remaining portion of this procedure to determine whether still lower oxygen levels are practical.

3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2. As in Step 2, record the

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[1] This tuning procedure is based on a tune-up procedure developed by KVB, Inc. for the United States EPA.

[2] The smoke-spot number can be determined with ASTM Test Method D-2156 or with the Bacharach method. ASTM Test Method D-2156 is included in a tuneup kit that can be purchased from the Bacharach Company.

[3] Typical minimum oxygen levels for boilers at high firing rates are:

1. For natural gas: 0.5% - 3%
2. For liquid fuels: 2% - 4%

stack gas temperature, CO concentration (for gaseous fuels) or smoke-spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.

4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this level gradually reduce the combustion air flow, in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels). Also observe the flame and record any changes in its condition.

5. Continue to reduce combustion air flow stepwise, until one of these limits is reached:
   a. Unacceptable flame conditions - such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability.
   b. Stack gas CO concentrations greater than 400 ppm.
   c. Smoking at the stack.
   d. Equipment-related limitations - such as low windbox/furnace pressure differential, built in air-flow limits, etc.

6. Develop an O_2/CO curve (for gaseous fuels) or O_2/smoke curve (for liquid fuels) similar to those shown in Figures 1 and 2 using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.

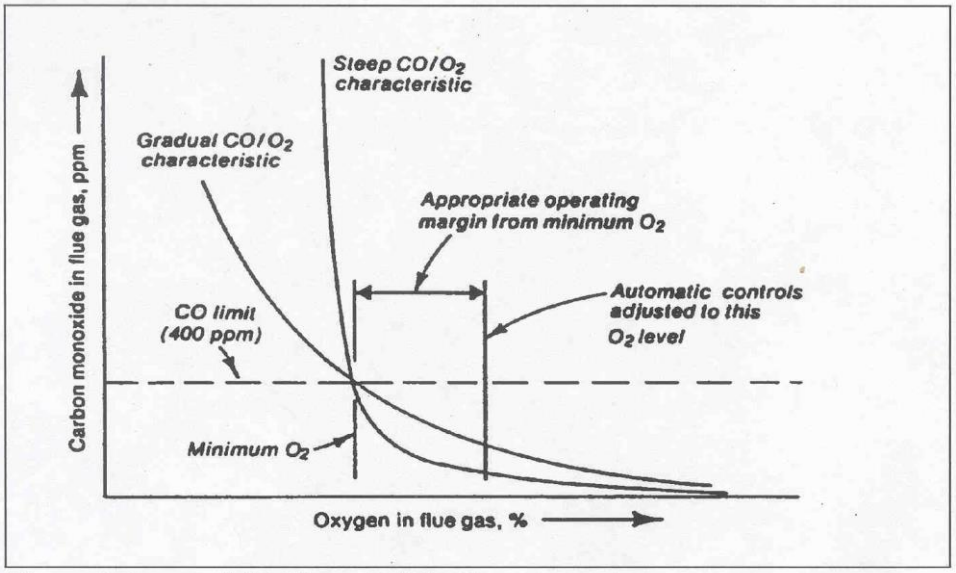

Figure 1 Oxygen/CO Characteristic Curve

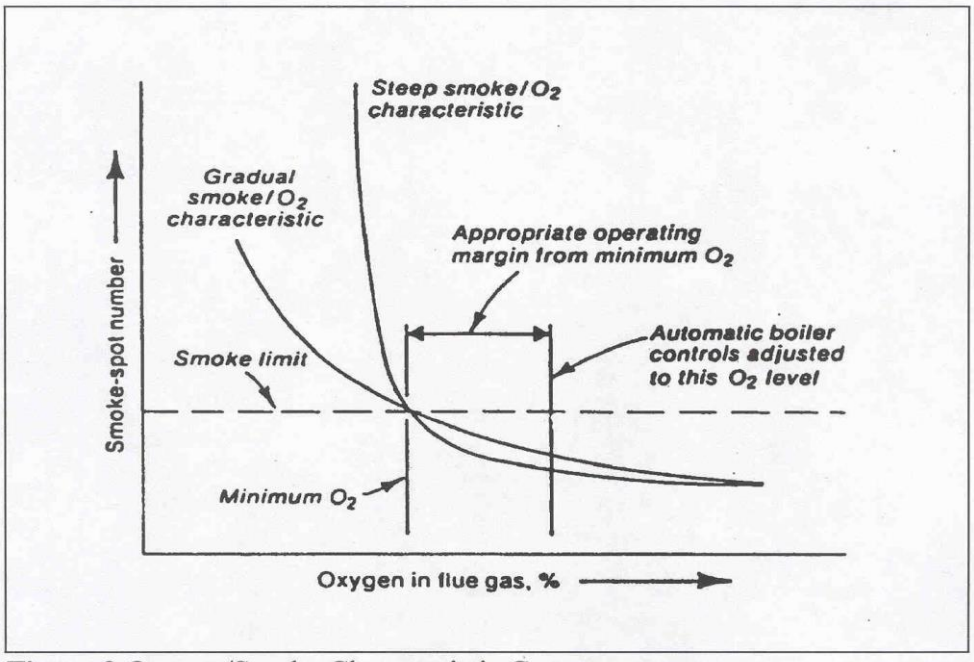

Figure 2 Oxygen/Smoke Characteristic Curve

7. From the curves prepared in Step 6, find the stack gas oxygen levels where the CO emissions or smoke-spot number equal the following values:

Fuel	Measurement	Value
Gaseous	CO Emissions	400 ppm
#1 and #2 oils	smoke-spot number	number 1
#4 oil	smoke-spot number	number 2
#5 oil	smoke-spot number	number 3
Other oils	smoke-spot number	number 4

The above conditions are referred to as the CO or smoke thresholds, or as the minimum excess oxygen level.

Compare this minimum value of excess oxygen to the expected value provided by the combustion unit manufacturer. If the minimum level found is substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mixing, thereby allowing operation with less air.

8. Add 0.5 to 2.0 percent O2 to the minimum excess oxygen level found in Step 7 and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above the minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.

9. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1-8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that rate.
10. Verify that the new settings can accommodate the sudden load changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 5 result, reset the combustion controls to provide a slightly higher level of excess oxygen at the affected firing rates. Next, verify these new settings in a similar fashion. Then make sure that the final control settings are recorded at steady-state operating conditions for future reference.
11. When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or heater records indicating name and signature of person, title, and date the tuneup was performed.

B. Equipment Tuning Procedure for Natural Draft-Fired Boilers, Steam Generators, and Process Heaters.

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant codes, regulations, and equipment manufacturers specifications and operating manuals.

Should a different tuning procedure be used, a copy of this procedure should be kept with the unit records for two years and made available to the District personnel on request.

1. **PRELIMINARY ANALYSIS**
   a. CHECK THE OPERATING PRESSURE OR TEMPERATURE.
      Operate the boiler, steam generator, or heater at the lowest acceptable pressure or temperature that will satisfy the load demand. This will minimize heat and radiation losses. Determine the pressure or temperature

that will be used as a basis for comparative combustion analysis before and after tuneup.

b. CHECK OPERATING HOURS.

Plan the workload so that the boiler, steam generator, or process heater operates only the minimum hours and days necessary to perform the work required. Fewer operating hours will reduce fuel use and emissions. For units requiring a tuneup to comply with the rule, a totalizing non-resettable fuel meter will be required for each fuel used and for each boiler, steam generator, and heater to prove fuel consumption is less than the heat input limit in therms per year specified in the rule.

c. CHECK AIR SUPPLY.

Sufficient fresh air supply is essential to ensure optimum combustion and the area of air supply openings must be in compliance with applicable codes and regulations. Air openings must be kept wide open when the burner is firing and clear from restriction to flow.

d. CHECK VENT.

Proper venting is essential to assure efficient combustion. Insufficient draft or overdraft promotes hazards and inefficient burning. Check to be sure that vent is in good condition, sized properly and with no obstructions.

e. COMBUSTION ANALYSIS.

Perform an "as is" combustion analysis (CO, O2, etc.) with a warmed up unit at high and low fire, if possible. In addition to data obtained from combustion analysis, also record the following:

i. Inlet fuel pressure at burner (at high & low fire)

ii. Draft at inlet to draft hood or barometric damper

1) Draft hood: high, medium, and low

2) Barometric Damper: high, medium, and low

iii. Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the boiler, steam generator, or process heater.

iv. Unit rate if meter is available.

With above conditions recorded, make the following checks and corrective actions as necessary:

2. **CHECKS & CORRECTIONS**

a. CHECK BURNER CONDITION.

Dirty burners or burner orifices will cause boiler, steam generator, or process heater output rate and thermal efficiency to decrease. Clean burners and burner orifices thoroughly. Also, ensure that fuel filters and moisture traps are in place, clean, and operating properly, to prevent plugging of gas orifices. Confirm proper location and orientation of burner diffuser spuds, gas canes, etc. Look for any burned-off or missing burner parts, and replace as needed.

b. CHECK FOR CLEAN BOILER, STEAM GENERATOR, OR PROCESS HEATER TUBES & HEAT TRANSFER SURFACES.

External and internal build-up of sediment and scale on the heating surfaces creates an insulating effect that quickly reduces unit efficiency. Excessive fuel cost will result if the unit is not kept clean. Clean tube surfaces, remove scale and soot, assure proper process fluid flow and flue gas flow.

c. CHECK WATER TREATMENT & BLOWDOWN PROGRAM.

Soft water and the proper water or process fluid treatment must be uniformly used to minimize scale and corrosion. Timely flushing and periodic blowdown must be employed to eliminate sediment and scale build-up on a boiler, steam generator or process heater.

d. CHECK FOR STEAM, HOT WATER OR PROCESS FLUID LEAKS.

Repair all leaks immediately since even small high-pressure leaks quickly lead to considerable fuel, water and steam losses. Be sure there are no leaks through the blow-off, drains, safety valve, by-pass lines or at the feed pump, if used.

3. **SAFETY CHECKS**

a. Test primary and secondary low water level controls.

b. Check operating and limit pressure and temperature controls.

c. Check pilot safety shut off operation.

d. Check safety valve pressure and capacity to meet boiler, steam generator or process heater requirements.

e. Check limit safety control and spill switch.

4. **ADJUSTMENTS**

While taking combustion readings with a warmed up boiler, steam generator, or process heater at high fire perform checks and adjustments as follows:

a. Adjust unit to fire at rate; record fuel manifold pressure.

b. Adjust draft and/or fuel pressure to obtain acceptable, clean combustion at both high, medium and low fire. Carbon Monoxide (CO) value should always be below 400 parts per million (PPM) at 3% 02. If CO is high make necessary adjustments.

Check to ensure boiler, steam generator, or process heater light offs are smooth and safe. A reduced fuel pressure test at both high and low fire should be conducted in accordance with the manufacturers instructions and maintenance manuals.

c. Check and adjust operation of modulation controller. Ensure proper, efficient and clean combustion through range of firing rates.

When above adjustments and corrections have been made, record all data.

5. **FINAL TEST**

Perform a final combustion analysis with a warmed up boiler, steam generator, or process heater at high, medium and low fire, whenever possible. In addition to data from combustion analysis, also check and record:

a. Fuel pressure at burner (High, Medium, and Low).

b. Draft above draft hood or barometric damper (High, Medium and Low).

c. Steam pressure or water temperature entering and leaving boiler, steam generator, or process heater.

d. Unit rate if meter is available.

When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or process heater records indicating name and signature of person, title, company name, company address and date the tuneup was performed.

(Adopted October 5, 1990)(Amended July 10, 1992)(Amended May 13, 1994)
(Amended September 5, 2008)(Amended November 1, 2013)
(PAR December 7, 2018)

PROPOSED AMENDED RULE 1146.1. EMISSIONS OF OXIDES OF NITROGEN FROM SMALL INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS, AND PROCESS HEATERS

(a) Applicability

This rule applies to boilers, steam generators, and process heaters that are greater than 2 million Btu per hour and less than 5 million Btu per hour rated heat input capacity used in any industrial, institutional, or commercial operation. with the exception of RECLAIM facilities (NOx emissions only).

(b) Definitions

(1) ADSORPTION CHILLER UNIT means any natural gas fired unit that captures and uses waste heat to provide cold water for air conditioning and other process requirements.

(2) ANNUAL HEAT INPUT means the actual amount of heat released by fuels burned intotal heat input to a unit during a calendar year, based on the fuel's higher heating value.

(3) ATMOSPHERIC UNIT means any natural gas fired unit with a non-sealed combustion chamber in which natural draft is used to exhaust combustion gases.

(4) BOILER OR STEAM GENERATOR means any combustion equipment fired with liquid and/or gaseous (including landfill and digester gas) and/or solid fossil fuel, and used to produce steam or to heat water, and that is not used exclusively to produce electricity for sale. Boiler or Steam Generator does not include any open heated tank, adsorption chiller unit, or waste heat recovery boiler that is used to recover sensible heat from the exhaust of a combustion turbine or any unfired waste heat recovery boiler that is used to recover sensible heat from the exhaust of any combustion equipment.

(5) BTU means British thermal unit(s) or units.

(6) COMMERCIAL OPERATION means any office building, lodging place, or similar location designed for tenancy by one or more business entities or residential occupants.

(7) FIRE-TUBE BOILER means any boiler that passes hot gases from a fire box through one or more tubes running through a sealed container of water. The heat of the gases is transferred through the walls of the tubes by thermal conduction, heating the water and ultimately creating steam.

(8) FORMER RECLAIM FACILITY means a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program.

(~~7~~9) HEALTH FACILITY has the same meaning as defined in Section 1250 of the California Health and Safety Code.

(10) HEAT INPUT means the chemical heat released due to assumed complete combustion of fuel in a unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.

(~~8~~11) INDUSTRIAL OPERATION means any entity engaged in the production and/or provision of chemicals, foods, textiles, fabricated metal products, real estate, personal services or other kindred or allied products or services.

(~~9~~12) INSTITUTIONAL OPERATION means any public or private establishment constituted to provide medical, educational, governmental, or other similar services to promote safety, order, and welfare.

(13) MODIFICATION means any physical change that meets the criteria set forth in Rule 1302 – Definitions.

(14) MUNICIPAL SANITATION SERVICES means basic sanitation services provided to the residents of a municipality by sewage treatment plants and municipal solid waste landfills.

(15) NON-RECLAIM facility means a facility, or any of its successors, that was not in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.

(~~10~~16) NOx EMISSIONS means the sum of nitric oxides and nitrogen dioxides~~ in the flue gas~~ emitted, ~~collectively expressed~~calculated as nitrogen dioxide.

(~~11~~17) OPEN HEATED TANK means a non-pressurized self-heated tank that may include a cover or doors that can be opened or detached to put in or remove parts, components or other material for processing in the tank. Tanks heated solely by an electric heater, boiler, thermal fluid heater or heat recovered from another process using heat exchangers are excluded from this definition.

(~~12~~18) PROCESS HEATER means any combustion equipment fired with liquid and/or gaseous (including landfill and digester gas) and/or solid fossil fuel and which transfers heat from combustion gases to water or process streams. Process Heater does not include any kiln or oven used for drying, curing, baking, cooking, calcining, or vitrifying; or any unfired waste heat recovery heater that is used to recover sensible heat from the exhaust of any combustion equipment.

(~~13~~19) RATED HEAT INPUT CAPACITY means the heat input capacity as specified by the permit issued by the Executive Officer, or if not specified on the permit, as specified on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the new maximum heat input shall be considered as the rated heat input capacity.

(20) RECLAIM FACILITY means a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.

~~(14) SCHOOL means any public or private school, including juvenile detention facilities with classrooms, used for purposes of the education of more than 12 children at the school, including in kindergarten and grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes. The term includes any building or structure, playground, athletic field, or other area of school property, but does not include unimproved school property.~~

(~~15~~21) THERM means 100,000 Btu.

(~~16~~22) THERMAL FLUID HEATER means a natural gas fired process heater~~PROCESS HEATER~~ in which a process stream is heated indirectly by a heated fluid other than water.

(~~17~~23) UNIT means any boiler, steam generator, or process heater as defined in paragraph (b)(4) or (b)(~~12~~18).

(c) Requirements

Notwithstanding the exemptions contained in Rule 2001 – Applicability, Table 1 – Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018, the owner or operator of any unit(s) subject to this rule shall not operate the unit in a manner

that exceeds the applicable emission limits specified in paragraphs (c)(1), (c)(2), and (c)(3).

~~(1) On or after September 5, 2008, the owner or operator of any unit subject to subdivision (a) shall operate such unit so that it discharges into the atmosphere no more than 30 ppm of NOx emissions or for natural gas fired units 0.037 pound NOx per million Btu of heat input, as specified in the permit to operate.~~

(~~2~~1) An owner or operator of any unit subject to subdivision (a) must ~~select to~~ comply with ~~one~~the applicable ~~of the following~~ NOx emission limits specified in Table 1146.1-1: ~~and apply for a permit to construct to operate such unit in compliance with the selected emission limit and the corresponding permit application and full compliance dates.~~

Table 1146.1-1 – NOx Emission Limits and Compliance Schedule

Rule Reference	**Category**	**Limit**[1]	~~**Submit Application for Permit to Construct on or before**~~	~~**Unit Shall be in Full Compliance on or before**~~ **Compliance Schedule for Non-RECLAIM Facilities**	**Compliance Schedule for RECLAIM and Former RECLAIM Facilities**
(c)(1)(A)	All Other Units	30 ppm or for natural gas fired units 0.036 lbs/10^6 Btu		September 5, 2008	See Rule 1100 – Implementation Schedule for NOx Facilities
(c)(1)(B)	Any Units Fired on Landfill Gas	25 ppm	~~January 1, 2014~~	January 1, 2015	
(c)(1)(C)	Any Units Fired on Digester Gas	15 ppm	~~January 1, 2014~~	January 1, 2015	
(c)(1)(D)	Atmospheric Units	12 ppm or 0.015 lbs/10^6 Btu	~~January 1, 2013~~	January 1, 2014	
(c)(1)(E)	Any Units Fired on Natural Gas, e~~E~~xcluding ~~Units Located at Schools and Universities~~Fire-tube Boilers subject to (c)(1)(F), Atmospheric Units, and Thermal Fluid Heaters	9 ppm or 0.011 lbs/10^6 Btu	~~January 1, 2011~~	January 1, ~~2012~~2014 or See (c)~~(5)(A)~~(6) for units with a previous NOx limit less than or equal to 12 ppm and greater than 9 ppm prior to September 5,2008	
	~~Any Units Fired on Natural Gas Located at Schools and Universities, Excluding Atmospheric Units, and Thermal Fluid Heaters~~	~~9 ppm or 0.011 lbs/10^6 Btu~~	~~January 1, 2013~~	~~January 1, 2014~~	
(c)(1)(F)	Any Fire-tube Boilers Fired on Natural Gas, excluding units with less	7 ppm or 0.0085 lbs/10^6 Btu		*Date of amendment* or	

	than or equal to 12 ppm and greater than 9 ppm prior to [*date of amendment*]			See (c)(5)(A) for units complying with a previous NOx emission limit that is less than or equal to 9 ppm prior to [*date of amendment*]	
(c)(1)(G)	Thermal Fluid Heaters	12 ppm or 0.015 lbs/10^6 Btu		*Date of amendment* or See (c)(5)(B) for units with a previous NOx limit ≤less than or equal to 20 ppm prior to [*date of amendment*] or See (e)(2) for units with a previous NOx limit ≥greater than 20 ppm prior to [*date of amendment*]	
[1] All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.					

(32) For dual fuel co-fired combustion units a weighted average emission limit calculated by Equation 1146.1-1 may be used in lieu of the emission limits of Table 1146.1-1 provided a totalizing fuel flow meter is installed pursuant to paragraph (c)(677), for units burning a combination of both fuels.

$$\textbf{Weighted Limit} = \frac{(CL_A \times Q_A) + (CL_B \times Q_B)}{Q_A + Q_B} \qquad \textbf{Equation 1146.1-1}$$

Where:

CL_A = compliance limit for fuel A

CL_B = compliance limit for fuel B

Q_A = heat input from fuel A

Q_B = heat input from fuel B

(43) The owner or operator of any unit(s) with a rated heat input capacity greater than 2 million Btu per hour shall not discharge into the atmosphere carbon monoxide (CO) emissions in excess of 400 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) or for natural gas fired units 0.30 lbs/10^6 Btu.

(54) In lieu of complying with the applicable emission limits specified in paragraph (c)(1), (c)(2), (c)(3), (e)(1), and (e)(2)(c)(4) any unit(s) subject to subdivision (a) in operation prior to September 5, 2008 at non-RECLAIM

facilities, or in operation prior to [*12 months* after *date of amendment*] at RECLAIM or former RECLAIM facilities, and with an annual~~n annual~~ heat input of less than or equal to 18,000 therms per calendar year, shall:

(A) be operated in a manner that maintains stack-gas oxygen concentrations at less than or equal to 3 percent on a dry basis for any 15-consecutive-minute averaging period; or

(B) be tuned at least twice per year, (at intervals from four to eight months apart) in accordance with the procedure described in Attachment 1 or the unit manufacturer's specified tune-up procedure. If a different tune-up procedure from that described in attachment 1 is used then a copy of this procedure shall be kept on site. The owner or operator of any unit(s) selecting the tune-up option shall maintain records for a rolling of twenty four month period verifying that the required tune-ups have been performed. If the unit does not operate throughout a continuous six-month period within 12month period, only one tune-up is required for the twelve month period that includes the entire period of non-operation. For this case, the tune-up shall be conducted within 30 days of start-up. No tune-up is required during a rolling twelve month period for any unit that is not operated during that rolling 12 month period; this unit may be test fired to verify availability of the unit for its intended use but once test firing is completed it shall be shutdown. Records of test firings shall be maintained for a rolling twenty four month period, and shall be made accessible upon request from an authorized District representative upon request.

(~~6~~5) Notwithstanding paragraph (c)(1), ~~A~~an owner or operator that has installed, ~~or~~ modified, or has been issued a SCAQMD Permit to Construct or Permit to Operate for the following units prior to [*date of amendment*], at a non-RECLAIM facility~~FACILITY~~, shall meet the NOx emission limit specified in Table 1146.1-1 by [*15 years after the date of amendment*] or when 50 percent or more of the unit's burners are replaced, whichever is earlier: ~~a natural gas fired unit prior to September 5, 2008 complying with the applicable BACT emission limit of 12 ppm or less of NOx may defer compliance with paragraph (c)(2) until the unit's burner(s) replacement.~~

(A) Fire-tube boilers fired on nNatural gas ~~fired units~~ subject to subparagraph ~~(c)(1)(E) or~~ (c)(1)(F) complying with a previous NOx emission limit that is less than or equal to 9~~12~~ ppm; or

(B) Thermal fluid heaters subject to subparagraph (c)(1)(G) complying with a previous NOx emission limit that is less than or equal to 20 ppm.

(6) Notwithstanding the NOx emission limit specified in Table 1146.1-1 of paragraph (c)(1), by [*15 years after the date of amendment*] or when 50 percent or more of the unit's burners are replaced, whichever is earlier, the owner or operator that has installed, modified, or has been issued a SCAQMD Permit to Operate prior to September 5, 2008 for a natural gas fired unit complying with a previous NOx emission limit of 12 ppm or less and greater than 9 ppm shall not operate in a manner that discharges NOx emissions (reference at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of 9 ppm.

(~~76~~7) Any owner or operator who chooses the pound per million Btu of heat input compliance option in paragraph (c)(1) or (c)(3)~~, (c)(2), or (c)(4)~~ for natural gas fired units or chooses the weighted average emission limit using Equation 1146.1-1 under paragraph (c)(~~3~~2) shall install a non-resettable, totalizing fuel meter for each fuel used on an individual unit basis, as approved by the Executive Officer.

(~~87~~8) ~~On or after January 1, 2015, a~~An owner or operator of any landfill or digester gas (biogas) unit co-fired with natural gas shall not operate the unit in a manner that exceeds the applicable landfill or digester gas emission concentration limits specified in paragraph (c)(~~2~~1), provided that the facility monthly average biogas usage by the biogas units is 90% or more, based on the higher heating value of the fuels used.

(A) The Executive Officer may approve the burning of more than 10% up to:

(i) 25% natural gas in a biogas fired unit at the 15 ppm (digester gas) or 25 ppm (landfill gas) NOx level, when it is necessary, if the only alternative to limiting natural gas to 10% would be shutting down the unit and flaring more biogas.

(ii) 50% natural gas in a digester gas-fired unit at the 15 ppm NOx level, when it is necessary as specified in clause (c)(~~87~~8)(A)(i) and for units installed on or after September 5,

2008 provided the unit has demonstrated compliance with the NOx limits in paragraph (c)(~~2~~1) applicable to units fired exclusively on natural gas.

For units subject to this subparagraph, the percent natural gas usage shall be based on the facility monthly average biogas usage by the biogas units and the higher heating value of the fuels used.

(B) Any biogas-fired unit burning more than the approved percent natural gas as determined under subparagraph (c)(~~87~~8)(A) shall comply with the weighted average NOx limit specified in paragraph (c)(~~3~~2).

(~~8~~9) Notwithstanding the NOx emission limits specified in Table 1146.1-1 of paragraph (c)(1) and paragraph (e)(3), and until a Regulation XI rule referenced in paragraph (f)(2) is adopted or amended and that rule compliance date occurs, an owner or operator shall not operate units at a municipal sanitation service facility in a manner that discharges NOx emissions (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of:

(A) 9 ppm for natural gas fired units; or

(B) 9 ppm, upon burner replacement, for natural gas fired units that were installed or modified prior to September 5, 2008 complying with a previous NOx emission limit of 12 ppm or less; or

(C) 30 ppm for thermal fluid heaters; or

(D) 30 ppm, upon burner replacement, for any low-fuel use unit complying with paragraph (c)(4).

(d) Compliance Determination

The owner or operator of any unit(s) subject to this rule shall meet the following requirements for determining compliance:

(1) Owners or operators of any units shall have the option of complying with either the pound per million Btu of heat input or parts per million emission limits specified in paragraph (c)(1), (c)(2), or (c)(3)~~, or (c)(4)~~.

(2) All emission determinations shall be made in the as-found operating condition, except no compliance determination shall be established during unit start-~~-~~up, shutdown, or under breakdown conditions~~. Start-up or shutdown intervals shall not last longer than is necessary to reach stable temperatures~~. In no case shall the start-up or shutdown interval last longer

than six hours or the time specified in the permit to operate, whichever is less. Start-up~~s~~ and shutdown~~s~~ intervals shall not last longer than is necessary to reach stable conditions. A~~n~~ compliance determination as specified in paragraph (d)(~~6~~5) shall be conducted at least 250 operating hours, or at least thirty days subsequent to the tuning or servicing of any unit, unless it is an unscheduled repair.

~~(3) All parts per million emission limits specified in subdivision (c) are referenced at 3 percent volume stack-gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.~~

(~~4~~3) Compliance with the NOx and CO emission requirements of paragraphs (c)(1) through (c)(~~4~~3) and the stack-gas oxygen concentration requirement of subparagraph (c)(~~5~~4)(A) shall be determined using a District approved contractor under the Laboratory Approval Program according to the following procedures:

(A) District Source Test Method 100.1 - Instrumental Analyzer Procedures for Continuous Gaseous Emission Sampling (March 1989); or

(B) District Source Test Method 7.1 - Determination of Nitrogen Oxide Emissions from Stationary Sources (March 1989) and Method 10.1 - Carbon Monoxide and Carbon Dioxide by Gas Chromatograph/Non-Dispersive Infrared Detector (GC/NDIR) - Oxygen by Gas Chromatograph-Thermal Conductivity (GC/TCD) (March 1989); or

(C) United States Environmental Protection Agency Conditional Test Method CTM-030, Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions from Natural Gas-Fired Engines, Boilers and Process Heaters Using Portable Analyzers; or

(D) ASTM D6522-00(2005) Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers

(E) any other test method determined to be alternative and approved before the test in writing by the Executive Officers of the District and the California Air Resources Board and the Regional Administrator of the United States Environmental Protection Agency, Region IX.

Records of all source tests shall be maintained for a period of two years (five years for Title V facilities) and shall be made available to District personnel upon request. Emissions determined to exceed any limits established by this rule through the use of any of the above-referenced test methods shall constitute a violation of this rule.

(~~5~~4) For any owner or operator who chooses the pound~~s of~~ per million Btu of heat input compliance option of paragraph (c)(1), (c)(2), or (c)(~~4~~3) for natural gas fired units, NOx emissions in pounds per million Btu of heat input shall be calculated using the procedures in 40 CFR Part 60, Appendix A, Method 19, Sections 2 and 3 and CO emissions in pounds per million Btu of heat input shall be calculated according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1.

(~~6~~5) Compliance determination with the NOx emission requirements specified in paragraph (d)(~~4~~3) shall be conducted once every five years.

(~~7~~6) Any owner or operator of units subject to this rule shall perform diagnostic emission checks of NOx emissions with a portable NOx, CO, and oxygen analyzer according to the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to South Coast Air Quality Management District Rules 1146 and 1146.1 according to the following schedule:

(A) ~~On or after July 1, 2009, t~~The owner or operator of units subject to paragraphs (c)(1), (c)(2), or ~~through~~ (c)(~~4~~3) shall check NOx emissions at least quarterly or every 2,000 unit operating hours, whichever occurs later. If a unit is in compliance for four consecutive required diagnostic emission checks, without any adjustments to the oxygen sensor set points, then the unit may be checked semi-annually or every 4,000 unit operating hours, whichever occurs later, until the diagnostic emission check exceeds the applicable limit specified in paragraphs (c)(1)~~,~~ or (c)(2)~~, or (c)(3)~~.

(B) ~~On or after January 1, 2015 or during burner replacement, whichever occurs later,~~ The owner or operator of units subject to~~subject to~~ ~~complying with~~ the requirements specified in paragraph (c)(~~5~~4)

shall check NOx emissions according to the tune-up schedule specified in subparagraph (c)(~~5~~4)(B).

(C) Records of all monitoring data required under subparagraphs (d)(~~7~~6)(A) and (d)(~~7~~6)(B) shall be maintained for a rolling twelve month period of two years (five years for Title V facilities) and shall be made available to District personnel upon request.

(D) The portable analyzer diagnostic emission checks required under subparagraphs (d)(~~7~~6)(A) and (d)(~~7~~6)(B) shall only be conducted by a person who has completed an appropriate District-approved training program in the operation of portable analyzers and has received a certification issued by the District.

(~~8~~7) An owner or operator shall comply with the requirements as applied to CO emissions specified in paragraphs (d)(~~6~~5) and (d)(~~7~~6).

(~~9~~8) A diagnostic emission check conducted under the requirements specified in paragraph (d)(~~7~~6) that finds emissions in excess of those allowed by this rule or a permit condition shall not constitute a violation of this rule if the owner or operator corrects the problem and demonstrate compliance with another emission check within 72 hours from the time the owner or operator knew of excess emissions, or reasonably should have known, or shut down the unit by the end of an operating cycle, whichever is sooner.

(~~10~~9) Notwithstanding the requirements specified in paragraph (d)(~~9~~8) any diagnostic emission check conducted by District staff that finds emissions in excess of those allowed by this rule or a permit condition is a violation.

(~~11~~10) An owner or operator may opt to lower the unit's rated heat input capacity. The lowered rated heat input capacity shall not be less than or equal to 2 million Btu per hour and shall be based on manufacturer's identification or rating plate or permit condition.

(e) Compliance Schedule

~~(1) Owners or operators of units shall comply with the applicable schedule specified in paragraphs (c)(1) and (c)(2).~~

(1) The owner or operator of any unit(s) at a RECLAIM or former RECLAIM facility subject to paragraph (c)(1) shall meet the applicable NOx emission limit in Table 1146.1-1 in accordance with the schedule specified in Rule 1100 – Implementation Schedule for NOx Facilities.

(2) An owner or operator of a non-RECLAIM facility with any thermal fluid heaters with a NOx emission limit greater than 20 ppm shall:

(A) On or before [*12 months after date of amendment*], submit a complete permit application for each thermal fluid heater that does not currently meet the limit specified in subparagraph (c)(1)(G); and

(B) On or before January 1, 2022, meet the applicable NOx emission limit in Table 1146.1-1 for thermal fluid heaters subject to subparagraph (c)(1)(G).

(~~2~~3) By ~~*On or after* January 1, 2015~~ [*15 years after the date of amendment*] or ~~during burner replacement~~ when 50 percent or more of the unit's burners are replaced, whichever is ~~later~~earlier, no person shall operate in the District any unit subject to~~subject to~~complying with ~~which~~that discharges into the atmosphere NOx emission in excess of 12 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes)~~does not meet the emissions limits specified in paragraph (c)(1)~~.

(~~3~~4) ~~If any~~ Any unit subject to~~subject to~~complying with the requirements specified in paragraph (c)(~~5~~4) that exceeds 18,000 therms of annual~~annual~~ heat input from all fuels used ~~*in any twelve month period*~~ shall constitute a violation of this rule. In addition, the owners or operators shall:

(A) within 4 months after exceeding 18,000 therms of annual heat input ~~*in any twelve month period*~~, submit required applications for permits to construct and operate; and

(B) within 18 months after exceeding 18,000 therms of annual heat input ~~*in any twelve month period*~~, demonstrate and maintain compliance with all applicable requirements specified in paragraphs (c)(1) through (c)(~~4~~3) for the life of the unit.

(~~4~~5) The Executive Officer shall grant in writing a time extension to the full compliance date with the applicable NOx compliance limits for any natural gas fired units specified in paragraph (c)(~~2~~1) for any health facility as defined ~~in writing~~ in Section 1250 of the California Health and Safety Code that can demonstrate that the Office of Statewide Health Planning and Development has approved an extension of time to comply with seismic safety requirements pursuant to Health and Safety Code Sections 130060 and 130061.5. The extension of time granted by the Executive Officer shall be consistent with the time extension granted pursuant to Health and Safety

Code Section 130060 but not to exceed January 1, 2015 and shall be consistent with the time extension granted pursuant to Health and Safety Code Section 130061.5 but not to exceed January 1, 2020. Those health facilities granted a time extension shall submit a compliance plan to the Executive Officer on or before January 1, 2010.

(f) Exemptions

The provisions of this rule shall not apply to:

(1) any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities; or

(2) any unit at a municipal sanitation service facility that is subject to a NOx emission limit in a ~~different~~ Regulation XI rule adopted or amended after [*date of amendment*].

ATTACHMENT 1

A. Equipment Tuning Procedure[1] for Forced-Draft Boilers, Steam Generators, and Process Heaters

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.

1. Operate the unit at the firing rate most typical of normal operation. If the unit experiences significant load variations during normal operation, operate it at its average firing rate.
2. At this firing rate, record stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke-spot number[2] (for liquid fuels), and observe flame conditions after unit operation stabilizes at the firing rate selected. If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values[3], and if CO emissions are low and there is not smoke, the unit is probably operating at near optimum efficiency - at this particular firing rate.
3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2. As in Step 2, record the stack gas temperature, CO concentration (for gaseous fuels) or smoke-spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.

However, complete the remaining portion of this procedure to determine whether still lower oxygen levels are practical.

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[1]This tuning procedure is based on a tune-up procedure developed by KVB, Inc. for the United States EPA.

[2]The smoke-spot number can be determined with ASTM Test Method D-2156 or with the Bacharach method. ASTM Test Method D-2156 is included in a tuneup kit that can be purchased from the Bacharach Company.

[3]Typical minimum oxygen levels for boilers at high firing rates are:

1. For natural gas: 0.5% - 3%
2. For liquid fuels: 2% - 4%

4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this level gradually reduce the combustion air flow, in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels). Also observe the flame and record any changes in its condition.
5. Continue to reduce combustion air flow stepwise, until one of these limits is reached:
   a. Unacceptable flame conditions - such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability.
   b. Stack gas CO concentrations greater than 400 ppm.
   c. Smoking at the stack.
   d. Equipment-related limitations - such as low windbox/furnace pressure differential, built in air-flow limits, etc.
6. Develop an O_2/CO curve (for gaseous fuels) or O_2/smoke curve (for liquid fuels) similar to those shown in Figures 1 and 2 using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.

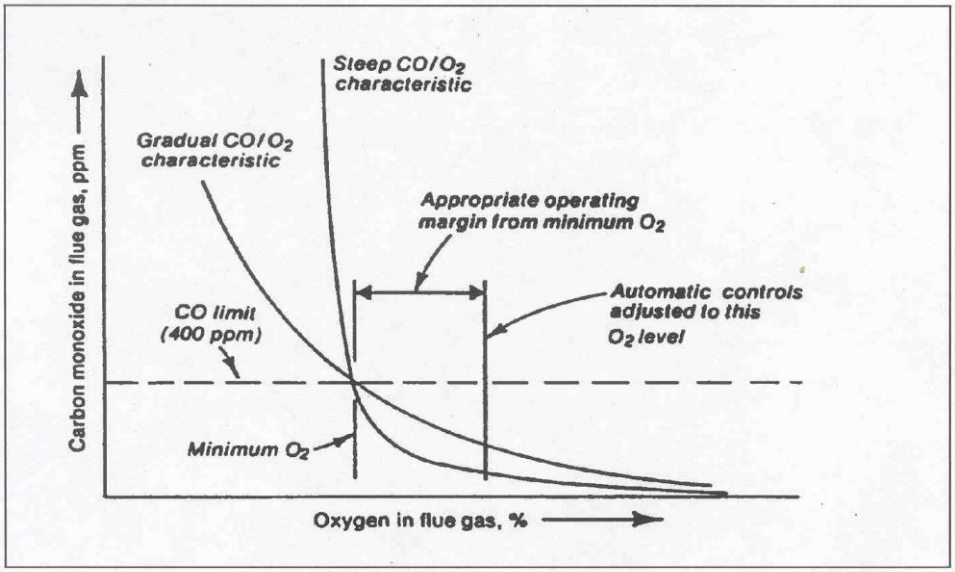

Figure 1 Oxygen/CO Characteristic Curve

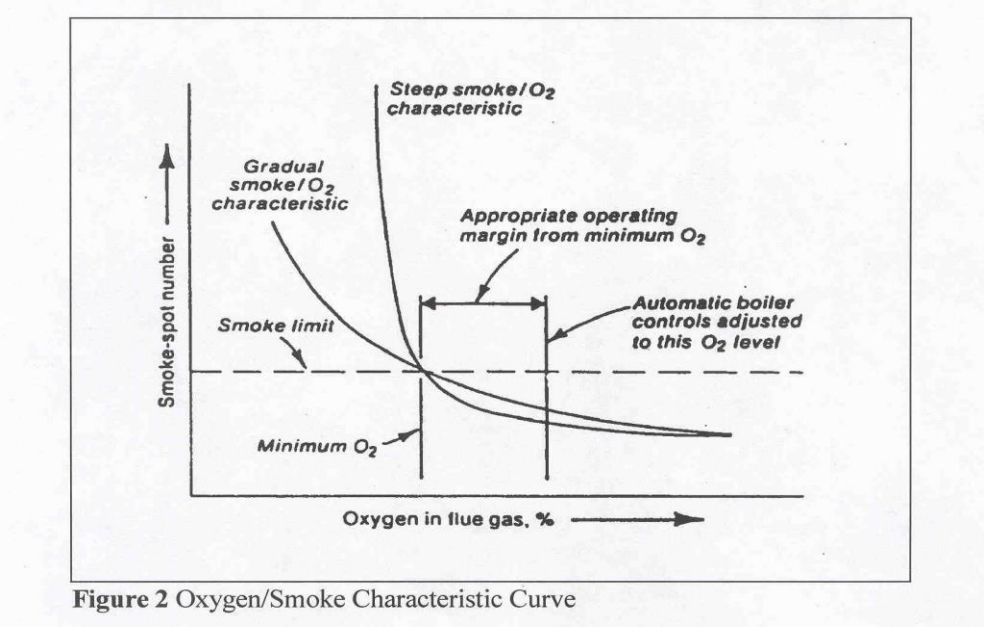

Figure 2 Oxygen/Smoke Characteristic Curve

7. From the curves prepared in Step 6, find the stack gas oxygen levels where the CO emissions or smoke-spot number equal the following values:

Fuel	Measurement	Value
Gaseous	CO Emissions	400 ppm
#1 and #2 oils	smoke-spot number	number 1
#4 oil	smoke-spot number	number 2
#5 oil	smoke-spot number	number 3
Other oils	smoke-spot number	number 4

The above conditions are referred to as the CO or smoke thresholds, or as the minimum excess oxygen level.

Compare this minimum value of excess oxygen to the expected value provided by the combustion unit manufacturer. If the minimum level found is substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mixing, thereby allowing operation with less air.

8. Add 0.5 to 2.0 percent O2 to the minimum excess oxygen level found in Step 7 and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above the minimum oxygen level accounts for fuel variations, variations

in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.

9. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1-8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that rate.
10. Verify that the new settings can accommodate the sudden load changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 5 result, reset the combustion controls to provide a slightly higher level of excess oxygen at the affected firing rates. Next, verify these new settings in a similar fashion. Then make sure that the final control settings are recorded at steady-state operating conditions for future reference.
11. When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or heater records indicating name and signature of person, title, and date the tuneup was performed.

B. Equipment Tuning Procedure for Natural Draft-Fired Boilers, Steam Generators, and Process Heaters.

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant codes, regulations, and equipment manufacturers specifications and operating manuals.

Should a different tuning procedure be used, a copy of this procedure should be kept with the unit records for two years and made available to the District personnel on request.

1. **PRELIMINARY ANALYSIS**

a. CHECK THE OPERATING PRESSURE OR TEMPERATURE.

Operate the boiler, steam generator, or heater at the lowest acceptable pressure or temperature that will satisfy the load demand. This will minimize heat and radiation losses. Determine the pressure or temperature that will be used as a basis for comparative combustion analysis before and after tuneup.

b. CHECK OPERATING HOURS.

Plan the workload so that the boiler, steam generator, or process heater operates only the minimum hours and days necessary to perform the work required. Fewer operating hours will reduce fuel use and emissions. For units requiring a tuneup to comply with the rule, a totalizing non-resettable fuel meter will be required for each fuel used and for each boiler, steam generator, and heater to prove fuel consumption is less than the heat input limit in therms per year specified in the rule.

c. CHECK AIR SUPPLY.

Sufficient fresh air supply is essential to ensure optimum combustion and the area of air supply openings must be in compliance with applicable codes and regulations. Air openings must be kept wide open when the burner is firing and clear from restriction to flow.

d. CHECK VENT.

Proper venting is essential to assure efficient combustion. Insufficient draft or overdraft promotes hazards and inefficient burning. Check to be sure that vent is in good condition, sized properly and with no obstructions.

e. COMBUSTION ANALYSIS.

Perform an "as is" combustion analysis (CO, O_2, etc.) with a warmed up unit at high and low fire, if possible. In addition to data obtained from combustion analysis, also record the following:

i. Inlet fuel pressure at burner (at high & low fire)

ii. Draft at inlet to draft hood or barometric damper

1) Draft hood: high, medium, and low

2) Barometric Damper: high, medium, and low

iii. Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the boiler, steam generator, or process heater.

iv. Unit rate if meter is available.

With above conditions recorded, make the following checks and corrective actions as necessary:

2. **CHECKS & CORRECTIONS**

a. CHECK BURNER CONDITION.

Dirty burners or burner orifices will cause boiler, steam generator, or process heater output rate and thermal efficiency to decrease. Clean burners and burner orifices thoroughly. Also, ensure that fuel filters and moisture traps are in place, clean, and operating properly, to prevent plugging of gas orifices. Confirm proper location and orientation of burner diffuser spuds, gas canes, etc. Look for any burned-off or missing burner parts, and replace as needed.

b. CHECK FOR CLEAN BOILER, STEAM GENERATOR, OR PROCESS HEATER TUBES & HEAT TRANSFER SURFACES.

External and internal build-up of sediment and scale on the heating surfaces creates an insulating effect that quickly reduces unit efficiency. Excessive fuel cost will result if the unit is not kept clean. Clean tube surfaces, remove scale and soot, assure proper process fluid flow and flue gas flow.

c. CHECK WATER TREATMENT & BLOWDOWN PROGRAM.

Soft water and the proper water or process fluid treatment must be uniformly used to minimize scale and corrosion. Timely flushing and periodic blowdown must be employed to eliminate sediment and scale build-up on a boiler, steam generator or process heater.

d. CHECK FOR STEAM, HOT WATER OR PROCESS FLUID LEAKS

Repair all leaks immediately since even small high-pressure leaks quickly lead to considerable fuel, water and steam losses. Be sure there are no leaks through the blow-off, drains, safety valve, by-pass lines or at the feed pump, if used.

3. **SAFETY CHECKS**

a. Test primary and secondary low water level controls.

b. Check operating and limit pressure and temperature controls.

c. Check pilot safety shut off operation.

d. Check safety valve pressure and capacity to meet boiler, steam generator or process heater requirements.

e. Check limit safety control and spill switch.

4. **ADJUSTMENTS**

While taking combustion readings with a warmed up boiler, steam generator, or process heater at high fire perform checks and adjustments as follows:

a. Adjust unit to fire at rate; record fuel manifold pressure.

b. Adjust draft and/or fuel pressure to obtain acceptable, clean combustion at both high, medium and low fire. Carbon Monoxide (CO) value should always be below 400 parts per million (PPM) at 3% 0_2. If CO is high make necessary adjustments.

Check to ensure boiler, steam generator, or process heater light offs are smooth and safe. A reduced fuel pressure test at both high and low fire should be conducted in accordance with the manufacturers instructions and maintenance manuals.

c. Check and adjust operation of modulation controller. Ensure proper, efficient and clean combustion through range of firing rates.

When above adjustments and corrections have been made, record all data.

5. **FINAL TEST**

Perform a final combustion analysis with a warmed up boiler, steam generator, or process heater at high, medium and low fire, whenever possible. In addition to data from combustion analysis, also check and record:

a. Fuel pressure at burner (High, Medium, and Low).

b. Draft above draft hood or barometric damper (High, Medium and Low).

c. Steam pressure or water temperature entering and leaving boiler, steam generator, or process heater.

d. Unit rate if meter is available.

When the above checks and adjustments have been made, record data and attach combustion analysis data to boiler, steam generator, or process heater records indicating name and signature of person, title, company name, company address and date the tuneup was performed.

ATTACHMENT I

(Adopted January 9, 1998)-(Amended January 7, 2005)-(Amended May 5, 2006)
(PAR December 7, 2018)

PROPOSED AMENDED RULE 1146.2. EMISSIONS OF OXIDES OF NITROGEN FROM LARGE WATER HEATERS AND SMALL BOILERS AND PROCESS HEATERS

(a) Purpose and Applicability

The purpose of this rule is to reduce NOx emissions from natural gas-fired water heaters, boilers, and process heaters as defined in this rule. This rule applies to units that have a rated heat input capacity less than or equal to 2,000,000 BTU per hour. Type 1 Units as defined in this rule are typically, but not exclusively, large water heaters or smaller-sized process heaters in the above range. Type 2 Units as defined in this rule are typically, but not exclusively, small boilers or larger-sized process heaters in this range. Beginning, January 1, 2000, the provisions of this rule are applicable to manufacturers, distributors, retailers, refurbishers, installers and operators of new units. Beginning, July 1, 2002, the provisions of this rule are also applicable to operators of existing Type 2 Units.

(b) Definitions

(1) BEST AVAILABLE RETROFIT CONTROL TECHNOLOGY (BARCT) as defined in the California Health and Safety Code Section 40406.

(~~1~~2) BOILER OR STEAM GENERATOR means any equipment that is fired with or is designed to be fired with natural gas, used to produce steam or to heat water, and that is not used exclusively to produce electricity for sale. Boiler or Steam Generator does not include any waste heat recovery boiler that is used to recover sensible heat from the exhaust of a combustion turbine or any unfired waste heat recovery boiler that is used to recover sensible heat from the exhaust of any combustion equipment.

(~~2~~3) BTU means British thermal unit(s) ~~or units~~.

(~~3~~4) CERTIFIED RETROFIT KIT means any burner and ancillary controls or blowers that have been demonstrated to comply with the provisions of this rule, on a retrofit basis, on a particular model of unit.

(~~4~~5) FIRE-–TUBE BOILER means a BOILER that passes~~in which~~ hot gases from a fire box through one or more tubes running through a sealed container of water. The heat of the gases is transferred through the walls of the tubes by thermal conduction, heating the water and ultimately creating

steamthe combustion chamber pass through one or more tubes within the boiler.

(6) FORMER RECLAIM FACILITY means a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program.

(57) HEAT INPUT means the chemical heat released due to assumed complete combustion of fuel in a unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air. to the unit measured as BTU per hour.

(68) HEAT OUTPUT means the enthalpy of the working fluid output of the unit.

(79) INDEPENDENT TESTING LABORATORY means a testing laboratory that meets the requirements of District Rule 304, subdivision (k) and is approved by the District to conduct certification testing under the Protocol.

(810) INSTANTANEOUS WATER HEATER means a WATER HEATER with a RATED HEAT INPUT CAPACITY less than or equal to 2,000,000 BTU per hour that heats water only when it flows through a heat exchanger.

(911) NOx EMISSIONS means the sum of nitricogen oxides and nitrogen dioxides emittedin the flue gas, collectively expressedcalculated as nitrogen dioxide.

(1012) POOL HEATER means a WATER HEATER designed to heat a pool, hot tub or spa.

(1113) PROCESS HEATER means any equipment that is fired with or is designed to be fired with natural gas and which transfers heat from combustion gases to water or process streams. Process Heater does not include any kiln or oven used for annealing, drying, curing, baking, cooking, calcining, or vitrifying; or any unfired waste heat recovery heater that is used to recover sensible heat from the exhaust of any combustion equipment.

(1214) PROTOCOL means South Coast Air Quality Management District Protocol: Nitrogen Oxides Emissions Compliance Testing for Natural Gas-Fired Water Heaters and Small Boilers.

(15) RECLAIM FACILITY means a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.

(~~13~~16) RATED HEAT INPUT CAPACITY means the gross HEAT INPUT of the combustion device, as supported by required documentation and which shall be specified on a permanent rating plate.

(~~14~~17) RECREATIONAL VEHICLE means any vehicle used for recreational purposes designed to include a water heater and licensed to be driven or moved on the highways of California.

(~~15~~18) REFURBISHER means anyone who reconditions a Type 1 Unit or TYPE 2 UNIT and offers the unit for resale, for use in the District.

(~~16~~19) RESELLER means anyone who sells either retail, wholesale or on an individual basis TYPE 1 UNITS or TYPE 2 UNITS.

(~~17~~20) RESIDENTIAL means any structure which is designed for and used exclusively as a dwelling for not more than four families, and where such equipment is used by the owner or occupant of such a dwelling.

(~~18~~21) TANK TYPE WATER HEATER means a WATER HEATER with a RATED HEAT INPUT CAPACITY from 75,000 BTU per hour to 2,000,000 BTU per hour and with an integral closed vessel in which water is heated and stored for use external to the vessel.

(~~19~~22) THERM means 100,000 BTU.

(~~20~~23) THERMAL FLUID HEATER means a natural gas fired PROCESS HEATER in which a process stream is heated indirectly by a heated fluid other than water.

(~~21~~24) TYPE 1 UNIT means any WATER HEATER, BOILER or PROCESS HEATER with a RATED HEAT INPUT CAPACITY less than or equal to 400,000 BTU per hour excluding TANK TYPE WATER HEATERS subject to the limits of District Rule 1121.

(~~22~~25) TYPE 2 UNIT means any WATER HEATER, BOILER or PROCESS HEATER with a RATED HEAT INPUT CAPACITY greater than 400,000 BTU per hour up to and including 2,000,000 BTU per hour.

(~~23~~26) UNIT means any BOILER, STEAM GENERATOR, WATER HEATER or PROCESS HEATER as defined in paragraph (b)(~~1~~2), (b)(~~3~~4), (b)(~~4~~5), (b)(~~8~~10), (b)(~~10~~12), (b)(~~11~~13), (b)(~~18~~21), (b)(~~20~~23), (b)(~~21~~24), (b)(~~22~~25) or (b)(~~24~~27).

(~~24~~27) WATER HEATER means any equipment that is fired with or designed to be fired with natural gas and that is used solely to heat water for use external to the equipment.

(c) Requirements

(1) On or after January 1, 2000, no person shall manufacture for use, or offer for sale for use, in the District any new Type 2 Unit, unless the NOx emissions level is less than or equal to 30 ppm of NOx emissions (at 3% O_2, dry) or 0.037 pound NOx per million BTU of heat input and no more than 400 ppm of carbon monoxide (at 3% O_2, dry), as certified by the District according to subdivision (d).

(2) On or after January 1, 2001, no person shall manufacture for use, or offer for sale for use, in the District any new Type 1 Unit, unless the NOx emissions level is less than or equal to 40 nanograms of NOx (calculated as NO_2) per joule (93 lb per billion BTU) of heat output or 55 ppm NOx emissions (at 3% O_2, dry), as certified by the District according to subdivision (d).

(3) Except for units at a RECLAIM or former RECLAIM facility, ~~O~~on or after July 1, 2002, no person shall operate in the District any unit with a rated heat input capacity greater than 1,000,000 BTU per hour but less than or equal to 2,000,000 BTU per hour manufactured prior to January 1, 1992, which does not meet the emissions limits required by paragraph (c)(1). Alternatively, a unit may be modified or demonstrated to meet the emission limits of paragraph (c)(1) pursuant to the provisions of subdivision (e).

(4) Except for units at a RECLAIM or former RECLAIM facility, ~~On~~ on or after January 1, 2006, no person shall operate in the District any unit more than 15 years old, based on the original date of manufacture as specified in paragraph (c)(6), with a rated heat input capacity greater than 1,000,000 BTU per hour but less than or equal to 2,000,000 BTU per hour and manufactured on or after January 1, 1992, which does not meet the emissions limits required by paragraph (c)(1). Alternatively, a unit may be modified or demonstrated to meet the emission limits of paragraph (c)(1) pursuant to the provisions of subdivision (e).

(5) Except for units at a RECLAIM or former RECLAIM facility, ~~On~~ on or after January 1, 2006, no person shall operate in the District any unit more than 15 years old, based on the original date of manufacture as specified in paragraph (c)(6), with a rated heat input capacity greater than 400,000 BTU per hour but less than or equal to 1,000,000 BTU per hour manufactured prior to January 1, 2000, which does not meet the emissions limits required by paragraph (c)(1). Alternatively, a unit may be modified or demonstrated

to meet the emission limits of paragraph (c)(1) pursuant to the provisions of subdivision (e).

(6) The original date of manufacture shall be determined by:

(A) Original manufacturer's identification or rating plate permanently fixed to the equipment. If not available, then;

(B) Invoice from manufacturer for purchase of equipment. If not available, then:

(C) Unit is deemed to be more than 15 years old.

(7) On or after January 1, 2010, no person shall manufacture for use or offer for sale for use within the District any Type 2 unit unless the unit is certified pursuant to subdivision (d) to a NOx emission level of less than 14 nanograms of NOx (calculated as NO_2) per joule of heat output or less than or equal to 20 ppm of NOx emissions (at 3% O_2, dry).

(8) On or after January 1, 2012, no person shall manufacture for use or offer for sale for use within the District any Type 1 unit (excluding pool heaters), unless the unit is certified pursuant to subdivision (d) to a NOx emission level of less than 14 nanograms of NOx (calculated as NO_2) per joule of heat output or less than or equal to 20 ppm of NOx emissions (at 3% O_2, dry).

(9) Notwithstanding the exemptions contained in Rule 2001 – Applicability and its accompanying Table 1 – Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018, ~~O~~on or after May 5, 2006, the owner or operator of any Type 2 unit shall perform maintenance in accordance with the manufacturer's schedule and specifications as identified in a manual and other written materials supplied by the manufacturer or distributor. The owner or operator shall maintain on site a copy of the manufacturer's and/or distributor's written instructions and retain a record of the maintenance activity for a period of not less than three years.

(10) Notwithstanding the exemptions contained in Rule 2001 – Applicability and its accompanying Table 1 – Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018, ~~T~~the owner or operator shall maintain on site a copy of all documents identifying the unit's rated heat input capacity. The rated heat input capacity shall be identified by a manufacturer's or distributor's manual or invoice. If a unit is modified, the

rated heat input capacity shall be calculated pursuant to paragraph (f)(3). The documentation of rated heat input capacity for modified units shall include a description of all modifications, the dates the unit was modified and calculation of rated heat input capacity. All documentation shall be signed by the licensed person modifying the unit.

(11) Notwithstanding the requirements in paragraph (c)(7), until December 31, 2010, any person may sell, offer for sale, or install any Type 2 units that are manufactured and purchased prior to January 1, 2010 and in compliance with paragraph (c)(1).

(12) Notwithstanding the requirements in paragraph (c)(8), until December 31, 2012, any person may sell, offer for sale, or install any Type 1 units that are manufactured and purchased prior to January 1, 2012 and in compliance with paragraph (c)(2).

(13) By January 1, 2022, the Executive Officer shall conduct a technology assessment and report to the Governing Board if the NOx emission limits in subdivision (c) represent BARCT.

(A) If the Executive Officer determines that the NOx emission limits specified in paragraph (c)(1) represents BARCT, notwithstanding the exemptions contained in Rule 2001 – Applicability and its accompanying Table 1 – Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018, the owner or operator of a RECLAIM or former RECLAIM facility with any Type 2 Units shall meet the NOx emission limit specified in paragraph (c)(1) by December 31, 2023. A Type 2 unit may be modified or demonstrated to meet the emission limit of paragraph (c)(1), pursuant to the provisions of subdivision (e). Alternatively, a Type 2 unit may be replaced with a certified unit in compliance with the provisions of paragraph (c)(7).

(B) If the technology assessment specified in this paragraph demonstrates that more stringent BARCT requirements are applicable, the Executive Officer shall initiate rule development for the implementation schedule of the more stringent BARCT requirements within six months after the technology assessment.

(d) Certification

(1) The manufacturer shall obtain confirmation from an independent testing laboratory prior to applying for certification that, each unit model or retrofit kit complies with the applicable requirements of subdivision (c). This confirmation shall be based upon emission tests of a randomly selected unit of each model, and the Protocol shall be adhered to during the confirmation testing of all units subject to this rule.

(2) When applying for unit(s) certification, the manufacturer shall submit to the Executive Officer the following:

(A) A statement that the model is in compliance with subdivision (c). The statement shall be signed and dated, and shall attest to the accuracy of all statements;

(B) General Information

(i) Name and address of manufacturer,

(ii) Brand name, and

(iii) Model number, as it appears on the unit rating plate;

(C) A description of each model being certified; and

(D) A source test report verifying compliance with the emission limits in subdivision (c) for each model to be certified. The source test report shall be prepared by the confirming independent testing laboratory and shall contain all of the elements identified in Section 10 of the Protocol for each unit tested. The source test shall have been conducted no more than ninety (90) days prior to the date of submittal to the Executive Officer.

(3) When applying for unit certification, the manufacturer shall submit the items identified in paragraph (d)(2) no more than ninety (90) days after the date of the source test identified in subparagraph (d)(2)(D) and at least 120 days prior to the date of the proposed sale of the units.

(4) The Executive Officer shall certify a unit model which complies with the provisions of subdivision (c) and of paragraphs (d)(1), (d)(2), and (d)(3).

(5) Certification status shall be valid for three years from the date of approval by the Executive Officer. After the third year, recertification may be required according to the requirements of paragraphs (d)(1) and (d)(2).

(e) Modification (Retrofit) Provisions and Demonstration of Compliance With Emission Limits.

Any unit, may be modified or demonstrated to meet the requirements of paragraph (c)(1), (c)(2), (c)(3), (c)(4), or (c)(5) provided:

(1) The unit is certified pursuant to subdivision (d); or

(2) A certified retrofit kit has been installed; or

(3) A copy of a source test report conducted by an independent third party, demonstrating the specific unit complies with the emission limits at low and high fire, shall be maintained on-site; and

(4) The source test report clearly specifies the emissions limit of the unit in parts per million or pounds of NOx per million BTU of heat input. The source test report must identify that the source test was conducted pursuant to a District approved protocol; and

(5) The source test report shall be maintained on-site at the facility where the unit is being operated and made available to the Executive Officer, at all times, upon request, as long as the unit is being operated. The model and serial numbers of the specified unit shall clearly be indicated on the source test report.

(f) Identification of Compliant Units

(1) Newly Manufactured Units

The manufacturer shall display the model number of the unit complying with subdivision (c) on the shipping carton and permanent rating plate. The manufacturer shall also display the certification status on the shipping carton and on the unit.

(2) Certified Retrofit Kits

The manufacturer shall display the model number of the retrofit kit and manufacturer and model of applicable units on the shipping carton and in a plainly visible portion of the retrofit kit.

(3) Modified Units

A unit with a new or modified burner shall display the new rated heat input capacity and certification status on a new permanent rating plate. The gross heat input shall be based on the maximum fuel input corrected for fuel heat content, temperature and pressure.

(g) Enforcement

The Executive Officer may periodically inspect distributors, retailers, and installers of units located in the District, and conduct such tests as are deemed necessary to ensure compliance with subdivision (c).

(h) Exemptions

(1) The provisions of this rule shall not apply to:

(A) Units used in recreational vehicles.

(B) Units subject to the limits in District Rule 1121 – Control of Nitrogen Oxides From Residential Type, Natural Gas-fired Water Heaters.

(C) Units at a RECLAIM or former RECLAIM facility subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities.

(D) Units at a municipal sanitation service facility subject to a NOx emission limit in a Regulation XI rule adopted or amended after [*date of amendment*].

(2) The provisions of paragraphs (c)(3), (c)(4), and (c)(5) shall not apply to:

(A) Any residential unit.

(B) Units with a rated heat input capacity greater than 400,000 BTU per hour, but less than or equal to 2,000,000 BTU per hour that are demonstrated to use less than 9,000 therms during every calendar year. Compliance with the exemption limit shall be demonstrated by a calculation based on the annual fuel consumption recorded by an in line fuel meter or the annual operating hours recorded by a timer and using one of the following methods.

(i) Annual therm usage recorded by fuel meter and corrected to standard pressure; or

(ii) Amount of fuel (i.e., in thousand cubic feet of gas corrected to standard pressure) converted to therms using the higher heating value of the fuel; or

(iii) Annual therm usage calculated by multiplying the number of hours fuel is burned by the rated heat input capacity of the unit converted to therms.

~~*(3) The NOx emission limits of paragraphs (c)(1), (c)(2), (c)(3), (c)(4) and (c)(5) of this rule shall not apply to units located at* RECLAIM facilities.~~

~~any RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities.~~

(i) Progress Reports

Any person that manufacturers Type 1 units or Type 2 fire tube boilers, steam boilers producing steam pressure greater than 100 pounds per square inch or thermal fluid heaters subject to this rule shall submit to the District a report on progress towards compliance with the emission limits of paragraphs (c)(7) and (c)(8). Progress reports shall include detailed information on all burner and control technologies evaluated and emission tests. The progress reports shall be submitted to the District for the following categories of equipment by the specified date:

(1) Type 2 fire tube boilers, steam boilers producing steam pressure greater than 100 pounds per square inch and thermal fluid heaters shall be submitted to the District by January 31, 2008.

(2) Type 1 units shall be submitted to the District by January 31, 2010.

PROPOSED RULE 1100. IMPLEMENTATION SCHEDULE FOR NOx FACILITIES

(a) Purpose

The purpose of this rule is to establish the implementation schedule for Regulation XX NOx RECLAIM facilities that are transitioning to a command-and-control regulatory structure.

(b) Applicability

This rule applies to any owner or operator of a RECLAIM or former RECLAIM facility that owns or operates equipment that meets the applicability provisions specified in:

(1) Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; or

(2) Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters.

(c) Definitions

(1) ANNUAL HEAT INPUT means the total heat input to a unit during a calendar year.

(~~1~~2) FORMER RECLAIM FACILITY means a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program.

(~~2~~3) HEAT INPUT means the chemical heat released due to assumed complete combustion of fuel in a unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.

(~~3~~4) INDUSTRY-SPECIFIC CATEGORY means RECLAIM or former RECLAIM facilities subject to NOx emission limits in a rule adopted on or after November 2, 2018 for refineries or electricity generating facilities.

(~~4~~5) NOx EMISSIONS means the sum of nitric oxides and nitrogen dioxides emitted, calculated as nitrogen dioxide.

(~~5~~6) RATED HEAT INPUT CAPACITY means the heat input capacity as specified by the permit issued by the Executive Officer, or if not specified on the permit, as specified on the nameplate of the combustion unit. If the combustion unit

has been altered or modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the new maximum heat input shall be considered as the rated heat input capacity.

(~~6~~7) RECLAIM FACILITY means a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.

(~~7~~8) RULE 1146 UNIT means any boiler, steam generator, water heater, or process heater subject to Rule 1146 with a rated heat input capacity that is equal to or greater than 5 million Btu per hour, excluding units specified in Rule 1146 exemptions.

(~~8~~9) RULE 1146.1 UNIT means any boiler, steam generator, or process heater subject to Rule 1146.1 with a rated heat input capacity that is greater than 2 million Btu per hour and less than 5 million Btu per hour, excluding units specified in Rule 1146.1 exemptions.

(~~9~~10) TITLE V FACILITY means any facility that meets the criteria set forth in Rule 3001 - Applicability.

(d) Rule 1146 and Rule 1146.1 Implementation Schedule

(1) An owner or operator of a RECLAIM or former RECLAIM facility with any Rule 1146 or Rule 1146.1 unit shall:

(A) On or before [*12 months after date of adoption*], submit complete SCAQMD permit applications for any Rule 1146 and Rule 1146.1 units that currently do not meet the applicable NOx concentration limit specified in paragraph (d)(3);

(B) On or before January 1, 2021 meet the applicable NOx concentration limit for a minimum of 75% of the cumulative total rated heat input capacity of all Rule 1146 and Rule 1146.1 units at the facility; and

(C) On or before January 1, 2022 meet the applicable NOx concentration limit of 100% of Rule 1146 and Rule 1146.1 units at the facility.

(2) An owner or operator that elects to replace an existing Rule 1146 or Rule 1146.1 unit at a RECLAIM or former RECLAIM facility with a new unit may use the rated heat input capacity of the unit being replaced to meet the required percentage of the cumulative total rated heat input capacity for all Rule 1146 and Rule 1146.1 units at the facility specified under subparagraphs (d)(1)(B) and (d)(1)(C) provided the owner or operator:

(A) On or before [*12 months after date of adoption*], submits complete SCAQMD permit applications for any applicable new Rule 1146 and Rule 1146.1 units, as well as accepts a permit condition that identifies which unit(s) will be replaced and no longer operated when the new units are installed or after January 1, 2023, whichever is earlier; and

(B) Replaces the existing unit on or before January 1, 2023.

(3) The applicable NOx concentration limits specified in subparagraphs (d)(1)(B) and (d)(1)(C) are as follows:

(A) Rule 1146 units shall meet the NOx concentration limit for the category of equipment specified in Rule 1146, Table 1146-1 – NOx Emission Limits and Compliance Schedule; and

(B) Rule 1146 units that meet the applicability provisions specified in Rule 1146 paragraph (c)(2) shall meet the ammonia emission limit specified in Rule 1146 paragraph (c)(2); and

(C) Rule 1146.1 units shall meet the NOx concentration limit for the category of equipment specified in Rule 1146.1, Table 1146.1-1 – NOx Emission Limits and Compliance Schedule

(4) In lieu of complying with the applicable emission limits specified in paragraph (d)(3), the owner or operator of the following unit(s) in operation prior to [*12 months after date of adoption*] with an annual heat input less than or equal to as specified below, shall retain and comply with the unit's NOx emission limit and source testing requirements specified in the SCAQMD Permit to Operate as of [*date of adoption*].

(A) 90,000 therms per year and complying with the requirements specified in Rule 1146 paragraph (c)(5); or

(B) 18,000 therms per year and complying with the requirements specified in Rule 1146.1 paragraph (c)(4).

(5) Notwithstanding paragraph (d)(1), an owner or operator of a RECLAIM or former RECLAIM facility that has installed, modified, or has been issued a SCAQMD Permit to Construct or Permit to Operate for the following Rule 1146 or Rule 1146.1 units prior to [*date of adoption*] shall meet the NOx emission limit specified in paragraph (d)(3) by [*15 years after the date of adoption*] or when 50 percent or more of the unit's burners are replaced, whichever is earlier:

~~(A) Units subject to Rule 1146 subparagraph (c)(1)(F) complying with a previous NOx emission limit that is less than or equal to 7 ppm ; or~~

(A) Fire-tube boilers, as defined in Rule 1146 paragraph (b)(7), subject to Rule 1146 subparagraph (c)(1)(G) or (c)(1)(J) complying with a previous NOx emission limit that is less than or equal to 9 ppm and greater than 5 ppm; or

(B) Units subject to Rule 1146 subparagraph ~~(c)(1)(G),~~ (c)(1)(H)~~, (c)(1)(J),~~ or (c)(1)(K) complying with a previous NOx emission limit that is less than or equal to 12 ppm and greater than 5 ppm; or

(C) Units subject to Rule 1146.1 subparagraph (c)(1)(E)~~ or (c)(1)(F)~~ complying with a previous NOx emission limit that is less than or equal to 12 ppm and greater than 9 ppm; or

(D) Fire-tube boilers, as defined in Rule 1146.1 paragraph (b)(7), fired on natural gas subject to Rule 1146.1 subparagraph (c)(1)(F) complying with a previous NOx emission limit that is less than or equal to 9 ppm; or

(~~D~~E) Thermal fluid heaters, as defined in Rule 1146 paragraph (b)(26), subject to Rule 1146 subparagraph (c)(1)(L) complying with a previous NOx emission limit that is less than or equal to 20 ppm; or

(~~E~~F) Thermal fluid heaters, as defined in Rule 1146.1 paragraph (b)(22), subject to Rule 1146.1 subparagraph (c)(1)(G) complying with a previous NOx emission limit that is less than or equal to 20 ppm.

(6) Notwithstanding paragraph (d)(1), by [*15 years after the date of adoption*] or when 50 percent or more of the unit's burners are replaced, whichever is earlier, the owner or operator that has installed, modified, or has been issued a SCAQMD Permit to Construct or Permit to Operate prior to [*date of adoption*] for the following units shall not operate in a manner that discharges NOx emissions (reference at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of:

(A) 7 ppm for Rule 1146 Group I units operating without air pollution control equipment for the after treatment of the emissions in the exhaust complying with a previous NOx emission limit of 7 ppm or less and greater than 5 ppm; or

(B) 9 ppm for Rule 1146 Group III or Rule 1146.1 natural gas fired units complying with a previous NOx emission limit of 12 ppm or less and greater than 9 ppm.

(7) The owner or operator of any Rule 1146 Group I unit complying with the requirements specified in subparagraph (d)(6)(A) that exceeds 300,000 therms of annual heat input from all fuels used shall:

(A) within 4 months after exceeding 300,000 therms of annual heat input, submit complete SCAQMD permit applications for the unit that does not meet the applicable NOx concentration limit specified in paragraph (d)(3); and

(B) within 18 months after exceeding 300,000 therms of annual heat input, demonstrate and maintain compliance with the applicable NOx concentration limit specified in paragraph (d)(3) for the life of the unit.

(~~6~~8) Any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category is not subject to the requirements contained in this subdivision.

(e) The applicable monitoring, reporting, and recordkeeping requirements are as follows:

(1) For Title V facilities, an owner or operator of a RECLAIM facility shall comply with the monitoring, reporting, and recordkeeping requirements specified in Rule 2012.

(2) Except for Title V facilities, the owner or operator of a RECLAIM facility that becomes a former RECLAIM facility shall comply with the monitoring, reporting, and recordkeeping requirements in the applicable rule(s) as specified in subdivision (b) upon the date the facility becomes a former RECLAIM facility.

ATTACHMENT K

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Staff Report

Proposed Amended Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters;

Proposed Amended Rule 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters;

Proposed Amended Rule 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and

Proposed Rule 1100 - Implementation Schedule for NOx Facilities

DECEMBER 2018

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EXECUTIVE SUMMARY

Control Measure CMB-05 of the Final 2016 Air Quality Management Plan (AQMP) included a five tons per day NOx emission reduction as soon as feasible but no later than 2025, and to transition the Regional Clean Air Incentives Market (RECLAIM) program to a command-and-control regulatory structure requiring Best Available Retrofit Control Technology (BARCT) as soon as practicable. California State Assembly Bill 617, approved by the Governor on July 26, 2017, requires Air Districts to develop, by January 1, 2019, an expedited schedule for the implementation of BARCT no later than December 31, 2023 for facilities that are in the state greenhouse gas cap and trade program.

The RECLAIM program, which is under Regulation XX, was adopted in October 1993 and is a market-based emissions trading program designed to reduce NOx and SOx emissions. Proposed Amended Rules 1146, 1146.1 and 1146.2 update NOx emission limits for boilers, heaters, and steam generators. The revised NOx emission limits represent BARCT and apply to RECLAIM and non-RECLAIM facilities. Proposed Rule 1100 – Implementation Schedule for NOx Facilities (PR 1100) establishes the compliance schedule for facilities exiting the RECLAIM program. The compliance deadlines for Proposed Amended Rules 1146 and 1146.1 were established taking into consideration equipment size range, fuel type, the number of units at a facility, and facilities with multiple units subject to multiple source-specific command-and-control rules. PR 1100 allows facilities with Rule 1146/1146.1 units until January 1, 2022 to retrofit all existing units and until January 1, 2023 to replace any existing units. Proposed Amended Rule 1146.2 applies to units between 400,000 to 2 million British thermal units per hour (MMBtu/hr) and requires units to comply with the 30 ppm limit by December 31, 2023, if a technology assessment (to be completed by January 1, 2022) determines that the NOx emission limits specified in Rule 1146.2 still represent BARCT.

Of the 103 RECLAIM facilities that will be affected by the proposed amendments, 65 facilities would be required to retrofit the non-compliant units by the compliance dates specified in PR 1100, while 21~~20~~ facilities that have units that meet the applicable RECLAIM BARCT[1] limit of 12 ppm would not need to meet the lower NOx emission limit under Proposed Amended Rules 1146 and 1146.1 until the unit's burner replacement or 15 years after rule adoption, whichever occurs earlier[2]. The permitted Rule 1146/1146.1/1146.2 units in the remaining 17~~18~~ facilities meet the proposed NOx emission limits, but could be impacted by the changes in Monitoring, Reporting and Recordkeeping requirements as they transition from the RECLAIM program into a command-and-control regulatory structure. For non-RECLAIM, 824 facilities could potentially be impacted by the proposed amendments.

The cost-effectiveness for Proposed Amended Rules 1146 and 1146.1 ranged from ~~less than $11,000~~ $17,000 to $36,000 per ton of NOx reduced varying depending on the equipment size, type of retrofits, and the unit's operation and load. The cost-effectiveness for Proposed Amended Rule 1146.2 is less than $10,000 per ton of NOx reduced for Rule 1146.2 units at RECLAIM or former RECLAIM facilities to meet the current rule limit. ~~The proposed rule amendments are estimated to reduce 0.27 tons per day of NOx from RECLAIM equipment by January 1, 2023. For non-RECLAIM facilities, the cost-effectiveness is below $11,000 per ton of NOx reduced f~~For units that would be required to demonstrate compliance upon burner replacement or 15 years after

[1] RECLAIM BARCT as stated in Rule 2002 Table 3

[2] The count of RECLAIM facilities with units meeting the applicable RECLAIM BARCT limit of 12 ppm, also includes facilities with thermal fluid heaters currently meeting a NOx emission limit of 20 ppm or less.

rule adoption, whichever occurs earlier, the cost-effectiveness ranges from $17,000 to $31,000 per ton of NOx reduced. For thermal fluid heaters, the cost-effectiveness is approximately $36,000 per ton of NOx reduced. For non-RECLAIM facilities, the cost-effectiveness was assumed to be the same as the one for RECLAIM facilities, which varies from $17,000 to $36,000 per ton of NOx reduced. The proposed rule amendments are estimated to reduce 0.27 tons per day of NOx by January 1, 2023 and an estimated additional reduction of 0.04 tons per day of NOx by 15 years after rule amendment.

CHAPTER 1: BACKGROUND

INTRODUCTION

REGULATORY HISTORY

AFFECTED INDUSTRIES

PUBLIC PROCESS

INTRODUCTION

The Regulation XX - Regional Clean Air Incentives Market (RECLAIM) was adopted in October 1993. The purpose of RECLAIM is to reduce NOx and SOx emissions through a market-based approach. The program replaced a series of existing and future command-and-control rules and was designed to provide facilities with the flexibility to seek the most cost-effective solution to reduce their emissions. It also was designed to provide equivalent emission reductions, in the aggregate, for the facilities in the program compared to what would occur under a command-and-control approach. Regulation XX includes a series of rules that specify the applicability and procedures for determining NOx and SOx facility emissions allocations, program requirements, as well as monitoring, reporting, and recordkeeping requirements.

Regulation XX – RECLAIM has been amended several times to reflect BARCT on a programmatic basis and was most recently amended on December 4, 2015 to achieve BARCT equivalent programmatic NOx emission reductions through an overall reduction in RECLAIM trading credits (RTCs) of 12 tons per day from compliance years 2016 through 2022. RECLAIM was amended on October 7, 2016 to address RTCs from facility shutdowns. In January 2018, Rules 2001 and 2002 were amended to commence the initial steps to transition RECLAIM facilities to a command-and-control regulatory approach. The most recent amendments to RECLAIM was on October 5, 2018, when Rules 2001 and 2002 were amended to provide existing facilities a pathway to voluntarily exit the RECLAIM program and add provisions to allow facilities that are notified to exit RECLAIM, the option to stay in RECLAIM until New Source Review issues are resolved.

Control Measure CMB-05 of the Final 2016 Air Quality Management Plan (AQMP) included a five tons per day NOx emission reductions as soon as feasible but no later than 2025, and to transition the RECLAIM program to a command-and-control regulatory structure requiring Best Available Retrofit Control Technology (BARCT) as soon as practicable. Consistent with the adoption resolution for the 2016 AQMP, staff is providing quarterly updates to the Stationary Source Committee on the status of the transition of RECLAIM facilities to command-and-control with quarterly reports provided on October 20, 2017, February 16, 2018, and June 15, 2018.

On July 26, 2017 California State Assembly Bill (AB) 617 was approved by the Governor, which addresses non-vehicular and vehicular air pollution (criteria pollutants and toxic air contaminants). It is a companion legislation to AB 398, which was also approved, and extends California's cap-and-trade program for reducing greenhouse gas emissions from stationary sources. RECLAIM facilities that are in the cap-and-trade program are subject to the requirements of AB 617. Among the requirements of this bill is an expedited schedule for implementing BARCT for cap-and-trade facilities. Air Districts are to develop by January 1, 2019 an expedited schedule for the implementation of BARCT no later than December 31, 2023 with emphasis on the largest emission sources first.

In 2015, staff conducted a programmatic analysis of equipment at each RECLAIM facility to determine if there are appropriate and up to date BARCT NOx limits within existing command-and-control rules. It was determined that existing command-and-control rules would need to be adopted and/or amended to provide implementation timeframes for achieving BARCT compliance limits for certain RECLAIM equipment and to update emission limits to reflect current BARCT in some existing rules.

Proposed Amended Rules (PARs)1146, 1146.1 and 1146.2 update NOx emission limits for boilers, heaters, and steam generators applicable to these rules. The revised NOx emission limits represent

BARCT and apply to RECLAIM and non-RECLAIM facilities. Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters applies to existing boilers, steam generators, and process heaters with maximum rated heat input capacities greater than or equal to 5 million British thermal units per hour (MMBtu/hr). Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters applies to boilers, steam generators, and process heaters with maximum rated heat input capacities greater than 2 MMBtu/hr and less than 5 MMBtu/hr. Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters establishes NOx emission limits for large water heaters, boilers and process heaters less than or equal to 2 MMBtu/hr. Table 1 summarizes the applicability and existing NOx emission limits in Rules 1146, 1146.1 and 1146.2.

Proposed Rule 1100 - Implementation Schedule for NOx Facilities (PR 1100) establishes the compliance schedule for facilities exiting the RECLAIM program. The compliance timeframe for PARs 1146 and 1146.1 was established taking into consideration equipment size range and the number of units at each facility. Also taken into consideration within the compliance schedule are facilities with multiple units subject to multiple source-specific landing rules. PR 1100 allows facilities with Rule 1146 and/or Rule 1146.1 units until January 1, 2022 to retrofit all existing units and until January 1, 2023 to replace any existing units, if they elect to replace their equipment instead.

Table 1
Applicability and Existing NOx Emission Limits of Rules 1146, 1146.1, and 1146.2

Rule	Applicability	Size	Summary of NOx Emission Limits
Rule 1146	Boilers, steam generators, and process heaters	≥ 5 MMBtu/hr	• 5 ppm for units burning natural gas ≥ 75 MMBtu/hr; • 9 ppm for units burning gaseous fuels 5 to 75 MMBtu/hr • 30 ppm for thermal fluid heaters burning gaseous fuels • 40 ppm for nongaseous fuels • 12 ppm for atmospheric units • 15 ppm for units burning digester gas • 25 ppm for units burning landfill gas
Rule 1146.1	Boilers, steam generators, and process heaters	>2 and <5 MMBtu/hr	• 9 ppm for units burning natural gas • 30 ppm for thermal fluid heaters burning gaseous fuels • 12 ppm for atmospheric units • 15 ppm for units burning digester gas • 25 ppm for units burning landfill gas
Rule 1146.2	Natural gas-fired water heaters, boilers, and process heaters	≤ 2 MMBtu/hr	• Manufacturer limit of 20 ppm; • End-user limit of 30 ppm

REGULATORY HISTORY

The following section provides an overview of the regulatory history for Rules 1146, 1146.1, and 1146.2. All three rules currently exempt RECLAIM facilities.

Rules 1146 and 1146.1

Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters was adopted September 1988 and establishes NOx limits for boilers, steam generators, and process heaters greater than or equal to 5 MMBtu/hour.

Rule 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters was adopted October 1990 and establishes NOx limits for boilers, steam generators and process heaters greater than 2 MMBtu/hour and less than 5 MMBtu/hour. In September 2008, Rules 1146 and 1146.1 were amended to reduce the allowable NOx emission limits from boilers based on rated heat input capacity. Rule 1146 establishes three groups of units based on the size or type of fuel used. The three Rule 1146 groups are as follows:

- Group I units include any unit burning natural gas, excluding digester and landfill gases, with a rated heat input greater than or equal to 75 MMBtu/hr, excluding thermal fluid heaters.
- Group II units include any unit burning gaseous fuels, excluding digester and landfill gases, with a rated heat input less than 75 MMBtu/hr down to and including 20 MMBtu/hr, excluding thermal fluid heaters.
- Group III units include any unit burning gaseous fuels, excluding digester and landfill gases, and thermal fluid heaters[3] with a rated heat input less than 20 MMBtu/hr down to and including 5 MMBtu/hr, and all units operated at schools and universities greater than or equal to 5 MMBtu/hr.

Under the 2008 amendment Rule 1146 Group I units were required to meet a lower emission limit of 5 ppm. Rule 1146 Group II and III units and Rule 1146.1 units, which represented approximately 2,100 units, were required to comply with the 9 ppm (0.011 lbs/10^6 Btu) NOx limit by January 1, 2012 through January 1, 2015. Amendments of Rule 1146 and 1146.1 also required equipment fired by landfill or digester gas to meet emissions limits of 25 ppm and 15 ppm, respectively, by January 1, 2015. The applicable compliance date depended on the unit's rated heat capacity, the number of units at the facility, and the type of service (e.g., supplying steam at a university). Both Rules 1146 and 1146.1 were amended in November 2013 to address an issue related to rule enforceability raised by EPA.

Rule 1146.2

Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers was adopted on January 9, 1998. Rule 1146.2 establishes NOx emission limits for large water heaters and small boilers with a rating of less than 2 MMBtu/hr. SCAQMD has developed a certification program (Rule 1146.2 Certification Program) through which manufacturers submit documentation for new units, including source test reports, to SCAQMD to demonstrate compliance with Rule 1146.2 emission limits. Rule 1146.2 does not regulate residential gas-fired tank type water heaters less than 75,000 Btu/hr heat input which are regulated under SCAQMD Rule 1121. Units used in

[3] A Thermal fluid heater means a process heater in which a process is heated indirectly by a heated fluid other than water.

recreational vehicles, and mobile homes are also exempt from the requirements of Rule 1146.2. The 1998 adoption of Rule 1146.2 established NOx emission limits for large water heaters and small boilers ranging from 75,000 Btu/hr up to and including 2 MMBtu/hr. New water heaters or boilers greater than 0.4 MMBtu/hr and less than or equal to 2 MMBtu/hr (Type 2) were required to meet an emission limit of 30 ppm of NOx and 400 ppm of CO. New units from 75,000 Btu/hr to 0.4 MMBtu/hr (Type 1) were required to meet a NOx emission limit of 55 ppm or 40 ng/Joule of heat output. Compliance dates for emission limitations were based on the date of equipment manufacture.

Rule 1146.2 was amended by the SCAQMD Governing Board at the January 7, 2005 hearing. Under the amended rule, compliance for existing in-use equipment was implemented as the unit reached 15 years of life. Lower emissions limits for new equipment were not considered for the January 7, 2005 rule amendment because additional time was needed to evaluate low NOx technologies and their cost-effectiveness.

Rule 1146.2 was amended again in May 2006 to address NOx emission limits for new equipment. With the exception for small pool heaters rated less than or equal to 400,000 Btu/hr, new manufactured units greater than 400,000 Btu/hr must meet a NOx emission limit of 20 ppm starting January 1, 2010. Most new manufactured units less than or equal to 400,000 Btu/hr must meet a 20 ppm (less than 14 ng/Joule heat output) NOx limit by January 1, 2012. Pool heaters rated less than or equal to 400,000 Btu/hr, will continue to meet the existing limit of 55 ppm (or 40 ng/Joule heat output). The cost-effectiveness for meeting a 20 ppm NOx limit averaged $2,400 per ton for Type 2 units and up to $16,000 per ton for Type 1 units less than or equal to 400,000 Btu/hr.

AFFECTED INDUSTRIES

PARs 1146, 1146.1, and 1146.2 affect facilities in the NOx RECLAIM program as well as facilities outside of the RECLAIM program with boilers, heaters, and process heaters that are greater than 75,000 Btu/hr. PARs 1146 and 1146.1 will require facilities to comply with lower emissions limits for applicable units located in the South Coast Air Basin and Coachella Valley. Rule 1146.2 does not have new requirements for non-RECLAIM facilities so these facilities are not impacted by the proposed amendments. In addition, PARs 1146, 1146.1, and 1146.2 exempt units that are subject to an industry-specific rule that includes a NOx emission limit for the applicable units in Rules 1146, 1146.1, and 1146.2. For example, boilers that are subject to an emission limit in Rule 1109.1 (Refinery Equipment) and Rule 1135 (Emissions of Oxides of Nitrogen from Electricity Generating Facilities) are regulated under the respective rules, and are exempt from PAR 1146 series. On the other hand, non-electricity generating boilers are not regulated in Rule 1135, and they will be subject to PAR 1146 series. As a result, power generating boilers at electricity generating facilities and boilers at refineries that are in RECLAIM are not included in the analyses presented in this staff report.

Out of the 259 facilities currently in the NOx RECLAIM program as of August 2018, approximately 103 facilities would be affected by PARs 1146, 1146.1, and 1146.2 and PR 1100. For non-RECLAIM, 824 facilities could potentially be impacted by the proposed amendments.

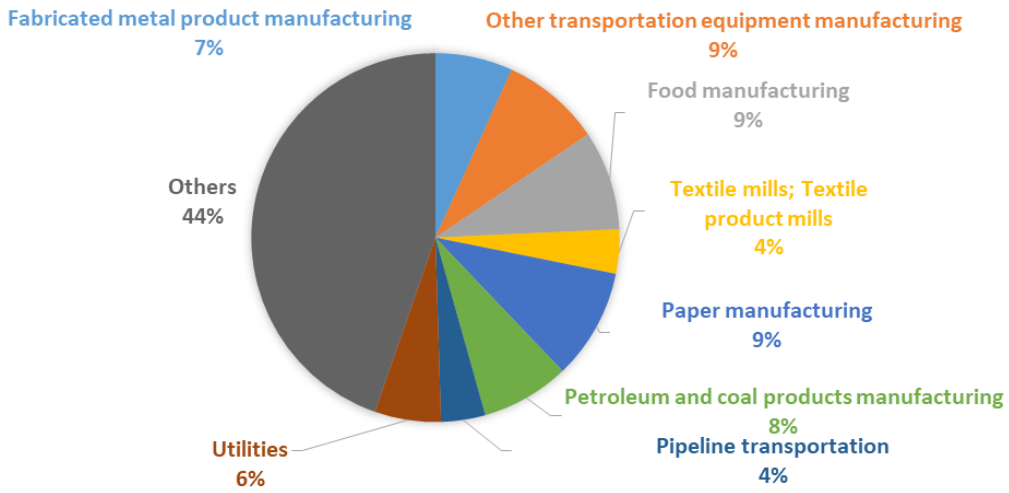


Figure 1
Industries Affected by PARs 1146 Series

When grouped according to the North American Industry Classification System (NAICS) (Figure 1), transportation equipment manufacturing, paper manufacturing, and food manufacturing are the largest contributors each accounting for 9% of the total, followed by petroleum and coal products manufacturing, fabricated metal product manufacturing, utilities, textile product mills, and pipeline transportation. Each single remaining group comprises less than 4% of the total. Remaining NAICS groups include, but are not limited to, chemical manufacturing, primary metal manufacturing, computer and electronic product manufacturing, and oil and gas extraction.

From the 2008 Rule 1146 staff report, the largest affected industry sector in non-RECLAIM was the health services industry which made up 19% for all Rule 1146 units when grouped according to Standard Industrial Classification (SIC). Next, education services and food industry sectors each accounted for 11% of the total units followed by chemicals and allied products, nonclassifiable establishments, and personal services with 4% of the total units each. Hotels and other lodging places and then executive, legislative, and general government each contributed about 3% of the total units. Remaining SIC groups contributed to less than 3% each and include, but are not limited to, textile mill products; justice, public order, and safety; fabricated metal product; and real estate. Similar distributions were outlined in the 2008 Rule 1146.1 staff report for respective units. The total size of non-RECLAIM natural gas fired equipment subject to Rule 1146 and 1146.1 is estimated to be about ~~2,370~~1,807 units as of November 2018.

In the non-RECLAIM universe, there are approximately 20 digester gas fired units and three landfill gas fired units currently operating in the district. Majority of these units are operated by sewage treatment facilities and landfills that offer essential public services to various municipalities. In acknowledgement of the unique challenges faced by the industry, these units will be addressed in a separate sector specific command-and-control rule to be developed, and will not be subject to the proposed emission limits in the PAR 1146 and 1146.1.

PUBLIC PROCESS

Development of PARs 1146, 1146.1, and 1146.2 and PR 1100 was conducted through a public process. SCAQMD staff has held seven working group meetings at SCAQMD Headquarters in Diamond Bar on November 30, 2017, January 16, 2018, March 7, 2018, April 12, 2018, August

2, 2018, August 29, 2018, and October 16, 2018. The Working Group is composed of representatives from the manufacturers, trade organizations, permit stakeholders, businesses, environmental groups, public agencies, consultants, and other interested parties. The purpose of the working group meetings are to discuss proposed concepts and to work through the details of staff's proposal. A Public Workshop was held on February 14, 2018. A California Environmental Quality Act (CEQA) scoping meeting was held concurrently with the Public Workshop. Based on additional BARCT analysis, another Public Workshop was held on September 20, 2018.

In addition to the PARs 1146, 1146.1, and 1146.2 and PR 1100 Working Group Meetings, staff has also discussed concepts for the proposed rules at the RECLAIM Working Group meetings on July 13, 2017, September 14, 2017, October 12, 2017, January 11, 2018, February 8, 2018, March 8, 2018, April 12, 2018, May 9, 2018, June 14, 2018, July 12, 2018, and September 13, 2018. On April 20, 2018 and October 19, 2018, the proposed amendments to Rule 1146 series and PR 1100 and the associated impacts were presented to the Stationary Source Committee.

Staff has also had numerous individual meetings with stakeholders who will be impacted by this rulemaking.

CHAPTER 2: CONTROL TECHNOLOGIES

BARCT ASSESSMENT FOR RULE 1146 AND 1146.1 EQUIPMENT

CONTROL TECHNOLOGY ASSESSMENT FOR RULE 1146.2 EQUIPMENT

BARCT ASSESSMENT FOR RULE 1146 AND 1146.1 EQUIPMENT

The California Clean Air Act (CCAA) requires districts to achieve and maintain state standards by the earliest practicable date, and for extreme non-attainment areas, to include all feasible measures. [Health and Safety (H&S) Code §§40913, 40914, and 40920.5]. The required use of *Best Available Retrofit Control Technology* (BARCT) for existing stationary sources is one of the specified feasible measures. Health & Safety Code §40406 defines BARCT as follows:

> *Best Available Retrofit Control Technology means 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.*

The BARCT technology assessment for the source categories subject to the proposed amended rules included review of commercially available NOx emission reduction technologies for boilers, steam generators, and process heaters and an evaluation of applicable NOx concentration limits established under existing rules and regulations at other air districts. A summary of the analysis is provided below.

Assessment of SCAQMD Regulatory Requirements

As part of the BARCT assessment, staff reviewed SCAQMD Rules 1146 and 1146.1 which regulates emissions of oxides of nitrogen from industrial, institutional, and commercial boilers, steam generators and process heaters. Rule 1146 regulates units rated to greater than or equal to 5 MMBtu/hr and Rule 1146.1 regulates units rated to greater than equal to 2 MMBtu/hr and less than 5 MMBtu/hr. Current rule emission limits were adopted on September 5, 2008. All parts per million emission limits specified in rules are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

Under Rule 1146 boilers, steam generators and process heaters fueled by gaseous fuels, excluding digester and landfill gases, are segregated into three different size groups: Group I (≥75 MMBtu/hr), Group II (≥20 and <75 MMBtu/hr) and Group III (≥5 and <20 MMBtu/hr). Group I units are limited to 5 ppm NOx, Group II and III are limited to 9 ppm NOx. Units that are fueled with non-gaseous fuels are subject to emission limit of 40 ppm.

Rule 1146.1 limit boilers and process heaters fueled by natural gas to 9 ppm NOx. Both Rules 1146 and 1146.1 includes a limit of 12 ppm NOx for atmospheric units[4] and a limit of 30 ppm for thermal fluid heaters. All units subject to Rule 1146 and 1146.1 fired by landfill gases are required to meet NOx emissions limits of 25 ppm by January 1, 2015, and units fueled by digester gas are required to meet 15 ppm by January 1, 2015.

Other Regulatory Requirements

Analysis of NOx Concentration Limits for Rules 1146 and 1146.1 Equipment at Other Air Districts

Staff reviewed other air district's requirements for Rule 1146 and 1146.1 equipment to identify rules and regulations with lower emission limits or limits representing improvements in pollution control technologies. A comparison of the requirements in the PAR 1146 series with the analogous rules adopted by four other air districts in California was made. The four air districts were San

[4] An atmospheric boiler is defined as a natural gas fired unit with a non-sealed combustion chamber in which natural draft is used to exhaust combustion gases.

Joaquin Valley, Sacramento Metropolitan, Ventura, and Bay Area. They are selected based on the severity of their nonattainment status for ozone and PM2.5 federal air quality standards.

SJVAPCD Rule 4306, SJVAPCD Rule 4307, and SJVAPCD Rule 4320

SJVAPCD Rules 4306 Boilers, Steam Generators, and Process Heaters – Phase 3 and 4320 Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr apply to any gaseous fuel or liquid fuel fired boiler, steam generator, or process heater with a total rated heat input greater than 5 MMBtu/hr. SJVAPCD Rule 4307 Boilers, Steam Generators, and Process Heaters – 2.0 MMBtu/hr to 5.0 MMBtu/hr apply to any gaseous fuel or liquid fuel fired boiler, steam generators, and process heaters with a total heat input greater than or equal to 2.0 MMBtu/hr and less than or equal to 5.0 MMBtu/hr. SJVAPCD Rule 4307 limits natural gas fired non-atmospheric units to 9 ppm, natural gas fired atmospheric units to 12 ppm, and gaseous fuel-fired units to 30 ppm. SJVAPCD Rule 4320 Advanced Emissions Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr limits NOx emissions from units with greater than a 20 MMBtu/hr input rating to 7 ppm (or 5 ppm for compliance at a later date). For units with greater than a 5 MMBtu/hr input rating up to and including 20 MMBtu/hr, emission limit was set at 9 ppm (or 6 ppm for compliance at a later date). Units located at a wastewater treatment facility fired by <50% California public utility commission (PUC) quality gas, such as biogas, emission limit was set at 12 ppm (or 9 ppm for compliance at a later date). Depending on the equipment size and selected NOx limit, the proposed compliance date extended from January 1, 2011 to January 1, 2014.

Overall, SJVAPCD has a more stringent limit than SCAQMD rules for the subcategory between 20 and 75 MMBtu/hr (7 ppm in SJVAPCD Rule 4320 vs 9 ppm in SCAQMD Rule 1146). SJVAPCD is also more stringent for units located at wastewater treatment facilities fired with biogas (between 9 to 12 ppm in SJVAPCD Rule 4320 vs 15 ppm for digester gas fired units and 25 ppm for landfill gas fired units in SCAQMD Rule 1146 and Rule 1146.1) for units greater than 5 MMBtu/hr. It is important to note that for SJVAPCD's Rules 4306 and 4320, the owner or operator has the option of paying into an annual emissions fee in lieu of complying with the limits. Also, for units ≥ 75 MMBtu/hr, emission limit in SCAQMD Rule 1146 (5 ppm) is more stringent than SJVAPCD's limit of 7 ppm for natural gas units.

Sacramento Metropolitan Air Quality Management District (SMAQMD) Rule 411

SMAQMD Rule 411 NOx from Boilers, Process Heaters and Steam Generators establishes NOx emission limits boilers greater than or equal to 1 MMBtu/hr. The emission limits range from 15 to 30 ppm for units 1 to 20 MMBtu/hr, depending on equipment size and operation. For units greater than 20 MMBtu/hr, the limit is 9 ppm. Units that are fueled with landfill gas or combination of landfill gas and natural gas are limited to between 15 ppm as of October 27, 2009.

Ventura County Air Pollution Control District (VCAPCD) Rule 74.15 and Rule 74.15.1

VCAPCD Rule 74.15 Boilers, Steam Generators and Process Heaters (5 MMBtu/hr and greater) establishes a NOx emission limit of 40 ppm for boilers greater than or equal to 5 MMBtu/hr regardless of fuel type. For natural gas fired units greater than 2 and less than 5 MMBtu/hr, emission limits range from 9 to 12 ppm in Rule 74.15.1 Boilers, Steam Generators and Process Heaters (1 to 5 MMBtu/hr). Rule 74.15.1 also requires units greater than 2 and less than 5 MMBtu/hr fueled by digester and landfill gases to meet emission limits of 15 ppm and 25 ppm respectively. The same rule requires units equal to or greater than 1 and less than or equal to 2 MMBtu/hr to limits their NOx emissions to 20 ppmv.

Bay Area Air Quality Management District (BAAQMD) Regulation 9 Rule 7

BAAQMD Regulation 9 Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters) establishes NOx emission limits for boilers greater than 2 MMBtu/hr. The emission limits range from 15 to 30 ppm for units 2 MMBtu/hr to and including 20 MMBtu/hr, depending on equipment size and operation. For units greater than 20 MMBtu/hr and less than 75 MMBtu/hr, the limit is 9 ppm. The emission limit is 5 ppm for units greater than or equal to 75 MMBtu/hr. Units greater than 1 MMBtu/hr fueled by landfill or digester gas are required to meet emission limit of 30 ppm.

Assessment of NOx Emission Limits for Existing Units

Permit Limits

As part of BARCT analysis, permit limits for existing boilers, steam generators, and process heaters fueled by natural gas, landfill gas and digester gas from within SCAQMD as well as permitting databases from other agencies were reviewed. The objective of this task is to ascertain if any existing units are currently permitted below current limits of Rule 1146 and 1146.1. The analysis also looked into identifying other control technologies implemented by permitted equipment in order to achieve designated permit limits. Additional considerations were made in regards to equipment configurations such as water-tube and fire-tube. Data from outside of SCAQMD was obtained from analyzing clearinghouse databases from the United States Environmental Protection Agency (US EPA), California Air Resources Board (CARB), and various local level agencies such as San Joaquin Valley APCD and Bay Area AQMD as well as installation lists provided by equipment vendors and local air agencies.

From the US EPA and California ARB clearinghouse database, several large units (>75 MMBtu/hr) fired with natural gas were found to be permitted at 5 ppm NOx with SCR post combustion controls, and the requirements are in line with SCAQMD Rule 1146 Group I requirements. No examples of units fired with natural gas with a permit limit of 7 ppm or below utilizing ULNB replacements were identified in the EPA or CARB clearinghouses. Similar results were found from clearinghouse databases of BAAQMD, SJVAPCD, SMAQMD and VCAPCD. From vendor provided installation lists and source test data, one new natural gas fired unit was identified in SJVAPCD with a permitted limit of 5 ppm with only ULNB. One new natural gas fired unit was identified within SCAQMD with permit limit of 7 ppm utilizing only ULNB as control technology.

Analysis of previously mentioned clearinghouse databases were also conducted for landfill gas fired and digester gas fired units. Landfill gas and digester gas are both forms of biogas created by decomposition of organic materials. Landfill gas is generated by chemical reactions between waste components and microbial action during waste decomposition occurring in landfill operations. Due to the nature of landfills, the supply of combustible gases are dependant on the amount of waste added and is expected to fall off after landfill closure as biological materials complete their decomposition process. Digester gas is generated by anaerobic biological reactions that occur inside of anaerobic digesters, or bioreactors. Rules 1146 and 1146.1 currently limits digester gas fired units to 15 ppm and landfill gas fired units to 25 ppm.

In addition to the database available online, SJVAPCD and SMAQMD provided permitting data and source test results for the landfill gas fired and digester gas fired units in the respective jurisdiction. The lowest permitted digester gas fired unit, demonstrated by source test, is located in SJVAPCD with a permit limit of 5 ppm. The unit is rated at 99 MMBtu/hr equipped with SCR post combustion control technology and was permitted as new; however, it is important to note that the source of this unit's digester gas is not from a wastewater treatment facility and would not

necessarily have the same challenges as those experienced in wastewater treatment facilities. One unit operating at a wastewater reclaimation facility located in SJVAPCD was able to demonstrate compliance to a permit limit of 9 ppm with only burner replacement with ULNB technology. Digester units located in SCAQMD are permitted to a limit of 15 ppm. Based on this analysis, the lowest permitted digester gas unit across the three air districts achieved a NOx limit of 9 ppm using a burner replacement.

The lowest permitted landfill gas fired unit, demonstrated by source test, is located in SMAQMD with a permit limit of 15 ppm. The unit located in SMAQMD is rated at 32.4 MMBtu/hr and utilized ULNB replacement technology. Another unit fired with landfill gas was identified in SJVAPCD with a permit limit of 9 ppm and rated to 38 MMBtu/hr; however, this unit is pending source test to demonstrate compliance with permitted limit. The lowest limit for permitted landfill units located in SCAQMD is rated to 115 MMBtu/hr, permitted new, limited to 21 ppm.

Permit limits from thermal fluid heaters located within SCAQMD were also analyzed. Thermal fluid heaters are a form of process heaters that indirectly heat processes through the usage of thermal fluids that are not water. Thermal NOx emissions from thermal fluid heater differ from other water process heaters due to higher operating temperatures. The current emission limit for thermal fluid heaters under Rule 1146 and 1146.1 is 30 ppm. Permit limits for units in SCAQMD range between 9 ppm to 30 ppm. Most of the newly permitted units located in SCAQMD are given permit limits of 20 ppm based on manufacturer guarantees. One unit was found to be permitted new at 9 ppm with only ULNB technology and some units were permitted at 12 ppm utilizing burner replacements. From analysis of existing permitted limits, the unit with the lowest permitted emission limit was identified to be located in SJVAPCD with a permitted limit of 5 ppm utilizing only ULNB technology. The unit was permitted as new equipment subject to BACT. The analysis was able to show that the lowest achieved controlled emission from thermal fluid heaters utilizing burner replacements was 12 ppm.

The main limitation involved with utilizing clearinghouse databases is the frequency in which they are updated. Clearinghouse data are usually not up-to-date and do not reflect most recent best available control technology. Information that are not available in clearinghouse data are provided by vendors in the form of installation lists.

Source Test

One of the main tools used for compliance demonstration is source tests conducted under District approved protocols. Rules 1146 and 1146.1 require periodic source testing for facilities to demonstrate compliance with applicable rule and permit limits. For RECLAIM facilities permitted with concentration limits, periodic RECLAIM source tests must be conducted to demonstrate equipment operates under the permitted concentration limit.

Facility submitted source test results were analyzed to determine the technical feasibility of establishing a lower BARCT limit. Within SCAQMD, there is a total of ~~1,072~~722 non-RECLAIM[5] units subject to Rule 1146.1, ~~1,068~~1,075 non-RECLAIM[6] units subject to Rule 1146, and 259 units subject to RECLAIM rules. A total of 196 units was surveyed for real world emissions via facility submitted source test reports. Total units surveyed make up for 8.2% of total units located in SCAQMD with 105 units from the non-RECLAIM universe and 91 units from the

~~[5] Command and control equipment distribution figures obtained from 2008 rule revision staff report for Rule 1146 and 1146.1~~

~~[6] Command and control equipment distribution figures obtained from 2008 rule revision staff report for Rule 1146 and 1146.1~~

RECLAIM universe. Source tests were obtained from SCAQMD database which consists of reports submitted by facilities to demonstrate compliance to various monitoring and testing requirements. SCAQMD requires equipment source tests to be conducted in an "as found" condition and emissions results are an average of the testing period. Some source test are conducted at different "loads" at a set time span. To account for source tests conducted at multiple load settings, the highest emission result was used for the analysis.

From the data set mentioned above, 34 units were subject to Rule 1146.1 NOx limits for natural gas fired equipment ranging from 9 to 12 ppm. Ten out of the 34 natural gas fired units were atmospheric units subject to the rule limit of 12 ppm. Six out of 10 atmospheric units were source tested about 10% below the rule limit (i.e., below 10.8 ppm), three out of 10 atmospheric units were source tested >30% below the rule limit (i.e., <8.4 ppm), and one out of 10 atmospheric units were source tested <10% below rule limit (i.e., between 10.8 to 12 ppm). It should be noted that the three atmospheric units tested >30% below the rule limit were all new installations. Twenty four of the 34 units were non-atmospheric units. Thirteen out of the 24 non-atmospheric units demonstrated <10% below the rule limit. The remaining eleven out of 24 non-atmospheric units demonstrated levels substantially lower (> 30%) than 9 ppm (i.e., below 6.3 ppm). Among the 11 units, nine were new or modified units permitted at BACT, and 2 utilized burner replacements. The source test results demonstrate that it is technically feasible for a Rule 1146.1 unit to achieve an emission level of 7 ppm with a burner replacement, providing at least 10% buffer for rule compliance. From this analysis, the source test records do not support the feasibility of Rule 1146.1 atmospheric units to achieve an emission level of 9 ppm with only a burner replacement, after providing a 10% buffer for possible rule compliance.

A total of 134 units surveyed were subject to Rule 1146, with 2 atmospheric units (5 to 10 MMBtu/hr), 73 units in Group III (5 to 20 MMBtu/hr), 44 units in Group II (20 to 75 MMBtu/hr) and 15 units in Group I and II equipped with SCR. Units equipped with SCR are required to meet 5 ppm regardless of unit size, so analysis summary combined Group I and SCR equipped units together.

Results displayed in Table 2 show that it is technically feasible for Rule 1146 Group III and Group II units to achieve an emission limit of 7 ppm with burner replacements; and Rule 1146 units equipped with SCR to achieve an emission limit of 4 ppm, both providing a 10% buffer for possible compliance demonstration. Table 2 also ~~shows~~ suggests that it is not technically feasible for Rule 1146 atmospheric units to achieve an emission level of 9 ppm with burner replacements since none of the atmospheric units surveyed demonstrated source test results >30% below the exisiting rule limit.

Table 2
Source Test Evaluation for Rule 1146 Equipment

Category	Equipment Range	Current Rule Limit	Total Units Surveyed	Number of Units Tested to be > 30% below Existing Rule Limit	
				New	Retrofit
Rule 1146 Atmospheric (Group III)	5-10 MMBTU/HR	12 ppm	2	2	0
Rule 1146 Group III	5-20 MMBTU/HR	9 ppm	73	9	2
Rule 1146 Group II	20-75 MMBTU/HR	9 ppm	44	10	2
SCR Equipped Boilers (Groups I, II, & III)	21-127 MMBTU/HR	5 ppm	15	1	5

Source tests records from a total of 14 thermal fluid heaters ranging from 2 MMBtu/hr to 10 MMBtu/hr with emissions limit of 30 ppm were evaluated. Five out of 14 units source tested substantially (>64%) below the permit limit. Out of the five units, 3 units were new or modified equipment permitted at BACT and 2 units utilized burner replacements. This shows that it is technically feasible for thermal fluid heaters applicable to Rule 1146.1 and 1146 ~~thermal fluid heaters~~ to achieve an emission level of 12 ppm with burner replacements after providing at least 10% buffer for rule compliance.

In addition to natural gas fired units, source test results of 10 digester gas fired units and three landfill gas fired units subject to Rule 1146 and 1146.1 were also evaluated. Digester gas fired units ranged between 3 to 63 MMBtu/hr while landfill gas fired units ranged from 115 to 335 MMBtu/hr. Out of 10 digester gas fired units, five units source tested substantially (>40%) below permit limit of 15 ppm. Out of those five units, two units were boilers with burner replacements and the other three units were permitted new. These results show that it is technically feasible for digester gas fired units to meet emission limits lower than 15 ppm with only burner replacements. Out of the three source tests for landfill gas fired units, two units were source tested to show emissions below permitted limits (>20%) of 21 and 25 ppm. Surveyed units in the landfill facilities are operating with the burners that were originally equipped for the boilers. Original permit applications for the three landfill gas fired units were submitted between 1984 and 1990. Even though analyzed source test results were limited to equipment operating with burners designed back in original permit application, test results suggest that it is feasible for currently equipped burners to be able to meet a lower emission limit; however, the two landfills located in SCAQMD had been closed. Additional analysis will be required in order to determine the effects of lowering quality of gas from inactive landfills.

Continuous Emissions Monitoring System

Continuous emissions monitoring systems (CEMS) are continuous monitors affixed to the equipment's exhaust stack that offers constant real time averages (both 15 minute and hourly) for NOx or CO depending on the type of analyzer used. CEMS are used in both non-RECLAIM and RECLAIM applications. RECLAIM major sources are required to have continuous NOx emissions monitoring in the form of CEMS or district approved equivalent. CEMS systems in NOx RECLAIM are used to track NOx emissions at the equipment stack and calculate mass NOx emission averages in real time. RECLAIM CEMS are also used to transmit daily aggregate emission reports to District central station for RECLAIM reporting purposes. Facilities equipped with CEMS are required to conduct annual relative accuracy test audit (RATA) to demonstrate the accuracy of each system.

CEMS data from two RECLAIM major sources and three non-RECLAIM landfill gas fired sources were analyzed to study the behavior of equipment emissions throughout the span of an operational year. Analyzed CEMS data consists of 15 minute average and hourly average. The hourly average data is calculated from four 15 minute "quadrants" for every hour. Fifteen minute "quadrants" consists of averages of minute data that is collected from the CEMS analyzer located at the equipment exhaust stack. CEMS analyzers also have certified ranges of detection and data points are only valid between 10 to 95% of total analyzer range. To ensure accuracy of the analyzer data, data points that reside outside of CEMS analyzers certified valid ranges are excluded from this analysis.

CEMS data from two RECLAIM major sources were analyzed, and both units were equipped with SCR post combustion controls with permit limits of 5 ppm. The analyzed data show while facility's RATA results demonstrated emissions that were considerably (>30%) lower than the

permit limit, CEMS readings demonstrated that the real world emissions (in ppm @ 3% O2) from major sources with permit limit of 5 ppm often fluctuate from 3 ppm to 4.5 ppm even though facility passed annual RATA or periodic source tests with emissions results of <3.5 ppm. Results from this analysis were considered for ~~preliminary~~ staff BARCT recommendations.

In addition to analyzing RECLAIM CEMS results, CEMS data from all three landfill gas fired boilers located in SCAQMD were analyzed to study the behavior of emissions from landfill gas fired equipment. Facility reported emissions for both 15 minute averages and one hour averages. It is important to note that CEMS from RECLAIM and non-RECLAIM units serves different purposes. RECLAIM CEMS are utilized for emissions reporting while non-RECLAIM CEMS are used as a tool of enforcement. Rule 1146 contains periodic monitoring requirements that utilize both 15 minute and 60 minute averages. In order to take a conservative approach, focus was given to the 15 minute data in order to understand emissions behavior from landfill gas fired sources. CEMS analyzers are certified for accuracy only within 10 to 95% of their rated ranges; therefore, all measurements outside of their respective analyzer certified ranges were deemed invalid. Monthly averages of valid CEMS 15 minute data was calculated to obtain a macro perspective of equipment emissions. From the calculated monthly averages of 15 minute data, one out of three units demonstrated emission levels between 16 to 18 ppm NOx while the other two units demonstrated emissions of around 21 ppm NOx.

Monthly emission ranges from valid CEMS data also analyzed to provide understanding of emissions behavior for landfill gas fired equipment. One concern raised from stakeholders is the inconsistencies in equipment emissions due to gas "pockets" which would cause emission levels to unexpectedly spike without warning, resulting in violation of rule and permit requirements. To better understand this behavior, monthly maximum and minimum was determined from valid set of emissions data and standard deviation was calculated using the same valid monthly dataset used to calculated monthly emissions averages. It is observed that standard deviations across all data sets were relatively small which indicate a relatively small data spread; however, there were 1 to 2% of data points from each month that exceeded equipment permit limits. Start up and shutdown periods were accounted for due to the periods of inactivity before or after. Monthly maximums for some months were observed to be over twice the monthly average. In conclusion all three landfill gas fired units show fluctuations with their real world emissions. Results from this analysis were considered for ~~preliminary~~ BARCT recommendations and possible future rulemaking.

Monitoring, Reporting and Recordkeeping (MRR)

RECLAIM

Under RECLAIM mass emissions reported by each facility are used to track and demonstrate compliance. To ensure the integrity of reported emissions, RECLAIM includes substantial monitoring and reporting requirements, as specified in Rule 2012 - Requirements for Monitoring, Reporting and Recordkeeping for Oxides of Nitrogen Emissions. RECLAIM MRR requirements are developed to accurately determine mass emissions of NOx for each facility, which is necessary for emission reconciliation and compliance demonstration in the cap-and-trade regulatory structure. RECLAIM MRR requirements are segregated by device classifications. The 4 major device classifications are major sources, large sources, process units, and Rule 219 exempt equipment. A summary of the MRR requirements is discussed here and additional analysis can be found in Appendix A.

Major sources are units with a total heat input rating of greater than or equal to 40 MMBtu/hr with total annual fuel usage of greater than 90 Billion Btu. Units that are classified as major sources are

required to install a continuous emissions monitoring system (CEMS) or District approved equivalent. To ensure the integrity of reported emissions, RECLAIM includes substantial monitoring and reporting requirements for major sources such as annual (or semi-annual) relative accuracy testing audit (RATA), daily emissions electronic reporting, quarterly aggregate electronic reporting, quarterly certifications of emissions reports (QCER), and annual permit emissions program (APEP) report ~~(APEP)~~.

Large sources are units with a total heat input rating of greater than or equal to 10 MMBtu/hr and less than 40 MMBtu/hr with annual emissions of between 4 and 10 tons. Under the RECLAIM program, units classified as large sources are required to electronically report monthly emissions and quarterly aggregate emissions as well as QCER and APEP requirements. Large sources are also required to conduct source testing every three years and conduct semi-annual tuning.

Process units are units with a total heat input rating of between 2 MMBtu/hr and 10 MMBtu/hr. Process units share similar reporting requirements as Rule 219 exempt equipment which are rated to less than or equal to 2 MMBtu/hr. Both process units and Rule 219 exempt equipment are required to submit quarterly electronic emissions reports as well as QCER and APEP requirements. Process units assigned concentration limits are required to conduct source testing every five years and all process units are required to conduct semi-annual tuning. Rule 219 exempt equipment are not subject to periodic testing or tuning requirements unless required by permit.

Non-RECLAIM

In a command-and-control regulatory structure, a device-level emission standard (expressed in concentration such as ppm in Rules 1146, 1146.1 and 1146.2) is used for regulatory and compliance demonstration. Rules 1146 and 1146.1 also requires periodic emissions monitoring for facilities to demonatrate compliance to emission concentration limits.

Non-RECLAIM units with total heat input rating of greater than or equal to 5 MMBtu/hr are subject to Rule 1146. Rule 1146 units with the exception of CEMS equipped units are subject to periodic monitoring and source testing to demonstrate compliance to command-and-control concentration limits. Facilities are required to conduct initial periodic monitoring either monthly or every 750 hours and then quarterly or every 2,000 hours after three consecutive passes. Source testing is required every three years for units with total heat input of greater than or equal to 10 MMBtu/hr and every five years for units with total heat input of greater than or equal to 5 MMBtu/hr and less than 10 MMBtu/hr. CEMS is required for units with total heat input of greater than or equal to 40 MMbtu/hr and with total annual heat input of greater than 200 Billion Btu. Units equipped with CEMS are also subject to monitoring and reporting requirements of Rule 218 which includes annual ~~relative accuracy testing (~~RATA~~)~~, and semi-annual reporting. Periodic tuning is required for units complying with low-use requirements.

Non-RECLAIM units with total heat input of greater than 2 MMBtu/hr and less than 5 MMBtu/hr are subject to Rule 1146.1. Rule 1146.1 units are subject to periodic monitoring and source testing to demonstrate complaicne to command-and-control concentration limits. Facilities are required to conduct initial periodic monitoring either quarterly or every 2,000 hours and then semi-annually or every 4000 hours after four consecutive passes. Source testing is required every five years. Periodic tuning is required for units complying with low-use requirements.

Rule 1146.2 applies to units rated to less than or equal to 2 MMBtu/hr and does not require periodic monitoring, recordkeeping or reporting.

Comparison of MRR Requirements in RECLAIM and Non-RECLAIM

Staff has analyzed the MRR requirements in RECLAIM and Rule 1146 Series. Comparisons between the MRR requirements in RECLAIM and Rule 1146 Series of (a) source testing, (b) tune up / emission checks, (c) reporting, (d) recordkeeping, and (e) missing data procedures are presented in Appendix A Tables A1-5, respectively. In general, RECLAIM MRR and Rule 1146 command and control MRR are comparable. The reporting element of the RECLAIM program is more comprehensive than Rule 1146 command and control requirements; however, the focus of RECLAIM reporting is to certify the accuracy of RTC reconciliation while the focus of Rule 1146 reporting is for compliance determination. RECLAIM periodic compliance monitoring and Rule 1146 command-and-control periodic compliance monitoring are generally comparable with the exception of facilities operating a unit that is in between the CEMS applicability threshold or facilities subject to Title V.

Since the applicability threshold in annual heat input is lower in RECLAIM, it is possible that a piece of equipment required to maintain a CEMS under RECLAIM Rule 2012 might not be required to maintain the CEMS when it is subject to Rule 1146. Mass emissions reported by RECLAIM facilities are used to track and demonstrate compliance in the RECLAIM program and not necessarily required to demonstrate compliance to Rule 1146. Facilities transitioning from RECLAIM to an equipment-based command-and-control regulatory structure should be subject to the same regulatory requirements as other non-RECLAIM facilities. In particular, Rule 1146 was approved in the California State Implementation Plan (SIP) in 2014 (79 FR 57442). It was determined by EPA that Rule 1146 is consistent with the relevant policy and guidance as required under the Clean Air Act.

Title V requires additional periodic monitoring for the SIP-approved, federally enforceable rules that do not contain sufficient monitoring requirements to assure compliance with the emission limitations or other requirements. SCAQMD has developed guidelines, outlined in SCAQMD Periodic Monitoring Guidelines[7], for periodic monitoring, testing and recordkeeping requirements that may be incorporated in Title V permits. Currently, the monitoring requirements in the RECLAIM program are comprehensive and address the Title V periodic monitoring requirements. Staff is currently working on adopting Proposed Rule 113 – Monitoring, Reporting, and Recordkeeping (MRR) Requirements for NOx and SOx Sources in order to address the additional MRR as required by the Title V program.

Assessment of Pollution Control Technologies

Ultra-Low NOx Burners Systems

For gaseous fuels, thermal NOx is generally the largest contributor of NOx emissions. High flame temperatures trigger the disassociation of nitrogen molecules from combustion air and a chain reaction with oxygen follows to form oxides of nitrogen. Factors that minimize the formation of thermal NOx include reduced flame temperature, shortened residence time, and an increased fuel to air ratio. To reduce NOx emissions, combustion parameters can be optimized, control techniques can be applied downstream of the combustion zone, or a combination of the two approaches can be utilized. Common types of combustion modification include: lowered flame temperature; reduced residence time at high combustion temperature; and reduced oxygen concentration in the high temperature zone.

There are a variety of configurations and types of burners for ultra-low NOx burner (ULNB) systems. Often, fuel and air are pre-mixed prior to combustion. This results in a lower and more

[7] Periodic Monitoring Guideline. http://www.aqmd.gov/home/permits/title-v/title-v-requirements#pm.

uniform flame temperature. Some premix burners also use staged combustion with a fuel rich zone to start combustion and stabilize the flame and a fuel lean zone to complete combustion and reduce the peak flame temperature. These burners can also be designed to spread flames over a larger area to reduce hot spots and lower NOx emissions. Radiant premix burners with ceramic, sintered metal or metal fiber heads spread the flame and produce more radiant heat. When a burner produces more radiant heat, it results in less heat escaping the boiler through the exhaust gases.

Most premix burners require the aid of a blower to mix the fuel with air before combustion takes place (primary air). A commonly used application in combination with these burners is flue gas recirculation (FGR). FGR recycles a portion of the exhaust stream back into the burner. Increasing the amount of primary air and/or use of FGR can reduce flame temperature but it also reduces the temperature of combustion gases through dilution and can reduce efficiency. To maintain efficiency a manufacturer may have to add surface area to the heat exchanger. Increasing the primary air may also destabilize the flame. Ultra-low NOx burners require sophisticated controls to maintain emissions levels and efficiency, to stabilize the flame, and to maintain a turndown ratio that is sufficient for the demands of the particular operation.

It was noted in the 2008 staff report to Rule 1146 and 1146.1 that there was clear evidence that these types of burners had been successfully retrofitted on boilers and heaters according to SJVAPCD in their Rule 4306. Source tests that were conducted in conjunction with Rule 4306 showed a 98% compliance rate with a 9 ppm NOx limits using ultra-low NOx burners. In 2010, SCAQMD staff published a technology assessment report discussing the implementation assessment of ultra-low NOx burners subject to Rules 1146 and 1146.1. The report concluded that the 9 ppm NOx limit can be achieved by ultra-low NOx burner systems for boilers and process heaters greater than 2 MMBtu/hour. There were ultra-low NOx burners from 16 different manufacturers that could achieve the 9 ppm NOx compliance limit.

Selective Catalytic Reduction (SCR) Systems

SCR is a post-combustion control technology that is a commercially available commonly employed to control NOx emissions from boilers and other NOx sources. It is considered to be BARCT, if cost-effective, for controlling NOx emissions from existing combustion sources such as boilers and process heaters. A typical SCR system design consists of an ammonia storage tank, ammonia vaporization and injection equipment, a booster fan for the flue gas exhaust, an SCR reactor with catalyst, an exhaust stack plus ancillary electronic instrumentation and operations control equipment. The technology uses a precious metal catalyst that selectively reduces NOx in the presence of ammonia. Ammonia is injected in the flue gas stream where it reacts with NOx and oxygen in the presence of the catalyst to produce nitrogen and water vapor.

For conventional SCRs, the minimum temperature for NOx reduction is 500 degrees F and the maximum operating temperature for the catalyst is 800 degrees F. Depending on the application, the type of fuel combusted, and the presence of sulfur compounds in the exhaust gas, the optimum flue gas temperature of an SCR system is case-by-case and will range between 550 degrees F and 750 degrees F to limit the occurrence of several undesirable side reactions at certain conditions. Depending on the type of combustion equipment utilizing SCR technology, the typical amount of ammonia slip can vary between less than five ppmv when the catalyst is fresh and 20 ppmv at the end of the catalyst life. However, newly permitted SCR systems have an ammonia slip limit of 5 ppmv. In addition to the conventional SCR catalysts, there are high temperature SCR catalysts that can withstand temperatures up to 1200 degrees F and low temperature SCR catalysts that can operate below 500 degrees F.

Based on the 2008 staff reports for Rule 1146 and 1146.1, SCR as applied to Rule 1146 boilers can achieve NOx concentrations from 5 to 6 ppm for units greater than or equal to 75 MMBtu/hr.

Other Potential Technologies

The following section summarizes an alternative technology that may have the potential to reduce NOx emissions for this source category.

ClearSign Technology

ClearSign Combustion Corporation in Seattle has developed two technologies applicable for boilers and heaters: DUPLEX™ technology and Electrodynamic Combustion Control (ECC™). DUPLEX™ technology can be installed in new boilers or heaters, or retrofit in existing boilers and heaters. The DUPLEX technology comprises a proprietary DUPLEX tile installed downstream of conventional burners. The hot combustion flame from the conventional burners impinges onto the DUPLEX tile, and the tile helps radiate heat evenly with high emissivity to the combustion products. DUPLEX operation also creates more mixing and shorter flames. Since the flame length is one parameter that limits the total heat release in a furnace, decreased flame length can allow for significantly higher process throughputs. DUPLEX tile is expected to have a 3- to 5-year life. The Electrodynamic Combustion Control (ECC™) uses an electric field to effectively shape the flame, accelerate flame speed, and improve flame stability. The total electrical field power required to generate such effects is less than 0.1% of the firing rate. Bench test performance estimates for DUPLEX and ECC indicated that NOx and CO were less than 5 ppmv, when furnace temperatures were steady maintained between 1200 and 1800 degrees F.

In San Joaquin Valley, this technology has been installed in two small refinery heaters, three oilfield steam generators, and six enclosed flares. While it is a promising technology, more testing/demonstration would be needed before sustainability / durability is proven.[8]

Vendors Discussion

The following nine vendors and manufacturers (in alphabetical order) were contacted requesting information regarding ULNB and SCR systems. Five out of the nine provided technical input and cost estimates that has been included in the discussion below and the cost-effectiveness analysis in this staff report.

- Alzeta
- California Boiler
- Heat Transfer Solutions
- McGill AirClean
- McKenna Boiler
- Nationwide Boiler Incorporated
- Parker Boiler Company
- RF MacDonald
- Superior Boiler

Ultra-Low NOx Burners Systems

Except for atmospheric units and thermal fluid heaters, the current NOx limit for units burning gaseous fuels, excluding digester and landfill gases, with a rated heat input capacity between 2 and 75 MMBtu/hr is 9 ppm. Based on the information obtained through vendor discussions, lower

[8] "Clearsign Ultra Low NOx Technology", San Joaquin Valley APCD, November 7-8 2017.

NOx emissions with ultra-low NOx burners are feasible for burner replacements and new installations. For certain applications and for new installations, achieving 5 ppm NOx limit with an ultra-low NOx burner without SCR is feasible. Based on discussions with three vendors, burner replacements on existing units could potentially meet 7 ppm or less. With the exception of one vendor, 7 ppm or less with ultra-low NOx burners are limited to fire-tube boilers and not currently available for water-tube boilers. The difference between water-tube and fire-tube boilers is that a water-tube boiler circulates water through a series of tubes, the tubes are heated externally by the combustion gas, and the surrounding hot gases heat the water in the steam-generating tubes; whereas a fire-tube boiler passes combustion gases inside a series of tubes that are surrounded by a closed vessel of water that is heated to produce steam.

Two of the three vendors stated they would be able to provide 7 ppm ultra-low NOx burner replacements for existing units with a rated heat input capacity greater than 2 MMBtu/hr and up to 30 MMBtu/hr for one vendor and 60 MMBtu/hr for the other. The third vendor that could provide 7 ppm ultra-low NOx burner replacements specified a rated heat input capacity of at least 8.4 MMBtu/hr, since a minimum furnace size would be required, and up to 50 MMBtu/hr. In addition to these size requirements, based on discussions with the third vendor, the proper back and steam pressure, as well as the age of the unit would be factors in whether an existing unit could achieve a NOx emission limit of 7 ppm or less with a burner replacement. Additionally, for existing units to achieve 7 ppm or less with ultra-low NOx burner replacements additional controls, such as variable frequency drive (VFD) and oxygen trim might~~are~~ also be needed. Historically, the scope of staff's analysis does not go beyond determining feasibility of the proposed control options to account for detailed engineering of viable alternatives as other means to meet the proposed limits. The limitations provided by some vendors are precautions for case-by-case scenarios, were certain burner designs or unit specifications could have limitations in achieving 7 ppm or less with only an ultra-low NOx burner replacement. However, these restrictions were not presented by all vendors. Vendors have been providing 7 ppm ultra-low NOx burner replacements as retrofits for a wide and diverse variety of boilers, which has been standard practice for units in SJVAPCD. In addition to the information gathered from vendor discussions, the source test results discussed and summarized aboved show that it is technically feasible for existing Rule 1146 Group II and Group III and Rule 1146.1 units to achieve an emission limit of 7 ppm or less with burner replacements.

SCR Systems

The NOx emission limit specified in Rule 1146 for Group I units is 5 ppm, which is met with the use of SCR. SCR systems are scalable and generally utilized for units greater than 10 MMBtu/hr. Based on the information obtained through vendor discussions, it is potentially feasible for retrofit units to meet 4 ppm or less. While vendors have not been able to guarantee 3 ppm or less for SCR retrofits for units subject to the proposed amendments, there are some applications that can achieve 4 ppm or less. However, there are several limitations for SCR retrofits to meet 4 ppm or less, such the age, flow, and size of the catalyst bed of the existing SCR system. Another factor that might limit SCR retrofit applications from meeting 4 ppm or less is the required 5 ppm ammonia slip; for example, NOx emissions of 2.5 ppm is feasible but at the cost of higher ammonia slip (i.e. 10 ppm). The existing catalyst bed might not be large enough to comply with both the lower NOx limit and the 5 ppm ammonia slip limit. Additionally, a NOx feedback analyzer will most likely be needed in order to maintain the lower NOx levels. The most significant constraint is the inadequate safety margin between the permitted limit and the actual emissions to account for fluctuations in external factors such as ambient temperature or fuel heat input (i.e. gas Btu).

Atmospheric Units

Atmospheric units are currently required to meet 12 ppm NOx in Rules 1146 and 1146.1. A vendor has stated that they can provide new atmospheric units with ultra-low NOx burners to meet 9 ppm. However, this lower limit would not be feasible for all retrofit applications via burner replacement. Since fluctuations in ambient conditions affect atmospheric units more than sealed combustion units, a 9 ppm NOx emission limit is currently not feasible for retrofitted atmospheric units.

Thermal Fluid Heaters

The NOx emission limit for thermal fluid heaters in Rules 1146 and 1146.1 is currently 30 ppm. Thermal fluid heaters typically operate at much higher temperatures than process heaters that use water as the heating fluid, which could result in higher NOx emissions. Based on discussions with vendors, thermal fluid heaters with ultra-low NOx burners guaranteed to meet 20 ppm or less are available. While 9 ppm is available for new units of certain applications, burner replacements for existing units could meet 15 to 12 ppm. However, there could be some loss in efficiency for the units since premix combustion burners requires higher percentage of oxygen.

Landfill and Digester Gas Fired Units

The NOx emission limit for digester gas fired units in Rules 1146 and 1146.1 is currently 15 ppm. Based on discussions with vendors, digester gas fired units can be guaranteed to meet 12 ppm, while 9 ppm is dependant on fuel composition and heating value which can vary depending on facility. NOx concentrations limits below 7 ppm is not feasible due to the presence of H_2S. Lowering digester gas emissions might also cause an increase in CO emissions.

The NOx emission limit for landfill gas fired units in Rules 1146 and 1146.1 is currently 25 ppm. Based on discussions with vendors, it is feasible for landfill gas fired units to meet between 15 to 20 ppm NOx when the methane concentration of supplied landfill gas is between 50 to 60%. If fuel is supplemented by up to 10% natural gas by volume, methane concentration requirement of supplied landfill gas can be lowered to 50%.

Low-Fuel Use Units

Rule 1146 and 1146.1 each include a provision for units that operate with low fuel usage. The low fuel use provisions limit annual usage to <90,000 therms/year and <18,000 therms/year, in Rule 1146 (c)(5) and Rule 1146.1 (c)(4) respectively. As a matter of illustration, the operating capacity for a 10 MMbtu/hr unit with an annual usage of 90,000 therms/year is approximately 11 percent. The annual fuel usage limit is listed as a condition in the permit, and is used for compliance determination. If a low fuel use unit exceeds the fuel usage limit in the permit, the operator or owner of the unit shall demonstrate compliance with the BARCT emission limit within 18 months after the exceedance. Although low fuel use units are exempt from the BARCT emission limits, they are still subject to a NOx emission limit of 30 ppm (or 0.036 lbs/10^6 Btu) upon the unit's burner replacement. The 30 ppm limit was established based on the "off-the-shelf" technology that was available back in the technology assessment of the 2008 amendments. As part of the current BARCT assessment, the emission limit for low fuel use units is reassessed. Whereas the BARCT emission limits, representing the *best* available retrofit control technology, for Group I, Group II, and Group III units vary from 5 to 9 ppm, the current "off-the-shelf" technology for a *basic* retrofit for a natural gas fired unit is 12 ppm. The emission limit of 12 ppm was based on discussion with vendors, taking into the consideration that many of the low fuel use units have a higher equipment life and they have been in operation for more than 30 years. Nonetheless, given the low fuel usage, it is not cost--effective to require immediate retrofits for these units (see the cost-effectiveness section for more details). As a result, staff does not recommend reducing the

emissions limit for these units at this time as this would not be BARCT because it is not cost-effective. Therefore, it is recommended for low fuel use units to meet a NOx emission limit of 12 ppm upon replacement of burner.

Summary of BARCT Technology Assessment for Rules 1146 and 1146.1

Natural Gas Fired Equipment

Based on the review of the types of pollution control technologies available to reduce NOx emissions applicable to the boilers, steam generators and process heaters subject to Rule 1146 and 1146.1, SCR and ultra-low NOx burners are still the main technologies that can achieve the NOx concentration limits specified in these rules[9].

Natural gas fired units make up for the majority of equipment subject to Rules 1146 and 1146.1. Currently, San Joaquin Valley APCD Rule 4320 limits units with greater than a 20 MMBtu/hr input rating to 7 ppm (or 5 ppm for compliance at a later date) with an option to comply with a mitigation fee. Source test and permitting data from SJVAPCD demonstrated that compliance to their limits was being achieved without the need for facilities to comply with this mitigation fee option. Based on source test records, it is technically feasible to retrofit non-atmospheric units and thermal fluid heaters to meet lower emission limits as shown in Table 3. Information obtained from vendor discussions confirms findings from the source test analysis. Considerations were made on the operational differences between water-tube and fire-tube boilers which could impact the ability for equipment to come into compliance with staff's recommendations. With additional considerations to the operational differences between water-tube and fire-tube boilers, staff proposes different limits for these types of boiler groups. Staff's recommendation based on feasibility is shown in Table 3.

Table 3
Staff Recommendations for Rules 1146 and 1146.1

Group	Size (MMBtu/hr)	Recommended Emission Limit	Supporting Evidence
Rule 1146 Group I	≥75	5 ppm via SCR (same as existing limit)	N/A
Rule 1146 Group II	≥20 to <75	For units > 12 ppm: 5 ppm via SCR For units ≤ 12 ppm: Fire-tube boilers: 7 ppm via ULNB Other boilers: 9 ppm via ULNB	• Existing permitted equipment currently equipped with SCR • Source test results from permitted equipment • Scalability of SCR technology from vendor discussions
Rule 1146 Group III	≥5 to <20	Fire-tube boilers: 7 ppm via ULNB Other boilers: 9 ppm via ULNB	• Existing equipment permitted at 7 ppm • Source test result from permitted equipment • Vendor discussions backs up feasibility of 7 ppm retrofits for fire-tube equipment
Rule 1146.1	>2 to <5	Fire-tube boilers: 7 ppm via ULNB Otherboilers: 9 ppm via ULNB	• Source test result from permitted equipment • Vendor discussions backs up feasibility of 7 ppm retrofits for fire-tube equipment
Atmospheric Units	≤10	12 ppm via ULNB (same as existing limit)	N/A
Thermal Fluid Heaters	N/A	12 ppm via ULNB	• Existing equipment permitted at 12 ppm • Source test result from permitted equipment • Vendor discussions backs up feasibility of 12 ppm retrofits

[9] In the event that an owner or operator installs a new burner to meet the proposed emission limit, a permit modification would be required. If the owner or operator chooses to increase the boiler's rating in the process, the equipment would be subject to the emission limit set by Best Available Control Technology (BACT).

Landfill and Digester Gas Fired Equipment

Analysis of source test results from digester gas fired equipment demonstrated that it is feasible for digester gas fired units to be retrofitted to meet a lower BARCT limit. Rules 1146 and 1146.1 currently require digester gas fired units to meet NOx emission limits of 15 ppm. However SJVAPCD Rule 4320 contains a more stringent limit of 9 to 12 ppm for all units fired with <50% PUC quality natural gas. Since SJVAPCD allows facilities to mix in up to 50% PUC quality natural gas in order to meet their rule limits, it allows facilities greater flexibility to demonstrate compliance to their rule limits. Units located in SCAQMD demonstrate compliance to biogas limits in rules 1146 and 1146.1 with between 90% to 100% biogas content while units that are co-fired with natural gas (>10% of total usage) require emissions limit to be calculated by the weighted average of each fuel. When allotted for 50% mix of PUC quality natural gas and digester gas, the weighted average is around 12 ppm which is near SJVAPCD's rule limit of 9 to 12 ppm. During the 2008 rule amendment for Rules 1146 and 1146.1, the compliance date for units fired with digester gas was set to January 1, 2015. As a result, most of the facilities recently retrofitted their units to meet the 15 ppm requirement. Given an average lifetime of 15 years for burners, the retrofitted units could have a remaining lifetime of >10 years. By requiring facilities to meet a lower limit three years after the previous amended compliance date could possibly result in stranded assets. Due to the nominal differences between SCAQMD and SJVAPCD limits as well as the relatively recent compliance date for digester gas fired boilers, staff recommends retaining current NOx emission limits for digester gas fired boilers at this time.

In addition to single fueled and co-fired boilers, there are dual fuel boilers. Some dual fuel units located at sewage treatment facilities are capable of utilizing both natural gas and digester gas separately, but cannot be co-fired from a fuel mix. Due to the separation of fuels, dual fuel boilers are permitted to meet both the limit for digester gas and natural gas depending on the fuel used unlike the weighted average emissions limit of co-fired units. Source tests obtained from a retrofitted dual fuel unit in SJVAPCD was able to demonstrate that dual fuel units are capable of achieving 7 ppm when firing on natural gas only. Digester gas and natural gas fired dual fueled units located in SCAQMD are primarily used in wastewater treatment facilities which provide essential public services. Currently SJVAPCD Rule 4320 limit for dual fueled boilers located at wastewater treatment plants is 9 ppm instead of the 7 ppm limit for natural gas fired equipment. Dual fueled units located at sewage treatment facilities within SCAQMD are currently permitted to meet 15 ppm for digester gas and 9 ppm for natural gas. Wastewater treatment facilities need the ability to quickly switch between the two fuels depending on demand which leaves little to no time to retune the boiler for each fuel. There are no examples of digester gas and natural gas dual fueled units located in SJVAPCD or SCAQMD that are currently permitted to 7 ppm when fired by natural gas. Due to the nature of dual fueled units from the varying BTU ratings from natural gas and digester gas, additional analysis is required to determine BARCT for this type of equipment located at wastewater treatment facilities.

Three active landfill gas fired boilers located at two closed landfills in SCAQMD were identified, one is rated to 115 MMBtu/hr and the remaining two are identical units rated to 335 MMBtu/hr, all three units are permitted below current rule limit of 25 ppm. One landfill was closed in 1996 and the other one was closed in 2013. All three landfill gas fired units located in SCAQMD are operating with original burners permitted in 1984 and 1990. Source test results from SMAQMD demonstrated the feasibility for a lower rated unit (32.4 MMBtu/hr) to meet a NOx limit of 15 ppm and one ULNB retrofitted landfill gas fired unit located in SJVAPCD has a permit limit of 9 ppm; however, all the landfill gas fired units located in SCAQMD are larger in size. Based on discussions with vendors, landfill gas fired units should be able to meet concentration limits

between 15 to 20 ppm if the methane concentration of supplied landfill gas is between 50 to 60%, which may differ between facilities. Based on landfill gas analysis conducted during the equipment source tests in 2017, the current methane concentration from both closed landfills ranged between 27 to 33%.

Two facilities located in SCAQMD operating three identified landfill gas fired boilers are closed as of 1996 and 2013. Throughout the rulemaking process, stakeholders that operate equipment fired with landfill gas voiced concerns regarding to the decline in fuel quality and fuel production due to landfill closure. Based on input from facility operators, another challenge faced by these facilities is that replacement and retrofitting will be costly due to the age and unique layout of their equipment. Facility operators also noted that there is no guarantee the newer equipment will be able to operate on the current low methane content of the landfill gas. As for the equipment found in other air districts such as SJVAPCD and SMAQMD, the units identified are significantly smaller in size, so their analysis to establish respective BARCT limits do not necessarily account for the same challenges as the equipment located in SCAQMD. Stakeholders have also raised concerns in regards to the reliability of dual fuel units that can also meet 7 ppm when firing with natural gas only; citing that it is crucial for units to quickly and reliably switch between the two fuels, and facilities do not have time to retune everytime fuel switch occurs.

In consideration to the unique challenges faced by sewage treatment facilities and landfills providing essential public services, staff has decided not to change the NOx concentration limits at this time and to initiate a separate rulemaking efforts to establish an industry specific rule for equipment operated at POTWs and sanitation districts to better address the uniqueness of these facilities such as the type, quantity, and quality of gas and that these units are at essential public services.

Cost-Effectiveness Analysis

In order to assess the cost-effectiveness for the proposed BARCT limits, cost information about the control equipment was obtained from discussions with manufacturers and vendors, as well as from the U.S. EPA SCR Cost Manual[10]. The cost for the control equipment consists of two main components, the capital cost and annual cost. The capital cost is a one-time expense of the equipment, installation, and permitting fees, whereas the annual operating cost includes any recurring expense, such as the cost for electricity, operation and maintenance (O&M), monitoring, and consumables like ammonia and catalyst.

Cost estimates for the equipment and installation were obtained from 5 vendors. The cost depended on the equipment size, NOx emission limit, and the type of retrofit control technology (ultra-low NOx burner or SCR). The budget prices obtained assumed the cost was for retrofits only, that there would be no major changes to existing units such as major structural or foundation changes. Additionally, the useful life for the control equipment was assumed to be 15 years for ultra-low NOx burners and 25 years for SCR. As shown in the graphs below in Figures 2 and 3, when the average costs were compared, there were substantial deviations because of outlier prices obtained from one vendor. To be conservative, the cost-effectiveness analysis is based on the average cost including the outlier. In addition to the average cost for the equipment and installation, the permitting fees are included as part of the capital cost in the cost-effectiveness analysis. The most current fee rates in Rule 301~~310~~ – Permitting and Associated Fees were used to estimate the permitting cost for each category grouped by unit size. Additionally, a recurring

[10] U.S. EPA SCR Cost Manual available at: https://www3.epa.gov/ttn/ecas/docs/SCRCostManualchapter7thEdition_2016.pdf.

cost for SCR retrofits was included in the cost-effectiveness analysis to account ~~for~~ for the annual operating permit renewal fee for SCR systems.

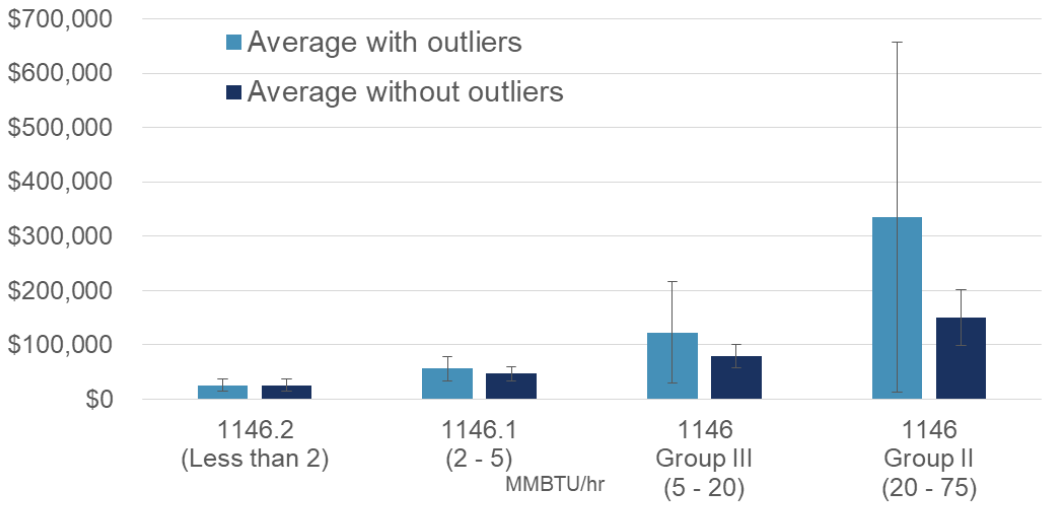


Figure 2
Average Cost with Outliers (Ultra-Low NOx Burner Replacements)

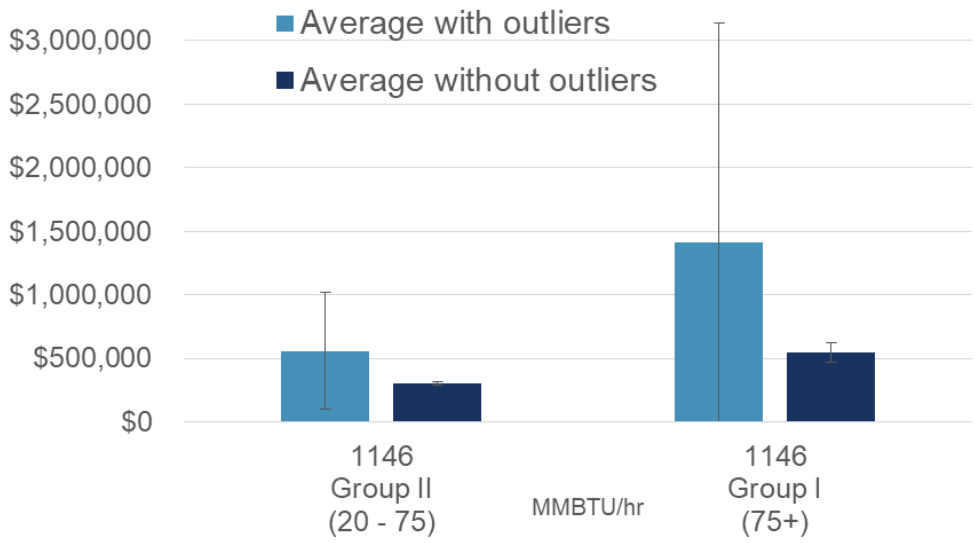


Figure 3
Average Cost with Outliers (SCR Retrofits)

The average equipment and installation cost for Rule 1146 Group I, Group II, Group III, and Rule 1146.1 units was based on the vendor cost estimates for natural gas units of a given size within the size range of each group category. Figures 4 through 9 show the linear correlations between equipment and installation cost for natural gas fired units based on size (MMBtu/hr). The linear

correlation equation (rounded up to two significant figures) displayed in the figures below are for 9 ppm ultra-low NOx burner replacements and 5 ppm SCR retrofits. In the figures below, each data point is the average vendor cost with outliers for a natural gas unit of a given size. The equipment and installation cost for 9 ppm ultra-low NOx burner replacements for existing units with a rated heat input capacity between 2 and 60 MMBtu/hr are shown in Figures 4 and 5. Figure 6 and 7 shows the equipment and installation cost for 5 ppm SCR retrofits for existing units with a rated heat input capacity between 40 and 181.3 MMBtu/hr.

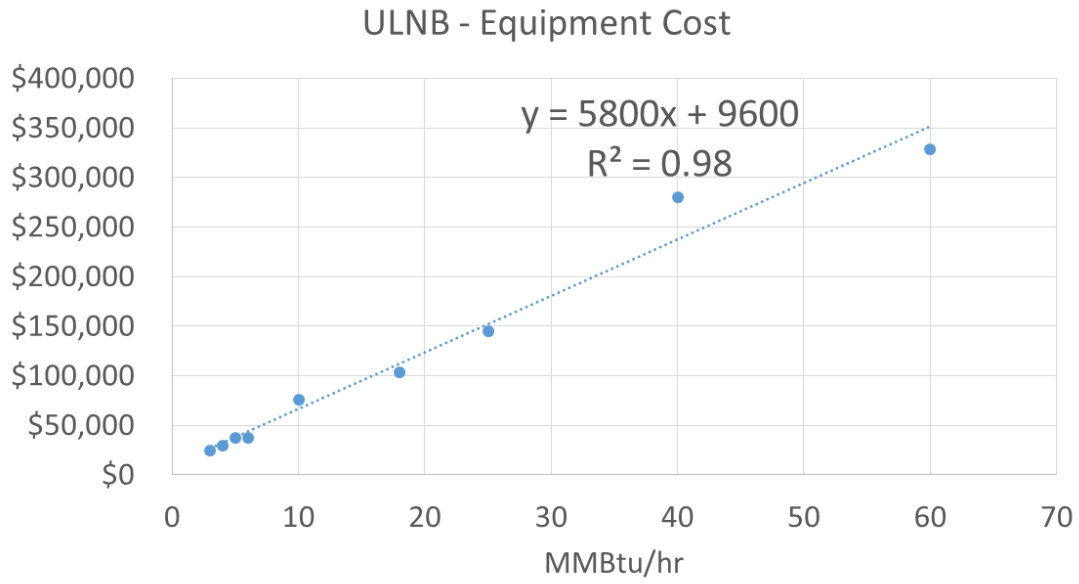


Figure 4
Equipment Cost (9 ppm Ultra-Low NOx Burner Replacements)

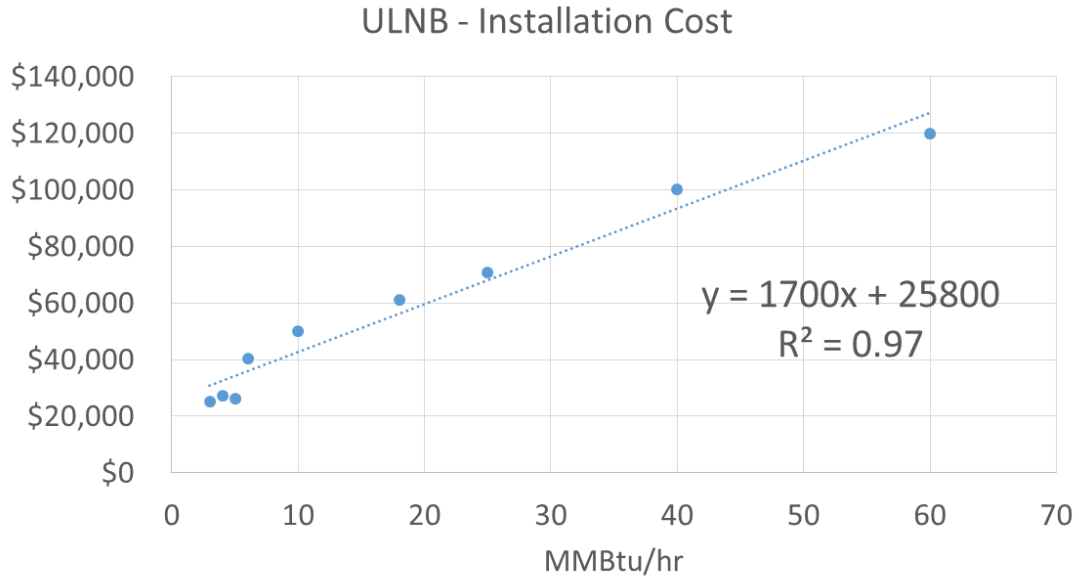


Figure 5
Installation Cost (9 ppm Ultra-Low NOx Burner Replacements)

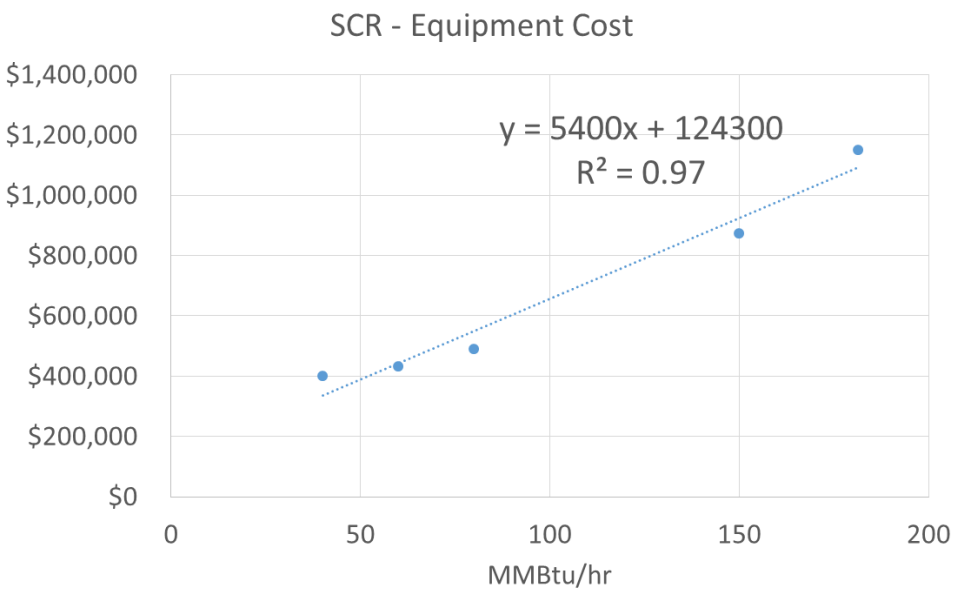


Figure 6
Equipment Cost (5 ppm SCR Retrofits)

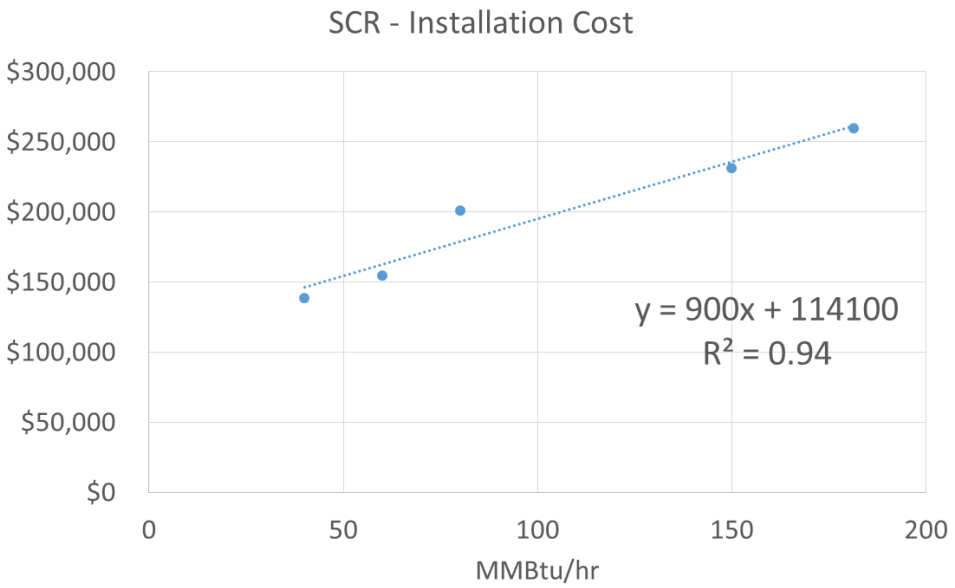


Figure 7
Installation Cost (5 ppm SCR Retrofits)

The cost-effectiveness analysis assumed an additional cost for the equipment that might be needed ~~of~~ for a 7 ppm ultra-low NOx burner replacement for fire-tube boilers. This additional ~~equipment~~ cost was assumed to be for the additional controls needed, such as variable frequency drive amd oxygen trim sensors, in comparison to ~~a~~ the equipment cost for a standard 9 ppm ultra-low NOx burner. It was assumed that the additional equipment cost for a 7 ppm ultra-low NOx burner varied by equipment size. Therefore, the additional equipment cost that ~~were~~ was added to the cost of the 9 ppm ultra-low NOx burner for a 7 ppm ultra-low NOx burner was approximately $3,000 for

Rule 1146.1 units, $10,000 for Rule 1146 Group III units, and $21,000 for Rule 1146 Group II units.

Figures 8 and 9 below summarize the average capital cost that was included in the cost-effectiveness analysis for ultra-low NOx burners and SCR retrofits, repectively. The capital cost in the cost-effectiveness analysis for ultra-low NOx burner replacements, which included the equipment, installation, and permitting costs, was based on 7 ppm and 9 ppm for Rule 1146 Group III and Rule 1146.1 units, where 57~~55~~% of the units were fire-tube boilers required to meet 7 ppm and 43~~45~~% were non fire-tube boilers required to meet 9 ppm[11]. For Rule 1146 Group III, the average capital cost was based on the equipment, installation, and permitting cost of a 6, 10, and 18 MMBtu/hr unit, which was $89,000, $137,000, and $176,000, respectively. For Rule 1146.1, the average capital cost was based on the equipment, installation, and permitting cost of a 3, 4, and 5 MMBtu/hr unit, which was $55,000, $62,000, and $69,000, respectively. The capital cost for atmospheric units and thermal fluid heaters was based on the equipment, installation, and permitting cost of a 2, 5, and 10 MMBtu/hr unit and a12 ppm NOx emission limit. The average capital cost for thermal fluid heaters was $40,000 (2 MMBtu/hr), $54,000 (5 MMBtu/hr), and $91,000 (10 MMBtu/hr). The average capital cost for atmospheric units was $36,000 (2 MMBtu/hr), $47,000 (5 MMBtu/hr), and $66,000 (10 MMBtu/hr). The average capital cost for Rule 1146.2 units was based on the equipment and installation cost of a 0.4 MMBtu/hr ($30,000), 1 MMBtu/hr ($32,000), and 2 MMBtu/hr ($36,000) unit and a 30 ppm NOx emission limit.

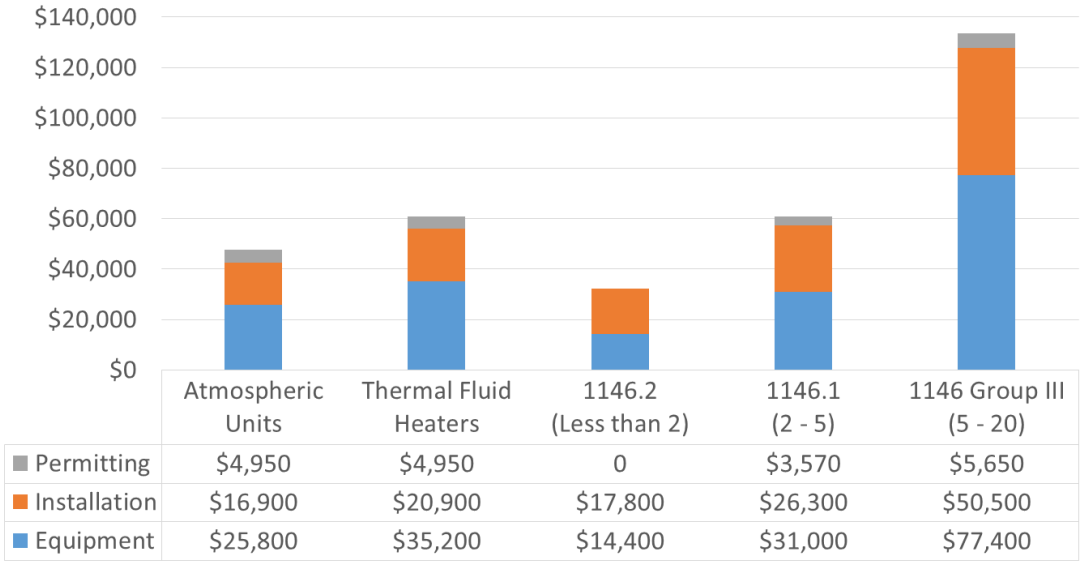
The average capital cost in the cost-effectiveness analysis for SCR retrofits, which included the equipment, installation, and permitting costs, was based on Rule 1146 Group I and Group II units required to meet a 5 ppm NOx emission limit. The average rated heat input capacity that was used to determine the average capital cost for Rule 1146 Group I was 181.3 MMBtu/hr based on the sizes of the three Group I units in RECLAIM that need to be retrofitted. The three units were two 147 MMBtu/hr and one 250 MMBtu/hr. The average capital costs for these respective sizes are $1,151,000 and $1,784,000. The average ~~capitol~~ capital cost for Rule 1146 Group II was based on the equipment, installation, and permitting cost of a 25, 40, and 60 MMBtu/hr unit. The average capital costs was $549,000 (40 MMBtu/hr) and $598,000 (60 MMBtu/hr). For a 25 MMBtu/hr unit, the SCR equipment and installation costs were conservativlely assumed to be the same as that of a 40 MMBtu/hr unit.

The capital costs summarized in Figures 8 and 9 are estimates based on average costs for conventional equipment and standard installations[12]. Some facilities might experience higher than average costs if they decide to stay with a specific vendor or have unique equipment that might required specialized engineering or complex installations. The capital costs varied from vendor to vendor. For example, the cost by vendors ranged from $495,000 to $4 million for Rule 1146 Group I, which had an average capital cost of $1.41 million, from $290,000 to $1.32 million for Group II, which had an average capital cost of $557,000, from $76,000 to $255,000 for Group III, which had an average capital cost of $123,000, and from $28,000 to $89,000 for Rule 1146.1 units, which had an average capital cost of $57,000. The average cost was used to estimate the cost-effectiveness for each group, since it is a better representation to include the costs provided by all

[11] When estimating equipment cost, the percentage of fire-tube boilers was conservatively assumed to be the highest percentage between Rule 1146 Group III and Rule 1146.1 units. This was a conservative approach since the average percentage of fire-tube boilers across Rule 1146 Group II, Group III, and Rule 1146.1 is approximately 40% (rounded up to nearest ten).

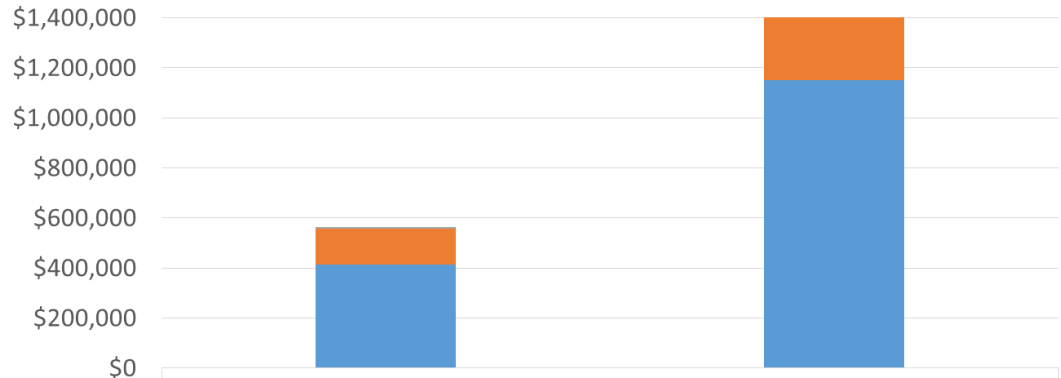
[12] Total and average differences due to rounding

five vendors as an indication of the actual impacts on stakeholders, given that not all stakeholders will select the vendor with the highest costs.



	Atmospheric Units	Thermal Fluid Heaters	1146.2 (Less than 2)	1146.1 (2 - 5)	1146 Group III (5 - 20)
Permitting	$4,950	$4,950	0	$3,570	$5,650
Installation	$16,900	$20,900	$17,800	$26,300	$50,500
Equipment	$25,800	$35,200	$14,400	$31,000	$77,400

Figure 8
Capital Cost (Ultra-Low NOx Burner Replacements)



	1146 Group II (20 - 75)	1146 Group I (75+)
Permitting	$8,370	$8,960
Installation	$144,000	$260,000
Equipment	$412,300	$1,149,400

Figure 9
Capital Cost (SCR Retrofits)

The recurring expenses included in the annual cost were additional electrical, O&M, and monitoring expenses, as well as ammonia and catalyst consumption that are not already required for the existing operation. Additional details of the annual costs that were included in the cost-effectiveness analysis are provided in the following sections.

Additional Electrical Cost

For retrofits with ultra-low NOx burner replacements, the potential cost increase for electricity is from the use of flue gas recirculation (FGR), which requires additional energy due to the higher dilution. However, there are potential savings gained with a new burner since the new burner would have greater efficiency and higher turndowns compared to the older burner. Additionally, the installation of variable frequency drive (VFD) and oxygen sensors can reduce the electrical cost. Therefore, the cost-effectiveness analysis for retrofits with ultra-low NOx burner replacements does not account for additional electrical cost. For SCR retrofits, there will be a cost increase due to the additional energy consumption required for the higher pressure drop, ammonia vaporization, and induction fan associated with the SCR system. The additional energy consumption was calculated using the U.S. EPA SCR Cost Manual, where the estimated power consumption (kW) for the SCR system depended on the unit's rated heat input capacity (MMBtu/hr). The cost was determined assuming a 50% operating capacity and an industrial electricity rate of 12.68 cent per kW-hr [13]. The additional electrical cost included in the cost-effectiveness analysis was approximately $11,900 for Rule 1146 Group II units and $51,800 for Rule 1146 Group I units.

Although, there are additional electrical cost with an SCR system, there are potential savings for units currently using FGR. After installing SCR, units that currently use FGR could reduce or eliminate the use of FGR, since the NOx emissions could primarily be control by the SCR system rather than with FGR. Therefore, savings based on the number of existing non-compliant units with FGR was accounted for when calculating the potential increase in electrical cost. Approximately 47 units between 20 and 75 MMBtu/hr and 3 units greater than 75 MMBtu/hr currently use FGR. The savings were estimated by calculating the annual electrical cost for the energy consumption of FGR based on the average heat input of the burners in Group I and Group II of Rule 1146. The total savings applied in the cost-effectiveness analysis was assumed to be the difference in electrical cost from the reduction in FGR utilization[14] of 30% down to 15%. This potential savings in electrical cost (based on a 20% operating capacity and an industrial electricity rate of 12.68 cent per kW-hr) for each non-compliant unit utilizing FGR was distributed among the total number of non-compliant units in each group category. The number of non-compliant Rule 1146 units for Group II and Group I was 52 and 3, respectively. The FGR savings included in the cost-effectiveness analysis was approximately $3,000 for Rule 1146 Group II units and $14,700 for Rule 1146 Group I units.

Ammonia and Catalyst Cost

SCR uses catalyst and ammonia to selectively reduce NOx. Ammonia is injected into the flue gas stream where it reacts with NOx and oxygen within the catalyst to produce nitrogen and water vapor. The U.S. EPA SCR Cost Manual was used to estimate, based on the unit's rated heat input and a 50% operating capacity, the consumption rate of ammonia and the catalyst volume required to reduce NOx emission from 30 ppm down to 5 ppm with an ammonia slip limit of 5 ppm. The average price of 19% aqueous ammonia obtained from two suppliers was used to determine the recurring cost for the SCR ammonia consumption. The additional recurring annual cost for ammonia that was included in the cost-effectiveness analysis was approximately $5,400 for Rule 1146 Group II units and $23,100 for Rule 1146 Group I units.

[13] U.S. Energy Information Administration Electric Power Monthly Reports (data for the monthly price of electricity for industrial sector in California was used to calculate the annual average for the months of June 2017 – June 2018)
[14] Electrical use for FGR utilization was estimated using data from the chart available at: https://www.preferred-mfg.com/assets/documents/Combustion%20Control%20Strategies.pdf

As for the catalyst, according to discussions with vendors, the catalyst replacement frequency is between 7 to 12 years. Therefore an average replacement frequency of 9 years and a catalyst replacement cost of $258.80 per cubic foot[15] was assumed to estimate the recurring catalyst cost. The additional recurring annual cost for the catalyst consumption that was included in the cost-effectiveness analysis was approximately $3,200 for Rule 1146 Group II units and $13,900 for Rule 1146 Group I units.

Additional O&M Cost

For the O&M cost included in the cost-effectiveness analysis was only the recurring annual cost for labor and materials that are not already part of the existing operations. Existing burners already have service contracts in place, plus there would most likely be less maintenance and fewer repairs for the retrofit burner. Also, additional controls, such as oxygen sensors for oxygen trim would reduce the combustion tuning frequency of a burner without these controls. The oxygen sensors have typical lifespans of 10 – 15 years similar to the ultra-low NOx burners. Therefore no additional O&M cost were accounted for in the cost-effectiveness analysis for retrofits with ultra-low NOx burner replacements. For a retrofit with an SCR system, there will be additional O&M costs compared to a unit with no SCR. The additional O&M cost associated with SCR retrofits accounted for the recurring expense of annual SCR maintenance checks. According to the U.S. EPA SCR Cost Manual, the annual maintenance labor and material cost for an SCR system was assumed to be 0.5% of equipment and installation cost. The additional O&M cost that was included in the cost-effectiveness analysis was approximately $2,800 for Rule 1146 Group II units and $7,100 for Rule 1146 Group I units.

Additional Monitoring Cost

Emissions monitoring was considered separately from the O&M cost. The monitoring cost included in the cost-effectiveness analysis was the additional cost for monitoring, reporting, and recordkeeping (MRR) that is not already required for the existing operations. RECLAIM or former RECLAIM Title V facilities will continue with their current MRR requirements specified in Rule 2012, whereas non-Title V facilities would transition to the command-and-control landing rule requirements. Except for reporting requirements, the MRR requirements for Rule 2012 are comparable to command-and-control MRR requirements for Rules 1146 and 1146.1. Since the MRR requirements will either remain the same or be similar to the existing requirements, no additional monitoring cost was considered in the cost-effectiveness analysis for ultra-low NOx burner retrofits. On the other hand, since SCR systems will have an ammonia emission limit, there will be additional monitoring cost due to ammonia slip tests. The additional monitoring costs will require quarterly ammonia testing in the first year of operation and then annually thereafter when four consecutive quarterly source tests demonstrate compliance. The ammonia slip source test was estimated to be ~~$3,333~~ 3,400 per year based on information obtained from discussions with vendors.

For RECLAIM facilities, substantial reporting requirements are currently required pursuant to Rule 2012, and the transition into a command-and-control rule would not impose additional monitoring costs. Instead, since RECLAIM has extensive reporting requirements, as discussed in Appendix A, it is anticipated that there might be potential cost savings in MRR for some facilities by transitioning into the command-and-control rule. For instance, RECLAIM facilities are required to electronically report their emissions daily for major source units, monthly for large source units and quarterly for other units, in addition to the quarterly certification of emissions and

[15] December 2015 Staff Report for NOx RECLAIM Amendments to Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

annual permit emissions reports. In contrast, Rule 1146 only requires units with CEMS to report their emissions once every 6 months pursuant to Rule 218 – Continuous Emission Monitoring. The potential savings due to the change in reporting requirements as they transition from RECLAIM to Rule 1146 was estimated based on the approximated annual staffing cost that would be needed to fulfill RECLAIM reporting requirements. The potential savings were approximated to be $40,000 and $2,000 per piece of major and non-major sources, respectively. However, at this time these potential savings were not included in the cost-effectiveness analysis since no change is being proposed to the reporting requirements for Title V facilities and aggregate savings for Non-Title V facilities are minimal. Additionally, since the annual heat input threshold for CEMS applicability is lower in RECLAIM, it is possible that a piece of equipment required to maintain a CEMS under RECLAIM Rule 2012 might not be required to maintain the CEMS when it is subject to Rule 1146. However, due to the uncertainty in quantifying the potential cost savings for facilities impacted by the change in the CEMS applicability threshold as they transition from RECLAIM into Rule 1146, this potential savings was not included in the cost-effectiveness analysis.

The California Health & Safety Code (H&SC) Section 40920.6 requires a cost-effectiveness analysis when establishing BARCT requirements. The cost-effectiveness of a control technology is measured in terms of the control cost in dollars per ton of air pollutant reduced. The costs for the control technology includes purchasing, installing, operating, and maintaining the control technology. The 2016 AQMP established a cost-effectiveness threshold of $50,000 per ton of NOx reduced. The cost-effectiveness is estimated based on the present worth value of the control cost, which is calculated according to the capital cost (initial one-time equipment, installation, and permitting expense) plus the annual operating cost (recurring expenses over the useful life of the control equipment times a present worth factor). The present worth factor was based on the Discount Cash Flow (DCF) method assuming a 4% real interest rate. The assumed useful life was 25 years for SCR systems and 15 years for ultra-low NOx burners. Table 4 below summarizes the cost-effectiveness for the categories in the PAR 1146 series. The present worth value for Rule 1146 Group I units ranged based on unit size from $2,278,000 (147 MMBtu/hr) to $3,617,000 (250 MMBtu/hr). The present worth value for Rule 1146 Group II units ranged according to unit size between $841,000 (25 MMBtu/hr) to $1,117,000 (60 MMBtu/hr). Rule 1146 Group III units had a present worth value based on unit size between $89,000 (6 MMBtu/hr) to $176,000 (18 MMBtu/hr). The present worh value for Rule 1146.1 ranged from $55,000 (3 MMBtu/hr) to $68,000 (5 MMBtu/hr). Rule 1146.2 units had a present worth value between $30,000 (0.4 MMBtu/hr) to $36,000 (2 MMBtu/hr).

As discussed previously, the capital cost for atmospheric units and thermal fluid heaters was based on the equipment, installation, and permitting cost for units with a rated heat input of 2, 5, and 10 MMBtu/hr. The emission reductions for these units was based according to a 20% operating capacity and a reduction to 12 ppm NOx from a NOx emissions baseline of 30 ppm. The present worth values were $36,000 (2 MMBtu/hr), $47,000 (5 MMBtu/hr), and $66,000 (10 MMBtu/hr) for atmospheric units and $40,000 (2 MMBtu/hr), $54,000 (5 MMBtu/hr), and $91,000 (10 MMBtu/hr) for thermal fluid heaters.

For non-RECLAIM facilities, the cost-effectiveness was assumed to be the same as the cost-effectiveness for units that would be required to demonstrate compliance upon burner replacements or 15 years after rule amendment, whichever occurs earlier, which ranged from $17,000 to $31,000 per NOx reduced, and approximately $36,000 per NOx reduced for thermal fluid heaters, as was estimated for RECLAIM facilities.

The cost-effectiveness values presented in this analysis and summarized below in Table 4, differ slightly from that of the ~~Draft~~ Socioeconomic Impact Assessment (SIA) for PAR 1146 series and PR 1100. The analysis used in the ~~Draft~~ SIA assumes a staggered implementation costs from 2020 to 2023 where 75% of capital costs are assumed in the first year, 20% in the second year, and 5% in the final year of implementation. ~~Additionally, cost effectiveness calculations will differ based on whether the Discounted Cash Flow (DCF) or Levelized Cash Flow (LCF) method was used~~.

Table 4
Cost-Effectiveness Analysis

Category	Size (MMBtu/hr)	Recommended Emission Limit	Present Worth Value per unit	Reductions* (tpy)	Control Technology useful life	Cost-effectiveness ($/ton)
1146 Group I	≥ 75	5 ppm (existing limit)	$2,765,000	16	SCR – 25 yrs	$21,000
1146 Group II	≥20 to <75		For units > 12 ppm*			
		5 ppm	$960,000	56	SCR – 25 yrs	$36,000
			For units ≤ 12 ppm*			
		7 ppm for fire-tube boilers	$21,000	1.72	ULNB – 15 yrs	$11,000
1146 Group III	≥5 to <20	7 ppm for fire-tube boilers (9 ppm for others)	For units > 12 ppm*			
			$134,000	22.6	ULNB – 15 yrs	$28,000
			For units ≤ 12 ppm*			
			$10,000	1.88	ULNB – 15 yrs	<$10,000
1146.1	≥2 to <5	Same as above	For units > 12 ppm*			
			$61,000	2.18	ULNB – 15 yrs	$36,000
			For units ≤ 12 ppm*			
			$3,000	0.19	ULNB – 15 yrs	<$10,000
1146.2	<2	30 ppm (existing limit)	$33,000	0.95	ULNB – 15 yrs	<$10,000
Atmospheric Units	≤10	12 ppm (existing limit)	$143,000	0.34	ULNB – 15 yrs	$29,000
Thermal Fluid Heaters	NA	12 ppm	$183,000	0.34	ULNB – 15 yrs	$36,000

Category	Size (MMBtu/hr)	Recommended Emission Limit	Present Worth Value per unit	Number of Units	Reductions* (tpy)	Control Technology useful life	Cost-effectiveness ($/ton)
1146 Group I	≥75	5 ppm (existing limit)	$2,775,000	3	16	SCR – 25 yrs	$21,000
1146 Group II	≥20 to <75		For units > 12 ppm*				
		5 ppm	$970,000	52	56	SCR – 25 yrs	$36,000
			For units ≤ 12 ppm*				
		7 ppm for fire-tube boilers (excl. units w/ previous limit >9 or ≤5 ppm)	$30,000	14	1.7	ULNB – 15 yrs	$17,000
1146 Group III	≥5 to <20	7 ppm for fire-tube boilers (excl. units w/ previous limit >9 and ≤12 ppm) (9 ppm for others)	For units > 12 ppm*				
			$134,000	67	22	ULNB – 15 yrs	$28,000
			For units ≤ 12 ppm*				
			$16,000	41	1.7	ULNB – 15 yrs	$26,000
1146.1	≥2 to <5	Same as above	For units > 12 ppm*				
			$61,000	19	2.2	ULNB – 15 yrs	$36,000
			For units ≤ 12 ppm*				
			$7,000	12	0.2	ULNB – 15 yrs	$31,000
1146.2	<2	30 ppm (existing limit)	$33,000	3	0.9	ULNB – 15 yrs	<$10,000
Atmospheric Units	≤10	12 ppm (existing limit)	$48,000#	N/A#	0.3^	ULNB – 15 yrs	$29,000
Thermal Fluid Heaters	NA	12 ppm	$61,000#	N/A#	0.3^	ULNB – 15 yrs	$36,000

** Estimated using emissions from RECLAIM units*
^ Estimated assuming 20% operating capacity and a baseline of 30 ppm
 # The present worth value for atmospheric units and thermal fluid heaters is the average of the present worth values of a 2, 5, and 10 MMBtu/hr unit. However, the cost-effectiveness for these two categories was estimated using the sum of the emission reductions and present worth values of the units ~~Estimated assuming retrofit to meet 20 ppm~~

Cost estimates from one impacted RECLAIM facility were received after the release of the Draft Staff Report on November 6, 2018. The cost estimates were specific to one Rule 1146 Group III boiler fired on natural gas and process gas, which is a specialized boiler designed with 3 NOx burners to process a mixture of fuel at that facility. Based on information provided from the facility, the total estimate of replacing the 3 burners was approximately $1.3 million, including about $200,000 for tuning the existing system and about $250,000 for contingency. The equipment and installation cost was estimated at $500,000, which is about 70% higher than the high end of the capital cost estimates provided in the staff report (equipment and installation cost varies from approximately $80,000 to $300,000 for that specific boiler size). Given the short timeframe of the information received, the estimations could not be verified and incorporated into the comprehensive cost analysis. Yet, a sensitivity analysis was conducted to estimate the impacts to the cost-effectiveness of Group III units if the estimations (at face value without verification or solicitations of costs from other vendors) are used to meet the NOx limit at that specific RECLAIM facility. The updated cost-effectiveness for Group III, including the one estimate at $1.3 million at the RECLAIM facility, increased from $28,000 per ton of NOx reduced to $30,000 per ton of NOx reduced. Therefore, it is concluded that after accounting for the cost of retrofitting a specialized boiler, it is cost-effective for Group III units to comply with PAR 1146.

Rules 1146 and 1146.1 include a provision for units that operate with low fuel usage. The low fuel use provisions limit annual fuel usage to <90,000 therms/year and <18,000 therms/year for Rule 1146 (c)(5) and Rule 1146.1 (c)(4), respectively. Although it is technically feasible for low fuel use units to retrofit to meet the BARCT emission limits, the resulting emission reductions would be low resulting in the retrofit being not as cost-effective (> $50,000 per ton of NOx reduced). For example, the cost-effectiveness for a 10 MMBtu/hr water-tube boiler operating at 90,000 therms/year to meet the BARCT emission limit of 9 ppm is about $56,000/ton. For the same boiler with a fuel usage of 45,000 therms/year, the cost-effectiveness is approximately $112,000/ton. Due to their lower operations and potential emission reductions, it is not cost-effective to require immediate retrofits for low use units to meet the BARCT emission limits.

Incremental Cost-effectiveness

H&SC Section 40727.2 requires an incremental cost-effectiveness analysis for BARCT rules or emission reduction strategies when there is more than one control option which would achieve the emission reduction objective of the proposed amendment, relative to ozone, CO, SOx, NOx, and their precursours. Incremental cost-effectiveness is defined as the difference in control cost divided by the difference in emission reductions between two potential control options that can achiee the same emission goal or a regulation.

The incremental cost-effectiveness for PAR 1146 ~~and 1146.1~~ was calculated assuming that units between 5 and 75 MMBtu/hr currently complying with a NOx emission limit of 12 ppm or less would be required to meet a more stringent 5 ppm NOx limit with SCR retrofits instead of ~~instead of~~ the proposed limits (7 ppm for fire-tube boilers or 9 ppm for all others) by 15 years after the date of the proposed amendment or when 50 percent or more of the unit's burners are replaced, whichever is earlier. As shown in the Table 5 below, the incremental cost-effectiveness ranged from $290,976 per tons of NOx reduced for units between ≥20 and <75 MMBtu/hr to $1,472,777 per tons of NOx reduced for units between ≥5 to <20 MMBtu/hr.

Table 5
Incremental Cost-effectiveness

Group	Size (MMBtu/hr)	Current Proposal	Alternative	Incremental Cost-Effectiveness
Rule 1146 Group II	≥20 to <75	For units > 12 ppm 5 ppm via SCR	None	Not Applicable
		For units ≤ 12 ppm 7 ppm via ULNB for fire-tube boilers 9 ppm via ULNB for non fire-tube boilers	5 ppm via SCR	$290,976
Rule 1146 Group III	≥5 to <20	7 ppm via ULNB for fire-tube boilers 9 ppm via ULNB for non fire-tube boilers	5 ppm via SCR	$1,472,777

There were no other potential control options identified for PAR 1146.1 as alternatives that would achieve the proposed BARCT NOx emission limits given that SCR systems are not scalable down to these units.

Since the emissions limits for the PAR 1146.2 remain the same as the existing rule requirements, an estimate of the incremental cost-effectiveness for the proposed amendments to Rule 1142 relied upon the analysis conducted during the 2006 amendment to Rule 1146.2. In the 2006 amendment to Rule 1146.2, the incremental cost-effectiveness for the larger Type 2 units meeting a lower NOx emission limit of 12 ppm / 20 ppm from 30 ppm was analyzed. The incremental cost-effectiveness was about $2,400 per ton of NOx reduced for meeting the 20 ppm limit and $24,100 per ton of NOx reduced for meeting the 12 ppm limit. The incremental cost-effectiveness between NOx emission limits of 20 ppm and 12 ppm was about $43,600 per additional ton reduced. After adjusting for inflation between 2006 and 2017, the updated incremental cost-effectiveness ranged from roughly $2,700 to $27,000 per tons of NOx reduced for meeting the 20 ppm and 12 ppm respectively. Since staff is not proposing changes to the NOx concentration limit for Rule 1146.2 at this time, staff has committed to conduct a technology assessment and possibly a more extensive rulemaking in the future.

Summary of NOx BARCT Emission Limit

Staff's ~~preliminary~~ recommendation for the BARCT emission limits are established using information gathered from existing SCAQMD regulations, existing permitted units located in SCAQMD, regulatory requirements for other air districts, existing permitted units located in other air districts, the technology assessment, and considerations for application specific limitations. Both retrofits and new installations are considered. After considering the cost-effectiveness, staff recommendations for NOx BARCT can be found in the table below:

Table 6
Staff's ~~Preliminary~~ Recommendations for NOx BARCT

Unit Description	Recommended NOx Emission Limits and Compliance Dates			
Rule 1146	**Units >5 ppm**	**Units ≤5 ppm**	**Compliance Date >5 ppm**	**Compliance Date ≤5 ppm**
≥75 MMBtu/hour (Rule 1146 Group I)	5 ppm via SCR (same as existing limit)	In compliance with rule limit	75% of 1146 & 1146.1 units by Jan 2021 100% of 1146 & 1146.1 units by Jan 2022 Replacement by Jan 2023	No Action Needed
Rule 1146 and 1146.1	**Units >12 ppm**	**Units ≤12 ppm**	**Compliance Date >12 ppm**	**Compliance Date ≤12 ppm**
≥20 to <75 MMBtu/Hour (Rule 1146 Group II)	5 ppm via SCR	Fire-tube: 7 ppm via ULNB Others: 9 ppm via ULNB	Same as above	Burner replacement or 15 yrs after amendment (for both RECLAIM and non-RECLAIM)
≥5 to <20 MMBtu/Hour (Rule 1146 Group III)	Fire-tube: 7 ppm via ULNB Others: 9 ppm via ULNB	Fire-tube (Excl. units w/ previous limits >9 and ≤12 ppm): 7 ppm via ULNB Others: 9 ppm via ULNB		
>2 to <5 MMBtu/Hour (Rule 1146.1)				
Atmospheric Units ≤10 MMBtu/Hour	12 ppm via ULNB (same as existing limit)	In compliance with rule limit		No Action Needed
Thermal Fluid Heaters	**Units >20 ppm**	**Units ≤20 ppm**	**Compliance Date >20 ppm**	**Compliance Date ≤20 ppm**
All Sizes	12 ppm via ULNB	12 ppm via ULNB	Same as above for RECLAIM facilities Jan 2022 for non-RECLAIM facilities	Burner replacement or 15 yrs after amendment (for both RECLAIM and non-RECLAIM)

Unit Description	Recommended NOx Emission Limits and Compliance Dates			
Rule 1146	**Units >5 ppm**	**Units ≤5 ppm**	**Compliance Date >5 ppm**	**Compliance Date ≤5 ppm**
≥75 MMBtu/hour (Rule 1146 Group I)	5 ppm via SCR (same as existing limit)	In compliance with rule limit	75% of 1146 & 1146.1 units by Jan 2021 100% of 1146 & 1146.1 units by Jan 2022 Replacement by Jan 2023	No Action Needed
Rule 1146 and 1146.1	**Units >12 ppm**	**Units ≤12 ppm**	**Compliance Date >12 ppm**	**Compliance Date ≤12 ppm**
≥20 to <75 MMBtu/Hour (Rule 1146 Group II)	5 ppm via SCR	Fire-tube: 7 ppm via ULNB Others: 9 ppm via ULNB		
≥5 to <20 MMBtu/Hour (Rule 1146 Group III)	Fire-tube: 7 ppm via ULNB Others: 9 ppm via ULNB	Fire-tube: 7 ppm via ULNB Others: 9 ppm via ULNB	Same as above	Burner replacement or 15 yrs after amendment (for both RECLAIM and non-RECLAIM)
>2 to <5 MMBtu/Hour (Rule 1146.1)				
Atmospheric Units ≤10 MMBtu/Hour	12 ppm via ULNB (same as existing limit)	In compliance with rule limit		No Action Needed
Thermal Fluid Heaters	**Units >20 ppm**	**Units ≤20 ppm**	**Compliance Date >20 ppm**	**Compliance Date ≤20 ppm**
All Sizes	12 ppm via ULNB	12 ppm via ULNB	Same as above for RECLAIM facilities Jan 2022 for non-RECLAIM facilities	Burner replacement or 15 yrs after amendment (for both RECLAIM and non-RECLAIM)

CONTROL TECHNOLOGY ASSESSMENT FOR RULE 1146.2 EQUIPMENT

As part of the technology assessment under the 2006 amendment for Rule 1146.2, source test reports conducted for the Rule 1146.2 Certification Program were analyzed to assess the advancement in pollution control technologies. It was found that low-NOx burners for boilers and heaters in this size range can achieve less than 10 ppm NOx (at 3% oxygen). In particular, about 15% of the Type 2 units (more than 400,000 Btu/hr) had a certification level of less than 10 ppm of NOx, indicating that Type 2 units are capable of meeting a lower emission level at 12 ppm. Although a lower NOx emission limit was technically feasible at the time of the 2006 amendment, the average cost-effectiveness for the 12 ppm emission limit was $24,100, which was considerably higher than the then-proposed emission limit of 20 ppm (average cost-effectiveness = $2,400). Due to the relatively high cost of implementing the 12 ppm emission limit for Type 2 units in 2006, the 20 ppm emission limit was proposed and adopted in the 2006 amendment.

Analysis of NOx Concentration Limits for Rule 1146.2 Equipment at Other Air Districts

To evaluate for potential BARCT advancement from the 2006 amendment, staff has evaluated the following analogous rules in other California Air Districts:

- SJVAPCD Rule 4308 Boilers, Steam Generators, and Process Heaters – 0.075 MMBtu/hr to Less Than 2.0 MMBtu/hr
- SMAQMD Rule 411 NOx from Boilers, Process Heaters and Steam Generators
- SMAQMD Rule 414 Water Heaters, Boilers and Process Heaters Rated Less Than 1,000,000 Btu Per Hour
- VCAPCD Rule 74.15.1 Boilers, Steam Generators and Process Heaters 1 to 5 MMBTUs
- VCAPCD Rule 74.11.1 Large Water Heaters and Small Boilers
- BAAQMD Regulation 9 Rule 6 Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters

SCAQMD staff evaluated the requirements contained within the analogous rules and found no requirements that were more stringent than those already in Rule 1146.2.

Summary of BARCT Technology Assessment for Rule 1146.2

Based on the above information, there is a potential opportunity to lower the NOx concentration emission limit for Rule 1146.2. However, amending the NOx concentration limit will affect both RECLAIM and non-RECLAIM sources, and requires a much more extensive rulemaking process. Since a major objective is to initiate the transition of RECLAIM facilities into a command-and-control regulatory structure with highest priority given to older, higher polluting units that will need to install retrofit controls, staff is not proposing changes to the NOx concentration limit for Rule 1146.2 equipment at this time. Staff is committed to return to Rule 1146.2 to further assess the advancement and the cost-effectiveness of advanced control technologies for this source category.

CHAPTER 3: SUMMARY OF PROPOSALS

INTRODUCTION

PROPOSED AMENDED RULE 1146

PROPOSED AMENDED RULE 1146.1

PROPOSED AMENDED RULE 1146.2

PROPOSED RULE 1100

TRANSITION LOGISTICS

INTRODUCTION

The primary objectives of PARs 1146, 1146.1, and 1146.2 are to establish NOx limits that represent BARCT requirements for equipment regulated under these rules and to remove the exclusion of RECLAIM facilities. Additional definitions and provisions were needed to clarify the revised requirements for the applicable facilities. The key revisions to the rules are discussed below.

PROPOSED AMENDED RULE 1146

Rule 1146 Applicability (Subdivision (a))

Rule 1146 applies to boilers, steam generators, and process heaters of equal to or greater than 5 MMBtu/hr of rated heat input capacity used in all industrial, institutional, and commercial operations and currently exempts power generating boilers at electricity generating facilities (EGFs), boilers and process heaters with a rated heat input capacity greater than 40 MMBtu/hr that are used in petroleum refineries, sulfur reaction plant boilers, and units operated at RECLAIM facilities pertaining to NOx emissions only.

The proposed amendments would revise and move these exemptions from subdivision (a) – Applicability to a new subdivision (f) – Exemptions.

Rule 1146 Definitions (Subdivision (b))

The following definitions were added to Rule 1146 to distinguish different boiler types, facility types, and consistently define the meaning of modification.

FIRE-TUBE BOILER in paragraph (b)(7), which means:

> *"any boiler that passes hot gases from a fire box through one or more tubes running through a sealed container of water. The heat of the gases is transferred through the walls of the tubes by thermal conduction, heating the water and ultimately creating steam."*

FORMER RECLAIM FACILITY in paragraph (b)(8), which means:

> *"a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program."*

MODIFICATION in paragraph (b)(16), which means:

> *"any physical change that meets the criteria set forth in Rule 1302 – Definitions."*

MUNICIPAL SANITATION SERVICES in paragraph (b)(17), which means:

> *"basic sanitation services provided to the residents of a municipality by sewage treatment plants and municipal solid waste landfills"*

NON-RECLAIM FACILITY in paragraph (b)(18), which means:

> *"a facility, or any of its successors, that was not in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX."*

RECLAIM FACILITY in paragraph (b)(23), which means:

> *"a facility, or any of its successors, that* ***was~~is currently~~*** *in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX."*

The following definitions were deleted from Rule 1146 since they were no longer referred to in this rule.

ANNUAL CAPACITY FACTOR

STANDBY BOILER

Rule 1146 Requirements (Subdivision (c))

Prior to this amendment, RECLAIM facilities were not required to comply with the command-and-control NOx emission limits in Rule 1146 because of the exemption specified in subdivision (j) of Rule 2001 and paragraph (a)(4) of the current Rule 1146. In order to remove this exemption, subdivision (c) will have the following notwithstanding clause:

> *"Notwithstanding the exemptions contained in Rule 2001 – Applicabilty, Table 1 – Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule was Adopted or Amended Prior to October 5, 2018, the owner or operator of any unit(s) subject to this rule shall not operate the unit in a manner that exceeds the applicable emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), and (c)(4)."*

RECLAIM and former RECLAIM facilities with equipment subject to Rule 1146 will be required to comply with the proposed NOx emission limit that is specified in paragraph (c)(1) based on the applicable category in Table 1146-1, which represents current BARCT. The implementation schedule will be detailed in PR 1100, as specified in subparagraph (e)(1).

The NOx emission limits are presented in Table 7 which is also in PAR 1146 Table 1146-1 – NOx Emission Limits and Compliance Schedule. This table changed for certain units in Group II, Group III, and thermal fluid heaters from Table 1146-1 in the current Rule 1146. The table was also updated to remove the columns specifying dates for submittal of compliance plans and permit applications. Also removed was the criteria for the previously required compliance plans that was specified in paragraph (c)(9) of the current Rule 1146.

The enhanced compliance limits for Group II units specified in Table 1146-2 and paragraph (c)(2) in the current Rule 1146 were removed. These enhanced limits and compliance dates are no longer applicable to the proposed amendment, given that the compliance dates have passed and that the standard limit for Group II has been revised in Table 1146-1 to 5 ppm or 0.0062 lbs/10^6 Btu. However, an existing Group II unit meeting 5 ppm based on the prior Enhanced Compliance Limits and Schedule in Table 1146-2 of the current Rule 1146 would still be required to meet 5 ppm. Group II units complying with 5 ppm would be subject to subparagraph (c)(1)(I) of the proposed amended rule, since such a unit would be excluded from subparagraph (c)(1)(G) or (c)(1)(H) given that the previous NOx limit prior to the date of amendment must be greater than 5 ppm for these subparagraphs to be applicable.

Paragraph (c)(2) was replaced to specify an ammonia slip limit as follows:

> *"The owner or operator of any unit(s) operating with air pollution control equipment that results in ammonia emissions in the exhaust shall not discharge into the atmosphere ammonia emissions in excess of 5 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 60 consecutive minutes), except for units complying with paragraph (c)(~~8~~9)."*

The ammonia emission limit of 5 ppm is consistent with the current BACT limit and would apply to units that are installed or modified on or after the date of the proposed amendment. As specified in paragraph (c)(~~8~~9), existing non-RECLAIM units installed or modified prior to the proposed amendment that are currently permitted with an ammonia emission limit greater than 5 ppm do not

have to meet the ammonia emission limit in paragraph (c)(2) or conduct follow the compliance schedule specified in paragraph (d)(3) until the air pollution control equipment is replaced or modified. However, any existing air pollution control equipment shall retain and continue to comply with the NOx emission limit and source testing requirements as specified in the unit's SCAQMD Permit to Operate.

"(~~8~~9) An owner or operator that has installed, modified, or has been issued a SCAQMD Permit to Construct or Permit to Operate prior to [date of amendment]for any unit(s) operating with air pollution control equipment that results in ammonia emissions in the exhaust complying with an ammonia emission limit greater than 5 ppm, when the air pollution control equipment is replaced or modified, the owner or operator shall:

(A) Meet the ammonia emission limit in specified in (c)(2); and

(B) During the first 12 months of operation, demonstrate compliance according to the schedule specified in paragraph (d)(3)."

Table 7
Rule 1146-1 – NOx Emission Limits and Compliance Schedule

Rule Reference	Category	Limit[1]	Compliance Schedule for Non-RECLAIM Facilities	Compliance Schedule for RECLAIM and Former RECLAIM Facilities
(c)(1)(A)	All Units Fired on Gaseous Fuels	30 ppm orfor natural gas fired units 0.036 lbs/10^6 Btu	September 5, 2008	See Rule 1100 – Implementation Schedule for NOx Facilities
(c)(1)(B)	Any Units Fired on Non-gaseous Fuels	40 ppm	September 5, 2008	
(c)(1)(C)	Any Units Fired on Landfill Gas	25 ppm	January 1, 2015	
(c)(1)(D)	Any Units Fired on Digester Gas	15 ppm	January 1, 2015	
(c)(1)(E)	Atmospheric Units	12 ppm or 0.015 lbs/10^6 Btu	January 1, 2014	
(c)(1)(F)	Group I Units	5 ppm or 0.0062 lbs/10^6 Btu	January 1, 2013	
(c)(1)(G)	Group II Units (Fire-tube boilers with a previous NOx limit ≤less than or equal to 9~~12~~ ppm and ≥greater than 5 ppm prior to [*date of amendment*])	7 ppm or 0.0085 lbs/10^6 Btu;	See (c)(7)(A)	
(c)(1)(H)	Group II Units (All others with a previous NOx limit ≤less than or equal to 12 ppm and ≥greater than 5 ppm prior to [*date of amendment*])	9 ppm or 0.011 lbs/10^6 Btu	January 1, 2014 ~~or~~ ~~See (c)(7)(A)~~	
(c)(1)(I)	Group II Units (All others)	5 ppm or 0.0062 lbs/10^6 Btu	*Date of amendment*	
(c)(1)(J)	Group III Units (Fire-tube boilers ~~only~~excluding units with a previous NOx limit less than or equal 12 ppm and greater than 9 ppm prior to [*date of amendment*])	7 ppm or 0.0085 lbs/10^6 Btu	*Date of amendment* or See (c)(7)(B) for units with a previous NOx limit less than or equal to 9 ppm prior to [*date of amendment*]	
(c)(1)(K)	Group III Units (All others)	9 ppm or 0.011 lbs/10^6 Btu	January 1, 2015 or See (c)(8)~~(7)(B)~~ for units with a previous NOx limit less than or equal to 12 ppm prior to September 5, 2008	
(c)(1)(L)	Thermal Fluid Heaters	12 ppm or 0.015 lbs/10^6 Btu	*Date of amendment* or See (c)(7)(C) for units with a previous NOx limit ≤less than or equal to 20 ppm prior to [*date of amendment*] or See (e)(2) for units with a previous NOx limit ≥greater than 20 ppm prior to [*date of amendment*]	

[1]All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

Requirements for Low-Fuel Use Units

Paragraph (c)(5), which contains provisions for non-RECLAIM low-fuel usage units that have been in operation prior to September 5, 2008, was extended to also apply to low-fuel usage units at a RECLAIM or former RECLAIM facility that are in operation prior to the 12 months after the date of the proposed amendment with an annual heat input less than or equal to 9.0×10^9 Btu (90,000 therms) per year. Pursuant to paragraph (e)(3), any owner or operator that complies with the alternative compliance option specified in paragraph (c)(5) will be subject to a NOx emission limit of 12 ppm 15 years after the date of amendment or when 50 percent or more of the unit's burners are replaced, whichever is earlier.

On or after January 1, 2015 or until burner replacement, whichever occurs later, is the compliance schedule for non-RECLAIM low-fuel use units that is currently specified in paragraph (e)(3) in the current Rule 1146. Since this date has passed, compliance until burner replacement will be retained for existing units that have not had a burner replacement, but a definite timeframe of 15 years after amendement of the rule is now included for non-RECLAIM, RECLAIM or former RECLAIM facilities as follows:.

> *"(3) By [15 years after the date of amendment] or when 50 percent or more of the unit's burners are replaced, whichever is earlier, no person shall operate in the District any unit subject to paragraph (c)(5) that discharges into the atmosphere NOx emissions in excess of 12 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes)."*

Additionally, paragraph (e)(4) was revised to clarify that the fuel use limitation for compliance determination is not based on the heat input during any twelve month period, but rather the "annual heat input", which is defined in subdivision (b) as the total heat input to the unit during a calendar year. If a low fuel use unit exceeds the fuel usage limit, the exceedance will constitute a violation of this rule and the operator or owner of the unit will be required to demonstrate compliance with the applicable NOx emission limit and all applicable requirements within 18 months after the exceedance.

Requirements for Units Complying with a NOx Emission Limit of 12 ppm or less (or Thermal Fluid Heaters Complying with a NOx Emission Limit of 20 ppm or less)

In the 2008 amendments of Rules 1146 and 1146.1, a provision was included for natural gas units ranging from 2 to 20 MMBtu/hr to comply with the BARCT emission limits until the unit's burner(s) replacement, if the units complied with the then-applicable BACT limit of 12 ppm and were installed prior to the 2008 amendments. The provision was specified in Rule 1146 (c)(7) and Rule 1146.1 (c)(6), respectively (November 1, 2013 amendment).

Currently, there are a total of 6797 RECLAIM units between 2 and 75 MMBtu/hr ~~with~~ complying with NOx emission limit between 9 and 12 ppm. The reported emissions for these 6797 units in 2016 totaled to 0.0430.058 tpd of NOx. If these units were required to meet the proposed NOx concentration limits of (7 ppm for fire-tube boilers currently meeting 9 ppm and 9 ppm for all others), the estimated emission reductions would be 0.0100.0063 tpd. Units currently complying with a 12 ppm NOx emission limit were either retrofitted or required to meet a specific emission limit to meet BACT if the unit was new. Assuming a useful equipment life of 15 years for ultra-low NOx burners, the majority of these units might not have met their full useful life by the compliance date under PR 1100. Additionally, there are 7 thermal fluid heaters currently complying with a NOx emission limit less than or equal to 20 ppm with reported emission of 0.0031 tpd. The estimated emission reductions would be 0.0012 tpd if these units were required to meet the proposed NOx emission limits of 12 ppm. Since it is not cost--effective to require

immediate retrofits for ~~these~~ units currently complying with a NOx emission limit of 12 ppm or less (or 20 ppm or less for thermal fluid heaters), a future compliance timeframe will be specified, as shown below, in Rule 1146 paragraphs (c)(7) and (c)(8) for units between 5 and 75 MMBtu/hr currently complying with a NOx emission limit between 5 and 12 ppm and thermal fluid heaters complying with a NOx emission limit of 20 ppm or less. These units will have to meet the applicable NOx emission limit by a date that is 15 years after the date of the proposed amendment or when 50 percent or more of the unit's burners are replaced. For units with multiple burners, each successive burner replacement after the date of rule amendment shall be added to the cumulative percentage of burners replaced. The same compliance timeframe will be specified in PR 1100 for units between 2 and 75 MMBtu/hr currently complying with a NOx emission limit of 12 ppm or less and thermal fluid heaters complying with a NOx limit of 20 ppm or less at a RECLAIM or former RECLAIM facility.

"(7) Notwithstanding paragraph (c)(1), *an owner or operator that has installed, modified, or has been issued a SCAQMD Permit to Construct or Permit to Operate for the following units prior to [date of amendment], at a non-RECLAIM facility, shall meet the NOx emission limit specified in Table 1146-1 by [15 years after the date of amendment] or when 50 percent or more of the unit's burners are replaced, whichever is earlier:*

(A) Group II fire-tube boilers~~units~~ subject to subparagraph (c)(1)(G) ~~or (c)(1)(H)~~ complying with a previous NOx emission limit that is less than or equal 9 ppm and greater than 5 ppm; or

(B) Group III fire-tube boilers~~units~~ subject to subparagraph (c)(1)(J) ~~or (c)(1)(K)~~ complying with a previous NOx emission limit that is less than or equal to 9~~12~~ ppm; or

(C) Thermal fluid heaters subject to subparagraph (c)(1)(L) complying with a previous NOx emission limit that is less than or equal to 20 ppm."

"(8) Notwithstanding the NOx emission limit specified in Table 1146-1 of paragraph (c)(1), by [15 years after the date of amendment] or when 50 percent or more of the unit's burners are replaced, whichever is earlier, the owner or operator that has installed, modified, or has been issued a SCAQMD Permit to Operate prior to September 5, 2008 for a Group III natural gas fired unit complying with a previous NOx emission limit of 12 ppm or less and greater than 9 ppm shall not operate in a manner that discharges NOx emissions (reference at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of 9 ppm."

As a conservative approach, fire-tube boilers subject to PARs 1146 and 1146.1 that were subject to the prior BACT limit of 12 ppm NOx before 2008 will be subject to 9 ppm upon burner replacements or 15 years after rule amendement, whichever is earlier, eventhough at least two vendors confirmed that 7 ppm retrofits are feasible for Rule 1146 Group II, Group III, and 1146.1 units and a third said they could provide them (except for certain cases). These units are older than the current 9 ppm fire-tube boilers, which operate with NOx emissions between 6 and 8 ppm, thus a 7 ppm retrofit for these units could possibibly just involve tuning of the unit with or without additional controls. Whereas, the older 12 ppm burners that typically operate with NOx emissions between 11 and 12 ppm, might require a burner replacement with a new burner that could possibly be of a different technology, which could cost up to 4 or 5 times more than just the additional controls (VFD/oxygen trim) that might be used for the 9 ppm burners to meet 7 ppm NOx.

Requirements for Biogas Units

Paragraph (c)(~~10~~11), which applies to biogas units that are co-fired with natural gas, would require compliance with the emission limits in Table 1146-1 by each applicable compliance date for the selected unit under PR 1100 for units located at a RECLAIM or former RECLAIM facility.

Requirements for Units at a Municipal Sanitation Service Facility

As discussed above, because of the inherent challenges for units at a municipal sanition service facility, such as sewage treatment plants and solid waste landills, the existing NOx emission limits in the current Rule 1146 will be retained for these units. The proposed 7 ppm NOx limit for Group II and Group III units or 12 ppm NOx limit for thermal fluid heaters specified in Table 1146-1, or the proposed 12 ppm for any low-fuel use unit complying with paragraph (c)(5), will not apply to units at a municipal sanitation service facility. These units will instead continue to meet the existing NOx limits as specified in paragraph (c)(~~11~~12):

"(12~~1~~) Notwithstanding the NOx emission limits specified in Table 1146-1 of paragraph (c)(1) or paragraph (e)(3), and unitl a Regulation XI rule referenced in paragraph (f)(5) is adopted or amended and that rule complance date occurs, an owner or operator shall not operate units at a municipal sanitation service facility in a manner that discharges NOx emissions (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of:

(A) 9 ppm for Group II and Group III units; or

(B) 9 ppm, upon burner replacement, for Group III units that were installed or modified prior to September 5, 2008 complying with a previous NOx emission limit of 12 ppm or less ~~shall~~; or

(C) 30 ppm for thermal fluid heaters; or.

(D) 30 ppm, upon burner replacement, for any low-fuel use unit complying with paragraph (c)(5)."

Rule 1146 Compliance Determination (Subdivision (d))

Subdivision (d) contains the compliance determination requirements for the equipment subject to this rule. Paragraph (d)(8) provides a clarification that is also contained in the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Units Subject to SCAQMD Rules 1146 and 1146.1 (Combustion Gas Periodic Monitoring Protocol). The purpose of the clarification is to exclude units that are subject to continuous emission monitoring system (CEMS) requirements from the periodic monitoring requirements (or diagnostic emission checks) contained in Rule 1146. Paragraph (c)(6) contains the continuous emission monitoring requirements and the proposed language in paragraph (d)(8) excludes the units that are subject to CEMS from performing diagnostic emission checks. Subparagraph (d)(8)(A) specifies the periodic monitoring for NOx emissions that each owner or operator of units subject to paragraphs (c)(1), (c)(2), or (c)(4) must conduct. Subparagraph (d)(8)(B) specifies the schedule for performing the diagnostic NOx emissions checks for low-fuel use units complying with the requirements specified in paragraph (c)(5). In the current Rule 1146, the schedule for performing the diagnostic emission checks for low-fuel units at a non-RECLAIM facility is on or after January 1, 2015 or during burner replacement, whichever occurs later. Since this date has passed and low-fuel units at a non-RECLAIM facility are currently complying with diagnostic NOx emissions checks according to the tune-up schedule specified in subparagraph (c)(5)(B), subparagraph (d)(8)(B) will state:

"The owner or operator of units subject to ~~complying with~~ the requirements specified in paragraph (c)(5) shall check NOx emissions according to the tune-up schedule specified in subparagraph (c)(5)(B)."

For units at a RECLAIM or former RECLAIM facility the NOx emissions checks pursuant to subparagraph (d)(8)(B) will be required according to the schedule for the selected unit under PR 1100 .

Compliance Demonstration for Ammonia Emissions

Paragraph (d)(3) was replaced with the compliance demonstration requirements for the ammonia emission limit specified in paragraph (c)(2). The compliance demonstration for ammonia emissions will be quarterly source testing for the first 12 months of operation and annually thereafter when four consecutive quarterly source tests demonstrate compliance, or in lieu of source testing, an ammonia Continuous Emission Monitoring System (CEMS) under an approved SCAQMD protocol.

"(3) An owner or operator of a unit subject to the ammonia emission limit specified in paragraph (c)(2) shall:

(A) Conduct quarterly a source test to demonstrate compliance with the ammonia emission limit, according to the procedures in District Source Test Method 207.1 for Determination of Ammonia Emissions from Stationary Sources, during the first 12 months of unit operation and thereafter, except that source tests may be conducted annually within 12 months thereafter when four consecutive quarterly source tests demonstrate compliance with the ammonia emission limit. If an annual test is failed, four consecutive quarterly source tests must demonstrate compliance with the ammonia emissions limits prior to resuming annual source tests; or

(B) Utilize an ammonia Continous Emissions Monitoring System (CEMS) certified under an approved SCAQMD protocol to demonstrate compliance with the ammonia emission limit."

Monitoring, Reporting and Recordkeeping Requirements

Staff compared monitoring reporting and recordkeeping requirements for Rule 1146, 1146.1, and 1146.2 to the monitoring and reporting requirements under RECLAIM. The detailed comparison is provided in Appendix A of this staff report. In general, most monitoring and recordkeeping requirements under RECLAIM were similar to the corresponding command-and-control rule. The most substantive difference was the threshold for continuous emissions monitoring systems. Staff is currently working on adopting Proposed Rule 113 – Monitoring, Reporting, and Recordkeeping (MRR) Requirements for NOx and SOx Sources. Once PR 113 is adopted, all Rule 1146/1146.1 equipment will transition to PR 113 for MRR. In the interim, the intention of PAR 1146 series and PR 1100 is for Title V ~~RECALIM~~ RECLAIM facilities to retain RECLAIM MRR requirements pursuant to Rule 2012. A discussion of the requirements of monitoring, recordkeeping, and reporting requirements for RECLAIM and non-RECLAIM facilities is presented below.

Non-Major Sources in Non-Title V Facilities

The requirements in monitoring and recordkeeping are comparable between RECLAIM and those specified in Rule 1146, Rule 1146.1, and Rule 1146.2. Since mass emissions are used for RTC reconciliation and compliance determination, the reporting requirements in RECLAIM include

both monthly/quarterly electronic reporting, and quarterly and annual paper reporting. The corresponding requirement in Rule 1146 is a semi-annual report only for equipment equipped with CEMS and subject to Rule 218 - *Continuous Emission Monitoring*. For facilities without CEMS, Rule 1146 applicable equipment must comply with periodic monitoring with the use of portable emission analyzers either monthly or every 750 operating hours, or quarterly or every 2000 operating hours. Given that the reporting requirements in RECLAIM were designed to ensure the integrity of the reported mass emissions, mass emission reporting requirements might not be needed if the facilities are subject to Rule 1146 series, which determine compliance through a concentration limit. As such, non-major sources in non-Title V facilities would be subject to the MRR requirements in Rule 1146 series.

Major Sources in Non-Title V Facilities

Major sources in the RECLAIM program are required to be equipped with a Continuous Emission Monitoring System (CEMS). A Major source is defined in Rule 2012 (c)(1) as follows:

> "*(A) any boiler, furnace, oven, dryer, heater, incinerator, test cell and any solid, liquid or gaseous fueled equipment with a maximum rated capacity:*
>
> *(i) greater than or equal to 40 but less than 500 million Btu per hour and an annual heat input greater than 90 billion Btu per year; or*
>
> *(ii) 500 million Btu per hour or more irrespective of annual heat input;"*

In Rule 1146, any units with a rated heat input capacity greater than or equal to 40 MMBtu/hr and an annual heat input greater than 200 billion Btu per year are required to have installed a continuous in-stack NOx monitor (CEMS-equivalent) (Rule 1146 (c)(6)). A comparison between the applicability thresholds in Rule 1146 and the RECLAIM program is shown in Table 8.

Table 8
Applicability Thresholds of CEMS in Rule 1146 and RECLAIM

	Rule 1146	RECLAIM
Size	40 MMBtu/hr	40 MMBtu/hr
Annual Fuel Usage	200 Billion Btu/year	90 Billion Btu/year

Since the applicability threshold in annual heat input is lower in RECLAIM, it is possible that a piece of equipment required to maintain a CEMS under RECLAIM Rule 2012 might not be required to maintain the CEMS when it is subject to Rule 1146. As discussed previously, mass emissions reported by RECLAIM facilities are used to track and demonstrate compliance in the RECLAIM program. To ensure the integrity of reported emissions, RECLAIM includes substantial monitoring and reporting requirements for major sources such as annual (or semi-annual) relative accuracy testing (RATA), daily emissions electronic reporting, quarterly aggregate electronic reporting, quarterly emissions reports (QCER), and annual emissions report (APEP). As RECLAIM facilities transition into an equipment-based command-and-control regulatory structure, to the extent possible, they should be subject to the same regulatory requirements as other non-RECLAIM facilities that are currently regulated by the respective command-and-control rules. In particular, Rule 1146 was approved in the California State Implementation Plan (SIP) in 2014 (79 FR 57442). It was determined by EPA that Rule 1146 is consistent with the relevant policy and guidance as required under the Clean Air Act. Therefore, as RECLAIM facilities exit the RECLAIM program, PAR 1146 requires that Rule 1146 equipment at a former RECLAIM facility to be subject to the CEMS requirements in Rule 1146. In other

words, a former non-Title V RECLAIM facility would be allowed to remove the CEMS that is equipped on a Rule 1146 unit, if the equipment size and annual heat input usage of the unit is lower than the CEMS applicability threshold as specified in Rule 1146.

To evaluate the potential impacts of the change in CEMS threshold as RECLAIM facilities transition into PAR 1146, the fuel usage records of RECLAIM units was retrieved for calendar year 2015 and 2016. Among the 18 units that exceed the equipment size threshold of ≥ 40 MMBtu/hr, one was defined as non-major sources under the RECLAIM program, as their annual heat inputs were less than the major source definition of 90 billion Btu per year as specified in Rule 2012 (c)(1). For this one, CEMS would not be required under both Rule 1146 or RECLAIM requirements. Fifteen of the 17 major source units reported fuel usage data in 2015 / 2016. Five of these units had an annual fuel usage that exceeded 200 billion Btu per year. These units would be required to be equipped with CEMS under both Rule 1146 and the RECLAIM program. A total of ten major source units reported fuel usage below 200 billion Btu per year with 7 units that reported fuel usage below 90 billion Btu per year, and 3 units reported fuel usage between 90 and 200 billion Btu per year. Although the annual heat input of these 7 major source units fall below the CEMS applicability threshold in Rule 1146, they are equipped with CEMS, as required by all major source units in RECLAIM. Therefore, these units might have higher fuel usage records before year 2015, which was not captured in this analysis. To be conservative, a total of 10 Rule 1146 major source units is estimated to be potentially impacted by the change in the CEMS applicability threshold as they transition from RECLAIM into Rule 1146, and they may potentially remove the CEMS currently equipped with the unit, dependent upon future fuel usage of each unit.

Title V Facilities

Title V is a federal program designed to standardize air quality permits and the permitting process for "major sources" of emissions across the country. EPA defines a "major source" as a facility that emits, or has the potential to emit (PTE) any criteria pollutant or hazardous air pollutant (HAP) at levels equal to or greater than the Major Source Thresholds (MST), which may vary depending on the attainment status (e.g. marginal, serious, extreme) of the geographic area and the criteria pollutant or HAP in which the facility is located. Title V requires additional periodic monitoring for the SIP-approved, federally enforceable rules that do not contain sufficient monitoring requirements to assure compliance with the emission limitations or other requirements. SCAQMD has developed guidelines, outlined in SCAQMD Periodic Monitoring Guidelines[16], for periodic monitoring, testing and recordkeeping requirements that may be incorporated in Title V permits. Currently, the monitoring requirements in the RECLAIM program are comprehensive and address the Title V periodic monitoring requirements. Therefore, RECLAIM Title V facilities will continue to comply with the monitoring, reporting, and recordkeeping requirements specified in Rule 2012 until PR 113 is adopted.

Rule 1146 Compliance Schedule (Subdivision (e))

Subdivision (e) contains the compliance schedule provisions for units at a RECLAIM or former RECLAIM facility and for thermal fluid heaters at a non-RECLAIM facility. Paragraph (e)(1) references the compliance schedule specified in PR 1100 for RECLAIM or former RECLAIM facilities, since PR 1100 will contain the implementation schedules for the units that will be transitioning out of the RECLAIM program.

> *"(1) The owner or operator of any unit(s) at a RECLAIM or former RECLAIM facility subject to paragraph (c)(1) shall meet the applicable NOx emission limit in Table*

[16] Periodic Monitoring Guideline. http://www.aqmd.gov/home/permits/title-v/title-v-requirements#pm.

1146-1 in accordance with the schedule specified in Rule 1100 – Implementation Schedule for NOx Facilities."

As stated below, Paragraph (e)(2) will specify the compliance schedule for non-RECLAIM thermal fluid heaters. Permit applications will be due 12 months after rule amendment for units with a NOx emission limit greater than 20 ppm. These thermal fluid heaters will have to meet the proposed 12 ppm NOx limit by January 1, 2022.

"(2) An owner or operator of a non-RECLAIM facility with any thermal fluid heaters with a NOx emission limit greater than 20 ppm shall:

(A) On or before [12 months after date of amendment], submit a complete SCAQMD permit application for each thermal fluid heater that does not currently meet the limit specified in subparagraph (c)(1)(L); and

(B) On or before January 1, 2022, meet the applicable NOx emission limit in Table 1146-1 for thermal fluid heaters subject to subparagraph (c)(1)(L)."

Rule 1146 Exemptions (Subdivision (f))

A new subdivision was added to include rule exemptions, which in the current rulewere stated in subdivision (a). For the proposed amended rule, the exemptions will be under subdivision (f) as follows:

"(f) Exemptions

The provisions of this rule shall not apply to:

(1) boilers used by electric utilities to generate electricity; or

(2) boilers and process heaters with a rated heat input capacity greater than 40 million Btu per hour that are used in petroleum refineries; or

(3) sulfur plant reaction boilers; or

(4) any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities; or

(5) any unit at a municipal sanitation service *facility that is subject to a NOx emission limit in a ~~different~~ Regulation XI rule adopted or amended after [date of amendment]."*

Units that are~~, or will be,~~ covered by a rule for an industry-specific category and subject to an applicable NOx emission limit are exempted from this rule. Paragraph (f)(4) includes any unit at a RECLAIM or former RECLAIM facility covered in an industry-specific category as defined in PR 1100. Currently, this includes energy generating boilers at electricity generating facilities (EGFs) and refinery boilers with applicable NOx limits specified in the corresponding rule. Paragraph (f)(5) will include units at municipal sanitation service facility, which will have a sector specific rule specifying the applicable NOx emission limits for these units.

PROPOSED AMENDED RULE 1146.1

Rule 1146.1 Applicability (Subdivision (a))
Rule 1146.1 applies to boilers, steam generators, and process heaters that are greater than 2 million Btu per hour and less than 5 million Btu per hour of rated heat input capacity used in any industrial, institutional, or commercial operation with the exception of boilers operated at RECLAIM facilities pertaining to NOx emissions only.

The proposed amendment to Rule 1146.1 will revise and move the exemption contained in subdivision (a) – Applicability to a new subdivision (f) – Exemptions.

Rule 1146.1 Definitions (Subdivision (b))
The following definitions were added to Rule 1146.1 to distinguish different boiler types, facility types, and consistently define the meaning of modification.

FIRE-TUBE BOILER in paragraph (b)(7), which means:

> *"any boiler that passes hot gases from a fire box through one or more tubes running through a sealed container of water. The heat of the gases is transferred through the walls of the tubes by thermal conduction, heating the water and ultimately creating steam."*

FORMER RECLAIM FACILITY in paragraph (b)(8), which means:

> *"a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program."*

HEAT INPUT in paragraph (b)(10), which means:

> *"the chemical heat released due to assumed complete combustion of fuel in a unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air."*

MODIFICATION in paragraph (b)(13), which means:

> *"any physical change that meets the criteria set forth in Rule 1302 – Definitions."*

MUNICIPAL SANITATION SERVICES in paragraph (b)(14), which means:

> *"basic sanitation services provided to the residents of a municipality by sewage treatment plants and municipal solid waste landfills."*

NON-RECLAIM FACILITY in paragraph (b)(15), which means:

> *"a facility, or any of its successors, that was not in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX."*

RECLAIM FACILITY in paragraph (b)(20), which means:

> *"a facility, or any of its successors, that <u>was</u>~~is currently~~ in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX."*

The following definitions were deleted from Rule 1146.1 since they were no longer referred to in this rule.

SCHOOL

Rule 1146.1 Requirements (Subdivision (c))

Prior to this amendment, RECLAIM facilities were not required to comply with the command-and-control NOx emission limits in Rule 1146.1 because of the exemption specified in subdivision (j) of Rule 2001. In order to remove this exemption, subdivision (c) will have the following notwithstanding clause:

> *"Notwithstanding the exemptions contained in Rule 2001 – Applicability, Table 1 –Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule was Adopted or Amended Prior to October 5, 2018, the owner or operator of any unit(s) subject to this rule shall not operate the unit in a manner that exceeds the applicable emission limits specified in paragraphs (c)(1), (c)(2), and (c)(3)*."

RECLAIM and former RECLAIM facilities with equipment subject to Rule 1146.1 will be required to comply with the proposed NOx emission limit specified in paragraph (c)(1) based on the applicable category in Table 1146.1-1, which represents current BARCT. The implementation schedule will be detailed in PR 1100, as specified in subparagraph (e)(1).

The NOx emission limits are presented in Table 9 which is also in PAR 1146.1 Table 1146.1-1 – NOx Emission Limits and Compliance Schedule. This table changed for fire-tube boilers and thermal fluid heaters. A new column for the rule reference of the different categories was added, while the column specifying dates for submittal of permit applications was removed. Additionally, PAR 1146.1 will move and specify in row (c)(1)(A) the existing NOx limit of 30 ppm (or for natural gas fired units 0.036 lbs/106 Btu) that was specified in paragraph (c)(1) of the current Rule 1146.1.

Table 9
Table 1146.1-1 – NOx Emission Limits and Compliance Schedule

Rule Reference	Category	Limit[1]	Compliance Schedule for Non-RECLAIM Facilities	Compliance Schedule for RECLAIM and Former RECLAIM Facilities
(c)(1)(A)	All Other Units	30 ppm or for natural gas fired units 0.036 lbs/10^6 Btu	September 5, 2008	See Rule 1100 – Implementation Schedule for NOx Facilities
(c)(1)(B)	Any Units Fired on Landfill Gas	25 ppm	January 1, 2015	
(c)(1)(C)	Any Units Fired on Digester Gas	15 ppm	January 1, 2015	
(c)(1)(D)	Atmospheric Units	12 ppm or 0.015 lbs/10^6 Btu	January 1, 2014	
(c)(1)(E)	Any Units Fired on Natural Gas, ~~e~~Excluding Fire-tube Boilers subject to (c)(1)(F), Atmospheric Units, and Thermal Fluid Heaters	9 ppm or 0.011 lbs/10^6 Btu	January 1, 2014 or See (c)(6)~~(5)(A)~~ for units with a previous NOx limit less than or equal to 12 ppm and greater than 9 ppm prior to September 5, 2008	
(c)(1)(F)	Any Fire-tube Boilers Fired on Natural Gas, excluding units with	7 ppm or 0.0085 lbs/10^6 Btu	*Date of amendment* or	

	less than or equal to 12 ppm and greater than 9 ppm prior to [*date of amendment*]		See (c)(5)(A) for units complying with a previous NOx emission limit that is less than or equal to 9 ppm prior to [*date of amendment*]	
(c)(1)(G)	Thermal Fluid Heaters	12 ppm or 0.015 lbs/10^6 Btu	*Date of amendment* or See (c)(5)(B) for units with a previous NOx limit ≤less than or equal to 20 ppm prior to [*date of amendment]* or See (e)(2) for units with a previous NOx limit >greater than 20 ppm prior to [*date of amendment*]	
[1] All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.				

Requirements for Low-Fuel Use Units

Paragraph (c)(4), which contains provisions for non-RECLAIM low fuel usage units that have been in operation prior to September 5, 2008, would also apply to units at a RECLAIM or former RECLAIM facility that have been in operation prior to the 12 months after the proposed amendment with an annual heat input less than or equal 18,000 therms per year. Pursuant to paragraph (e)(3), any owner or operator that complies with the alternative compliance option specified in paragraph (c)(4) will be subject to a NOx emission limit of 12 ppm 15 years after the date of amendment or when 50 percent or more of the unit's burners are replaced, whichever is earlier.

On or after January 1, 2015 or until burner replacement, whichever occurs later, is the compliance schedule currently specified in paragraph (e)(3) in the current Rule 1146.1 for non-RECLAIM low-fuel use units. Since this date has passed, compliance until burner replacement will be retained for existing units that have not had a burner replacement, but a definite timeframe of 15 years after amendement of the rule is now included for non-RECLAIM, RECLAIM or former RECLAIM facilities as follows:

> *"(3) By [15 years after the date of amendment] or when 50 percent or more of the unit's burners are replaced, whichever is earlier, no person shall operate in the District any unit subject to paragraph (c)(4) that discharges into the atmosphere NOx emissions in excess of 12 ppm (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes)."*

Additionally, paragraph (e)(4) was revised to clarify that fuel use limitation for compliance determination is not based on the heat input during any twelve month period, but rather the "annual heat input", which is defined in subdivision (b) as the total heat input to the unit during a calendar year. If a low fuel use unit exceeds the fuel usage limit, the exceedance will constitute a violation of this rule and the operator or owner of the unit will be required to demonstrate compliance with the applicable NOx emission limit and all applicable requirements within 18 months after the exceedance.

Requirements for Units Complying with a NOx Emission Limit of 12 ppm or less (or Thermal Fluid Heaters Complying with a NOx Emission Limit of 20 ppm or less)

As discussed previously, PARs 1146 and 1146.1 would allow the same compliance provisions for non-RECLAIM units between 2 and 75 MMBtu/hr meeting the then-applicable BACT limit of 12 ppm as was previously done during the 2008 amendments.

Paragraphs (c)(5) and (c)(6) will specify the compliance timeframe for units currently complying with a NOx limit of 12 ppm or less and thermal fluid heaters complying with a NOx limit of 20 ppm or less. These units will have to meet the applicable NOx emission limit by 15 years after the proposed amendment or when 50 percent or more of the unit's burners are replaced. The same compliance timeframe will be specified in PR 1100 for units currently complying with a NOx limit of 12 ppm or less and thermal fluid heaters complying with a NOx limit of 20 ppm or less at a RECLAIM or former RECLAIM facility.

"(5) Notwithstanding paragraph (c)(1), an owner or operator that has installed, modified, or has been issued a SCAQMD Permit To Construct or Permit to Operate for the following units prior to [date of amendment], at a non-RECLAIM facility, shall meet the NOx emission limit specified in Table 1146.1-1 by [15 years after the date of amendment] or when 50 percent or more of the unit's burners are replaced, whichever is earlier:

(A) Fire-tube boilers fired on n~~N~~atural gas fired ~~units~~ subject to subparagraph ~~(c)(1)(E) or~~ (c)(1)(F) complying with a previous NOx emission limit that is less than or equal to 9~~12~~ ppm; or

(B) Thermal fluid heaters subject to subparagraph (c)(1)(G) complying with a previous NOx emission limit that is less than or equal to 20 ppm

(6) Notwithstanding the NOx emission limit specified in Table 1146.1-1 of paragraph (c)(1), by [15 years after the date of amendment] or when 50 percent or more of the unit's burners are replaced, whichever is earlier, the owner or operator that has installed, modified, or has been issued a SCAQMD Permit to Operate prior to September 5, 2008 for a natural gas fired unit complying with a previous NOx emission limit of 12 ppm or less and greater than 9 ppm shall not operate in a manner that discharges NOx emissions (reference at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of 9 ppm."

Requirements for Biogas Units

Paragraph (c)(~~7~~8), which applies to biogas units that are co-fired with natural gas, would require compliance with the emission limits in Table 1146.1-1 by each applicable compliance date for the selected unit under PR 1100 for units located at a RECLAIM or former RECLAIM facility.

Requirements for Units at Municipal Sanitation Service Facilities

As discussed above, because of the inherent challenges for units at a municipal sanitation service facility, the existing NOx emission limits in the current Rule 1146.1 will be retained for these units. The proposed 7 ppm NOx limit for natural gas fired fire-tube boilers or 12 ppm NOx limit for thermal fluid heaters specified in Table 1146.1-1 will not apply to units at a municipal sanitation service facility. These units will instead continue to meet the existing NOx limits as specified in paragraph (c)(~~8~~9):

"(9~~8~~) Notwithstanding the NOx emission limits specified in Table 1146.1-1 of paragraph (c)(1) or paragraph (e)(3), and until a Regulation XI rule referenced in paragraph

(f)(2) is adopted or amended and that rule compliance date occurs, an owner or operator shall not operate units at a municipal sanitation service facility in a manner that discharges NOx emissions (referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of:

(A) 9 ppm for natural gas fired units; or

(B) 9 ppm, upon burner replacement, for natural gas fired units that were installed or modified prior to September 5, 2008 complying with a previous NOx emission limit of 12 ppm or less; or

(C) 30 ppm for thermal fluid heaters; or

(D) 30 ppm, upon burner replacement, for any low-fuel use unit complying with paragraph (c)(4)."

Rule 1146.1 Compliance Determination (Subdivision (d))

Subdivision (d) contains the compliance determination requirements for the equipment subject to this rule. Subparagraph (d)(6)(A) specifies the periodic monitoring for NOx emissions that each owner or operator of units subject to paragraphs (c)(1), (c)(2), or (c)(3) must conduct. For units at a RECLAIM or former RECLAIM facility, the NOx emissions checks will be required according to the monitoring schedule for the selected unit under PR 1100. Subparagraph (d)(6)(B) specifies the schedule for performing the diagnostic NOx emissions checks for low-fuel use units complying with the requirements specified in paragraph (c)(4). In the current Rule 1146.1, the schedule for performing the diagnostic emission checks for low-fuel units at a non-RECLAIM facility is on or after January 1, 2015 or during burner replacement, whichever occurs later. Since this date has passed and low-fuel units at a non-RECLAIM facility are currently complying with diagnostic NOx emissions checks according to the tune-up schedule specified in subparagraph (c)(4)(B), subparagraph (d)(6)(B) will state:

"The owner or operator of units subject to~~complying with~~ the requirements specified in paragraph (c)(4) shall check NOx emissions according to the tune-up schedule specified in subparagraph (c)(4)(B)."

For units at a RECLAIM of former RECLAIM facility the NOx emissions checks pursuant to subparagraph (d)(6)(B) will be required according to the schedule for the selected unit under PR 1100.

Rule 1146.1 Compliance Schedule (Subdivision (e))

Subdivision (e) contains the compliance schedule provisions for units at a RECLAIM or former RECLAIM facility and for thermal fluid heaters at a non-RECLAIM facility. Paragraph (e)(1) references the compliance schedule specified in PR 1100 for RECLAIM or former RECLAIM facilities, since PR 1100 will contain the implementation schedules for the units that will be transitioning out of the RECLAIM program. Paragraph (e)(2) will specify the compliance schedule for non-RECLAIM thermal fluid heaters. Permit applications will be due 12 months after rule amendment for units that are currently complying with a NOx emission limit greater than 20 ppm. These thermal fluid heaters will have to meet the proposed 12 ppm NOx limit by January 1, 2022. Paragraph (e)(3).

Rule 1146.1 Exemptions (Subdivision (f))

A new subdivision was added to include rule exemptions, which in the current rulewere stated in subdivision (a). For the proposed amended rule, the exemptions will be under subdivision (f) as follows:

"(f) Exemptions

The provisions of this rule shall not apply to:

(1) any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities; or

(2) any unit at a municipal sanitation service facility that is subject to a NOx emission limit in a ~~different~~ Regulation XI rule adopted or amended after [date of amendment]."

Units that are, or will be, covered by a rule for an industry-specific category and subject to an applicable NOx emission limit are exempted from this rule. Paragraph (f)(1) includes any unit at a RECLAIM or former RECLAIM facility covered in an industry-specific category as defined in PR 1100. Currently, this includes energy generating boilers at electricity generating facilities (EGFs) and refinery boilers with applicable NOx limits specified in the corresponding rule. Paragraph (f)(2) will include units at a municipal sanitation service facility, which will have a sector specific rule specifying the applicable NOx emission limits for these units.

PROPOSED AMENDED RULE 1146.2

Rule 1146.2 applies to large water heaters and small boilers and process heaters with a rated heat input capacity up to and including 2 MMBtu/hr. There are both manufacturer and end-user requirements contained in the rule. There were no changes to subdivision (a) Purpose and Applicability, subdivision (d) Certification, subdivision (e) Modification (Retrofit) Provisions and Demonstration of Compliance With Emission Limits subdivision (f) Identification of Compliant Units, subdivision (g) Enforcement, subdivision (i) progress reports. All other revisions to PAR 1146.2 are discussed below.

Rule 1146.2 Definitions (Subdivision (b))
The following definitions were added to Rule 1146.2.

BEST AVAILABLE RETROFIT CONTROL TECHNOLOGY in paragraph (b)(1), which means:

> *"as defined in the California Health and Safety Code Section 40406."*

FORMER RECLAIM FACILITY in paragraph (b)(6), which means:

> *"a facility, or any of its successors, that was in the Regional Clean Air Incentives Market as January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the RECLAIM program."*

RECLAIM FACILITY in paragraph (b)(15), which means:

> *"a facility, or any of its successors that <u>was</u>~~is currently~~ in the Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX."*

Rule 1146.2 Requirements (Subdivision (c))
Paragraphs (c)(3), (c)(4), and (c)(5) contain end-user requirements for the operation of units subject to the rule. As discussed in Chapter 2, staff anticipates to further assess the advancement of control technology and the cost-effectiveness of the equipment regulated under Rule 1146.2. To avoid the need to install an intermediate technology that would be obsolete upon future amendment to Rule 1146.2, it is recommended that RECLAIM facilities with Rule 1146.2 equipment can exit RECLAIM, but the compliance date under paragraph (c)(13) is proposed in a later timeframe (December 31, 2023) to allow staff time to conduct a technology assessment. Dependent on the results of the technology assessment, if it is determined that the NOx emission limits specified in Rule 1146.2 still represent BARCT, NOx RECLAIM facilities with Rule 1146.2 units will be required to meet the applicable NOx limits by December 31, 2023. In contrast, if a more stringent BARCT level is applicable, then a new compliance schedule will be developed through a future rule development.

Rule 1146.2 Exemptions (Subdivision (h))
Subdivision (h) contains the exemptions to the provisions of this rule. ~~Paragraph (h)(3)~~ <u>Subparagraph (h)(1)(C)</u> contains the exemption~~s~~ for units at any RECLAIM or former RECLAIM facilities that are subject to a NOx emission limit in a different rule for an industry-specific category as defined in PR 1100 – Implementation Schedule for NOx Facilities. <u>Subparagraph (h)(1)(D) states the exemption for units at a municipal sanitation service facility, which will have a sector specific rule specifying the applicable NOx emission limits for these units.</u>

PROPOSED RULE 1100

Proposed Rule 1100 - Implementation Schedule for NOx Facilities specifies the implementation schedule for NOx RECLAIM and former NOx RECLAIM facilities that have equipment regulated under PARs 1146 and 1146.1. The compliance timeframe for PARs 1146 and 1146.1 was established taking into consideration equipment size range and the number of units at a facility. Also taken into consideration within the compliance schedule are facilities with multiple units subject to multiple source-specific landing rules. Appendix B of this staff report contains the facility and equipment analysis that were conducted to understand the number, size and emissions of the units that would be required to meet the NOx emission limits. The implementation schedule for equipment regulated under PAR 1146.2 is included in that rule.

Rule 1100 Purpose (Subdivision (a))

The purpose of this rule is to establish the implementation schedule for Regulation XX NOx RECLAIM facilities that are transitioning to a command-and-control regulatory structure.

Rule 1100 Applicability (Subdivision (b))

Proposed Rule 1100 applies to RECLAIM and former RECLAIM facilities that own or operate equipment that meets the applicability provisions specified in PARs 1146 and 1146.1. The applicability provisions excludes equipment at energy generating facilities (EGFs) and refineries which will be subject to a NOx emission limit under other industry-specific rules.

Rule 1100 Definitions (Subdivision (c))

Definitions for a Rule 1146 unit and a Rule 1146.1 unit are included in PR 1100 that make reference to the definition of boiler and process heater contained in both Rule 1146 and Rule 1146.1. In addition, a definition for Industry-Specific Category has been specified that would list the types of RECLAIM facilities that would not be subject to the requirements of PR 1100. At this time, refineries and EGFs (except for non-power generating boilers) would not be subject to the command-and-control rules referenced in PR 1100 (Rule 1146 and Rule 1146.1) or the implementation schedule listed in subdivision (d). These types of equipment and all other combustion sources belonging to these two industry-specific categories will be addressed in individual command-and-control rules that will contain both the required emission limits and implementation schedule. Proposed Rule 1100 includes other definitions under subdivision (c) to improve the clarity of the proposed rule.

Rule 1100 Implementation Schedule (Subdivision (d))

Implementation Schedule for Retrofits

Proposed Rule 1100 subdivision (d) establishes the implementation schedule requirements for boilers and process heaters that will be subject to the emission requirements of Rule 1146 and Rule 1146.1. Proposed Rule 1100 requires owner or operators to submit a complete permit application no later than 12 months after rule adoption, which leaves about 18 – 24 months for permit approval, unit installation and source testing. RECLAIM facilities that do not meet the emission limits of Rule 1146 and Rule 1146.1 would have until 12 months after rule adoption to submit a complete permit application for retrofits or replacements. RECLAIM facilities retrofitting boilers and process heaters would have until January 1, 2021 to meet the applicable Rule 1146 and Rule 1146.1 emission requirements for at least 75% of the cumulative total rated heat input capacity for the boilers and process heaters at the facility. The rated heat input capacity is the equipment rating of the unit, expressed in million BTUs per hour. The final compliance deadline for the remaining units would be January 1, 2022. Subparagraph (d)(3) will include the rule references of the

applicable NOx concentration limits specified in subparagraphs (d)(1)(B) and (d)(1)(C). This implementation schedule will be specified in paragraph (d)(1) as follows:

> *"(1) An owner or operator of a RECLAIM or former RECLAIM facility with any Rule 1146 or Rule 1146.1 unit shall:*
>
> *(A) On or before [12 months after date of adoption], submit complete SCAQMD permit applications for any Rule 1146 and Rule 1146.1 units that currently do not meet the applicable NOx concentration limit specified in subparagraph (d)(3);*
>
> *(B) On or before January 1, 2021 meet the applicable NOx concentration limit for a minimum of 75% of the cumulative total rated heat input capacity for all Rule 1146 and Rule 1146.1 units at the facility; and*
>
> *(C) On or before January 1, 2022 meet the applicable NOx concentration limit of 100% of Rule 1146 and Rule 1146.1 units at the facility."*

When establishing the compliance schedule for PARs 1146 and 1146.1 for equipment at RECLAIM facilities, the compliance schedule of the 2008 amendment of Rules 1146 and 1146.1 was considered. In the 2008 amendments, there were about 2,100 active permitted units affected by the rule amendments. The impacted facilities were given about 3 - 5 years to comply with the then-proposed emission limits. Given the considerably lower number of units that would need to be retrofitted or replaced under the proposed amendments (126 permitted units for Rule 1146 and 19 permitted units for Rule 1146.1), therefore a similar, if not a shorter timeframe would be reasonable. The compliance timeframe for PARs 1146 and 1146.1 also took into consideration equipment size range, the number of units at a facility, and facilities with multiple units subject to multiple source-specific landing rules. The details of the analysis are provided in Appendix B of this staff report. Proposed Rule 1100 would require a compliance timeframe of 2 to 3 years. To focus on larger emission sources having an earlier final implementation date, staff proposed to stagger the implementation schedule by rated heat input, an approach that is consistent with the 2008 amendment of Rule 1146 and Rule 1146.1. About 17% of the affected facilities have multiple units with rated heat input in different size bins. Instead of setting a different compliance schedule for each size category, all Rule 1146 and 1146.1 equipment are grouped together providing more flexibility to operators to achieve the greatest emission reductions first.

Implementation Schedule for Replacement Equipment

An owner or operator that elects to fully replace the affected equipment, in lieu of installing ultra-low NOx burners or SCRs is given until January 1, 2023 to comply with the existing NOx emission limits in Rules 1146 and 1146.1, provided the owner or operator submits complete permit applications for any new Rule 1146 and Rule 1146.1 unit within 12 months after the date of rule adoption, as well as accepts a permit condition that identifies which unit(s) will be replaced and no longer operated once the new units are installed or after January 1, 2023, whichever is earlier. Additionally, the exisiting unit must be replaced on or before January 1, 2023.

Requirements for Units Complying with a NOx limit of 12 ppm or less (or Thermal Fluid Heaters Complying with a NOx limit of 20 ppm or less)

PARs 1146 and 1146.1 will include a provision for a compliance timeframe similar to the provision included during the 2008 amendments of Rule 1146 and 1146.1, for units that complied with the then-applicable BACT limit of 12 ppm and were installed prior to the 2008 amendments. Paragraphs (d)(5) and (d)(6) of PR 1100 will specify the compliance timeframe for units greater than 75 MMBtu/hr that are currently complying with a NOx limit of 7 ppm or less, units between 2 and 75 MMBtu/hr that are currently complying with a NOx limit of less than or equal to12 ppm

(9 ppm for fire-tube boilers) and greater than 5 ppm ~~or less,~~ and thermal fluid heaters complying with a NOx limit of 20 ppm or less. These units will have to meet the applicable NOx emission limit 15 years after the date of the proposed rule amendment or when 50 percent or more of the unit's burners are replaced, whichever is earlier. Subparagraph (d)(6)(A) specifies that Rule 1146 Group I units that are currently complying with a NOx emission limit of 7 ppm or less without an SCR system do not have to meet the current 5 ppm NOx limit in Rule 1146 until the annual heat input specified in paragraph (d)(7) is exceeded. The annual heat input threshold of 300,000 therms specified in paragraph (d)(7) is the annual heat input at which it would be cost-effective for a Rule 1146 Group I unit with a rated heat input of 75 MMBtu/hr currently meeting 7 ppm without an SCR system to meet 5 ppm with an SCR retrofit.

Requirements for Low-Fuel Use Units

Paragraph (d)(4) contains the provision that requires the owner or operator of any low-fuel use unit at a RECLAIM or former RECLAIM facility, that in lieu of complying with the applicable emission limits specified in paragraph (d)(3) will comply with the low-fuel use provisions pursuant to paragraph (c)(5) in Rule 1146 or paragraph (c)(~~6~~4) in Rule 1146.1, to retain and continue complying with the NOx emission limits and source testing requirements specified in the SCAQMD Permit to Operate as of the date of rule adoption. RECLAIM or former RECLAIM facilities that submit permit applications and accept a fuel use limitation prior to 12 months after the date of rule adoption, do not have to demonstrate that the unit did not previously exceeded the fuel usage thereshold, since provisions in Rule 1146 and Rule 1146.1 specify that exceedance of the accepted fuel usage limit will constitute a violation of the rule and require the operator or owner of the unit to demonstrate compliance with the applicable NOx emission limit and all applicable requirements within 18 months after the exceedance.

> *"(4) In lieu of complying with the applicable emission limits specified in paragraph (d)(3), the owner or operator of the following unit(s) in operation prior to [12 months after date of adoption] with an annual heat input less than or equal to as specified below, shall retain and comply with the unit's NOx emission limit and source testing requirements specified in the SCAQMD Permit to Operate as of [date of adoption].*
>
> *(A) 90,000 therms per year and complying with the requirements specified in Rule 1146 paragraph (c)(5); or*
>
> *(B) 18,000 therms per year and complying with the requirements specified in Rule 1146.1 paragraph (c)(4)."*

Exclusion for Facilities in an Industry-Specific Category

Paragraph (d)(~~8~~6) states that any unit at a RECLAIM facility that is subject to an industry-specific rule as defined in subdivision (c) would not be subject to the command-and-control rules referenced in subdivision (b) or the implementation schedule listed in subdivision (d).

Rule 1100 Applicable Monitoring, Reporting, and Recordkeeping (Subdivision (e))

Monitoring, Reporting, and Recordkeeping for Title V Facilities

Under the Title V program, "relaxation of any monitoring, recordkeeping, or reporting requirement, term, or condition in the Title V permit" is considered a significant revision (Rule 3000(b)(31)), and would trigger a public process (Rule 3005(f) and Rule 3006(a)). To avoid the need for an extensive public process triggered by the change in the MRR requirements, PR 1100 would require Title V facilities to maintain the RECLAIM MRR requirements as part of the proposed rule amendments. In other words, Title V facilities would still be subject to the MRR

requirements in RECLAIM after the transition in lieu of being subject to the command-and-control MRR. Staff is currently working on adopting Rule 113 – Monitoring, Reporting, and Recordkeeping (MRR) Requirements for NOx and SOx Sources. Once Rule 113 is adopted, all applicable PR 1100 equipment will transition to Rule 113 for MRR. In the interim, the intention of PR 1100 is for Title V ~~RECALIM~~ RECLAIM facilities to retain RECLAIM MRR. Paragraph (e)(1) states that RECLAIM or former RECLAIM facilities that are also in Title V would be required to comply with the monitoring, reporting, and recordkeeping requirements specified in Rule 2012. Additional information on MRR analysis can be found in Appendix A.

Monitoring, Reporting, and Recordkeeping for Non-Title V Facilities

Proposed Rule 1100 proposes that both major RECLAIM and non-major RECLAIM sources in non-Title V facilities to be subject to the MRR requirements in Rule 1146 series. Paragraph (e)(2) states that the monitoring, reporting, and recordkeeping requirements in the applicable rule(s) as specified in subdivision (b) shall automatically apply for a non-Title V RECLAIM facility once it becomes a former RECLAIM facility. Additional information on MRR analysis can be found in Appendix A.

TRANSITION LOGISTICS

The proposed amendments would initiate the transition of RECLAIM facilities into a command-and-control regulatory structure. A facility is ready to transition into command-and-control if all the NOx emitting equipment located at the RECLAIM facility is subject to a non-RECLAIM rule that regulates NOx emissions and does not specify an exemption for RECLAIM facility emissions. Command-and-control rules that exempt RECLAIM facilities will undergo amendments throughout the transition process to include RECLAIM facilities. Once the applicable rules at a RECLAIM facility have been adopted and/or amended a facility would be eligible exit.

The procedure for the transition can be found in Rules 2001 and 2002. Rule 2001 specifies the eligibility criteria for a facility to exit RECLAIM. Rule 2002 contains the notification procedures for facilities that will be transitioned out of RECLAIM and addresses the RTC holdings for these facilities that will be transitioned out of RECLAIM or that elect to exit RECLAIM. Rule 2002 Paragraphs (f)(6) through (f)(9), detail how a facility will be notified regarding the transition.

Rule 2001 Paragraph (g)(2) ~~would specify~~ specifies actions for submitting the request to opt-out of the NOx RECLAIM program:

> *"The owner or operator of a RECLAIM facility that is eligible to exit the NOx RECLAIM program, pursuant to the requirements of paragraph (g)(1), may notify the Executive Officer with a request to opt-out that includes the identification of:*
>
> > *(A) All permitted and unpermitted NOx RECLAIM emission equipment, including applicable control equipment; and*
> >
> > *(B) Permitted NOx emission levels, and if not available, manufacturer guaranteed NOx emission levels."*

Upon review of the submitted information, the Executive Officer would notify the facility that the facility meets the criteria to transition out of RECLAIM and would issue an initial determination notification to initiate the facility's transition to command-and control. A facility would then be subject to the provisions in ~~PAR~~Rule 2002 (f)(6) through (f)(10), but not be required to resubmit any equipment information required by subparagraphs (f)(6)(A) and (f)(6)(B) because the Executive Officer would have already obtained the facility's equipment information through the opt-out process prior to issuing the initial determination notification. If the Executive Officer denies the request to transition out of NOx RECLAIM, however, the facility would remain in the RECLAIM program. The reasons for a denial would be that the facility does not meet all the requirements in ~~proposed~~ paragraph (g)(1) of Rule 2001. If an applicable non-RECLAIM rule has not yet been amended, the facility would not be allowed to exit. Also, if it is determined that a piece of equipment that emits non-combustion NOx and has no applicable rule for its NOx emissions, the facility would not be allowed to exit. The facility would be notified if the request to opt-out is denied. These approval and denial provisions are contained in Rule 2001 subparagraph (g)(3), which states:

> *"If the owner or operator of a RECLAIM facility meets the criteria for exiting the NOx RECLAIM program, specified in paragraph (g)(1) and has satisfied the requirements of paragraph (g)(2), the Executive Officer will issue an initial determination notification and the facility shall be subject to the provisions of Rule 2002, paragraphs (f)(6) through (f)(10), excluding the requirements in subparagraphs (f)(6)(A) and (f)(6)(B). If the request to opt-out is denied, the facility shall remain in RECLAIM, and the owner or operator will be notified."*

Rule 2002 Paragraph (f)(10) outlines requirements pertaining to RTCs for facilities that are notified for exiting RECLAIM. It states that:

> *"The owner or operator of any RECLAIM facility that receives a final determination notification from the Executive Officer pursuant to paragraph (f)(8):*
>
> *(A) Shall not sell or transfer any future compliance year RTCs as of the date specified in the final determination notification and may only sell or transfer that current compliance year's RTCs until the facility is transitioned out of the RECLAIM program; and*
>
> *(B) Shall provide Emission Reduction Credits to offset any emissions increases, calculated pursuant to Rule 1306 – Emission Calculations, notwithstanding the exemptions contained in Rule 1304 – Exemptions, until New Source Review provisions governing emission calculations and offsets for former RECLAIM sources are amended after (date of amendment)."*

If, after review, a RECLAIM facility receives a final determination notification, then the facility would not be able to sell any future compliance year RTCs after a date certain as specified in the notification, but could only sell that current compliance year RTCs until the facility exits RECLAIM. Additionally, any RECLAIM facility that exits the NOx RECLAIM program will not have access to the SCAQMD internal offset bank until new provision governing emission calculations and offset requirements for former RECLAIM facilities are adopted in Regulation XIII. This temporary provision would require all former RECLAIM facilities to provide emission reduction credits (ERCs) to offset any emission increases for new or modified sources even if the facility has a PTE of less than 4 tons per year and would have been eligible for emission offsets from the SCAQMD internal bank if the source was not RECLAIM.

Currently, facilities regulated under the command-and-control regulatory structure are subject to Regulation XIII for New Source Review (NSR) requirements. There are a number of NSR policy issues that need to be resolved as facilities transition to a command-and-control regulatory structure. Staff has been working on these issues with the RECLAIM Working Group. In addition, staff will continue discussions with EPA on NSR issues. One of the most important NSR issues is the future availability of NOx ERCs in the open market and the concern that there is not a sufficient supply of ERCs in the open market for facilities that want to install new or modified equipment that triggers NSR. RECLAIM facilities that are comprised of the region's largest emitters would join an existing open market with a limited amount of ERCs. Until the NSR concerns are resolved, facilities will be allowed to remain in RECLAIM for a limited time upon receiving an initial determination notification. Facilities would not receive a final determination notification to exit RECLAIM until key elements such as NSR and permitting are resolved. However, these facilities may request to opt-out of RECLAIM before these key elements are resolved, upon meeting the specific conditions specified in subdivision (g) of Rule 2001. However, facilities would still be subject to non-RECLAIM rules and their associated BARCT implementation schedules that been adopted or amended to include RECLAIM facilities. Rule 2002 paragraph (f)(11) allows facilities to request to remain in RECLAIM:

> *"An owner of operator of a RECLAIM facility that receives an initial determination notification may elect for the facility to remain in RECLAIM if a request to the Executive Officer to remain in RECLAIM is submitted, including any equipment information required pursuant to paragraph (f)(6).*
>
> *(A) Upon written approval by the Executive Officer that the facility shall remain in RECLAIM:*

(i) The facility may remain in RECLAIM until a subsequent notification is issued to the facility that it must exit by a date no later than December 31, 2023.

(ii) The facility is required to submit any updated information within 30 days of the date of the subsequent notification.

(iii) The facility shall comply with all requirements of any non-RECLAIM rule that does not exempt NOx emissions from RECLAIM facilities."

As a result of the proposed amendments to Rules 1146, 1146.1 and 1146.2, staff has identified 22 RECLAIM facilities that could potentially be transitioned out of the RECLAIM program. These facilities have permitted NOx emissions solely from a combination of (i) Rule 1146, (ii) Rule 1146.1, and (iii) Rule 1146.2. After PARs 1146, 1146.1, and 1146.2 are amended to remove the exemption for RECLAIM facilities, the identified facilities will be ready to transition from the cap-and-trade regulatory approach to a command-and-control regime.

CHAPTER 4: IMPACT ASSESSMENT

INTRODUCTION

Among the 103 RECLAIM facilities that will be affected by the proposed amendments, 18 facilities already met BARCT requirements and will only be subject to change to monitoring recordkeeping and reporting. A total of 65 facilities would be required to retrofit the non-compliant units by the compliance dates specified in PR 1100, while 20 facilities operating units that comply with the applicable RECLAIM BARCT[17] limit of 12 ppm would not apply until the unit's burner replacement. The proposed rule amendments are estimated to reduce 0.27 tons per day (tpd) of NOx from RECLAIM facilities by January 1, 2023. The proposed amendments affect a wide variety of RECLAIM and non-RECLAIM facilities. Staff has estimated that there are about 291 active permitted units in the RECLAIM universe that are affected by this rule amendment (220, 39 and 32 permitted units affected by PAR 1146, 1146.1 and 1146.2 respectively). Among the 291 units impacted, 146~~148~~ units would be required to comply with the existing BARCT limits in Rule 1146 series (124~~126~~ permitted units for Rule 1146, 19 permitted units for Rule 1146.1, and 3 permitted units for Rule 1146.2) by the compliance dates as specified in PR 1100, 145~~142~~ units would be allowed to meet the emission limits upon burner replacement, and units that are already at BARCT would be subject to the change in MRR requirements upon transition. For non-RECLAIM, 824 facilities could potentially be impacted by the proposed amendments. The total size of non-RECLAIM natural gas fired equipment subject to Rule 1146 and 1146.1 is estimated to be about 1,807 units as of November 2018.

EMISSION REDUCTIONS

The total NOx inventory for the RECLAIM units affected by PARs 1146 series is estimated to be 0.42 tons per day. This estimate is taken from SCAQMD annual emission report (AER) inventory database for compliance year 2016 for permitted units, and excludes EGFs and refineries. The District's AER program was developed to track emissions of air contaminants from permitted facilities. Facilities with annual emissions exceeding 4 or more tons of nitrogen oxides (NOx), sulfur oxides (SOx), volatile organic compounds (VOCs), specific organics (SPOG), particulate matter (PM), or emissions of 100 tons per year or more of carbon monoxide (CO) are required by the District to submit an annual emissions report. Facilities could also be required to submit AER if the facility receives a notification from SCAQMD or subject to the AB2588 Program for reporting quadrennial updates to its toxics inventory. For each piece of RECLAIM equipment, the annual activity is estimated using the facilities fuel usage as reported in the AER reports for year 2016. Emission factor is represented by the permit limit specific for each unit. Emissions for RECLAIM units identified as major sources, as defined in SCAQMD Rule 2012, are constantly monitored with CEMS, so the units may not be assigned a permit limit for emissions reporting. Emission factors for RECLAIM major sources can be back-calculated using CEMS reporting data and reported fuel for the corresponding year. Annual emissions for major sources were calculated from facility submitted AER usage and emission factor derived from CEMS back-calculations or permit limit. For units with missing data or reports, their emissions were calculated assuming 50% operating capacity. The NOx emission distribution by the size range are as follows:

[17] RECLAIM BARCT as stated in Rule 2002 Table 3

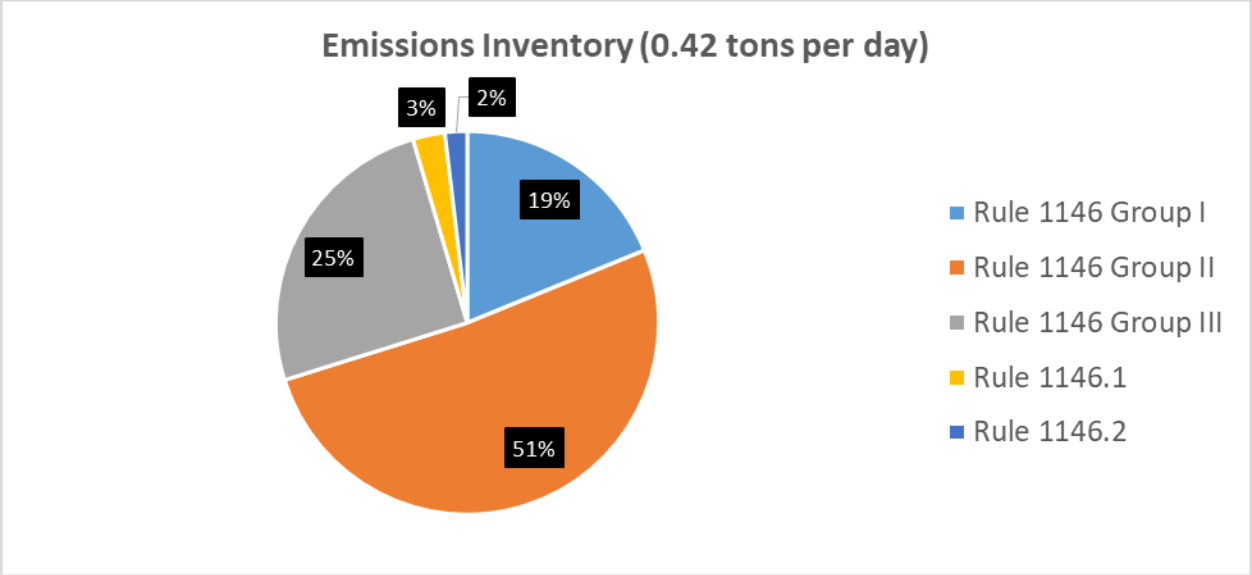


Figure 10
2016 RECLAIM Baseline Emissions by Size Range

As presented in Figure 10, about half of the 2016 baseline emissions were emitted from Rule 1146 Group II units (20 to <75 MMBtu/hr). On average, each Group II unit accounted for 0.0027 tpd of NOx emissions. Although Group I units contributed to 19% of baseline emissions, on average, each Rule 1146 Group I unit accounted for more than quadruple the amount of emissions (0.011 tpd) than a Group II unit (0.0027 tpd). This suggests that to achieve the greatest amount of emission reduction early, equipment with a larger heat input should be addressed first.

Emission reductions were calculated using the difference between the emission factor for the existing permit emission limits and the NOx emission limits for the various categories of boilers and heaters presented in the staff proposal. Based on this methodology, the proposed rule amendments are estimated to reduce approximately 0.27 tons per day of NOx emissions from RECLAIM facilities regulated under PARs 1146 series. The estimated emission reductions by unit size range are presented in Figure 11.

Note that the emissions for Rule 1146.2 were calculated based on the 32 permitted units. As discussed in Appendix B, the majority of Rule 1146.2 units are exempt from permitting. Therefore, the actual emission inventory, and the associated emission reductions of PAR 1146.2 could be considerably higher than the ones presented in Figures 10 and 11. To avoid overestimating the emission reductions from PAR 1146.2, only emissions from the permitted units were included in the analysis.

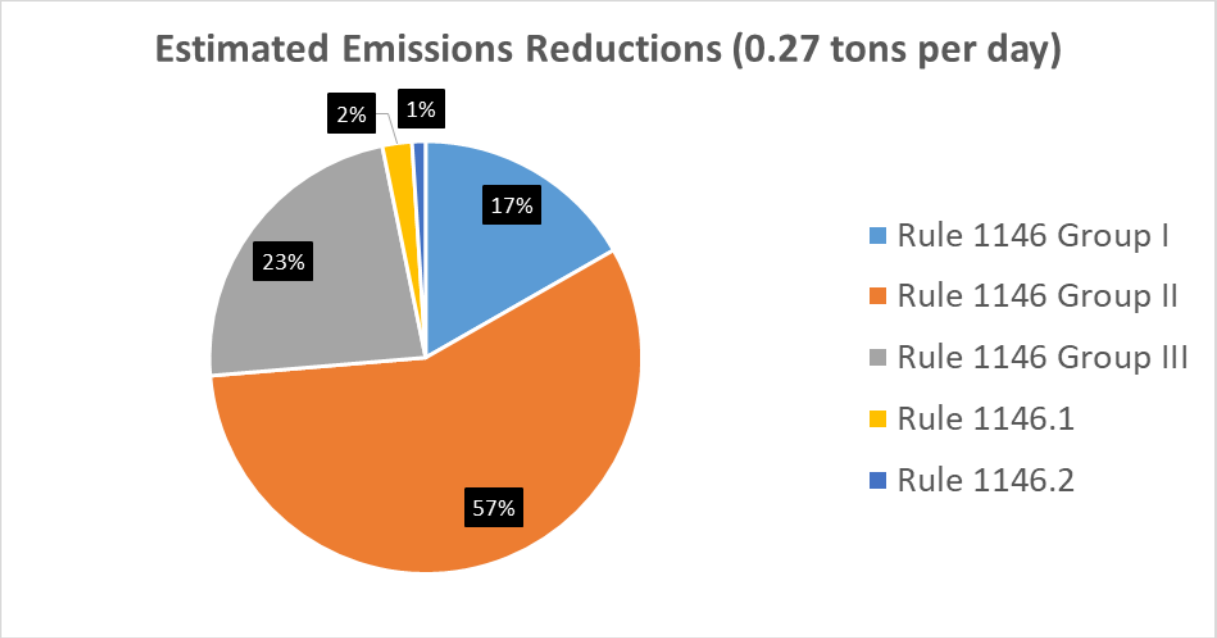


Figure 11
RECLAIM Emission Reduction by Size Range

Total emissions inventory for non-RECLAIM units affected by PAR 1146 series is estimated to be about 0.~~66~~ 44 tpd. Estimates for baseline emissions and emission reductions of units within the non-RECLAIM universe are calculated using unit distribution figures from 2008 amendments of Rule 1146 and Rule 1146.1 and adjusted to equipment distribution as of November 2018, thermal fluid heaters are not included in the calculation estimates.

Baseline emissions for non-RECLAIM units in Rule 1146 Group I, Rule 1146 Group II, Rule 1146 Group III, and Rule 1146.1 were calculated ~~with assumptions that unit composition of the universe is the same as that at the time of the 2008 evaluation and approximately of 80% of units evaluated in 2008 are still in operation~~from baseline emissions from the 2008 Rule 1146 Staff Report and adjusted to 2018 equipment distribution. Calculations for emission reductions also assumed that the fraction of fire-tube units in non-RECLAIM universe is the same as those in the RECLAIM universe, where 40% of Rule 1146 Group II, Rule 1146 Group III and Rule 1146.1 units were fire-tube units that will be subject to proposed limits of 7 ppm. Total emissions baseline calculated from units in Rule 1146 Group I, Rule 1146 Group II, Rule 1146 Group III, and Rule 1146.1 totaled around 0.44~~0.48~~ tpd and total reductions were calculated to be about 0.05~~4~~ tpd. Emission reductions for non-RECLAIM natural gas fired units are effective 15 years after date of rule amendment. For thermal fluid heaters in the non-RECLAIM universe, it is not feasible to quantify the total number of affected units due to the lack of distinction in their permits that set them apart from other process heaters; however, it is reasonable to assume the same fraction of thermal fluid heaters in RECLAIM is in the non-RECLAIM universe. The total fraction of RECLAIM thermal fluid heaters make up approximately 4.2% of the total universe. Since thermal fluid heaters are not limited in total heat input, the same fraction is applied to the total universe of 1,807 units to come up with the estimate of 76 total thermal fluid heaters in the non-RECLAIM universe.~~Thermal fluid heaters were not included in this calculation due to the lack of distinction in their permits that set them apart from other process heaters. Thermal fluid heaters make up for a very small portion of the RECLAIM universe (<4%) and the emission reductions are assumed to be nominal in the non-RECLAIM universe.~~

SOCIOECONOMIC ASSESSMENT

A ~~Draft~~ Final Socioeconomic Impact Assessment for PARs 1146 Series and PR 1100 ~~will be conducted~~is prepared and will be ~~available~~ included in the Final Hearing Package ~~to the public at least 30 days prior~~ to the SCAQMD Governing Board Meeting anticipated for December 7, 2018.

CALIFORNIA ENVIRONMENTAL QUALITY ACT ANALYSIS

PARs 1146 series and PR 1100 are considered a "project" as defined by the California Environmental Quality Act (CEQA), and the SCAQMD is the designated lead agency. Pursuant to CEQA Guidelines Sections 15252, 15162(b), and 15251(l) (codified in SCAQMD Rule 110), the SCAQMD has prepared a Final Subsequent Environmental Assessment (SEA) for PARs 1146 series and PR 1100 which relies on the March 2017 Final Program Environmental Impact Report (EIR) for the 2016 AQMP, the September 2008 Final Environmental Assessment (EA) for Rule 1146, the September 2008 Final EA for Rule 1146.1, and the May 2006 Final EA for Rule 1146.2.

~~PARs 1146 series and PR 1100 are considered a "project" as defined by the California Environmental Quality Act (CEQA), and the SCAQMD is the designated lead agency. Pursuant to the CEQA and SCAQMD's Certified Regulatory Program (Rule 110), the SCAQMD, as lead agency for the proposed project, prepared a Draft Subsequent Environmental Assessment (SEA) for PARs 1146 series and PR 1100 which was released for a 45-day public review and comment period from April 3, 2018 to May 18, 2018 and four comment letters were received. Subsequent to the release of the Draft SEA for public review, changes were made to the project description and the environmental analysis. For this reason, the SCAQMD revised and recirculated a Revised Draft SEA for an additional 45-day public review and comment period from September 27, 2018 to November 13, 2018. As with the Draft SEA, the analysis in the Revised Draft SEA also indicated that while reducing NOx emissions is an environmental benefit, secondary significant adverse environmental impacts are also expected for the topic area of hazards and hazardous materials. Since significant adverse impacts were identified, an alternatives analysis and mitigation measures are required and are included in the Revised Draft SEA. [CEQA Guidelines Section 15252].~~

~~The proposed project may have statewide, regional, or area-wide significance; therefore, a CEQA scoping meeting was required (pursuant to Public Resources Code section 21083.9(a)(2)) and held at the SCAQMD's Headquarters in conjunction with a prior Public Workshop on February 14, 2018. The comment made at the CEQA scoping meeting and the response to the comment is included in Appendix F of the Revised Draft SEA. The comment letters received relative to the Draft SEA and the responses to the comments are included in Appendix G of the Revised Draft SEA. In addition, all comments received during the public comment period on the analysis presented in the Revised Draft SEA will be responded to and included in an appendix to the Final SEA.~~

Prior to making a decision on the adoption of the proposed project, the SCAQMD Governing Board must review and certify the Final SEA, including responses to comments, as providing adequate information on the potential adverse environmental impacts that may occur as a result of adopting the proposed project.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings

California Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.

Necessity

PARs 1146, 1146.1 and 1146.2, and PR 1100 are needed to establish BARCT requirements for facilities that will be transitioning from RECLAIM to a command-and-control regulatory structure.

Authority

The SCAQMD obtains its authority to adopt, amend, or repeal rules and regulations pursuant to California Health and Safety Code Sections 39002~~, 39616~~, 40000, 40001, 40440, 40702, 40725 through 40728, and 41508.

Clarity

PARs 1146, 1146.1 and 1146.2, and PR 1100 are written or displayed so that their meaning can be easily understood by the persons directly affected by them.

Consistency

PARs 1146, 1146.1 and 1146.2, and PR 1100 are in harmony with and not in conflict with or contradictory to, existing statutes, court decisions or state or federal regulations.

Non-Duplication

PARs 1146, 1146.1 and 1146.2, and PR 1100 will not impose the same requirements as any existing state or federal regulations. The proposed amended rules are necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

Reference

In amending these rules, the following statutes which the SCAQMD hereby implements, interprets or makes specific are referenced: Health and Safety Code sections 39002, 40001, 40702, 40440(a), and 40725 through 40728.5.

COMPARATIVE ANALYSIS

Under H&SC Section 40727.2, the SCAQMD is required to perform a comparative written analysis when adopting, amending, or repealing a rule or regulation. The comparative analysis is relative to existing federal requirements, existing or proposed SCAQMD rules and air pollution control requirements and guidelines which are applicable to industrial, institutional, and commercial water heaters, boilers, steam generators, and process heaters. See Table 10 below.

Table 10
Comparative Analysis

Rule Element	PAR 1146	PAR 1146.1	PAR 1146.2	PR 1100	RECLAIM	Equivalent Federal Regulation
Applicability	Boilers, steam generators, and process heaters with maximum rated heat input capacities greater than or equal to 5 MMBtu/hr	Boilers, steam generators, and process heaters with maximum rated heat input capacities greater than 2 MMBtu/hr and less than 5 MMBtu/hr	Large water heaters, boilers and process heaters less than or equal to 2 MMBtu/hr	RECLAIM or post-RECLAIM facilities	Facilities regulated under the NOx RECLAIM program (SCAQMD Reg. XX)	None
Requirements* *All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.	NOx limits: • Digester gas: 15 ppmv • Landfill gas: 25 ppmv • Natural gas: 5 ppmv for ≥75 MMBtu/hr, 7 or 9 ppmv for 20–75 MMBtu/hr, 12 ppm for atmospheric, and 12 ppm for thermal fluid heaters For other types of fuels: 30 ppmv for other gaseous fuels; 40 ppmv for nongaseous fuels CO limit: 400 ppmv	• Digester gas: 15 ppmv • Landfill gas: 25 ppmv • Natural gas: 7 or 9 ppmv, 12 ppm for atmospheric, and 12 ppm for thermal fluid heaters • All others: 30 ppmv CO limit: 400 ppmv.	NOx limit is 20 ppmv for new units less than 2 MMBtu/hr. NOx limit is 30 ppmv for retrofit units less than 2 MMBtu/hr.	• Schedule for meeting BARCT emission limits and MRR requirements	For refinery gas: 2 ppmv for units > 40 MMBtu/hr For other units: 9 ppmv for units > 20 MMBtu/hr; and 12 ppmv for units ≥ 2 MMBtu/hr	None
Reporting	Every 6 months for units greater than or equal to 40 MMBtu/hr and an annual heat input greater than 200 x 10^9 Btu per year (Rule 218)	None	None	As specified in SCAQMD Rules 1146, 1146.1 and 1146.2	• Daily electronic reporting for major sources • Monthly to quarterly reporting for large sources and process units • Quarterly Certification of Emissions Report and Annual Permit Emissions Program for all units	None
Monitoring	• A continuous in-stack NOx monitor for units greater than or equal to 40 MMBtu/hr and an annual heat input greater than 200 x 10^9 Btu per year • Source testing once every 3 – 5 years for other units	• Source testing once every 5 years	None	As specified in SCAQMD Rules 1146, 1146.1 and 1146.2	• A continuous in-stack NOx monitor for major sources • Source testing once every 3 years for large sources •Source testing once every 5 years for process units	None
Recordkeeping	• Source test records • Maintenance & emission records = 2 years • Monitoring data = 2 years (5 years if Title V)	• Source test records = 2 years (5 years if Title V) • Monitoring data = 2 years (5 years if Title V)	None	As specified in SCAQMD Rules 1146, 1146.1 and 1146.2	• < 15-min. data = min. 48 hours; • ≥ 15-min. data = 3 years (5 years if Title V) • Maintenance & emission records, source test reports, RATA reports, audit reports and fuel meter calibration records for Annual Permit Emissions Program = 3 years (5 years if Title V)	None

APPENDIX A – ANALYSIS OF MRR REQUIREMENTS

INTRODUCTION

Under RECLAIM mass emissions reported by each facility are used to track and demonstrate compliance. To ensure the integrity of reported emissions, RECLAIM includes substantial monitoring and reporting requirements, as specified in Rule 2012 - *Requirements for Monitoring, Reporting and Recordkeeping for Oxides of Nitrogen Emissions.* RECLAIM MRR requirements are developed to accurately determine mass emissions of NOx for each facility, which is necessary for emission reconciliation and compliance demonstration in the cap-and-trade regulatory structure. RECLAIM MRR requirements are segregated by device classifications. The 4 major device classifications are major sources, large sources, process units, and Rule 219 exempt equipment.

In a command-and-control regulatory structure, a device-level emission standard (expressed in concentration such as ppm in Rules 1146, 1146.1 and 1146.2) is used for regulatory and compliance demonstration. Rules 1146 and 1146.1 also requires periodic emissions monitoring for facilities to demonatrate compliance to emission concentration limits. Staff has analyzed the MRR requirements in RECLAIM and Rule 1146 Series. Comparisons between the MRR requirements in RECLAIM and Rule 1146 Series of (a) source testing, (b) tune up / emission checks, (c) reporting, (d), recordkeeping, and (e) missing data procedures are presented in Tables A1-5, respectively.

Table A-1
Source Testing Requirements

Equipment Type		RECLAIM	Rule 1146 Series
RECLAIM	**Rule 1146 Series**		
Major Source* • ≥40 MMBtu/hr or • >10tpy	R1146 • ≥40 MMBtu/hr and • >200 Billion Btu/year	Continuous Emissions Monitoring System (CEMS) – Annual (or semi-annual#) certification of Relative Accuracy Test Audits (RATA) including source testing	
Large Source* • ≥10 and <40 MMBtu/hr or • >4 and <10 tpy	R1146 • ≥5 and <40 MMBtu/hr	Source testing once every 3 years;	Source testing once every 3 years for ≥10+ ; Source testing once every 5 years for ≥5 and <10 MMBtu/hr
Process Unit* • >2 and <10 MMBtu/hr • ≤2 MMBtu/hr if permitted	R1146.1 • >2 and <5 MMBtu/hr	Source testing once every 5 years for devices with concentration limit	Source testing once every 5 years;
R219 Exempt • ≤2 MMBtu/hr	R1146.2 • ≤2 MMBtu/hr	Not applicable^	Not applicable

* Refer to Rule 2012 for specific definitions
# Only applicable to RECLAIM facilities with standards exceeding the 7.5% requirements
^ Unless equipment is reported to be using an alternate emission factor
+ Except units equipped with CEMS

Table A-2
Tune Up / Emission Check Requirements

Equipment Type		RECLAIM Tune Up Frequency	Rule 1146 Series Diagnostic Emission Check Frequency
RECLAIM	**Rule 1146 Series**		
Major Source* • ≥40 MMBtu/hr or • >10tpy	R1146 • ≥40 MMBtu/hr and • >200 Billion Btu/year	Daily calibration and semi-annual tune ups OR Annual RATA	Not required for units with CEMS
Large Source* • ≥10 and <40 MMBtu/hr or • >4 and <10 tpy	R1146 • ≥5 and <40 MMBtu/hr	Semi-annual tune ups	At least monthly or every 750 operating hours, or quarterly or every 2000 operating hours
Process Unit* • >2 and <10 MMBtu/hr • ≤2 MMBtu/hr if permitted	R1146.1 • >2 and <5 MMBtu/hr	Semi-annual tune ups	At least quarterly or every 2000 operating hours or semi-annually or every 4000 operating hours
R219 Exempt • ≤2 MMBtu/hr	R1146.2 • ≤2 MMBtu/hr	Not applicable	Not applicable

* Refer to Rule 2012 for specific definitions

Table A-3
Reporting Requirements

Equipment Type		RECLAIM		Rule 1146 Series
RECLAIM	**Rule 1146 Series**	**Electronic**	**Paper**	
Major Source* • ≥40 MMBtu/hr or • >10tpy	R1146 • ≥40 MMBtu/hr and • >200 Billion Btu/year	Daily automatic reporting	Quarterly Certification of Emissions Report and Annual Permit Emissions Program	Every 6 months (Rule 218)
Large Source* • ≥10 and <40 MMBtu/hr or • >4 and <10 tpy	R1146 • ≥5 and <40 MMBtu/hr	Monthly reporting		None
Process Unit* • >2 and <10 MMBtu/hr • ≤2 MMBtu/hr if permitted	R1146.1 • >2 and <5 MMBtu/hr	Quarterly reporting		None
R219 Exempt • ≤2 MMBtu/hr	R1146.2 • ≤2 MMBtu/hr	Quarterly reporting		None

* Refer to Rule 2012 for specific definitions

Table A-4
Recordkeeping Requirements

Equipment Type		RECLAIM	Rule 1146 Series
RECLAIM	**Rule 1146 Series**		
Major Source* • ≥40 MMBtu/hr or • >10tpy	R1146 • ≥40 MMBtu/hr and • >200 Billion Btu/year	• < 15-min. data = min. 48 hours • ≥ 15-min. data = 3 years (5 years if Title V) • Maintenance & emission records, source test reports, RATA reports, audit reports and fuel meter calibration records for Annual Permit Emissions Program = 3 years (5 years if Title V)	• Source test records • Maintenance & emission records = 2 years • Monitoring data = 2 years (5 years if Title V)
Large Source* • ≥10 and <40 MMBtu/hr or • >4 and <10 tpy	R1146 • ≥5 and <40 MMBtu/hr		• Source test records • Monitoring data = 2 years (5 years if Title V)
Process Unit* • >2 and <10 MMBtu/hr • ≤2 MMBtu/hr if permitted	R1146.1 • >2 and <5 MMBtu/hr		• Source test records = 2 years (5 years if Title V) • Monitoring data = 2 years (5 years if Title V)
R219 Exempt • ≤2 MMBtu/hr	R1146.2 • ≤2 MMBtu/hr	• Fuel usage records	• Fuel usage records

* Refer to Rule 2012 for specific definitions

Table A-5
Missing Data Procedures

Equipment Type		RECLAIM	Rule 1146 Series
RECLAIM	Rule 1146 Series		
Major Source* • ≥40 MMBtu/hr or • >10tpy	R1146 • ≥40 MMBtu/hr and • >200 Billion Btu/year	For >95% availability (short gaps) • use avg. valid hour before and after or use highest hourly NOx conc. for last 30 days For <95% availability (longer gaps) • use highest hourly NOx conc. or last 30 days, or 365 days For <90% availability • use lifetime highest hourly NOx conc.	Not applicable
Large Source* • ≥10 and <40 MMBtu/hr or • >4 and <10 tpy	R1146 • ≥5 and <40 MMBtu/hr	If missing data is < 1 month • use average monthly for the previous 12 months. If missing data is > 1 month • use highest monthly fuel usage for the previous 12 months. If missing data is > 2 months or no records are available • assume 24 hours operation at maximum rated capacity at an uncontrolled emission factor	Not applicable
Process Unit* • >2 and <10 MMBtu/hr • ≤2 MMBtu/hr if permitted	R1146.1 • >2 and <5 MMBtu/hr	If missing data is < 1 quarter • use average quarterly fuel usage for the previous 4 quarters. If missing data is > 1 quarter • use source's highest quarterly fuel usage for the previous 4 quarters. If no records are available • assume 24 hours operation at maximum rated capacity at an uncontrolled emission factor	Not applicable
R219 Exempt • ≤2 MMBtu/hr	R1146.2 • ≤2 MMBtu/hr		

APPENDIX B – FACILITY AND EQUIPMENT ANALYSIS

INTRODUCTION

Starting March 2017, a monthly RECLAIM Working Group Meeting has been held to present and solicit information and suggestions from the public regarding the RECLAIM transition mechanisms. With the consideration of comments received, staff identified the following pathways to transition facilities out of RECLAIM:

- Source-specific command-and-control rules
- Industry-specific command-and-control rules
- Opt-out provisions

As of April 2018, four industry-specific categories have been identified. These four sectors are:

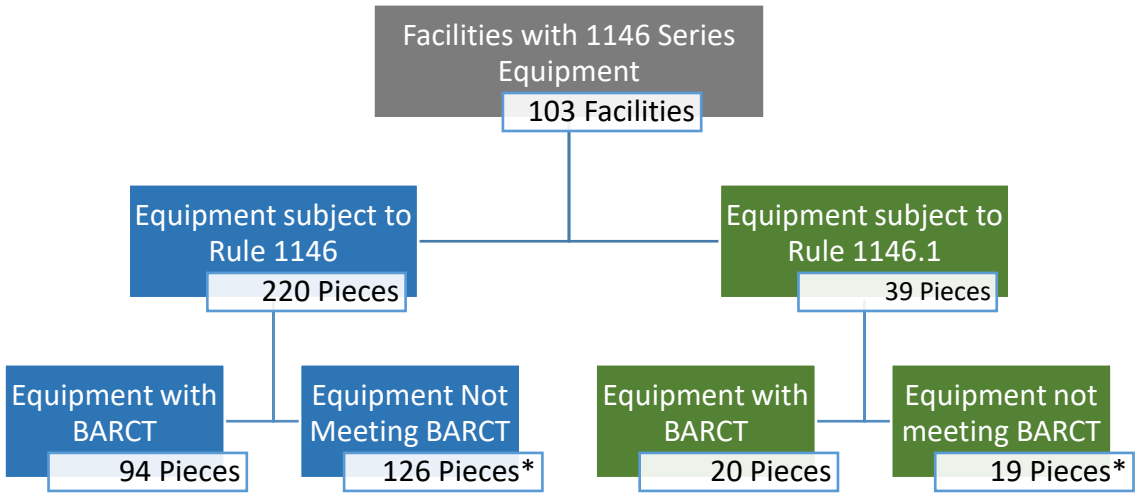
- Electricity Generating Facilities (EGFs)
- Refineries
- Metal Operations Facilities
- Aggregate Facilities

However the list of industry specific categories may change as the RECLAIM transition rulemaking process continues. The facilities in the four sectors would be subject to industry-specific command-and-control rules (Rule 1135 for EGFs; Rule 1109.1 for refineries; Rule 1147.1 for metal operations facilities; and Rule 1147.2 for aggregate facilities). Energy generating equipment located in EGFs and equipment located in refineries are subject to requirements to be established in the industry-specific rules. Since they would not follow the implementation schedule established for PARs 1146 series, they are not included in the permit analysis presented in this staff report. However, for metal operations and aggregate facilities as well as EGF equipment that do not generate electricity, their Rule 1146 series equipment will be subject to the requirements and implementation schedule as specified in the proposed rule amendments.

To understand the number and the size of units that need to meet the NOx concentration limits, permit data was retrieved in August 2017 for all Rule 1146, 1146.1, and 1146.2 units in RECLAIM to evaluate facilities with multiple pieces of Rule 1146 and 1146.1 equipment and those with both Rule 1146 series and other RECLAIM equipment.

Analysis of Rule 1146 and 1146.1 Units Currently Not Meeting NOx Limit

Out of the 259 RECLAIM facilities, 103 facilities were permitted with equipment that will be subject to PARs 1146, 1146.1 or 1146.2. As shown in Figure B-1, for the 103 facilities, there are 220 pieces of equipment that are subject to Rule 1146 and 39 pieces of equipment that are subject to Rule 1146.1. Of the 220 pieces of Rule 1146 equipment, 126 are currently not meeting the proposed BARCT limits. Of the 39 Rule 1146.1 equipment, 19 are currently not meeting the BARCT limit. Some facilities will have a combination of Rule 1146 and 1146.1 pieces of equipment at their facility.



**Includes units not subject to BARCT until burner replacement*

Figure B-1
RECLAIM Facilities with Rule 1146 Series Equipment

Figure B-2 shows the number of units that are currently not meeting the applicable NOx concentration limits in Rules 1146 and 1146.1 at a facility level. Equipment currently in compliance with RECLAIM BARCT[i] of 12 ppm are considered in compliance until burner replacement. Most of the facilities had 1 to 3 pieces of equipment that are non-compliant with Rule 1146 & Rule 1146.1 limits. Nine facilities had between 4 and 7 non-compliant units, while 2 facilities had 8 or more pieces of non-compliant equipment. One of two facilities had 19 units between 5 and 20 MMBtu/hr not meeting the Rule 1146 BARCT limit of 7 ppm. However, 13 of the 19 units are currently meeting the RECLAIM BARCT limit of 12 ppm, and would not need to meet the lower NOx emission limit under Proposed Amended Rules 1146 and 1146.1 until the unit's burner replacement or 15 years after rule adoption, whichever occurs earlier. The other facility had a total of 11 non-compliant units (3 Rule 1146 units and 7 Rule 1146.1 units), of which 3 would not need to meet the lower NOx emission limit under Proposed Amended Rules 1146 and 1146.1 until the unit's burner replacement or 15 years after rule adoption, whichever occurs earlier. Excluding the units that could delay compliance until burner replacement, these two facilities are required to retrofit 6 and 8 units, respectively. These units range from 2 to 13 MMBtu/hr, and compliance can be achieved with ultra-low NOx burners.

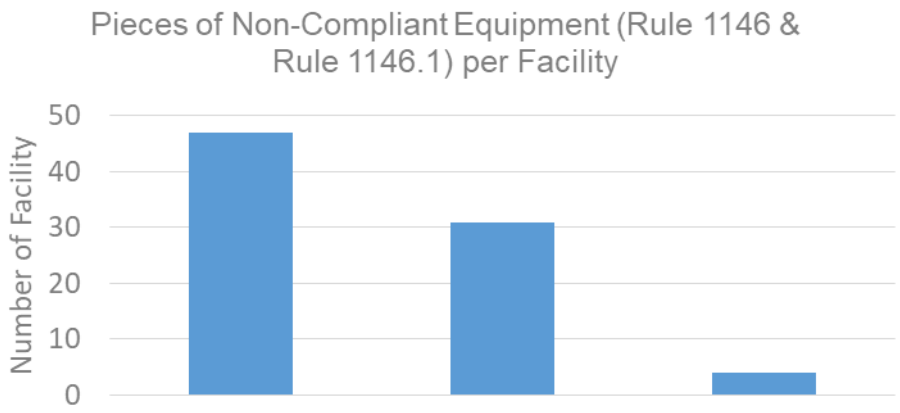


Figure B-2
Non-Compliant Equipment in Facilities Subject to Rules 1146 & 1146.1 Only

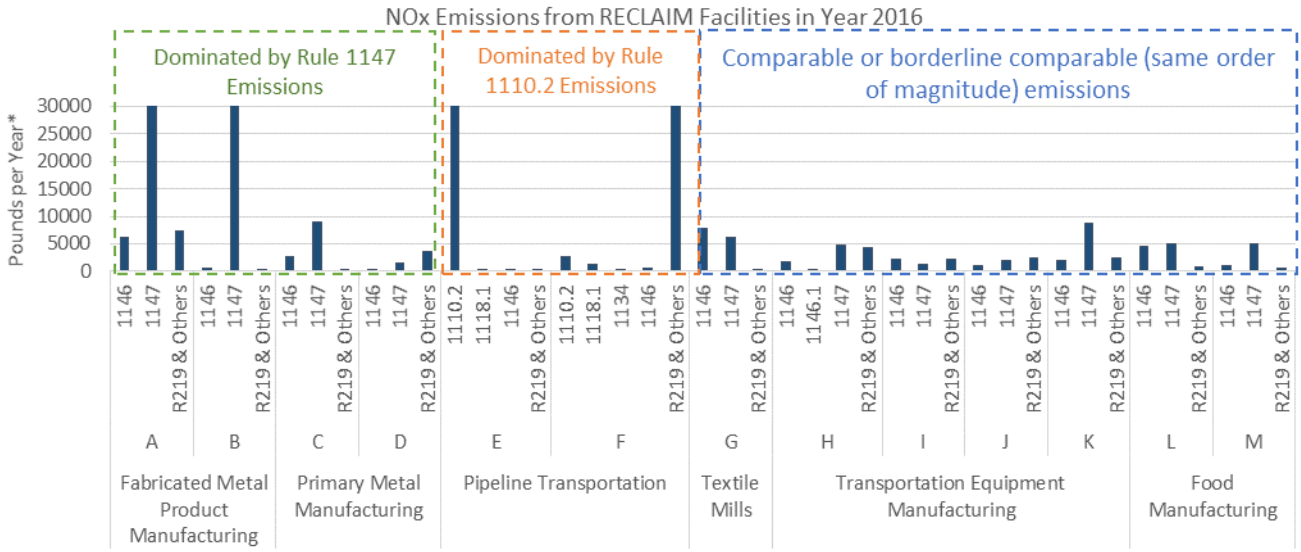
Analysis of Facilities with Rules 1146 and 1146.1 Equipment and Other Landing Rules
Staff has reviewed permits for all Rule 1146, 1146.1, and 1146.2 units in RECLAIM, and identified the number of non-Rule 1146 and 1146.1 units a facility has. As illustrated in Figure B-3, about half of the facilities had 3 or less non-Rule 1146 and 1146.1 units[18] ("other units"). Most of these equipment are subject to Rule 1110.2 (*Emissions from Gaseous - and Liquid-Fueled Engines*) or Rule 1147 (*NOx Reductions from Miscellaneous Sources*), which are scheduled to be amended in fall 2018 and in 2019 respectively. Twenty-five facilities had 4 to 10 other units. On this basis, facilities with 10 or less other units can meet the NOx concentration limits for Rule 1146 and/or Rule 1146.1 within three years.

Figure B-3
Non-Rule 1146 and Rule 1146.1 Equipment

To ensure that the greatest emissions reductions are achieved as early as practicable, staff evaluated the NOx emissions for each source category for facilities with more than 10 other units. Figure B(4) illustrates the NOx emissions of the 13 facilities with more than 10 units subject to other

[18] Excludes Rule 1470 equipment

landing rules. Four of the 13 facilities (Facilities A-D) had emissions dominated by Rule 1147 (*NOx Reductions from Miscellaneous Sources*) units. These facilities are associated with fabricated metal product manufacturing and primary metal manufacturing. Emissions from the two facilities (Facility E and Facility F) in the pipeline transportation industry were largely contributed by their internal combustion engines that are subject to Rule 1110.2 (*Emissions from Gaseous - and Liquid-Fueled Engines*). For the remaining facilities, emissions from their Rule 1146 series are mostly comparable with the emissions from other landing rules.



** Emissions from some facilities exceeded 30,000 pounds per year.*

Figure B-4
Emissions from Facilities with More than 10 Units
Subject to Other Landing Rules

For facilities with emissions dominated by other landing rules, staff evaluated each facility individually to better understand the emissions from different source types. The permitted units that are subject to the proposed rule amendments in Facility D and Facility E are already at BARCT, and they are not impacted by the compliance schedule in the proposed amendments. For Facilities A, B, C, and F, they have 5, 1, 2, and 3 permitted units that would be required to retrofit according to the compliance timeframe set forth in the proposed amendments.

These units ranged from 3 to 33 MMBtu/hr. For Rule 1146.1 and Rule 1146 Group III units not in compliance with RECLAIM BARCT of 12 ppm, will need to meet proposed limits of 7 ppm, compliance can be achieved with ultra-low NOx burners while units that meet RECLAIM BARCT would not need to meet the lower NOx emission limit under Proposed Amended Rules 1146 and 1146.1 until the unit's burner replacement or 15 years after rule adoption, whichever occurs earlier. Rule 1146 Group II units that are not in compliance with the RECLAIM BARCT will need to meet proposed limit of 5 ppm while Group II units currently in compliance with RECLAIM BARCT will need to meet proposed limit of 7 ppm at burner replacement. Rule 1146 Group II units that do not meet RECLAIM BARCT would require the more expensive control technology of SCR. In particular, the units in Facilities A-C are subject to Rule 1147, which is scheduled to be amended in 2019 as presented in various monthly RECLAIM Working Group Meetings. Given the time required for facilities to perform the engineering evaluation as well as the time needed for permit

application and processing, it is very likely that the implementation timeframe for the proposed amendments to Rule 1147 series would be later than January 1, 2021, leaving time for compliance with the Rule 1146 series equipment before that timeframe. Staff also determined that there are many other facilities belonging to different industries that are in a similar situation as some of these metal and aggregate facilities (e.g., many Rule 1147 pieces of equipment, along with Rule 1146 series equipment), and they would be subject to PARs 1146 series under the proposed amendments.

Analysis of Rule 1146.2 Units

Rule 1146.2 applies to boilers and process heaters with a rated heat input less than or equal to 2 MMBtu/hr. However, Rule 1146.2 units are exempt from SCAQMD permitting requirements per Rule 219 (Equipment Not Requiring a Written Permit Pursuant to Regulation II). Only a small portion of the Rule 1146.2 units are permitted due to unique circumstances, such as operators obtaining a lower emission factor for calculating the unit's potential to emit (PTE). As of September 2018, there is a total of 32 permitted Rule 1146.2 units in the RECLAIM universe, with 28 units meeting the existing Rule 1146.2 NOx concentration limit of 30 ppm. Among the 28 units, 21 of them were permitted at 12 ppm, above and beyond the 30 ppm requirement. Four of the 32 permitted Rule 1146.2 RECLAIM units were permitted at emission limits above the Rule 1146.2 limit, and would require retrofit / replacement to meet the existing Rule 1146.2 requirements. It is important to emphasize that majority of the Rule 1146.2 units in RECLAIM facilities are not permitted. Although non-RECLAIM facilities are required to register Rule 1146.2 equipment from 1 up to and including 2 MMBtu/hr under Rule 222 (*Filing Requirements For Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II*), RECLAIM facilities are exempt from the registration requirements. In addition, RECLAIM facilities report emissions from Rule 1146.2 units in the aggregate with other Rule 219 exempt equipment. Thus, the actual number of Rule 1146.2 units in the RECLAIM universe and its associated emissions could not be accurately quantified as part of this rule development, and the analysis below is the best estimate based on the best available information to date.

To better estimate the number of Rule 1146.2 units in RECLAIM, staff evaluated the equipment inventory provided by the facility responses from the initial determination notifications. This initial notification included an existing list of NOx emitting equipment and a request for the owner or operator of the RECLAIM facility to confirm the RECLAIM source equipment at the facility, as well as to identify any NOx emitting equipment that is not subject to permitting requirements (e.g., Rule 1146.2 units). As of April 2018, 37 RECLAIM facilities responded to the initial determination notifications, and a total of 118 Rule 1146.2 Type 2 units were reported. Based on the results of this initial survey, on average, each RECLAIM facility has 3.19 pieces of Rule 1146.2 Type 2 equipment. Assuming the same ratio for the rest of the RECLAIM facilities, it is estimated that about 850 Rule 1146.2 Type 2 units are present in the RECLAIM universe comprising of 259 facilities. While this provides an adequate estimation of the number of Rule 1146.2 units under the RECLAIM program, staff commits to collect and improve the RECLAIM inventory for this source category through annual inspections.

Equipment by Size

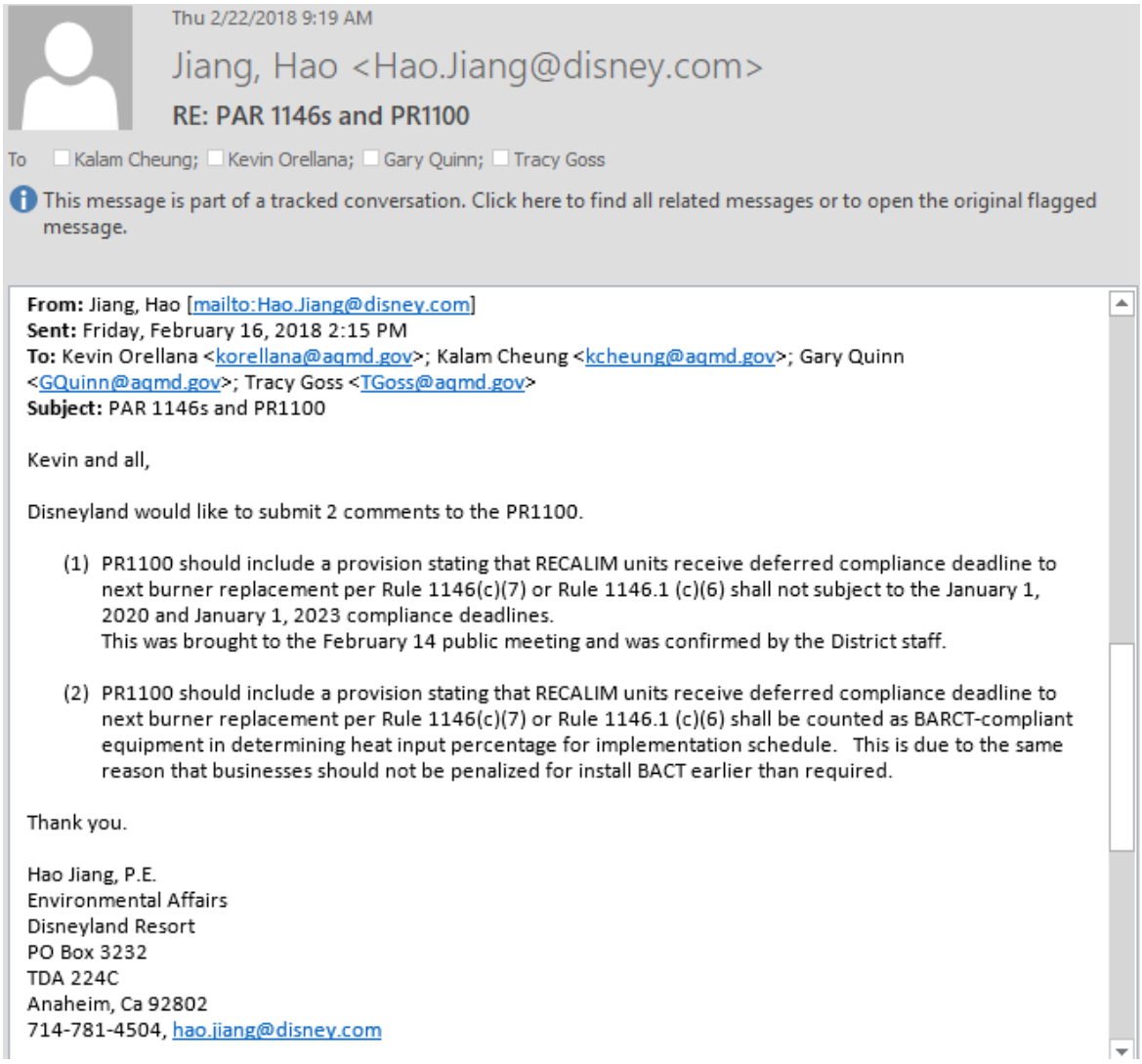
One major goal of PR 1100 is to ensure that facilities affected by multiple landing rules will achieve the greatest emission reductions early, and that facilities will address higher emitting equipment first. Equipment subject to PAR 1146 series and near final emission limits (RECLAIM BARCT) will not need to comply with lower emission limits under burner replacement or 15 years

after rule amendment. The distribution of units affected by PARs 1146 and 1146.1 by size range is presented in Table B-1.

Table B-1
Number of Equipment by Size

Rule Applicability	Meet RECLAIM BARCT	Do Not Meet RECLAIM BARCT
Rule 1146		
Group I (≥ 75 MMBtu/hr)	4	3
Group II (20 to <75 MMBtu/hr	26	52
Group III (5 to < 20 MMBtu/hr)	55	69
Rule 1146 Thermal Fluid Heaters	9	2
Rule 1146.1 (2 to <5 MMBtu/hr)	20	19
Total	**114**	**145**

APPENDIX C – PUBLIC COMMENTS



Thu 2/22/2018 9:19 AM

Jiang, Hao <Hao.Jiang@disney.com>

RE: PAR 1146s and PR1100

To Kalam Cheung; Kevin Orellana; Gary Quinn; Tracy Goss

This message is part of a tracked conversation. Click here to find all related messages or to open the original flagged message.

From: Jiang, Hao [mailto:Hao.Jiang@disney.com]
Sent: Friday, February 16, 2018 2:15 PM
To: Kevin Orellana <korellana@aqmd.gov>; Kalam Cheung <kcheung@aqmd.gov>; Gary Quinn <GQuinn@aqmd.gov>; Tracy Goss <TGoss@aqmd.gov>
Subject: PAR 1146s and PR1100

Kevin and all,

Disneyland would like to submit 2 comments to the PR1100.

(1) PR1100 should include a provision stating that RECALIM units receive deferred compliance deadline to next burner replacement per Rule 1146(c)(7) or Rule 1146.1 (c)(6) shall not subject to the January 1, 2020 and January 1, 2023 compliance deadlines.
This was brought to the February 14 public meeting and was confirmed by the District staff.

(2) PR1100 should include a provision stating that RECALIM units receive deferred compliance deadline to next burner replacement per Rule 1146(c)(7) or Rule 1146.1 (c)(6) shall be counted as BARCT-compliant equipment in determining heat input percentage for implementation schedule. This is due to the same reason that businesses should not be penalized for install BACT earlier than required.

Thank you.

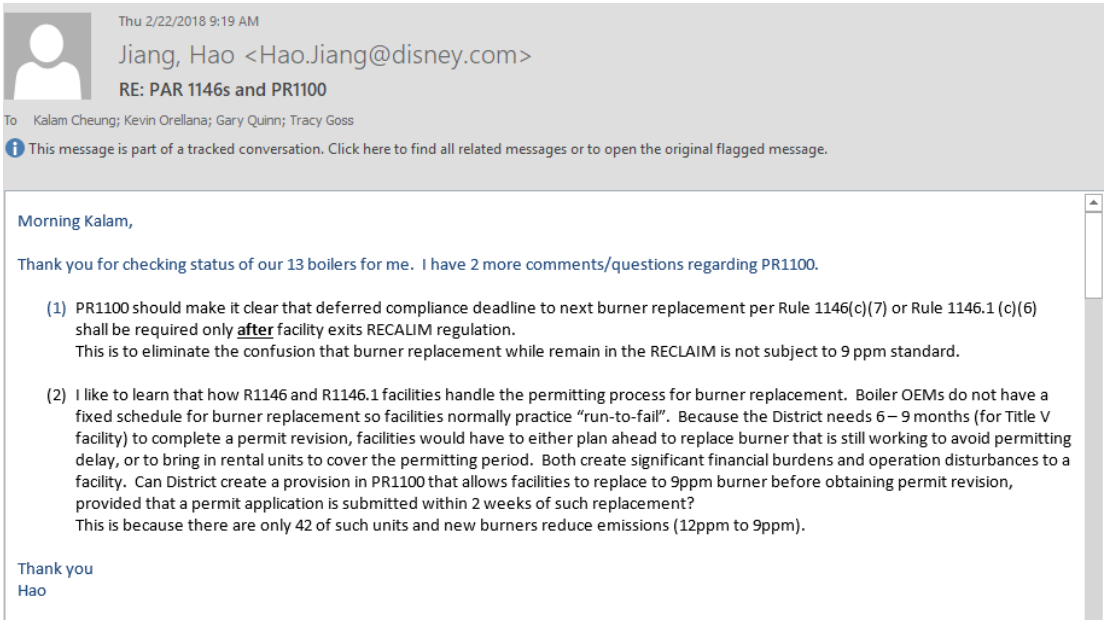
Hao Jiang, P.E.
Environmental Affairs
Disneyland Resort
PO Box 3232
TDA 224C
Anaheim, Ca 92802
714-781-4504, hao.jiang@disney.com

1-1

1-2

Response to Comment 1-1
Rule 1100 (d)(5) proposes to allow a RECLAIM or former RECLAIM facility that installed, or modified, or has been issued a SCAQMD Permit to Construct or Permit to Operate, a respective Rule 1146 or Rule 1146.1 natural gas fired unit prior to the date of rule adoption and near final emission limit to comply with proposed rule limits at the time of the unit's burner(s) replacement or 15 years after rule adoption.

Response to Comment 1-2
Units near final emission limit will be counted towards the 75% total heat input compliance requirement.



Thu 2/22/2018 9:19 AM

Jiang, Hao <Hao.Jiang@disney.com>

RE: PAR 1146s and PR1100

To Kalam Cheung; Kevin Orellana; Gary Quinn; Tracy Goss

This message is part of a tracked conversation. Click here to find all related messages or to open the original flagged message.

Morning Kalam,

Thank you for checking status of our 13 boilers for me. I have 2 more comments/questions regarding PR1100.

(1) PR1100 should make it clear that deferred compliance deadline to next burner replacement per Rule 1146(c)(7) or Rule 1146.1 (c)(6) shall be required only **after** facility exits RECALIM regulation.
This is to eliminate the confusion that burner replacement while remain in the RECLAIM is not subject to 9 ppm standard.

(2) I like to learn that how R1146 and R1146.1 facilities handle the permitting process for burner replacement. Boiler OEMs do not have a fixed schedule for burner replacement so facilities normally practice "run-to-fail". Because the District needs 6 – 9 months (for Title V facility) to complete a permit revision, facilities would have to either plan ahead to replace burner that is still working to avoid permitting delay, or to bring in rental units to cover the permitting period. Both create significant financial burdens and operation disturbances to a facility. Can District create a provision in PR1100 that allows facilities to replace to 9ppm burner before obtaining permit revision, provided that a permit application is submitted within 2 weeks of such replacement?
This is because there are only 42 of such units and new burners reduce emissions (12ppm to 9ppm).

Thank you
Hao

2-1

2-2

Response to Comment 2-1

As part of this rule amendment, PARs 1146 series will expand the applicability to include units that were not previously required to comply with Rules 1146 and 1146.1 because they were in the NOx RECLAIM program. Rule 1100 (c)(5) proposes to allow a RECLAIM or former RECLAIM facility that installed, or modified, or has been issued a SCAQMD Permit to Construct or Permit to Operate, a respective Rule 1146 natural gas fired unit or Rule 1146.1 natural gas fired unit prior to the date of rule adoption and near final emission limit to comply with proposed rule limits at the time of the unit's burner(s) replacement or 15 years after rule adoption.

Response to Comment 2-2

Before a burner becomes inoperable, the burner or boiler performance will suffer and show signs of wear and tear, which would be shown in the various operating parameters. For example, a review of higher fuel usage or even a Visible Emission Evaluation (VEE) at the smoke stack could indicate a problem with the burner assembly. Once a determination that the boiler is suffering a performance problem, an overall evaluation of the boiler should take place. Overall, if there are signs of a potential problem, routine maintenance should be able to ascertain the problem well ahead of time for planning purposes.

SoCalGas
A Sempra Energy utility

Daniel McGivney
Environmental Affairs
Program Manager

Tel: 951-225-2958
dmcgivney@semprautilities.com

February 28, 2018

Mr. Philip Fine, Ph.D.
Deputy Executive Officer
South Coast Air Quality
Management District
21865 Copley Drive
Diamond Bar, CA 91765

via email

Subject: Proposed Amended Rules 1146, 1146.1, 1146.2, and Proposed Rule 1100 Transition Rules for RECLAIM Facilities

Dr. Fine:

Southern California Gas Company (SoCalGas) appreciates the opportunity to provide comments on Proposed Amended Rules 1146, 1146.1, 1146.2, and Proposed Rule 1100 Transition Rules for RECLAIM Facilities. We look forward to continued engagement in the working group process as this, and other RECLAIM landing rules are developed.

Comments regarding Proposed Rule 1100

Permit Application Submittal Date

The August 1, 2018 permit application submittal deadline contained in draft Proposed Rule 1100 (PR 1100) does not provide adequate time for a regulated facility to prepare and submit a required permit application. Facilities need time to assess their equipment and determine a retrofit or replacement strategy, evaluate and estimate project costs, including ancillary activities such as necessary electrical, plumbing and/or ducting modifications. Additionally, facilities must obtain funding and management approval for these projects, perform engineering design and develop project bid specifications, and select equipment. These activities must occur before preparation and submittal of a permit application (which typically also requires bringing on a contracted entity to prepare the permit application). Depending upon type, complexity and size of a business, the time to do all of this can range from weeks to many months. At SoCalGas facilities, the above activities can take as long as 12 to 18 months.

3-1

1

As proposed in PR 1100, there are approximately 44 months between the scheduled May 2018 hearing to adopt amendments to the 1146 series rules and the final Best Available Retrofit Control Technology (BARCT) implementation date of January 1, 2022. **SoCalGas respectfully requests that the proposed permit application submittal deadline be revised to require submittal at one year from the date of Governing Board adoption of Rule 1100.** If amended in May as scheduled, this would still allow 20 and 32 months for permit issuance and construction/installation of necessary equipment to achieve compliance with the January 1, 2021 and 2022 deadlines.

3-1 cont.

General Comments Regarding the RECLAIM Transition

Permitting

SoCalGas is concerned about the transition process for Title V/major sources as we understand that there could be a lag in updating permits as facilities are transitioned out of RECLAIM and become regulated under command and control (C&C) regulations. This lag would appear to expose facilities to undue enforcement jeopardy as a facility may be responsible for complying with both C&C regulations due to the transition and requirements contained in the existing, and yet to be amended, Title V/RECLAIM permits.

We recommend that if permits cannot be updated at the time of transition, that the District consider including language in Rule 1100 that stays, or otherwise addresses, applicable requirements in the facilities' existing permits until permits can be amended.

3-2

Comments Regarding the Amendments to Rule 1146, 1146.1, 1146.2

Monitoring, Reporting & Recordkeeping

SoCalGas is concerned that the District is requiring facilities that transition out of the program to maintain existing RECLAIM program Monitoring, Reporting & Recordkeeping (MR&R) requirements even though they will be subject to command and control regulation. Transitioning facilities into a C&C regulatory regime requires those facilities to retrofit or replace existing equipment and install emissions controls to achieve BARCT standards contained in applicable C&C regulations. In many cases, this will result in emission reductions. SoCalGas believes that these reductions, and the MR&R contained in the landing rules, are sufficient to assure compliance. Therefore, retaining more costly RECLAIM MR&R, is not necessary or reasonable.

As MR&R has been a significant topic of discussion at all landing rule and RECLAIM phase-out working group meetings to date, SoCalGas recommends that the District continue to discuss this important issue so that there is consistent application of MR&R as facilities transition into a variety of landing rules. We suggest modifying the proposed 1146 series rules to include language transitioning RECLAIM facilities to current, or significantly similar, landing rule MR&R requirements and phase-out the bulk of existing RECLAIM MR&R requirements as these RECLAIM facilities fully transition to a full C&C regulatory program.

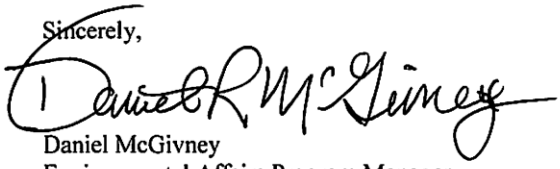
3-3

2

Conclusion

SoCalGas appreciates your consideration of these comments and recommendations. We look forward to continuing to work with staff regarding these amendments. Please contact me if there are any questions.

Sincerely,



Daniel McGivney
Environmental Affairs Program Manager
Southern California Gas Company

cc:
Susan Nakamura, SCAQMD
Tracy Goss, SCAQMD
Gary Quinn, SCAQMD
Kevin Orellana, SCAQMD
Lauren Nevitt, SoCalGas

3

Response to Comment 3-1
After considering public input, the permit application submittal deadline has been extended from August 1, 2018 to twelve months after rule adoption (i.e. December 7, 2019). Staff believes the new deadline provides adequate time if a comprehensive engineering or energy assessment is needed to prepare for the required permit application.

Response to Comment 3-2
As a facility modifies its equipment, permits can be modified to reflect compliance with command-and-control rules. In the Monthly RECLAIM Working Group Meeting held on April 12, 2018, staff presented an initial plan for permitting for the RECLAIM transition. Staff will continue to work with stakeholders and will modify the schedule as needed to transition facilities to command-and-control if additional time is needed to address transitional permitting issues.

Response to Comment 3-3
Staff acknowledges that part of the existing RECLAIM MRR requirements, such as daily monitoring and reporting of emissions, and missing data provisions, are developed for a compliance program that relies on reported mass emissions to track and demonstrate compliance. Staff has evaluated the MRR requirements in both RECLAIM and Rule 1146 series, and recommends that non-Title V facilities to be subject to the MRR requirements in Rule 1146 series after exiting the RECLAIM program. For Title V facilities, an extensive public review process is triggered by modifications on monitoring and recordkeeping requirements. Staff is recommending that Title V facilities maintain existing RECLAIM MRR requirements while the transition process proceeds. The SCAQMD is committed to re-evaluate monitoring and recordkeeping requirements for Title V facilities, and will continue to discuss the matter with EPA.

PLAINS
West Coast Terminals LLC

February 28, 2018

Gary Quinn, P.E.
Program Supervisor
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Subject: COMMENTS TO PAR 1146 and PR 1100

Dear Mr. Quinn:

Thank you for this opportunity to comment on SCAQMD Proposed Amended Rule 1146 and Proposed Rule 1100.

Plains West Coast Terminals (PWCT) has five RECLAIM facilities – PWCT Alamitos and PWCT Dominguez Hills have two Rule 1146 heaters each, PWCT Long Beach has two out of service heaters and a Rule 1147 afterburner, PWCT Huntington Beach has an out of service heater, and PWCT El Segundo no longer has a heater on location. The last three should comply fairly easily with using the Rule 1146 (c)(5) low use provision. The first two facilities with active heaters may be able to use the low use provision however, it only allows for an 18 month compliance date if it no longer meets the exemption while Proposed Rule 1100 allows a 31 month compliance date if adopted in its current version in May 2018. 4-1

PWCT will have from one to four heaters to retrofit by January 2021. The first hurdle will be to prepare *COMPLETE* permit to construct (PTC) applications by August 1, 2018. Before an application can be prepared, there are many planning components involved. These include: engineering evaluation of the current heaters, viability of retrofitting the existing configuration, scoping out viable venders and their guarantees for the retrofit, signing all subcontractors on an agreeable master services contract, scheduling the construction on-site with limited physical space, evaluating downtime options without interrupting our business, and more importantly budgeting this new unanticipated work in the middle of a fiscal year. We are requesting more time to provide the PTC applications, such as January 1, 2019 with a compliance date of 30 months for this major retrofit after the PTC is issued. We foresee SCAQMD staff being overly burdened with extra applications to process and feel it is unfair for us to have a shorter time to retrofit the heater due to unforeseen permitting evaluation time. 4-2

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Plains West Coast Terminals, LLC
5900 Cherry Avenue • Long Beach, CA 90805-4408 • (562) 728-2800 • FAX (562) 728-2860

Also while staff is evaluating the permit applications, there should be a distinction in the monitoring, recordkeeping, and reporting (MRR) requirements between NOx Title V facilities and other Title V facilities. Our facilities are in Title V because we have the potential to emit more than 10 tons per year of ROGs. All the other criteria pollutants are less than 10 tons per year. Therefore, the MRR requirements should entail those listed in Rule 1146 and not in Regulation XX – RECLAIM for large sources. 4-3

If you have any questions, please contact me at (661) 204-8749 or Ms. Connie Cunningham at (562) 728-2024.

Sincerely,

Glen Mears
Western Division ERC Director

Cc: Kevin Orellana, SCAQMD
Kalam Cheung, SCAQMD
Connie Cunningham, PWCT

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Response to Comment 4-1
Rule 1100(d)(4) allows low use units with an annual heat input less than 90,000 therms located at RECLAIM facilities, in operation prior to 12 months after date of rule adoption, to retain and comply with unit's NOx emission limit and source testing requirements specified in the SCAQMD permit to operate as of the date of rule adoption. Units complying with Rule 1100(d)(4) must also comply with requirements of Rule 1146(c)(5) and (e)(4).

As specified in Rule 1146 (e)(4), any unit complying with low use requirements of Rule 1146(c)(5) exceeding the low use threshold of 90,000 therms of heat input in any twelve month period, shall submit required applications for permits to construct and operate within 4 months after exceedance and demonstrate and maintain compliance with applicable requirements of Rule 1146(c)(1), (c)(2), (c)(3), (c)(4), and (c)(5) for the life of the unit.

Response to Comment 4-2
After considering public input, the permit application submittal deadline has been extended from August 1, 2018 to twelve months after rule adoption (i.e. December, 2019). Staff believes the new deadline provides adequate time if a comprehensive engineering or energy assessment is needed to prepare for the required permit application. Staff highly encourages facilities to start the necessary planning, engineering design, and budgeting process early to allow for enough time after the Permit to Construct (PTC) is issued.

The compliance date specified in PR 1100 is consistent with the compliance timeframe allowed in previous Rules 1146 and 1146.1 amendments in 2008. Units that are subject to Rules 1146 and 1146.1 are grouped together in the compliance schedule to allow facilities to decide which units they can demonstrate compliance by the earlier compliance date (January 1, 2021), thereby providing them more flexibility. In addition, for any operator that commits to fully replacing the affected equipment, in lieu of installing ultra-low NOx burners or SCR retrofit, extra time (until January 1, 2023) is allowed to comply with the existing NOx emission limits in Rules 1146 and 1146.1.

Response to Comment 4-3
Staff acknowledges that some NOx RECLAIM facilities are in the Title V program due to other pollutants such as VOC or PM. As discussed in Response to Comment 3-3, an extensive public review process is triggered by modifications on monitoring and recordkeeping requirements for Title V facilities. Since the RECLAIM Title V permit is a facility permit, the public review process could be triggered by changes in MRR requirements. The SCAQMD is committed to re-evaluate monitoring and recordkeeping requirements for Title V facilities, and will continue to discuss this matter with EPA.

February 28, 2018

Philip Fine, Ph.D.
Deputy Executive Officer
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765

Re: PAR1146, 1146.1, 1146.2 and PR1100

Dear Dr. Fine:

As Executive Director of the Southern California Air Quality Alliance I am providing the following comments on the proposed rules identified above.

Proposed Rule 1100

Proposed Rule 1100 currently includes a requirement that applications for permits to construct any new equipment or retrofit equipment necessary to comply with the emission standards in the 1146 series of rules be submitted by August 1, 2018. This time period is way too short for many if not all of the affected facilities. They will need adequate time to determine whether retrofits or replacements (or a combination of the two) are most appropriate, determine project costs, retain consultants to develop the appropriate engineering solution(s), obtain funding for the project, and then prepare a complete package to submit to SCAQMD in the form of the necessary permit forms and support documents. My members have advised me that this cannot reasonably be done (and done well) in the amount of time currently provided in the rule. We strongly request that additional time be provided and suggest that an appropriate amount of time is 12-18 months from the date of adoption of the proposed rules and amendments. 5-1

Proposed Amended Rule 1146, 1146.1 and 1146.2

I was very involved during the initial development and adoption of the RECLAIM program. One of the early "trade-offs" demanded by SCAQMD and EPA was extensive monitoring, recordkeeping and reporting requirements in exchange for the flexibility provided to facility operators in determining how to comply with the emission caps imposed by the RECLAIM program. With SCAQMD now moving those facilities to a command-and-control regime, facility operators are losing that flexibility. There is no longer a need to demonstrate that emissions are below arbitrary quarterly poundage limits reflected by RTC allocations since RTCs will no longer have any pertinence in the command-and-control program. Accordingly, we believe that it is only fair that the monitoring, recordkeeping and reporting requirements now applicable to facilities exiting RECLAIM be those that have traditionally been applicable to non-RECLAIM facilities and equipment. 5-2

We believe that requirements such as daily monitoring and reporting of emissions to the SCAQMD and missing data reporting have no relevancy to a

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(310) 348-8186 Ph
(310) 861-1484 Fax
colemanlaw@earthlink.net

command-and-control regime and should be eliminated as soon as a facility exits RECLAIM. Only monitoring, recordkeeping and reporting that is necessary to show compliance with the emission standards in the applicable rule should be required. We believe that the Rule 1146 series rules have adequate and appropriate monitoring, recordkeeping and reporting requirements and no different or more stringent requirements are necessary or appropriate.

5-2 cont.

Compliance During Transition from RECLAIM to Command and Control

All current RECLAIM facilities have facility permits with detailed permit requirements. Those permit requirements do not reflect the requirements of the command-and-control rules and may conflict with the command-and-control rules. There needs to be a recognition somewhere in the transition rules that the command-and-control requirements take precedence and that facility operators will not be considered in violation of facility permit requirements while the permit modification process is pending.

5-3

I look forward to continuing to work with you and SCAQMD staff on these and other issues that we will confront as we move ahead with "unwinding" the RECLAIM program.

Very truly yours

Curtis L. Coleman, Esq.
Executive Director
Southern California Air Quality Alliance

Response to Comment 5-1
After considering public input, the permit application submittal deadline has been extended from August 1, 2018 to twelve months after rule adoption (i.e. December 7, 2019). Staff believes the new deadline provides adequate time if a comprehensive engineering or energy assessment is needed to prepare the required permit application.

Response to Comment 5-2
See Response to Comment 3-3.

Response to Comment 5-3
See Response to Comment 3-2.

NORTHROP GRUMMAN

Northrop Grumman Systems Corporation
One Space Park
SDS362/R9
Redondo Beach, CA 90278

March 12, 2018

Gary Quinn,
Program Supervisor, Planning and Rules
21865 E. Copely Drive
Diamond Bar, CA 91765-4182

RE: COMMENTS ON PROPOSED RECLAIM TRANSITION TO RULES 1100, 1146, and 1146.1

Dear Mr. Quinn,

Per our meeting on February 7th, Northrop Grumman Systems Corporation is hereby submitting a proposed adjusted compliance timeline for replacing equipment subject to SCAQMD Rules 1100, 1146, and 1146.1. Northrop Grumman operates multiple manufacturing centers located in the South Coast Air Basin involved in advanced development engineering and production and assembly of aircraft, satellites, electronics, and extreme high frequency semiconductors for government and military customers. This letter pertains to the El Segundo, Manhattan Beach, and Redondo Beach sites collectively known as South Bay, comprised of over 3.4 million square feet, located in the vicinity of LAX, and managed under the same operating budgets and project management personnel. Although none of these three sites are subject to the cap and trade requirements of AB32, the facility in Redondo Beach (FID 800409) does submit an abbreviated report with emissions well below the 25,000 MT CO2e threshold for cap and trade.

6-1

We believe the transition to command and control rules is an excellent opportunity to reevaluate overall energy demand and usage. Instead of replacing like with like, a building by building robust engineering analysis would maximize this opportunity, yet it is a time-intensive endeavor. In addition, as a government contractor, Northrop Grumman is bound by specific procurement rules and requirements that significantly impede expedient vendor selection. Based on our best faith effort, we have put together what we believe to be a reasonable timeline to replace existing equipment covered under the proposed amended 1146 and 1146.1 rules.

Site	Bldg	Permit ID Number	Asset	Input rating (MMBTUH)	Year of Completion
Manhattan Beach	D1	D22	16044	2.5	Q4_2018
Manhattan Beach	D1	D314	21424	4.5	2019
Manhattan Beach	D1	D24	16043	4.5	2019
Manhattan Beach	R6	D19	19786	5	2020
Redondo Beach	S	D185	18310	2.07	2020
Redondo Beach	S	D183	18311	2.07	2021
Redondo Beach	S	D181	18312	2.07	2021
El Segundo	905	D37	BOOWC011	5.23	2021
Redondo Beach	S	D179	18313	2.07	2022
Redondo Beach	E1	D90	3000	5	2022
Redondo Beach	S	D187	18309	3	2023
Redondo Beach	R7	D102	8449	2.7	2023

We recognize that facilities covered under AB617 need to meet the 1/1/2021 and 1/1/2022 compliance deadlines, but we strongly believe a minor extension will allow facilities like ours to further explore opportunities, maximizing our emission reductions. Under our proposed timeline our three facilities would achieve 100% compliance by January 1 of the following years:

Manhattan Beach (FID 800408) – **2021**
El Segundo (FID 18924) – **2022**
Redondo Beach (FID 800409) – **2024**

6-1 cont.

If you have any questions or need additional information please don't hesitate to contact the undersigned at Matthew.Kent@ngc.com or at the number provided below.

Sincerely,
NORTHROP GRUMMAN SYSTEMS CORPORATION

Matthew Kent
Air Quality Engineer
Aerospace Systems
(310) 812-9698

Response to Comment 6-1

The compliance date specified in PR 1100 is consistent with the compliance timeframe allowed in previous Rules 1146 and 1146.1 amendments in 2008. Units that are subject to Rules 1146 and 1146.1 at a facility are grouped together in the compliance schedule to allow facilities to decide which units they can demonstrate compliance by the earlier compliance date (January 1, 2021), thus providing them more flexibility. In addition, for any operator that commits to fully replacing the affected equipment, in lieu of installing ultra-low NOx burners or SCR retrofits, extra time (January 1, 2023) is allowed to comply with the existing NOx emission limits in Rules 1146 and 1146.1.

Fri 4/20/2018 1:31 PM

Jiang, Hao <Hao.Jiang@disney.com>

PAR Rule 1100 comment

To Kevin Orellana; Kalam Cheung

Cc Tracy Goss; Gary Quinn

Kevin and Kalam,

Disneyland would appreciate the District to consider sunsetting RECLAIM MRR requirements after Title V facilities fully integrated into command-and-control rules, as proposed below. This is to avoid unnecessary and duplicated MRR requirements as current in PAR Rule 1100 to Title V facilities.

R1100(d)(4): All Title V facilities subject to this rule shall comply with the monitoring, reporting, and recordkeeping requirements specified in Rule 2012 until six months after the applicable compliance date specified in Rule 1100 – Implementation Schedule for NOx Facilities.

7-1

Thank you!

Hao Jiang, P.E.
Environmental Affairs
Disneyland Resort
PO Box 3232
TDA 224C
Anaheim, Ca 92802
714-781-4504, hao.jiang@disney.com

Response to Comment 7-1

As discussed in Response to Comment 3-3, an extensive public review process is triggered by modifications on monitoring and recordkeeping requirements for Title V facilities. The SCAQMD is committed to re-evaluate monitoring and recordkeeping requirements for Title V facilities, and will continue to discuss this with EPA. Staff is recommending that Title V facilities to maintain existing RECLAIM MRR requirements while the transition process proceeds. Staff intends to return to PR 1100 (d)(4) as the MRR requirements for Title V facilities exiting the RECLAIM program are addressed.

Subject: Comments on PR 1100 and 1146.x

Dear Tracy,

I am writing to reiterate some issues that I and others raised in the Public Workshop today.

1. The costs incorporated into the cost effectiveness calculations should include additional permit to operate fees in the operating costs for additional permit units such as for Selective Catalytic Reduction (SCR). 8-1
2. One problem we foresee is that in the case where a burner must be replaced due to a failure, the rules as currently drafted would trigger the lower emission limits. We are concerned that the SCAQMD would require a permit to construct for this installation, which would keep the affected unit shut down for several months or more while the permit application is prepared and then processed. Normal burner replacement if done with an identical burner would not require a permit. Perhaps the rule could have language addressing this issue. I confess I do not have a good recommendation at this point. 8-2

Thanks for listening!

Best regards,

Joe

Joseph Hower, PE, DEE

Principal and Vice-President - Mechanical Engineering
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Response to Comment 8-1:
Staff has updated cost-effectiveness calculations reflected in the staff report to include additional recurring permitting costs.

Response to Comment 8-2:
Objective of the rule provision is to allow burner (currently in compliance) to operate through it's useful life and for facility to bear the cost of a new burner only upon burner replacement. Burners that fail ahead of the 15 years will need to be replaced to meet new emission limits. Before a burner becomes inoperable, the burner or boiler performance will suffer and show signs of wear and tear, which would be shown in the various operating parameters. For example, a review of higher fuel usage or even a Visible Emission Evaluation (VEE) at the smoke stack could indicate a problem with the burner assembly. Once a determination that the boiler is suffering a performance problem, an overall evaluation of the boiler should take place. Overall, if there are signs of a potential problem, routine maintenance should be able to ascertain the problem well ahead of time for planning purposes.

Subject: SCAP Comments on PARs Series 1146

Hi Kevin,

Southern California Alliance of Publicly Owned Treatment Works (SCAP) appreciates the opportunity to provide comments on Proposed Amended Rules 1146/1146.1/1146.2. We also appreciate the acknowledgement that BARCT for digester gas will remain at 15 ppm NOx. However, we have concerns about the ability for dual fuel boilers using digester gas and/or natural gas to achieve the proposed limit. Ultra-low NOx burners are very sensitive, which makes it extremely challenging to operate when the proportion of digester gas to natural gas is altered. The proposal to lower the natural gas NOx limit will by default lower the dual fuel weighting limit and would likely restrict dual fuel use at wastewater treatment plants. To address this concern, SCAP respectfully requests that dual fuel boilers at wastewater treatment plants be allowed to use the existing natural gas NOx limits for the weighted limit formula, if the natural gas limits are lowered. 9-1

Our members have also expressed concerns about the feasibility of reducing the NOx limit to 7ppm on existing natural gas only boilers. We are concerned that the proposed limit might not be achievable when retrofitting a boiler. Our members use both natural gas and digester gas boilers to heat anaerobic digesters. In order to treat wastewater, our digesters need a reliable source of heat. Accordingly, we respectfully request that the viability of 7ppm NOx burners be carefully validated. In our experience vendors have difficulty delivering reliable retrofit technology, so we believe a detailed review of actual installations that have achieved the proposed limit using retrofitted burners is critical, especially for essential public services. 9-2

Thank you again for the opportunity to provide comments and please let me know if you have any questions regarding our concerns.

Sincerely,

David

DAVID L. ROTHBART, P.E., BCEE
SCAP Air Quality Committee Chair
Supervising Engineer | Air Quality Engineering
SANITATION DISTRICTS OF LOS ANGELES COUNTY | 1955 Workman Mill Road, Whittier, CA 90601
Phone: 562.908.4288 x2412 | Cell: 714.878.9655 | FAX: 562.692.9690
Converting Waste Into Resources | www.LACSD.org

Response to Comment 9-1:
Staff acknowledges the unique challenges faced by sewage treatment facilities and landfills offering essential public services and has initiated rulemaking efforts to establish an industry specific rule for equipment located at aforementioned facilities in order to address stakeholder concerns. Natural gas fired equipment in compliance with current NOx emission limits will not have to comply with new NOx emission limits until the time of burner replacement or 15 years after rule amendment.

Response to Comment 9-2:
Staff has been in contact with five equipment vendors throughout the rulemaking process. Three out of the five vendors expressed that 7 ppm burner retrofits are feasible. SJVAPCD adopted Rule 4320 on October 16, 2008 which implemented NOx emission limits of between 7 to 9 ppm for all natural gas fired units rated to >5 MMBtu/hr. Approximately ~~980~~ 708 units (between 5 to 300 MMBtu/hr) located in SJVAPCD were identified and source tested to comply with 7 ppm limit without use of the mitigation fee option. Over ~~1,000~~2,400 source test reports from equipment located in SCAQMD and SJVAPCD ~~support~~ were reviewed to evaluate the feasibility of the 7 ppm BARCT. ~~t~~The information received from vendors and evaluated source test results demonstrate that 7 ppm limit is feasible for new and retrofit equipment.

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September 25th, 2018

SCAQMD
21865 Copley Drive
Diamond Bar CA 91765

Attention: Mr. Tracy Goss, P.E
Manager

Subject: Comments RE: PR-1100

Dear Mr. Goss;

Appended below are some points regarding the Proposed rRle 1100 and preliminery draft of the staff report dated September 2018. I would appreciate the District respond to the comments listed below:

1. Economics analysis and Cost effectiveness of the proposed rule is not included. We would appreciate the opportunity to comment on the costs of equipment, replacement, installation and operation. 10-1

2. Atmospheric fired units (Parker Boilers) less than 10.0-MMBTU per hour input should also be subject to the Proposed 7-PPM NOx limit from current 12-PPM. In fact, they should have been subjected to meet current 9-PPM NOx emissions already. Currently 9-PPM technology does exist and can be adopted for these units. No Manufacturer should receive special treatment over their competition. 10-2

3. Source test reports of Ultra Low NOx burner installation outside this air basin need validation by the AQMD Source Testing Division. Copy of their reports need to be made public. Transperency of these source tests reports is necessary for proper goverence. 10-3

We are available to discuss the above comments and concerns at your convenience.

Please feel free to contact me at 714-984-5479 or email at Imran@boilerdynamics.com.

Sincerely,

Imran Husain-Tech Sales & Marketing
Boiler Dynamics, Inc

Encl; as above
Cc; Gary Quinn-PE-Program Supervisor

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Response to Comment 10-1:
Staff cost assumptions used to determine cost-effectiveness were presented in Working Group #5 on August 2nd, 2018 ,Working Group #7 on October 16th, 2018, and Chapter 2 of this staff report.

Response to Comment 10-2:
Staff has conducted a comprehensive BARCT analysis for boilers, process heaters and steam generators subject to Rule 1146 and 1146.1 operating within the district including atmospheric units rated between 2 to 10 MMBtu/hr. Source test results reviewed were not able to provide sufficient data to support establishment of 9 ppm BARCT. It is important to note that the current limit for atmospheric units in SJVAPCD Rule 4307 is also 12 ppm.

Staff has met with the commentor for additional information. Commentor's comments are addressing new units and not retrofits.

Response to Comment 10-3:
Equipment source test reports obtained from outside of SCAQMD were conducted using EPA approved test methods. For example, SJVAPCD source tests follow CARB Method 100 which is considered equivalent to SCAQMD Method 100.1. Information can be obtained through public records requests.

From: McGivney, Daniel [mailto:DMcGivney@semprautilities.com]
Sent: Thursday, October 4, 2018 9:42 AM
To: Kalam Cheung <kcheung@aqmd.gov>; Gary Quinn <GQuinn@aqmd.gov>
Cc: Nevitt, Lauren B <LNevitt@semprautilities.com>; Fickerson, Karin U <kFickerson@semprautilities.com>
Subject: Comment regarding PAR 1146 Series Rules Package

Kalam, Gary, per yesterday's conversation with Kalam, SoCalGas is providing a recommendation for consideration, regarding the definition of "Thermal Fluid Heater" which occurs in both Rules 1146 and 1146.1. SoCalGas understands that the current definition, aside from the proposed amended version which now includes the phrase "natural gas fired," has been in the these rules for quite some time. However, we believe that the definition does not accurately describe or distinguish a thermal fluid heater from a process heater, and would better accomplish that if it was further amended as noted below. Recognizing this request is fairly late in the process, SoCalGas would appreciate the District review this request and consider including SoCalGas' proposed language in the current proposed amendments scheduled to go before the Governing Board at its December 2 Board meeting. Should staff wish to discuss this proposal further, or if there are any questions, please contact me. Thank you.

11-1

SoCalGas Proposed Definition: THERMAL FLUID HEATER means a natural gas fired PROCESS HEATER in a system in which a process stream is heated indirectly by a heated fluid other than water.

Explanation: The proposed change to the thermal fluid heaters definition clarifies that the process streams are not inside the thermal fluid heater. Thermal fluid heaters work harder than process heaters or water heaters because the thermal fluid typically needs to be heated to higher temperatures than process streams or water. The slightly higher NOx limit for these units is justified because they heat the fluids to higher temperatures, and we want to assure it is clear which units are in this category.

Daniel McGivney
Environmental Affairs Program Manager
Southern California Gas Company
951-225-2958
dmcgivney@semprautilities.com

Response to Comment 11-1
SCAQMD staff appreciates your comments and participation throughout the rulemaking for PAR 1146 series and PR 1100.

Staff has taken consideration of your comments and updated the definition of thermal fluid heaters from "a PROCESS HEATER in which a process is heated indirectly by a heated fluid other than water" to "a natural gas fired process heater in which a process stream is heated indirectly by a heated fluid other than water."

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018282-0000

LATHAM&WATKINS LLP

November 1, 2018

VIA E-MAIL (see attached distribution)

Governing Board
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Re: Proposed Amended Rules 1146, 1146.1 and 1146.2

Dear SCAQMD Governing Board Member:

We are submitting these comments on behalf of our client the Regulatory Flexibility Group ("RFG") regarding Proposed Amended Rules 1146, 1146.1 and 1146.2 ("PAR 1146 Series"). The RFG is an industry coalition comprised of companies in the refining, utility and aerospace sectors that operate facilities within the jurisdiction of the South Coast Air Quality Management District ("SCAQMD"). RFG member facilities are subject to the Regional Clean Air Incentives Market ("RECLAIM") program, and will be seriously affected by the transition to a command-and-control regulatory structure that is currently underway. The RFG participated in the development of the RECLAIM program from its inception, and has been an active participant in all major amendments to the program, including those currently underway. 12-1

This rulemaking raises a number of issues that cut across some or all of the "landing rules" that are slated for amendment or adoption and that will directly affect RFG member companies. All of these issues have been raised with staff, and, in some cases, with Governing Board members, through written comments and verbal comments at working group meetings, public workshops, public hearings, committee meetings and individual company or coalition meetings. Following is a brief summary of each of the issues about which we have concerns, and attached to this letter are more detailed comment letters previously submitted to the SCAQMD on these issues.

Mandating Equipment Replacement Exceeds The SCAQMD's Authority

SCAQMD staff has taken the position that a best available retrofit control technology ("BARCT") standard may require total replacement of the emitting piece of equipment. Mandating replacement projects exceeds the authority of the SCAQMD to adopt BARCT standards for *existing* sources, as set forth in the California Health & Safety Code, and, therefore, runs afoul of the well-established legal principle that a regulatory agency must act within the 12-2

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scope of the authority delegated to it by the legislature. This issue is addressed in more detail in the following attachments:

- Attachment 1: August 24, 2018 comments from Latham & Watkins LLP on behalf of RFG
- Attachment 2: November 1, 2018 comments from Latham & Watkins LLP on behalf of RFG and WSPA

12-2 (Cont'd

New Source Review Issues Must Be Addressed Comprehensively And Expeditiously

Although SCAQMD staff has indicated that it is communicating with U.S. Environmental Protection Agency ("USEPA") staff regarding the nature of the new source review ("NSR") program that will apply to RECLAIM facilities once they exit the program, we are not aware of the specifics of those communications, and we have no reason to believe that material progress is being made to resolve this issue. Addressing fundamental programmatic issues, such as NSR, early in the transition process will result in a more orderly and efficient transition. This issue is addressed in more detail in the following attachment:

12-3

- Attachment 3: September 7, 2018 comments from Latham & Watkins LLP on behalf of WSPA

The California Environmental Quality Act Analysis For The Transition Project Is Piecemealed

It is a fundamental principle of California Environmental Quality Act ("CEQA") review that all environmental impacts for the whole of the project be analyzed together. In this case, the "project" is the RECLAIM transition as a whole as required by Control Measure CMB-05 as adopted in the 2016 AQMP. Yet, staff is conducting the CEQA review through a series of Supplemental Environmental Assessments ("SEA") that analyze only the impacts associated with the particular landing rule under consideration. Staff argues that this approach is acceptable because each SEA "tiers off" the March 2017 Final Program Environmental Impact Report for the 2016 AQMP and several other earlier certified CEQA documents, which analyzed the transition as a whole. However, the March 2017 Final Program EIR for the 2016 AQMP, which was completed in January 2018, did not analyze the transition of the RECLAIM program because the transition was not part of Control Measure CMB-05 as proposed at that time. Therefore, tiering off of the earlier CEQA documents to support rule amendments that seek to implement the transition is not possible because there is no comprehensive analysis in the earlier documents. In the absence of a program level CEQA analysis that includes the whole of the RECLAIM transition, staff's segmented analysis of each proposed rulemaking action constitutes classic "piecemealing" in violation of CEQA. This issue is addressed in more detail in the following attachment:

12-4

- Attachment 3: September 7, 2018 comments from Latham & Watkins LLP on behalf of WSPA

Incremental Socioeconomic Assessment

By analyzing the socioeconomic impacts associated with the transition in an incremental fashion in the context of each rulemaking, as opposed to a comprehensive analysis of the entire transition, staff is either underestimating the cumulative impacts or failing to identify them at all. An illustration of this problem can be found in the two sets of amendments to Rules 2001 and 2002 in 2018. In the January 2018 amendments to these rules, staff did not even address the impact that the removal of 38 facilities from the RECLAIM program that would then be eligible to take advantage of offset exemptions in Rule 1304 might have on the internal offset bank. In contrast, the Staff Report supporting the October 2018 amendments to these same rules expressed serious concerns about the potential impacts to the internal bank. Either staff erred in January by failing to analyze the potential impacts on the internal bank, or it overstated the potential impacts associated with the October amendments. In either case, this inconsistency illustrates the problem with undertaking analysis of the impacts associated with the RECLAIM transition in an incremental fashion. This issue is addressed in more detail in the following attachment:

- Attachment 3: September 7, 2018 comments from Latham & Watkins LLP on behalf of WSPA

12-5

Inappropriate Cost-Effectiveness Methodology

RFG objects to certain aspects of the cost-effectiveness methodology that SCAQMD staff is using to determine BARCT requirements for the landing rules currently under development. First, staff typically assumes a useful life for equipment of 25 years even though rulemaking requires replacement of technology much sooner. Use of a 25-year assumption makes the control equipment appear more cost-effective by diluting the significant capital costs of required projects over a much longer time period than is likely to occur. Second, staff utilizes the discounted cash flow ("DCF") method instead of the levelized cash flow ("LCF") method as used by several other air districts. The LCF method is a better representation of cost-effectiveness than the DCF method. Finally, staff utilizes a $50,000 per ton cost-effectiveness threshold for determining BARCT, which is much higher than that applied by other air quality agencies, and, in some cases, staff has concluded that controls with a cost-effectiveness above $50,000 per ton constitute BARCT. This issue is addressed in more detail in the following attachment:

- Attachment 4: July 3, 2018 comments from WSPA

12-6

LATHAM&WATKINS LLP

Thank you for your attention to these comments. We are available to discuss these issues with you and/or your Governing Board Assistant at any time.

Best regards,

Michael J. Carroll
of LATHAM & WATKINS LLP

Attachments

cc: Clerk of the Boards, SCAQMD
Wayne Nastri, SCAQMD
Philip Fine, SCAQMD
Barbara Baird, SCAQMD
Robert Wyman, Latham & Watkins LLP
John Heintz, Latham & Watkins LLP
RFG Members

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016282-0000/033950-0005

November 1, 2018

VIA EMAIL

Bayron T. Gilchrist, General Counsel
Barbara Baird, Chief Deputy Counsel
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Re: SCAQMD Staff Proposal to Require Equipment Replacement as BARCT

Dear Bayron and Barbara:

Thank you for your October 3, 2018 letter responding to our August 15, 2018 comments submitted on behalf of the Western States Petroleum Association ("WSPA"), and our August 24, 2018 comments submitted on behalf of the Regulatory Flexibility Group ("RFG"), regarding South Coast Air Quality Management District ("SCAQMD") staff's position that a best available retrofit control technology ("BARCT") standard may require total replacement of the emitting piece of equipment. Portions of your response reassert arguments that staff has made in the past in support of its position; namely, that neither the statutory definition of BARCT nor common dictionary definitions of "retrofit" specifically exclude replacements, and that the *American Coatings Ass'n v. South Coast Air Quality Mgt. Dist.*, 54 Cal 4th 446 (2012) case ("*American Coatings*") is supportive of staff's position. We responded to those arguments in our previous comment letters and will not revisit them here. This letter responds on behalf of WSPA and RFG to your assertions that the staff's position is supported by public policy considerations, and that we have failed to present any policy rationale for our position.

Staff asserts that requiring replacements under certain circumstances is supported by policy justifications, and, therefore, public policy supports an expansive interpretation of its authority that would include the authority to mandate replacements. This reasoning is contrary to two important public policies that are also well enshrined in administrative law. The first is that regulatory agencies must act within the scope of the authority delegated to them by the legislature, even if that means the agency may not undertake certain actions that it might otherwise view as sound public policy. The second is that public agencies may not substitute their own judgment for that of the legislature as reflected in the statutory grant of authority. These public policies and legal requirements support our position that staff cannot mandate replacements as BARCT.

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Public policy and well established law dictate that the SCAQMD act within the scope of authority granted to it by the legislature.

An agency can adopt, administer or enforce a regulation only if it is within the scope of authority conferred on it by other provisions of law. Cal Gov. Code § 11342.1. No regulation is valid unless it is consistent and not in conflict with the statute conferring authority to the agency. Cal Gov. Code § 11342.2. As explained in our previous comment letters, the statutory provisions defining BARCT and the SCAQMD's authority to adopt and implement BARCT standards are clear. "In the construction of a statute or instrument, the office of the Judge is simply to ascertain and declare what is in terms or in substance contained therein, *not to insert what has been omitted*, or to omit what has been inserted . . ." Cal. Civ. Proc. Code § 1858 (emphasis added). The role of an agency charged with implementing a statute is no different. In this case, staff seeks to insert what has been omitted by arguing that the term "retrofit" encompasses replacement, notwithstanding that there are numerous examples of the distinction between those terms throughout the statute. 12-2-1

Finding ambiguity where there is none, staff then invokes "public policy" to support an expansive interpretation of its authority. Relying on the example of replacing engines on Santa Catalina Island, staff argues that because the replacements would further the broader statutory purpose of reducing emissions, a mandate to do so is sound public policy, and, therefore, public policy supports an expansive interpretation of the agency's authority to impose such a mandate. 12-2-2

According to staff's reasoning, the scope of the agency's authority should be interpreted to encompass any action which the agency deems sound public policy, regardless of the specific language contained in the statutory grant of authority. In fact, you argue in your letter, citing *American Coatings,* that the agency's authority is essentially unbounded as long as the requirement is not arbitrary and capricious, or without reasonable or rational basis, or lacking in evidentiary support. However, as the cases relied upon in *American Coatings* make clear, a critical consideration in evaluating whether or not an agency action meets this standard is whether or not the action is within the scope of the agency's delegated authority. As stated in *Yamaha Corp. of America v. State Bd. of Equalization* (1998) 19 Cal.4th 1, citing *Wallace Berri & Co. v. State Bd. of Equalization* (1985) 40 Cal.3d 60, 65: " '[I]n reviewing the legality of a regulation adopted pursuant to a delegation of legislative power, the judicial function is limited to determining whether the regulation (1) is "within the scope of the authority conferred" [citation] and (2) is "reasonably necessary to effectuate the purpose of the statute" [citation].' [Citation.]" 12-2-3

The scope of authority delegated to an agency may not authorize it to take any and all actions that the agency deems sound public policy in light of its overall mission. In fact, acting as it does from a broader perspective, and balancing a broader range of policy considerations, the very reason the legislature imposes limitations on the authority of regulatory agencies is to prevent them from undertaking actions that they might otherwise be inclined to take because they deem them sound public policy. The fact that a proposed action may reflect sound public policy in the view of the agency does not mean that it is within the scope of the authority granted by the legislature. 12-2-4

Staff's position is contrary to the legislature's policy considerations embedded in the relevant statutory provisions.

By including economic impacts as one of the factors in the definition of BARCT, and by specifying the process for evaluating the cost-effectiveness of proposed BARCT standards, it is clear that one of the policies of the legislature was to balance the goal of achieving additional emission reductions from existing sources against the costs of achieving those reductions, and to impose limits on the costs that would be borne by existing sources to further control emissions.[1] The legislature determined that stationary sources should bear the cost of implementing cost-effective retrofits. If cost-effective retrofits are determined to be unavailable, then that is the end of the inquiry. There may be specific cases where the outcome results in foregone emission reductions, but it was the judgment of the legislature that this regulatory scheme struck the proper public policy balance between achieving air quality goals and imposing additional costs on regulated sources. It is not the place of the agency to substitute its own public policy considerations for those of the legislature when the language of the statute is clear, as it is here. 12-2-5

Furthermore, the fact that a replacement project may be cost-effective in a situation where available retrofits are not is irrelevant. Staff seems to suggest that if a replacement project would cost no more than a cost-effective retrofit project (if one existed), then the cost to the source is no greater than what the legislature intended, and, therefore, requiring replacement in such situations does not undercut any economic considerations that the legislature may have had in mind when adopting the statute. However, in situations where there are no available cost-effective retrofits, the legislature determined that the cost to the source for installing additional controls would be zero. Therefore, staff's determination that it can mandate replacement when there are no cost-effective retrofits, as long as the replacement is cost-effective, imposes costs on existing sources that go beyond what the legislature contemplated. The fact that the cost of a replacement may be less than, or more cost-effective than, available retrofits does not mean that the agency is entitled to mandate replacements. 12-2-6

Conclusion

SCAQMD staff is attempting to use policy rationale to read something into the statute that simply is not there. That approach is not only poor public policy, it is contrary to the law. Whether or not a particular course of action may be good public policy in the judgment of the agency does not mean it is within the authority of the agency to mandate it. Furthermore, in this case, that rationale elevates the judgment of the agency over that of the legislature with regards to the appropriate balance between furthering air quality objectives and maintaining a viable economy. There are limits on the rulemaking authority of the SCAQMD, and those limits may well preclude it from pursuing what it might otherwise view as good public policy in order to accomplish the broader policy objectives of the legislature. 12-2-7

[1] Health & Safety Code Sections 40406 and 40920.6.

LATHAM & WATKINS LLP

Thank you for considering these comments. We look forward to continuing to work with you on these rulemakings which are critically important to stakeholders as well as the regional economy. If you have any questions, please contact me at (714) 401-8105 or by email at michael.carroll@lw.com.

Sincerely,

Michael J. Carroll
of LATHAM & WATKINS LLP

cc: Robert Wyman, Latham & Watkins LLP
John Heintz, Latham & Watkins LLP
RFG Members
Bridget McCann, WSPA

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Response to Comment 12-1:

This comment introduces the party represented by the letter; no response to this the comment is necessary. SCAQMD staff appreciates comments and participation throughout the rulemaking for the transition of the RECLAIM program to a command-and-control regulatory structure.

Response to Comment 12-2:

This comment letter includes as an attachment the August 24, 2018 comment letter on this issue by Michael Carroll on behalf of the Regulatory Flexibility Group (RFG). A similar comment letter on behalf of WSPA attaches an August 15 letter from Michael Carroll on this subject. Neither the RFG letter nor the WSPA letter includes the SCAQMD's response to these letters. Therefore, we have attached the SCAQMD's letter dated October 3, 2018, from Chief Deputy Counsel Barbara Baird which responds to both the August 15 and August 24 letter. In addition, this comment letter includes a new November 1, 2018 comment letter, addressed to Bayron Gilchrist and Barbara Baird, responding to the SCAQMD October 3 letter. Comments contained in the November 1 letter from Michael Carroll are bracketed and staff's responses are presented below. It should be noted that Proposed Rules 1146, 1146.1, or 1146.2 does not require any facility to replace existing equipment to achieve compliance. Equipment replacement may be an option for compliance, but in all cases SCAQMD staff has determined that compliance is feasible through methods which the commenter would consider proper "retrofit" methods. Therefore, this issue is irrelevant to these proposed rules.

Response to Comment 12-2-1:

While the particular statutes cited do not apply to SCAQMD rulemaking, but only to state agencies, staff agrees that an agency can only adopt a rule that is within its delegated authority. Staff does not agree that it is seeking to insert what has been omitted, because both the statutory definition of BARCT in Section 40406 and the dictionary definition of "retrofit" which includes replacing equipment or a system are broad enough to encompass equipment replacement.

Response to Comment 12-2-2:

Staff disagrees that the term "retrofit" as used in the statute unambiguously precludes equipment replacement. Staff does believe that public policy supports the broader statutory interpretation, because if the SCAQMD could not adopt a rule requiring equipment replacement, assuming it is feasible and cost-effective, then the agency would not be able to require the oldest and dirtiest equipment to reduce its emissions if it could not be done cost-effectively through add-on controls.

Response to Comment 12-2-3:

The comment misstates the SCAQMD staff's position. Staff does not state that the agency may take any action that is deemed sound public policy, regardless of any statutory restrictions. Instead, staff fundamentally disagrees with the proposition that the definition of BARCT is a limitation on the SCAQMD's authority. Therefore, SCAQMD could require equipment replacement even if BARCT itself is limited to add-on controls. Under the principles that govern rulemaking, any such rule could not be arbitrary and capricious or entirely lacking in evidentiary support. The requirement in Section 40440(a) that SCAQMD impose BARCT on existing stationary sources is a mandate upon the agency, not a limitation. It does not preclude the agency from requiring additional control measures. This is clear from the statutory language, which says SCAQMD rules "shall" require BARCT, but does not say that they can only require BARCT. And the legislative history shows that the "BARCT standard was therefore part of a legislative enactment designed to augment rather than restrain the District's regulatory power." [American Coatings Ass'n. v. South Coast Air Quality Mgt. Dist., 54 Cal. 4th 446,466 (2012)]. And when the legislature reiterated the BARCT requirement for SCAQMD and expanded it to other districts, it specifically said that the bill was intended to establish "minimum requirements" and was not intended to "limit or otherwise

discourage those districts from adopting rules and regulations which exceed those requirements." [Stats. 1992 ch. 945, 18.]

Response to Comment 12-2-4:

Staff agrees that a proposed action may reflect sound public policy does not necessarily mean it is within the scope of legislative authority. However, staff believes that public policy is a relevant consideration in determining the intent of a statute.

Response to Comment 12-2-5:

Staff does not agree that BARCT was intended to limit what the agency could require, but rather to impose a minimum that the agency must require. See Response No. 12-2-3. Staff therefore disagrees with the commenter's assertion that the legislature intended that *no* controls could be required—and the cost of control would be zero- if add-on controls are not cost-effective. Once again, this approach would ironically insulate the oldest and highest-emitting equipment from reducing its emissions, while newer equipment for which add-on controls are feasible would bear the burden of compliance.

Response to Comment 12-2-6:

See Responses 12-2-3 and 12-2-5.

Response to Comment 12-2-7:

Staff does not agree that its approach elevates the agency's judgment over that of the legislature. Additionally staff does not agree that the legislature intended BARCT to be a limitation on an air district's authority, when the legislature specifically stated it did not intend to discourage districts from adopting rules which exceed the legislatively mandated "minimum" requirements, including BARCT. See Response 12-2-3. Moreover, if equipment replacement is cost-effective and feasible, there is no reason the legislature would want to preclude it.

Response to Comment 12-3:

The November 1, 2018, comment letter on behalf of the Regulatory Flexibility Group states that new source review issues must be addressed comprehensively and expeditiously. It further attaches a comment letter dated September 7, 2018 regarding proposed amended rules 2001 and 2002 which addresses new source review and other issues. SCAQMD staff responded to the September 7th letter in the staff report for PARs 2001 and 2002, which were adopted by the Governing Board at the October 5, 2018 Governing Board Meeting. The September 7th letter and the staff responses thereto are attached to this document as part of the public comments.

Response to Comment 12-4:

The November 1st comment letter on behalf of the Regulatory Flexibility Group asserts that staff is improperly "piecemealing" the CEQA analysis for the RECLAIM transition, citing a September 7th letter that is attached. The November 1st comment letter on behalf of WSPA makes the same argument and attaches an additional letter dated July 3, 2018 from WSPA. Staff has already responded to the September 7th letter as described above. The September 7th letter and staff's responses are included in this response to comments section of the staff report. The July 3rd letter does not include any additional discussion specific to Proposed Amended Rules 1146, 1146.1or 1146.2.

Response to Comment 12-5:

See response 12-3.

Response to Comment 12-6:

The major parameters in cost-effectiveness include capital and installation costs, operating, and maintenance costs, interest rates, and project life. DCF is based on a conversion of future

expenditures (including annual costs) to a present value basis using a present value factor. LCF is different in that fixed capital expenditures are converted into an equivalent annual amount using a capital recovery factor. LCF generally yields numbers that are 20 to 30% higher than DCF.
DCF is more versatile than LCF in that DCF can easily deal with non-constant annual operating and maintenance costs and those costs occurring longer than the standard one-year interval (e.g., catalyst replacement every five years). Second, DCF allows non-uniform emission reductions over the project life. Finally, DCF is neutral on how a project is financed by individual businesses, which is very much tied to the well-being of those businesses.

In addition the most important criteria in applying a cost-effectiveness methodology is to maintain consistency. That is, if past rulemaking projects are based on DCF, then it would be prudent to continue using DCF for future projects. The Governing Board approved the use of DCF in 1989. Likewise, it has been used for BACT determinations since 1995 and rule development since 1996. Using the LCF method for this analysis would result in the inability to compare cost-effectiveness for new BARCT with past rules.

Supplement to Response 12-2

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October 3, 2018

Via e-mail and U.S. Mail

Michael Carroll, Esq.
Latham & Watkins
650 Town Center Drive, 20th Floor
Costa Mesa, CA 92626-1925

Re: South Coast Air Quality Management District's Authority to Require Equipment Replacement

Dear Mr. Carroll:

This is in response to your letters of August 15, 2018, on behalf of the Western States Petroleum Association, and August 24, 2018, on behalf of the Regulatory Flexibility Group, regarding the District's ability to require equipment replacement as best available retrofit control technology (BARCT). Your letters take issue with many of the points made in the South Coast Air Quality Management District ("SCAQMD" or "the District") staff report for Proposed Amended Rule 1135. In this letter, we respond to your principal arguments.

In summary, we explain the particular instance in which SCAQMD has sought to specify a level equivalent to equipment replacement as BARCT for internal combustion engines on Santa Catalina Island. This letter demonstrates how public policy supports SCAQMD's interpretation. Moreover, as we explained in the Preliminary Draft Staff Report, the statutory definition of BARCT supports a broad interpretation. And applicable dictionary definitions do not preclude the view that BARCT can include equipment replacement. Additional arguments presented in your letters do not change this conclusion. Finally, even if a court were to conclude that BARCT cannot encompass equipment replacement, BARCT is not a limitation on SCAQMD authority. The SCAQMD retains broad statutory authority to adopt emission-control requirements for stationary sources, and that authority may require equipment replacement, as long as the requirement is not arbitrary and capricious.

Public Policy Supports the SCAQMD's Interpretation

Significantly, your letters fail to present any policy rationale for excluding replacement projects from BARCT. We note that you concede that a replacement project may be BARCT, as long as it does not include replacing the entire piece of equipment. (Aug. 15 Ltr., p. 2.) Presumably, something like a new ultra-low-NOx burner would be allowed as BARCT under your interpretation. However, the interpretation you urge would still unduly limit the application of BARCT and preclude SCAQMD from requiring cost-effective actions that would help achieve clean air. As noted in the staff report for PAR 1135, staff has proposed a BARCT for diesel fueled internal combustion engines that may be cost-effectively met by replacing the engine. If SCAQMD were precluded from requiring the replacement of these engines, the oldest and dirtiest power-producing equipment would continue to operate for possibly many years, even though it would be cost-effective and otherwise reasonable to replace those engines. As long as an emissions limit meets the requirements of the statutory definition set forth in section 40406, there is no policy reason why replacement equipment cannot be an element of BARCT. And there is no policy reason why the legislature would want BARCT to somehow limit the SCAQMD from requiring equipment replacement where that requirement is reasonable and feasible.[1]

The BARCT proposed for internal combustion engine power producers (replacement with Tier IV engines) is economically and practically reasonable and therefore does not "go beyond" BARCT, based on statutory definition. However, you seem to take the position that the District cannot require equipment replacement, whether as BARCT or otherwise. Such a position is contrary to the purpose behind the statutory scheme. As stated by the Supreme Court, the "statutes that provide the districts with regulatory authority serve a public purpose of the highest order-protection of the public health." (*W. Oil & Gas Assn. v. Monterey Bay Unified Air Pollution Control Dist.*, 49 Cal. 3d 408, 419 (1989) ("WOGA").) Therefore, courts should not find that any statute causes an "implied repeal" of the districts' authority. *Id.*

[1] You appear to contend that it is not necessary to supply a policy reason the legislature would exclude all replacements from BARCT, even if they meet the statutory definition (discussion at RECLAIM Working Group). However, "[i]f the statutory language permits more than one reasonable interpretation, courts may consider other aids, such as the statute's purpose, legislative history, and public policy." (*Jones v. Lodge at Torrey Pines Partnership,* 42 Cal. 3d. 1158, 1163 (2008).) In this case, the statute permits two reasonable interpretations, since the statutory definition in section 40406 does not preclude requiring equipment replacement if it is reasonable considering economic and other factors. The legislative history and public policy both support the SCAQMD's interpretation, and a narrow interpretation is inconsistent with the statutory purpose.

The proposal to require replacement of five out of the six internal combustion engines at Santa Catalina Island is supported by overwhelming policy justifications. There are six internal combustion engines at the facility, of which three are at least 50 years old. The other three were installed in 1974, 1985, and 1995. The 1995 engine was installed with SCR; the other five had SCR installed in 2003. Staff concludes that it would be more cost-effective to replace the five oldest of these engines with new Tier IV engines rather than to install additional add-on controls. (The sixth engine was found not to be cost-effective to replace). (Preliminary Draft Staff Report, p. 2-17.) These engines account for 0.06% of the electric utility power produced in the District. (Draft Staff Report, Table 4-1; 9 MWhr divided by 15,904 MWhr.) But they account for 5.7% of the emissions inventory from electricity generating facilities. (Draft Staff Report, Table 4-2; 0.2 tpd divided by 3.5 tpd.) If the SCAQMD could not require replacement of these engines, then paradoxically the oldest, highest-emitting equipment would escape control.

The SCAQMD has in the past required replacement of old equipment in appropriate cases. The SCAQMD has required replacement, for example, in its dry-cleaning rule, adopted in 2002, which required all perchloroethylene dry-cleaning machines to be phased out by 2020, with other specific requirements implemented starting shortly after rule adoption. (Rule 1421(d)(1)(F).) Thus, a perchloroethylene machine that was installed in 2001 would be required to be replaced with a non-perchloroethylene machine when it is 19 years old. While this is a rule relating to toxic air contaminants, we do not believe the SCAQMD's authority is any less for criteria pollutants.

As an additional policy and legal concern, we note that a restrictive definition of BARCT could potentially interfere with the SCAQMD's ability to require "reasonably available control technology" (RACT) for ozone as specified by Clean Air Act sections 182(b)(2) and 182(f). (42 U.S.C. §§7511a (b)(2) and 7511a(f).) EPA defines RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. (44 Fed. Reg. 53762 (Sept. 17, 1979).) This definition does not even include the word retrofit and therefore could not be limited in the manner asserted in your letter. Yet if a particular RACT determination were to call for replacement of old, high-emitting equipment, under your interpretation, SCAQMD would not be able to implement RACT and would ultimately be subject to sanctions for inability to submit an approvable state implementation plan (SIP). An interpretation which would lead to such unreasonable consequences should be rejected, especially where it would frustrate the apparent intent of the legislature, which wanted SCAQMD to impose more stringent controls, in order to attain the federal clean air standards. (*Friedman v. City of Beverly Hills,* 47 Cal. App. 4th 436, 444 (1996).) As is obvious, the actual statutory definition, like the definition of RACT, does not include the term "retrofit," and the statute should be interpreted to ensure adequate authority to comply with RACT requirements.

Dictionary Definitions Support SCAQMD's Interpretation

We do not agree that the term "retrofit" excludes replacement, such as replacement of an engine. Your August 15 letter concedes that "retrofit" can include "replacement," but asserts that it can include a replacement only if just a part of a whole object is being replaced, not the entire object. (Aug. 15 Ltr. pp. 2, 4.) We do not find that limitation in the dictionary definitions for the term "retrofit," including those cited in the SCAQMD staff report for Rule 1135. Instead, at least one definition provides that "retrofit" can mean "to replace existing parts, equipment, etc., with updated parts or systems." (http://www.dictionary.com/browse/retrofit.) Nothing in this definition requires that only part of a piece of equipment can be replaced. Indeed according to this definition, a retrofit can include the replacement of an entire system. We therefore disagree with your conclusion that the use of the term "retrofit" necessarily means that the pre-existing object that is the subject of the action (e.g., the source) continues to exist after the action. Your August 15 letter takes the position that the most common use of the term retrofit is for a change to equipment that does not include replacement of the whole piece of equipment (e.g., "to install [new or modified parts or equipment] in something previously manufactured or constructed.") (Aug. 15 Ltr. p. 2.) You note that the definition of "replace" means "to take the place of especially as a substitute or successor." (Aug. 15 Ltr. p. 2.) We agree that "replace" is a more specific term than "retrofit." Our disagreement is with the principle that "best available retrofit control technology" can never include replacement of existing equipment. In our view, at least one dictionary definition of the term "retrofit" encompasses "replacement of equipment or systems." *See* definition cited above. This definition is broad enough to include replacing the entire piece of equipment or system. Therefore, the key issue to determine is what the legislature meant when it imposed the BARCT requirement on SCAQMD.

Statutory Definition of BARCT Supports SCAQMD's Interpretation

The statutory definition of BARCT, as found in Health & Safety Code section 40406, does not contain any language precluding replacement technology. Section 40406 defines BARCT as "an emissions 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." Thus, BARCT is an emissions limitation. Nothing in the statutory definition specifies the type of technology that may be used. Your entire argument therefore rests on the use of the word "retrofit" in the term being defined. But the California Supreme Court has made it clear that it is the definition of BARCT that controls, not implications from the language used in the term itself. Thus, the Supreme Court rejected the argument that "best available retrofit control technology" is limited to that which is readily available at the time when the regulation is enacted, and instead concluded that it encompasses technology that is "achievable," i.e., expected to become available at a future date. (*American Coatings Ass'n. v. South Coast Air Quality Mgt. Dist.,* 54 Cal. 4th 446, 462 (2012).) The Court focused on the actual statutory definition, which provides that BARCT is "an emissions 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." (*American Coatings,* 54 Cal. 4th at 463.) The Court concluded that in

common usage, "achievable" means "capable of being achieved," which in turn includes "a potentiality to be fulfilled or a goal to be achieved at some future date." *Id.*

Thus, an emissions reduction was "achievable" when the rule was adopted in 1999 if it was "capable of being achieved" by the rule deadline of 2006. (*American Coatings,* 54 Cal. 4th at 464.) This was so even if that reduction was not "readily available" in 1999, notwithstanding the use of the word "available" in the term being defined. Your August 24 letter argues that this case did not decide whether BARCT may include replacement technology. That is true, but the Supreme Court did hold that the statutory definition controls, and in this case the statutory definition does not preclude replacement technology.

When the legislature has defined a term, courts must follow that definition. (*People v. Ward*, 62 Cal. App. 4th 122, 126 (1998).) Following the California Supreme Court's analysis in *American Coatings,* the test of whether an emission limit constitutes BARCT is whether it meets the definition found in the statute. (§40406.) If so, then it is within the statutory definition of BARCT, whether or not it is within the most common understanding of "retrofit." This does not mean that the word "retrofit" is surplusage. The use of the word "retrofit" serves to distinguish an emission limit that is imposed on existing sources, and which under the statutory definition must consider economic and other factors, from the emissions limit imposed on new sources. The limit for new sources must be met if it has been achieved in practice, regardless of cost. *See* definition of "best available control technology" [BACT] in section 40405, which includes "the most stringent emission limitation that is achieved in practice by that class or category of source." We do not argue that a replacement can be BARCT if it does not meet the definition of BARCT. Instead, if a limit meets that definition, it can be BARCT even if it can most cost-effectively be met by replacing the equipment with new equipment, as recognized in the dictionary definition discussed above.[2]

Other Statutory References to "Retrofit" Are Inapplicable

In your August 24 letter, you argue that the legislature has used the term replacement as well as retrofit in certain sections of the Health and Safety Code, so that these terms must mean something different from each other. (§§ 43021(a) and 44281(a).) Furthermore, the legislature

[2] Your August 24 letter also argues that *American Coatings* is irrelevant because it dealt with a rule for architectural coatings, requiring coating reformulation, which "does not typically involve the manufacture of modified production equipment or new add-on controls," whereas control technologies that require physical modification of existing equipment or installation of add-on controls may require "significant disruption to the operation of the facility." (Aug. 24 Ltr. p. 6.) We do not know whether the claim regarding architectural coatings is correct, but even if it is, we do not understand how this relates to the question at issue since *both* add-on controls (your definition of "retrofit") and replacements would involve the disruption of facility operations for some time.

defined retrofit in sections 44275(a)(19) and 44299.80(o) and the definition does not mention replacement but rather making modifications to the engine and fuel system. Finally, you note that these same code sections define "repower" as replacing an engine with a different engine. (§§ 44275(a)(18) and 44299.80(n); Aug. 24 Ltr., pp. 4-5.) However, all of these code sections were adopted long after 1987, when the legislature mandated SCAQMD to require BARCT for existing sources. They do not shed any light on what the legislature meant by "retrofit" in 1987 when section 40406 was adopted. All of the sections cited (except section 43021(a)) deal with incentive programs, and the definitions are specifically stated to be only "as used in this chapter"; i.e., for the specific incentive program. (§§44275(a); 44299.80(a).) These definitions facilitate the administering agency in implementing the programs, which generally provide different amounts of funding for different types of projects, including "repowering" or "retrofitting." (*See e.g.*, https://www.arb.ca.gov/msprog/moyer/source_categories/moyer_sc_on_road_hdv_2.htm.)

Therefore, the legislature had a specific purpose in distinguishing between replacements and retrofits in these particular chapters, whereas no one has identified a policy reason that the legislature would have wanted to exclude replacement projects from BARCT, as long as they met the statutory definition.[3]

Statute Discussing Best Available Control Technology Determinations Does Not Circumscribe BARCT Definition

Your August 24 letter argues that section 40920.6 supports your claim because it states that in establishing the best available control technology (BACT), the District shall consider only "*control options* or emission limits *to be applied to the basic production or process equipment*." (Emphasis is in letter.) You argue that this means BACT, and therefore BARCT, is a measure to be applied to the existing emitting source, not replacement of the emitting source in its entirety. (Aug. 24 Ltr. p. 4.) This inference is incorrect, since BACT is frequently applied to replacement of an entire source (such as repowers of electric generating units) as well as to new and modified

[3] Section 43021(a), enacted in 2017 as part of SB1, prohibits Air Resources Board rules that require the "retirement, replacement, retrofit, or repower" of a commercial motor vehicle for a period of time. While you argue that this language means that a replacement must be different than a retrofit, under that theory it must also mean that a replacement is different from a repower, whereas under the sections cited above, a repower IS a replacement. Presumably, the legislature wanted to make very sure it covered all possibilities. And to add to the confusion, the Carl Moyer statutes appear to distinguish "retrofit" (an eligible project under §44282(a)(2)) from "use of emission-reducing add-on equipment" (an eligible project under §44281(a)(3)). Normally installing add-on controls is considered a type of retrofit. (*See* Aug. 24 Ltr., p. 4.) Therefore, we cannot draw any conclusions from the use of different terms in different parts of the Health & Safety Code.

sources. Obviously, in the case of a new source, there is no existing equipment to which to apply the technology. We interpret this statutory language to mean that in establishing BACT, the SCAQMD may not fundamentally change the nature of the underlying process. For example, if an applicant seeks approval of a simple cycle turbine, the SCAQMD cannot require it to instead construct a combined cycle turbine, since they have different operational characteristics and needs to fill. This would be consistent with EPA's Draft NSR Workshop Manual, p. B-13, that specifies that in determining BACT, states need not redefine the design of the source, although they retain discretion to do so where warranted (i.e., to require consideration of inherently cleaner technology). (https://www.epa.gov/nsr/nsr-workshop-manual-draft-october-1990.) SCAQMD does not propose to require a facility subject to BARCT to "redefine" the nature of its source but merely to replace old diesel internal combustion engines with new diesel internal combustion engines meeting EPA's Tier IV standards. Therefore, section 40920.6 does not speak to the question at hand: whether BARCT precludes replacing old equipment with new equipment of the same type.

SCAQMD Has Authority to Require Equipment Replacement, Which is Not Limited by the Definition of BARCT

Finally, even if BARCT by itself did not include replacement equipment, the SCAQMD could still require the equipment to be replaced. Your August 24 letter states that the District's "authority is both granted and limited by section 40440(b)(1)," which provides that the District's rules "shall do all of the following: (1) Require the use of best available control technology for new and modified sources and the use of best available retrofit control technology for existing sources." We disagree that section 40440(a)(1) grants the authority to require BARCT (i.e., that without that section, the District would have no authority to require BARCT). We also disagree with the proposition that section 40440(a)(1) limits the District's authority.

State law has explicitly granted air districts primary authority over the control of pollution from all sources except motor vehicles since at least 1975, when the air pollution regulation provisions were recodified. (*See* § 40000, enacted Stats. 1975, ch. 957, § 12; *see also* § 39002, containing similar language and adopted in that same section.) As held by the California Supreme Court, these two sections (and their predecessors dating back to 1947) confirm that the air districts had plenary authority to regulate non-vehicular sources "for many years." *WOGA,* 49 Cal. 3d. at 418-419. And the Supreme Court had previously recognized the air districts' authority to adopt local regulations for non-vehicular sources under the predecessor statutes. (*Orange County Air Pollution Control Dist. v. Public Util. Comm.,* 4 Cal. 3d 945, 948 (1971).) Under these broad statutes, the districts could have adopted BARCT requirements for non-vehicular sources. Section 40440(a)(1), therefore, was not a statute granting authority, since the districts already had authority, but a statute imposing a *mandate* to adopt BARCT.

We also disagree with the claim that section 40440(a)(1) requiring the SCAQMD to impose BARCT on existing sources was a "limitation" of district authority. State law expressly provides that districts "may establish additional, stricter standards than those set forth by law," unless the

legislature has specifically provided otherwise. (§§ 39002; 41508.) Nothing in section 40440(a)(1) specifically limits the District's authority. In fact, the legislative history of the bill requiring SCAQMD to impose BARCT – among other requirements – states that "this bill is intended to encourage *more aggressive improvements in air quality* and to give the District new authority to implement such improvements." (*American Coatings*, 54 Cal. 4th at 466 (emphasis added).) As stated by the Supreme Court, "[t]he BARCT standard was therefore part of a legislative enactment designed to augment rather than restrain the District's regulatory power."[4] *Id.* As illustrated by the legislative history, BARCT is a "minimum" requirement, and the legislature did not intend it to preclude the District from adopting requirements that go beyond BARCT.

Moreover, when the legislature extended the BARCT requirement to other districts with significant air pollution (§40919(a)(3) (districts with serious pollution and worse)), the legislature expressly stated that the bill "is intended to establish minimum requirements for air pollution control districts and quality management districts" and that "[n]othing in this act is intended to limit or otherwise discourage those districts from adopting rules and regulations which exceed those requirements." (Stats. 1992, ch. 945 § 18.) Thus it is clear that BARCT is not intended to be a limitation or restriction on existing authority.[5]

In an earlier case, the California Supreme Court made it clear that new legislation does not impliedly repeal an air district's existing authority unless it "gives *undebatable evidence* of an intent to supersede" the earlier law. *WOGA,* 49 Cal. 3d. at 420 (internal citation omitted; emphasis by Supreme Court). There the Court noted that the present statutes and their predecessors giving air districts authority over non-vehicular sources, including the authority to regulate air toxics, had been in effect before the allegedly preempting law was enacted (in 1983; Stats 1983 Ch. 1047), and had been generally understood and acted upon. *WOGA*, 49 Cal. 3d at 419. The Court concluded there was no "undebatable evidence of a legislative intent to repeal the districts' statutory authority to protect the health of their citizens by controlling air pollution." *WOGA*, 49 Cal. 3d at 420. By the same token here, there is no undebatable evidence of an intent to limit air districts' existing authority by imposing a *mandate* to adopt BARCT requirements. Instead, BARCT was a minimum requirement that SCAQMD must impose, not a

[4] There were some new authorities granted in 1987, including section 40447.5, authorizing fleet rules and limits on heavy duty truck traffic and section 40447.6, authorizing the SCAQMD to adopt sulfur limits for motor vehicle diesel fuel. We do not believe that section 40440(a)(1) granted "new" authority to require BARCT, as the districts already had authority over non-vehicular sources.

[5] Although the California Supreme Court found it unnecessary to decide whether the SCAQMD could adopt rules going beyond BARCT, because it held that BARCT could include technology-forcing measures, it did state that BARCT was not designed to restrain the District's regulatory power. (*American Coatings*, 54 Cal 4th at 466, 469.)

limit on its ability to impose additional, including more stringent, requirements. Indeed, the argument that BARCT limits SCAQMD's authority is illogical. It would make no sense for the Legislature in 1987 to limit only the district with the worst air pollution (SCAQMD) while leaving untouched the authority of other districts with lesser levels of pollution.

Nor does this conclusion leave the SCAQMD with unlimited regulatory power. In going beyond the statutory minimum of BARCT for existing sources, the District would still be limited by the requirement that its rules may not be arbitrary and capricious, or without reasonable or rational basis, or entirely lacking in evidentiary support. (*American Coatings,* 54 Cal. 4th at 460.) And of course, the SCAQMD's rulemaking authority is limited by applicable constitutional principles. Therefore, stakeholders need not rely on an argument that BARCT restricts the SCAQMD's authority in order to ensure the SCAQMD does not implement arbitrary action.

Conclusion

SCAQMD has the authority to require equipment replacement as a BARCT requirement as long as the requirement meets the statutory definition of BARCT. But even if BARCT were to exclude equipment replacement, the SCAQMD would still have the authority to require replacement, as long as the requirement is not arbitrary and capricious. The proposed BARCT for internal combustion engines on Santa Catalina Island is reasonable and feasible, and no one has argued to the contrary.

Respectfully submitted,

SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT
Bayron T. Gilchrist, General Counsel

By: Barbara Baird
Barbara Baird, Chief Deputy Counsel

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cc: Bill Quinn, CCEEB Vice President

Supplement to Response 12-3

Comment Letter #2

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033950-0007

LATHAM & WATKINS LLP

September 7, 2018

VIA EMAIL

Dr. Philip Fine
Deputy Executive Officer
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Re: Proposed Amended Rules 2001 and 2002

Dear Dr. Fine:

We are submitting these comments on behalf of our client Western States Petroleum Association ("WSPA") on the most recent round of proposed amendments to South Coast Air Quality Management District ("SCAQMD") Rules 2001 and 2002. The amendments are being proposed in connection with the transition of the Regional Clean Air Incentives Market ("RECLAIM") program to a command-and-control regulatory structure. WSPA is a non-profit trade association representing companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas and other energy supplies in five western states including California. WSPA has been an active participant in air quality planning issues for over 30 years. WSPA-member companies operate petroleum refineries and other facilities in the South Coast Air Basin that will be impacted by the transition out of the RECLAIM program. 2-1

General Comments

The proposed amendments to Rules 2001 and 2002 are primarily interim measures intended to establish new eligibility criteria for exiting RECLAIM, provide opt-out procedures, and address, on a temporary basis, unresolved issues surrounding compliance of new source review ("NSR") for former RECLAIM facilities once they have transitioned out of the RECLAIM program. As WSPA and others have expressed in numerous meetings, workshops and hearings conducted in connection with the RECLAIM transition, we have serious concerns about the lack of clarity surrounding NSR in a post-RECLAIM regime. 2-2

We believe current SCAQMD staff's ("staff") proposed approach is premature, as staff has not addressed all of the underlying issues surrounding a RECLAIM sunset. RECLAIM is a comprehensive, complex program that was adopted as a whole. In the development of RECLAIM, staff not only determined current and future effective best available retrofit control

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technology ("BARCT"), but also examined and addressed NSR, reviewed socioeconomic impacts, mitigated implications of emissions trading, resolved enforcement and monitoring issues, and understood a host of other consequences of adopting such a program. This comprehensive approach ensured the overwhelming success of the RECLAIM program as it was designed. In contrast for this rulemaking, staff is dismantling the RECLAIM program without analyzing any of the consequences of the proposed approach. Most importantly, staff has not addressed NSR, nor the environmental and socioeconomic impacts of a RECLAIM sunset.

Our strong preference is that staff prioritizes resolution of the NSR issues and conduct an analysis of the entire RECLAIM transition project comparable with the same full analysis that was done during the implementation of RECLAIM before initiating rulemaking. There is no evidence that this has been done to date. We believe that addressing fundamental programmatic issues that will affect all former RECLAIM facilities, such as NSR, early in the transition process, and then moving on to the more narrowly applicable landing rules, would result in a more orderly and efficient transition in the following ways: 2-2 Cont

- It would provide facilities with an understanding of the NSR requirements and procedures that will apply to modifications required to comply with updated BARCT rules. It is not possible to develop a final and comprehensive plan for implementing new BARCT requirements without knowing the NSR requirements and procedures and how those will impact post-RECLAIM operating permits.

- It would result in a more efficient use of staff resources. For example, the proposed amendments to Rules 2001 and 2002 are essentially "stop-gap" measures that are necessary because the NSR and other programmatic issues remain unresolved. If the NSR and other programmatic issues were addressed, it would not be necessary to develop and implement such measures.

- It would avoid the current ad hoc, piecemeal approach to the RECLAIM Transition Project which results in additional confusion and uncertainty. This is illustrated by the fact that staff's positions with respect to certain issues related to the proposed amendments to Rules 2001 and 2002 are quite different than positions taken when these two rules were amended in January of this year in what we view as a rush to get the RECLAIM transition process underway. 2-3

- It would avoid legal vulnerabilities that we believe are inherent in the current ad hoc, piecemeal approach because the environmental and socioeconomic assessments of incremental rulemaking are disjointed and incomplete.

Should the District continue with this piecemeal approach, we offer the comments set forth below on the proposed amendments:

LATHAM & WATKINS LLP

Specific Comments on Proposed Amended Rule 2002(f)(11) – "Stay-In" Provision

The proposed amendments to Rule 2002 would allow facilities to remain in the RECLAIM program, and thereby avail themselves of the RECLAIM NSR program set forth in SCAQMD Rule 2005 for some period of time. Our understanding, which was confirmed by staff during the RECLAIM Working Group meeting on August 9, 2018, is that the decision of whether or not to remain in the RECLAIM program is completely within the discretion of the facility (assuming the facility meets the specified criteria). Some of the language in the proposed amendments could be read to grant the Executive Officer discretion (beyond merely confirming that the facility meets the specified criteria) to decide whether or not the facility may remain in the program. The following proposed changes are intended to better reflect staff's intent.

(11) An owner ~~of~~ **or** operator of a RECLAIM facility that receives an initial determination notification may elect **that** ~~for~~ the facility ~~to~~ remain in RECLAIM **by submitting** ~~if~~ a request to the Executive Officer to remain in RECLAIM ~~is submitted,~~ **together with** ~~including~~ any equipment information required pursuant to paragraph (f)(6).

(A) Upon **receiving a request to remain in RECLAIM and any equipment information required pursuant to paragraph (f)(6),** ~~written approval by~~ the Executive Officer **shall notify the owner or operator in writing** that the facility shall remain in RECLAIM **subject to the following**:

(i) The facility shall remain in RECLAIM until a subsequent notification is issued to the facility that it must exit by a date no later than December 31, 2023.

(ii) The facility is required to submit any updated information within 30 days of the date of the subsequent notification.

(iii) The facility shall comply with all requirements of any non-RECLAIM rule that does not exempt NOx emissions from RECLAIM facilities.

2-4

Specific Comments on Proposed Amended Rule 2002(f)(10) – "Opt-Out" Provision

Proposed Amended Rule 2002 includes an "opt-out" provision for those facilities that may be ready to voluntarily exit RECLAIM prior to the time that they might otherwise be transitioned out. The current staff proposal differs from previous proposals in that it places

2-5

certain restrictions on facilities after they have exited the program that we believe are unfair and unwarranted. Specifically, proposed paragraph (f)(10)(B) would prohibit such facilities from taking advantage of otherwise available offset exemptions in SCAQMD Rule 1304. In the event that an NSR event requiring offsets were to occur after the facility exited the RECLAIM program, it would be required to obtain emission reduction credits on the open market, which the staff acknowledges are "scarce." (July 20 Preliminary Draft Staff Report, p. 8).[1] We believe that it is unnecessary, unfair, and possibly contrary to state law, to deny former RECLAIM facilities advantages that they would otherwise be entitled to and that are available to all other non-RECLAIM facilities.

The Preliminary Draft Staff Report expresses concern that the potential impacts associated with emission increases from facilities that might exit the RECLAIM program, even if limited to the 37 facilities the staff initially identified as eligible to exit, could impose a demand on Rule 1304 offset exemptions that could approach or surpass the cumulative emissions increase thresholds of SCAQMD Rule 1315. (Preliminary Draft Staff Report, p. 8). In other words, staff is concerned that if former RECLAIM facilities were permitted to utilize Rule 1304 offset exemptions, the demand on the SCAQMD's internal emission offset bank, which supports the offset exemptions, might exceed previously analyzed levels. This concern seems inconsistent with positions taken by staff in connection with the January 2018 amendments to these two rules, and with more recent statements by staff suggesting that it believes the internal emission offset bank is the most viable source of emission offsets for former RECLAIM facilities on a long-term basis.

2-5 Cont

The January 2018 amendments established the criteria and procedures pursuant to which eligible facilities would be identified and exited from RECLAIM. According to the Final Staff Report, ". . . the proposed amendments would remove approximately 38 facilities from NOx RECLAIM." (January 5 Final Staff Report, p. 2).[2] Staff determined that the impact of exiting the initial round of facilities, including impacts associated with reduced demand for RTCs, would be minimal:

> Given the analysis above and the fact that the 38 facilities—which are potentially ready to exit out of the NOx RECLAIM program into command-and-control—account for about one percent of NOx emissions and NOx RTC holdings in the NOx RECLAIM universe, staff concludes that the potential impact of PAR 2002 on the demand and supply of NOx RTC market is expected to be

[1] References herein to "July 20 Preliminary Draft Staff Report" refer to the Preliminary Draft Staff Report, Proposed Amendments to Regulation XX- Regional Clean Air Incentives Market (RECLAIM), Proposed Amended Rules 2001 – Applicability and 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx), dated July 20, 2018.

[2] References herein to "January 5 Final Staff Report" refer to the Final Staff Report Proposed Amendments to Regulation XX – Regional Clean Air Incentives Market (RECLAIM) Proposed Amended Rules 2001 – Applicability and 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx), dated January 5, 2018.

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> minimal and large price fluctuations in the NOx RTC market are unlikely to result directly from the potential exit of the 38 directly affected facilities out of the NOx RECLAIM program. Therefore, PAR 2002 would have minimal impacts on the existing facilities that are not yet ready to exit the NOx RECLAIM program. (January 5 Final Staff Report, p. 12.)

To support its conclusion that exiting the initial round of facilities from the program would have minimal impacts as a result of foregone market demand for RTCs, staff analyzed three scenarios in which NOx emissions from the subject facilities were: i) 5% below 2015 NOx emissions; ii) the same as 2015 NOx emissions; and iii) 5% above 2015 NOx emissions. (January 5 Final Staff Report, p. 11). Staff determined that foregone market demand for RTCs associated with exiting the initial group of facilities under each of the three scenarios would be 0.073 tons per day (TPD), 0.080 TPD, and 0.086 TPD, respectively. Based on this analysis, staff concluded that the anticipated future demand for NOx RTCs associated with the exiting facilities was minimal, and that eliminating that demand would not materially impact the remaining market. In other words, staff concluded that the exiting facilities would have a negligible demand for RTCs in the future, including RTCs required to satisfy NSR requirements. As stated in the Summary of the Proposal:

> Considering the past market behavior by these facilities, staff concludes that the potential impact of PAR 2002 on the demand and supply of NOx RTC market is expected to be minimal and large price fluctuations in the NOx RTC market are unlikely to result directly from the potential exit of these facilities out of the NOx RECLAIM program. (Summary of Proposal, Agenda Item No. 18, January 5, 2018, p. 3.)

2-5
Cont

Notably, staff did not even address the impact that the January 2018 amendments might have on the internal bank even though those amendments were intended to result in precisely the situation about which staff is now expressing concern – the removal of 38 facilities from the RECLAIM program that would then be eligible to take advantage of offset exemptions in Rule 1304 like any other RECLAIM facility.

In contrast with the January 2018 Final Staff Report, the July 2018 Preliminary Draft Staff Report expresses serious concerns about the potential for increased NOx emissions from facilities exiting the program, stating that "[e]ven among the first 37 facilities identified that may be eligible to exit, any impacts from potential emissions increases are unknown and if significant enough, can approach or surpass the cumulative emissions increase thresholds of Rule 1315." (July 2018 Preliminary Draft Staff Report, p. 8).

Clearly, the conclusions reached by staff in the January 2018 Final Staff Report, upon which the Governing Board relied when it adopted the current versions of Rules 2001 and 2002, are inconsistent with the concerns being raised by staff in the current proposal. Either staff erred in January by underestimating the impacts on the RECLAIM market and failing to even analyze

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the potential impacts on the internal bank, or it is overstating the potential impacts associated with the current proposal. In either case, this inconsistency illustrates the problem with undertaking the RECLAIM transition in an ad hoc, piecemeal fashion.

California Environmental Quality Act Considerations

WSPA and others have expressed concerns regarding the "piecemeal" manner in which the California Environmental Quality Act ("CEQA") analysis for the RECLAIM transition is being conducted. ". . . CEQA's requirements 'cannot be avoided by chopping up proposed projects into bite-size pieces which, individually considered, might be found to have no significant effect on the environment or to be only ministerial.' [Fn. omitted.]" *Lincoln Place Tenants Assn. v. City of Los Angeles* (2005) 130 Cal.App.4th 1491,1507 quoting *Plan for Arcadia, Inc. v. City Council of Arcadia* (1974) 42 Cal.App.3d 712, 726. Staff explained its CEQA strategy for the RECLAIM transition in an April 25, 2018 letter to the Los Angeles County Business Federation in which it stated:

> The potential environmental impacts associated with the 2016 AQMP, including CMB-05, were analyzed in Program Environmental Impact Report (PEIR) certified in March, 2017 . . . In other words, the environmental impacts of the entire RECLAIM Transition project . . . were analyzed in the 2016 AQMP and the associated PEIR, which was a program level analysis . . . Since the SCAQMD has already prepared a program-level CEQA analysis for the 2016 AQMP, including the RECLAIM Transition, no additional program-level analysis is required and further analysis will be tiered off the 2016 AQMP PEIR. (http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/regxx/aqmd-response-letter-to-bizfed-042518.pdf?sfvrsn=6).

2-6

Consistent with the staff's explanation described above, SCAQMD staff has prepared a Draft Subsequent Environmental Assessment ("Draft SEA") to analyze environmental impacts from the proposed amendments to Rules 2001 and 2002. (http://www.aqmd.gov/home/research/documents-reports/lead-agency-scaqmd-projects). The Draft SEA attempts to tier off of the March 2017 Final Program Environmental Impact Report for the 2016 AQMP and tries to obscure the issue by citing to several other previously certified CEQA documents, including the December 2015 Final Program Environmental Assessment completed for the amendments to the NOx RECLAIM program that were adopted on December 4, 2015, and the October 2016 Addendum to the December 2015 Final Program Environmental Assessment completed for amendments to Rule 2002 to establish criteria and procedures for facilities undergoing a shutdown and for the treatment of RTCs. Consistent with the staff's earlier explanation, the Draft SEA states:

> "The decision to transition from NOx RECLAIM into a source-specific command-and-control regulatory structure was approved by the SCAQMD Governing Board as control measure CMB-05 in

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the 2016 AQMP and the potential environmental impacts associated with the 2016 AQMP, including CMB-05, were analyzed in the Final Program EIR certified in March 2017. This Draft SEA relies on the analysis in the March 2017 Final Program EIR for the 2016 AQMP." (Draft SEA, p. 2-5).

2-6 Cont

The proposed amendments to Rules 2001 and 2002 implement that portion of control measure CMB-05, written after the Governing Board's adoption of the 2016 AQMP that calls for the transition of the RECLAIM program to a command and control regulatory structure. As stated in the July 2018 Preliminary Draft Staff Report, "Proposed Amended Rules 2001 and 2002 will continue the efforts to transition RECLAIM facilities to a command-and-control regulatory structure . . ." (July 2018 Preliminary Draft Staff Report, p. 2). The problem with the proposal to tier the CEQA analysis for the currently proposed amendments to Rules 2001 and 2002 off from the March 2017 Final Program EIR for the 2016 AQMP is that control measure CMB-05 as proposed at the time the March 2017 Final Program EIR was prepared did not include a transition out of the RECLAIM program. That language was added well after the CEQA analysis was complete. Furthermore, no additional CEQA analysis was conducted to address the changes to CMB-05.

2-7

The Final Draft 2016 AQMP, which was ultimately presented to the SCAQMD Governing Board, was released in December 2016. Control measure CMB-05 called for an additional five tons per day of NOx reductions from sources covered by the RECLAIM program by the year 2031. CMB-05 also called for convening a Working Group to consider replacing the RECLAIM program with a more traditional command-and-control regulatory program, but did not include a mandate to undertake such a transition. SCAQMD Governing Board action on the Final Draft 2016 AQMP was noticed for February 3, 2017. When the 2016 AQMP item came up on the agenda, SCAQMD staff made a presentation, as is typical. No substantive questions were asked of the staff by Board Members, and no Board Members indicated an intention to offer amendments to the staff proposal. The public was then provided an opportunity to comment, and approximately five hours of public comment ensued.

2-8

Following the close of the public comment period, Board Member Mitchell stated her intention to introduce amendments to the staff proposal for control measure CMB-05 that would: i) accelerate the additional five TPD of reductions to 2025 from 2031; and ii) transition to a command-and-control program as soon as practicable. Board Member Mitchell did not provide any specific proposed language and did not make a formal motion to amend the staff proposal. For reasons that are not relevant here, action on the item was continued to the March 3, 2017 Governing Board hearing. The Governing Board stated its intention not to take additional public comment on the item at the March 3, 2017 hearing.

At the hearing on March 3, 2017, Board Member Mitchell introduced the following amendments to CMB-05 that included a direction to staff to develop a transition out of the RECLAIM program:

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BE IT FURTHER RESOLVED, that the SCAQMD Governing Board does hereby direct staff to modify the 2016 AQMP NOx RECLAIM measure (CMB-05) to achieve the five (5) tons per day NOx emission reduction commitment as soon as feasible, and no later than 2025, and to transition the RECLAIM program to a command and control regulatory structure requiring BARCT level controls as soon as practicable and to request staff to return in 60 days to report feasible target dates for sunsetting the RECLAIM program.

2-8 Cont

There was no Board Member discussion of the proposed amendments, and they were approved on a vote of 7-6.

The CEQA analysis supporting the 2016 AQMP commenced with a Notice of Preparation of a Draft Environmental Impact Report ("EIR") released on July 5, 2016. The Draft EIR was released on September 16, 2016, with the comment period closing on November 15, 2016. In mid-November 2016, four public hearings related to the AQMP were held in each of the four counties within the SCAQMD territory, at which comments on the Draft EIR were taken. After incorporating comments and making minor textual changes, the Final EIR was released in January 2017. No material changes or additional analysis were undertaken subsequent to the release of the Final EIR, which was certified by the Governing Board on March 3, 2017 as the March 2017 Final Program Environmental Impact Report for the 2016 AQMP, upon which staff now seeks to rely.

2-9

Thus, the transition out of the RECLAIM program, which the currently proposed amendments to Rules 2001 and 2002 seek to implement, was not included in the version of CMB-05 presented to the Governing Board as part of the 2016 AQMP. The March 2017 Final Program EIR for the 2016 AQMP, which was completed in January 2018, did not analyze the transition of the RECLAIM program because that was not prescribed by the CMB-05 measure at that time. Therefore, tiering off of the March 2017 Final Program EIR for the 2016 AQMP to support rule amendments that seek to implement the transition is not possible since there is no analysis from which to tier off. In the absence of a program level CEQA analysis that includes the RECLAIM transition, staff's segmented analysis of each proposed rulemaking action in the transition process constitutes classic "piecemealing" contrary to the requirements of CEQA.

Staff's attempt to tier without having completed a programmatic analysis of the RECLAIM Transition Project ignores the fact that RECLAIM is a comprehensive program that includes an assessment of BARCT for all of the sources in the program. It was adopted as a whole, a single package, not as a series of individual rules and regulations. There are no separate BARCT regulations in the RECLAIM program. Because RECLAIM allows for BARCT to be implemented on an aggregate basis, all BARCT determinations had to be made together. Furthermore, all RECLAIM rules are dependent upon one another, and none of these can stand alone. By attempting to analyze the impact of a single RECLAIM rule, i.e., BARCT determination, staff is ignoring the interdependency of the program, and thus, improperly disregarding the impacts of the comprehensive program.

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In the draft SEA, staff claims that it is speculative to determine what BARCT may be for all the various sources under the RECLAIM program. This underscores the fact that a comprehensive program transitioning RECLAIM sources to command and control rules was never developed or analyzed. Rather, staff is piecemealing the analysis of the RECLAIM transition. Such an approach has been rejected by the courts: "Instead of itself providing an analytically complete and coherent explanation, the FEIR notes that a full analysis of the planned conjunctive use program must await environmental review of the Water Agency's zone 40 master plan update, which was pending at the time the FEIR was released. The Board's findings repeat this explanation. To the extent the FEIR attempted, in effect, to tier from a *future* environmental document, we reject its approach as legally improper under CEQA." *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 440 [emphasis in original]. 2-10

Furthermore, RECLAIM is an emissions trading program. It allows facilities to choose to implement specific controls or to purchase emissions credits. Staff's piecemealing of the analysis does not account for those facilities that have implemented other means to comply with the program and the additional impacts the transition to individual command and control rules may have on these facilities. Additionally, these impacts cannot be captured in a single rule analysis. Rather, staff's piecemealing further ignores the impacts on facilities that are subject to multiple BARCT determinations.

Health & Safety Code Section 39616

The current staff proposal for amending Rule 2002 to prevent former RECLAIM facilities from accessing offset exemptions in Rule 1304 would place former RECLAIM facilities at a significant disadvantage relative to other non-RECLAIM facilities. California Health & Safety Code Section 39616(c)(7) prohibits imposing disproportionate impacts, measured on an aggregate basis, on those stationary sources included in the RECLAIM program compared to other permitted stationary sources. Creating a new category of sources without access to either RTCs or Rule 1304 offset exemptions to satisfy NSR requirements runs afoul of this prohibition. 2-11

Statement Pertaining to SCAQMD Rule 1306

The July 2018 Preliminary Draft Staff Report contains the following statement: "Moreover, Rule 1306 – Emission Calculations would calculate emission increases of exiting RECLAIM facilities based on actual to potential emissions, thereby further exacerbating the need for offsets." (Preliminary Draft Staff Report, p. 8). It is not clear why this would be the case. Furthermore, it is premature to make such assertions outside the context of an overall analysis of what the NSR requirements for former RECLAIM facilities might be. This is a critical issue that must be addressed in the overall development of the NSR program for former RECLAIM facilities. 2-12

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Conclusion

Thank you for considering these comments. We look forward to continuing to work with you on these rulemakings which are critically important to stakeholders as well as the regional economy. If you have any questions, please contact me at (714) 401-8105 or by email at michael.carroll@lw.com or Bridget McCann of WSPA at (310) 808-2146 or by email at bmccann@wspa.org.

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Cont

Sincerely,

Michael J. Carroll
of LATHAM & WATKINS LLP

cc: Cathy Reheis-Boyd, WSPA
Patty Senecal, WSPA
Bridget McCann, WSPA
Wayne Nastri, SCAQMD
Barbara Baird, SCAQMD
Michael Krause, SCAQMD

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Responses to Comment Letter #2 – Latham & Watkins LLP

Response 2-1:
This comment begins by introducing the parties represented by the letter; no response to this comment is necessary. SCAQMD staff appreciates your ongoing participation.

Response 2-2:
Staff understands that there is a priority to resolve the NSR issues. However, staff disagrees that the rulemakings that are currently underway in several categories should stop until NSR amendments are adopted. It is still possible for facilities to go through NSR permitting under current RECLAIM rules and furthermore, many emission reduction projects as a result of implementing BARCT would not trigger NSR. The CEQA and socioeconomic impacts will be evaluated for all the command and control rules identified as landing rules, including impacts for the installation of controls, as well as impacts for monitoring, reporting, and recordkeeping requirements. There will also be a CEQA and socioeconomic analysis conducted for any NSR (Regulation XIII) rulemaking. The amendments to PARs 2001 and 2002 are necessary because they establish a process that would be in place in order to transition facilities out of RECLAIM more efficiently once the NSR provisions for former RECLAIM facilities are adopted, as well as allowing facilities desiring to exit before NSR issues are resolved to do so.

Response 2-3:
While the amendments from January 2018 established the initial criteria for determining if RECLAIM facilities were ready to exit, the current proposed amendments provide revisions based on ongoing analysis of the RECLAIM universe. The January 2018 amendments contained an RTC analysis for the first 37 facilities that were identified as ready to exit. However, the analysis for the NSR rulemaking will consist of a different analysis and will apply to the entire universe of RECLAIM facilities. Comments about piecemealing CEQA and socioeconomic impacts were addressed in SCAQMD's response letter to BizFed on April 25, 2018, a copy of which is attached at the end of these responses.

Response 2-4:
The proposed amendments to Rule 2002 paragraph (f)(11) provide the option for a facility to remain in RECLAIM upon receipt of an initial determination notification. There is no discretion as to whether the Executive Officer would accept or deny the request. The only requirement aside from submitting a request to the Executive Officer is to provide a listing of any equipment information, as specified in the proposed rule language.

Response 2-5:
The socioeconomic analysis conducted for the January 2018 amendments focused on the impacts of RTCs on the facilities identified as ready to exit and on the existing RECLAIM market. The analysis required for an NSR rulemaking would be different and would be based on the demand for projects that would result in emission increases. A facility's RTC holdings are not entirely indicative or predictive of what future demand would be required. As such, even though an RTC analysis was conducted for the 37 facilities during the January 2018 amendments, an NSR rulemaking and ensuing analysis would apply to the entire universe of

RECLAIM facilities. Staff believes that allowing facilities to remain in RECLAIM would provide them with the opportunity to offset emission increases under RECLAIM rules. It should be noted that the intent of the proposed amendments is to address emission offsets pertaining to NOx only and this clarification has been made in PAR 2002. Staff believes that while the potential for exceeding any CEQA thresholds for the internal bank that was analyzed for non-RECLAIM facilities is small, facilities would not transitioned out of RECLAIM until NSR provisions governing former RECLAIM facilities are established. Facilities that still would like to exit RECLAIM, despite the restrictions to the internal bank for NOx offsets, can do so under the proposed amendments.

Response 2-6:
The commentator's suggestion that only one programmatic CEQA document should be prepared because future rule amendments to landing rules, or NSR (Regulation XIII) are related to PARs 2001 and 2002 is incorrect and inconsistent with SCAQMD past practice. SCAQMD past practice in conducting CEQA analyses for rule projects such as PARs 2001 and 2002 is that the project being contemplated undergoes its own CEQA analysis. All SCAQMD rules and regulations are related to each other in that they are adopted and/or amended to meet the clean air goals outlined in the 2016 AQMP. The CEQA document for the 2016 AQMP, the March 2017 Final Program EIR, contains the programmatic analyses of the overall effects of SCAQMD's clean air goals. However, CEQA neither requires the SCAQMD to simultaneously amend every rule that may be affected by a control measure in the 2016 AQMP nor requires one programmatic CEQA document to be prepared that encompasses every rule. Further, CEQA does not require delaying the adoption of BARCT rules until all BARCT rules have been developed.

The decision to transition from NOx RECLAIM into a source-specific command-and-control regulatory structure was approved by the SCAQMD Governing Board as control measure CMB-05 in the 2016 AQMP. CMB-05 is required by the California Health and Safety Code to implement BARCT in the RECLAIM program as well as other stationary sources, which will be completed upon rule amendment or adoption of various landing rules. CMB-05 identifies a series of approaches that can be explored to make the RECLAIM program more effective in ensuring equivalency with command-and-control regulations implementing BARCT and to generate further NOx emissions reductions at RECLAIM facilities.

CMB-05 specifically contemplates the unwinding of the RECLAIM program (see Appendix IV-A, pp. IV-A-67 to IV-A-71 - http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/appendix-iv-a.pdf). In the Revised Draft 2016 AQMP, control measure CMB-05 was revised to include the following language: "*One approach under serious consideration is a long-term transition to a traditional command-and-control regulatory structure. As many of the program's original advantages appear to be diminishing and generating increased scrutiny, an orderly sunset of the RECLAIM program may be the best way to create more regulatory certainty and reduce compliance burdens for RECLAIM facilities, while also achieving more actual and SIP creditable emissions reductions.*" Thus, the March 2017 Final Program EIR for the 2016 AQMP analyzed control measure CMB-05 which did contemplate

the potential for sunsetting the RECLAIM program, even though the final decision was not made until the adoption of the 2016 AQMP at the March 2017 Governing Board hearing.

Furthermore, the potential environmental impacts associated with the 2016 AQMP, including CMB-05, were specifically analyzed in the March 2017 Final Program EIR. In particular, the March 2017 Final Program EIR addressed the environmental effects of future expansion and other actions of reasonably foreseeable environmental consequences for the RECLAIM Transition project and determined that the overall implementation has the potential to generate adverse environmental impacts to seven topic areas: air quality; energy; hazards and hazardous materials; hydrology and water quality; noise; solid and hazardous waste; and transportation. More specifically the March 2017 Final Program EIR evaluated and identified the impacts from the installation and operation of additional control equipment, such as selective catalytic reduction (SCR) equipment, potentially resulting in construction emissions, increased electricity demand, hazards from the additional ammonia transport and use, increase in water use and wastewater discharge, changes in noise volume, generation of solid waste from construction and disposal of old equipment and catalyst replacements, as well as changes in traffic patterns and volume. The commentator has not identified any additional impact areas, mitigation, or project alternatives from the RECLAIM Transition project that were excluded from the analysis in the March 2017 Final Program EIR for the 2016 AQMP. In any event, the time to challenge the assessments for the analyses of March 2017 Final Program EIR for the 2016 AQMP relied upon has passed (see Public Resources Code Sections 21167 and 21167.2).

The environmental impacts of the entire RECLAIM Transition project were analyzed in the 2016 AQMP and the associated March 2017 Final Program EIR was a program level analysis. The SCAQMD has and will continue to evaluate each individual RECLAIM Transition rule that is developed pursuant to the 2016 AQMP, to determine if any additional CEQA review is required. This has been consistent with SCAQMD's past practice and is not considered Piecemealing, as explained in SCAQMD's response letter to BizFed on April 25, 2018, a copy of which is attached at the end of these responses.

While PARs 2001 and 2002 are part of SCAQMD's Regulation XX - Regional Clean Air Incentives Market (RECLAIM) and the changes contains in PARs 2001 and 2002 contemplate other rules to be amended in the future, separate CEQA analyses will be conducted for these future rule amendments. Table 1-1 identifies several source-specific landing rules as identified by the SCAQMD in its monthly rule forecast report as scheduled to be undergoing separate, future rule amendments[1] from PARs 2001 and 2002.

[1] SCAQMD, Draft Subsequent Environmental Assessment for PARs 2001 and 2002, August 2018, p. 1-6.

Table 1-1
Rule Development Forecast for Source-Specific Rules
Affected by NOx RECLAIM Transition

Rule Number	Rule Title	Rule Development Forecast (subject to change)
1109.1	Emissions of Oxides of Nitrogen from Boilers and Process Heaters in Refineries	December 2019
1110.2	Emissions from Gaseous- and Liquid-Fueled Engines	1st Quarter2019
1118.1	Control of Emissions from Non-Refinery Flares	December 2018
1134	Emissions of Oxides of Nitrogen from Stationary Gas Turbines	1st Quarter 2019
1135	Emissions of Oxides of Nitrogen from Electric Power Generating Systems	November 2018
1146	Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters	December 2018
1146.1	Emissions of Oxides of Nitrogen from Small Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters	
1146.2	Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	
1147	NOx Reductions from Miscellaneous Sources	TBD 2019
1147.1	NOx Reductions from Metal Operations Facilities	TBD 2019
1147.2	NOx Reductions from Aggregate Facilities	TBD 2019
1153.1	Emissions of Oxides of Nitrogen from Commercial Food Ovens	TBD 2019

Key: TBD = to be determined

Pursuant to the SCAQMD's Certified Regulatory Program (CEQA Guidelines Section 15251(l); codified in SCAQMD Rule 110 - the rule which implements the SCAQMD's certified regulatory program), the SCAQMD typically prepares an Environmental Assessment (EA) to evaluate the environmental impacts for rule projects proposed for adoption or amendment. PARs 2001 and 2002, are considered a "rule" project that is subject to CEQA under the SCAQMD's Certified Regulatory Program.

As the commentator states, the Draft SEA for PARs 2001 and 2002 relies on the analyses in and incorporates by reference previous CEQA analyses conducted in the March 2017 Final Program EIR for the 2016 AQMP, October 2016 Addendum to the December 2015 Final Program EA for NOx RECLAIM, and the December 2015 Final Program EA for NOx RECLAIM, which is specifically allowed per CEQA Guidelines Section 15162.The preparation of a Draft SEA for PARs 2001 and 2002 in this manner in no way chops up the project into "bite-sized pieces" to avoid CEQA or obscure the effects of the project. To the contrary, the Draft SEA for PARs 2001 and 2002 identifies the previous CEQA analyses conducted, which already identified and analyzed significant adverse impacts, so as to not

repeat or duplicate the information previously provided. The Draft SEA instead focuses on the changes proposed in PARs 2001 and 2002, which are administrative in nature and contain procedures for the transition of NOx RECLAIM facilities to a command-and-control regulatory structure where BARCT analyses will be conducted upon landing rules being amended or adopted, and do not themselves have significant environmental impacts.

Response 2-7:
As explained in Response 2-6, the March 2017 Final Program EIR for the 2016 AQMP evaluated and identified the impacts from the installation and operation of additional control equipment, which would be the same type of equipment and impacts that would occur under the RECLAIM Transition. Furthermore, the December 2015 Final Program EA for NOx RECLAIM also evaluated and identified the impacts from the installation and operation of additional control equipment to comply with BARCT, which is equivalent to command-and-control requirements. Thus, the environmental impacts analysis of complying with BARCT would be the same whether NOx RECLAIM continued in its present form or if NOx RECLAIM facilities transition to a command-and-control regulatory structure. Thus, even though the RECLAIM transition language was added to the 2016 AQMP, no changes were required to the March 2017 Final Program EIR since the impacts associated with implementing BARCT were already evaluated.

Response 2-8:
See Responses 2-6 and 2-7.

Response 2-9:
See Responses 2-6 and 2-7.

Response 2-10:
The Draft SEA for PARs 2001 and 2002 is unique in that there are multiple certified CEQA documents that apply to the project (e.g., the December 2015 Final Program EA and the October 2016 Addendum to the Final Program EA which were certified for the December 2015 and October 2016 amendments, respectively, to NOx RECLAIM; and the March 2017 Final Program EIR which was certified for the adoption of the 2016 AQMP). Concurrent to the rule development process for PARs 2001 and 2002, SCAQMD staff is also in the process of conducting a BARCT analysis and separate rule development and CEQA analysis for PAR 1146 series with PR 1100, and PAR 1135. Implementation of PARs 2001 and 2002 will mean that the environmental effects from affected facilities complying with PAR 1135, and PAR 1146 series with PR 1100, will occur according to the timing and analyses contained in their CEQA documents, upon their certification. The Final SEA for PARs 2001 and 2002 incorporates by reference the Draft SEA for PAR 1146 series with PR 1100 and the Draft Mitigated SEA for PAR 1135 per CEQA Guidelines Section 15150, since the environmental effects from implementing PAR 1146 series with PR 1100, and PAR 1135 would not be speculative for evaluation per CEQA Guidelines Section 15145. However, incorporating these CEQA documents by reference is not the same as tiering per CEQA Guidelines Section 15152 and thus, the Final SEA for PARs 2001 and 2002 is not tiering off of the CEQA documents for PAR 1146 series with PR 1100 and PAR 1135 since they have not yet been certified as of this publication date.

As explained in Response 2-6, other rules have been identified for future rule development efforts, but as of the date of this publication, the BARCT analysis for these other rules has not yet begun. For the remainder of the rules listed in Table 1-1, SCAQMD staff has not begun the rule development process and as such, BARCT assessments have not yet been conducted. While an agency must use its best efforts to find out and disclose all that it reasonably can, foreseeing the unforeseeable is not possible. [CEQA Guidelines Section 15144]. Thus, potential environmental impacts, beyond those identified in the March 2017 Final Program EIR for the 2016 AQMP, the December 2015 Final PEA and the October 2016 Addendum to the Final PEA for the December 2015 and October 2016 NOx RECLAIM amendments, respectively, associated with complying with future rules where the BARCT assessments have not been completed, are not reasonably foreseeable at this time. Further, it would be speculative to assume what new BARCT will be for each of the remaining rules identified in Table 1-1 prior to conducting a full BARCT review during the rule development process. Thus, the SCAQMD finds that the additional impacts that may occur from implementing future BARCT is also too speculative now for evaluation per CEQA Guidelines Section 15145. As such, the analysis of the potential environmental effects associated with implementing PARs 2001 and 2002 is limited to known impacts for BARCT as established in the December 2015 and October 2016 amendments to NOx RECLAIM and impacts for new BARCT where the BARCT assessments have been completed or are near completion, which to date is PAR 1146 series and PR 1100, as well as PAR 1135. See also Response 2-6.

Response 2-11:

Staff disagrees with the comment that a new category of sources has been created that would not have access to either RTCs or Rule 1304 offset exemptions to satisfy NSR requirements. As stated in the response to comment 2-5, the rule language has been clarified that the intent of restricting access to the internal bank would only apply to NOx offsets only, if a RECLAIM facility elects to opt-out. A facility that elects to remain in RECLAIM can offset NOx emission increases with RTCs, while obtaining offset exemptions for other pollutants, if eligible under Rule 1304 requirements. A facility that elects to exit RECLAIM would temporarily not be allowed access to the internal bank for NOx offsets. There are some RECLAIM facilities that have expressed interest in exiting RECLAIM despite the fact that the NSR issues have not been resolved. To the extent that facilities choose to exit, they are voluntarily doing so and are not being forcibly deprived of access to RECLAIM.

Response 2-12:

Staff is committed to addressing all issues pertaining to NSR requirements for former RECLAIM facilities. It has been discussed at several of the RECLAIM working group meetings that there are inherent differences in how emission increases are calculated for both RECLAIM and non-RECLAIM facilities. This is one of many NSR aspects that will be evaluated during the Regulation XIII rulemaking.

Supplement to Response 2-3:
SCAQMD's Response Letter to BizFed on April 25, 2018

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

Office of the Executive Officer
Wayne Nastri
909.396.2100, fax 909.396.3340

April 25, 2018

Hilary Norton, et. al
Biz Fed Chair
Los Angeles County Business Federation
6055 E. Washington Blvd., #260
Commerce, CA 90040

Re: CEQA Analysis and Socioeconomic Analysis for RECLAIM Rulemaking

Dear Ms. Norton,

Thank you for your comment letter and participation during the rulemaking effort to transition facilities in the Regional Clean Air Incentives Market (RECLAIM or Regulation XX) to source-specific command and control rules pursuant to the 2016 Air Quality Management Plan (AQMP) approved by the South Coast Air Quality Management District (SCAQMD) Governing Board as control measure CMB-05 in the 2016 AQMP.

CMB-05 described equipment from all facilities in RECLAIM, including fluid catalytic cracking units, boilers, heaters, and furnaces, among others. The control measure identified a series of approaches that could be taken to ensure equivalency with command and control regulations implementing BARCT, with the expectation that there would be a 5 tpd NOx emission reduction commitment as soon as feasible, but no later than 2025.

The potential environmental impacts associated with the 2016 AQMP, including CMB-05, were analyzed in Program Environmental Impact Report (PEIR), certified in March, 2017. The 2016 AQMP PEIR determined that the overall implementation of CMB-05 has the potential to generate adverse environmental impacts to seven topic areas – air quality, energy, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste, and transportation. More specifically, the PEIR evaluated the impacts from installation and operation of additional control equipment and SCR or SNCR equipment potentially resulting in construction emissions, increased electricity demand, hazards from additional ammonia transport and use, increase in water use and wastewater discharge, changes in noise volume, generation of solid waste from construction and disposal of old equipment and catalysts replacements, as well as changes in traffic patterns and

Hilary Norton April 25, 2018

volume. In other words, the environmental impacts of the entire RECLAIM Transition project, as referenced by the commenter, were analyzed in the 2016 AQMP and the associated PEIR, which was a program level analysis. The commentator has not identified any additional impact areas, mitigation, or project alternatives from the RECLAIM Transition that were excluded from analysis in the 2016 AQMP PEIR. In any event, the time to challenge the 2016 AQMP PEIR has passed. (Pub. Res. Code §§ 21167, 21167.2.)

Since the SCAQMD has already prepared a program-level CEQA analysis for the 2016 AQMP, including the RECLAIM Transition, no additional program-level analysis is required and further analysis will be tiered off the 2016 AQMP PEIR. (CEQA Guidelines § 15168; Al Larson Boat Shop, Inc. v. Board of Harbor Commissioners (1993) 18 Cal.App.4th 729, 740-41.) The SCAQMD has and will continue to evaluate each individual RECLAIM Transition rule that is developed pursuant to the 2016 AQMP, to determine if any additional CEQA review is required. (CEQA Guidelines § 15168.) Additional analysis could include the preparation of a project-level EIR or Subsequent EIR to the 2016 AQMP PEIR. (CEQA Guidelines §§ 15161, 15162.) Streamlined environmental review pursuant to a Program EIR is expressly allowed in CEQA and is not considered piecemealing. (CEQA Guidelines §§ 15165, 15168.) Furthermore, any such review would include consideration of potential cumulative impacts with other RECLAIM Transition rules, as well as other activities. (CEQA Guidelines § 15355.)

Similarly, the Final Socioeconomic Report for the 2016 AQMP fully analyzed the socioeconomic impacts for the 2016 AQMP, including the entire RECLAIM Transition project. The commenter notes that a single 2016 AQMP policy directive controls the entire RECLAIM transition project. That policy directive, CMB-05, was presented in the socioeconomic report where the potential cost of reducing 5 tpd NOx emissions were estimated and the associated regional economic impacts projected. Specifically, the costs presented were scaled from a thorough BARCT assessment conducted as part of the 2015 NOx RECLAIM Amendments, and the analysis conservatively assumed that the estimated cost per ton of NOx emission reduction would be 50 percent higher than the cost-per-ton estimate of installing all BARCT control equipment identified in the 2015 NOx RECLAIM Amendments. The analysis comports with applicable Governing Board resolutions and statutory requirements.

If you have any questions or would like to discuss these issues, please contact me at 909-396-3131, wnastri@aqmd.gov, or Dr. Philip Fine, Deputy Executive Officer, Planning, Rule Development and Area Sources, at 909-396-2239, pfine@aqmd.gov.

Sincerely,

Wayne Nastri
Executive Officer

2

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033950-0005

November 1, 2018

VIA E-MAIL (see attached distribution)

Governing Board
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Re: Proposed Amended Rules 1146, 1146.1 and 1146.2

Dear SCAQMD Governing Board Member:

We are submitting these comments on behalf of the Western States Petroleum Association ("WSPA") regarding proposed amendments to Rules 1146, 1146.1 and 1146.2 ("PAR 1146 Series"). WSPA is a non-profit trade association representing companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas and other energy supplies in five western states, including California. WSPA has been an active participant in air quality planning issues for over 30 years. WSPA-member companies operate petroleum refineries and other facilities in the South Coast Air Basin that will be impacted by the transition out of the RECLAIM program.

Equipment and WSPA member's facilities will be subject primarily to Proposed Rule 1109.1 for Refinery Equipment. However, the PAR 1146 Series raise a number of issues that are relevant to other "landing rules," including Proposed Rule 1109.1. Some of these are broader policy issues that cut across the entire RECLAIM transition process, and some are more specific to the types of equipment covered by the PAR 1146 Series and Proposed Rule 1109.1. Many of these issues have been raised with staff, and, in some cases, with Governing Board members, through written and verbal comments at working group meetings, public workshops, public hearings, committee meetings and individual company or coalition meetings. We will be raising these issues, and others, with greater specificity in the context of future rulemaking that more directly affects our member companies, including Proposed Rule 1109.1, but we want to take this opportunity to ensure that you are aware of our concerns early in the transition rulemaking process.

Section 1 of this letter provides brief summaries of each of the broader RECLAIM transition issues about which we have concerns. Attached to this letter are more detailed comment letters previously submitted to the SCAQMD on these issues. Section 2 of this letter identifies more specific comments on PAR 1146 Series that may have implications for Proposed Rule 1109.1.

13-1

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LATHAM & WATKINS LLP

Section 1 – Broader RECLAIM Transition Issues

Mandating Equipment Replacement Exceeds The SCAQMD's Authority

SCAQMD staff has taken the position that a best available retrofit control technology ("BARCT") standard may require total replacement of the emitting piece of equipment. Mandating replacement projects exceeds the authority of the SCAQMD to adopt BARCT standards for *existing* sources, as set forth in the California Health & Safety Code, and, therefore, runs afoul of the well-established legal principle that a regulatory agency must act within the scope of the authority delegated to it by the legislature. This issue is addressed in more detail in the following attachments:

- Attachment 1: July 3, 2018 comments from WSPA
- Attachment 2: August 15, 2018 comments from Latham & Watkins LLP on behalf of WSPA
- Attachment 3: November 1, 2018 comments from Latham & Watkins LLP on behalf of WSPA and RFG

New Source Review Issues Must Be Addressed Comprehensively And Expeditiously

Although SCAQMD staff has indicated that it is communicating with U.S. Environmental Protection Agency ("USEPA") staff regarding the nature of the new source review ("NSR") program that will apply to RECLAIM facilities once they exit the program, we are not aware of the specifics of those communications, and we have no reason to believe that material progress is being made to resolve this issue. Addressing fundamental programmatic issues, such as NSR, early in the transition process will result in a more orderly and efficient transition. This issue is addressed in more detail in the following attachments:

- Attachment 4: May 1, 2018 comments from WSPA
- Attachment 5: September 7, 2018 comments from Latham & Watkins LLP on behalf of WSPA

The California Environmental Quality Act Analysis For The Transition Project Is Being Piecemealed

It is a fundamental principle of California Environmental Quality Act ("CEQA") review that all environmental impacts for the whole of the project be analyzed together. In this case, the "project" is the RECLAIM transition as a whole, as required by Control Measure CMB-05 in the 2016 AQMP. Yet, staff is conducting the CEQA review through a series of Supplemental Environmental Assessments ("SEA") that analyze only the impacts associated with the particular landing rule under consideration. Staff argues that this approach is acceptable because each SEA "tiers off" the March 2017 Final Program Environmental Impact Report for the 2016 AQMP and several other earlier certified CEQA documents, which, according to staff, analyzed the transition as a whole. However, the March 2017 Final Program EIR for the 2016 AQMP, which was completed in January 2018, did not analyze the transition of the RECLAIM program because the transition was not part of Control Measure CMB-05 as proposed at that time.

13-2

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Therefore, tiering off of the earlier CEQA documents to support rule amendments that seek to implement the transition is not possible because there is no comprehensive analysis of the transition in the earlier documents. In the absence of a program level CEQA analysis that includes the whole of the RECLAIM transition project, staff's segmented analysis of each proposed rulemaking action constitutes classic "piecemealing" in violation of CEQA. This issue is addressed in more detail in the following attachments:

- Attachment 4: May 1, 2018 comments from WSPA
- Attachment 5: September 7, 2018 comments from Latham & Watkins LLP on behalf of WSPA

13-2 (cont'd)

Incremental Socioeconomic Assessment

By analyzing the socioeconomic impacts associated with the transition in an incremental fashion in the context of each rulemaking, as opposed to conducting a comprehensive analysis of the entire transition, staff is either underestimating the cumulative socioeconomic impacts or failing to identify them at all. An illustration of this problem can be found in staff's analysis of amendments to Rules 2001 and 2002 approved in January and October of 2018. In the January amendments, staff did not even address the impact that the removal of 38 facilities from the RECLAIM program, all of which would be eligible to take advantage of offset exemptions in Rule 1304, might have on the internal offset bank that supports those exemptions. In contrast, the Staff Report supporting the October 2018 amendments to the same rules expressed serious concerns about the potential impacts on the internal bank. Based on these concerns, staff proposed and the Governing Board adopted language prohibiting former RECLAIM facilities from utilizing offset exemptions that rely upon the internal bank. Either staff erred in January by failing to sufficiently analyze potential impacts on the internal bank and the credit market in general, or it overstated the potential impacts associated with the October amendments. In either case, this inconsistency illustrates the problem with undertaking analysis of the impacts associated with the RECLAIM transition in an incremental fashion. This issue is addressed in more detail in the following attachments:

- Attachment 4: May 1, 2018 comments from WSPA
- Attachment 5: September 7, 2018 comments from Latham & Watkins LLP on behalf of WSPA

13-3

Inappropriate Cost-Effectiveness Methodology

WSPA objects to certain aspects of the cost-effectiveness methodology that SCAQMD staff is using to determine BARCT requirements for the landing rules currently under development. First, staff typically assumes a useful life for equipment of 25 years even though rulemaking requires replacement of technology much sooner. Use of a 25-year assumption makes the control equipment appear more cost-effective by diluting the significant capital costs of required projects over a much longer time period than is likely to occur. Second, staff utilizes the discounted cash flow ("DCF") method instead of the levelized cash flow ("LCF") method as used by several other air districts. The LCF method is a better representation of cost-effectiveness than the DCF

13-4

method. Finally, staff utilizes a $50,000 per ton cost-effectiveness threshold for determining BARCT, which is much higher than that applied by other air quality agencies, and, in some cases, staff has concluded that controls with a cost-effectiveness above $50,000 per ton constitute BARCT. This issue is addressed in more detail in the following attachment:

- Attachment 1: July 3, 2018 comments from WSPA

13-4 (Cont'd

Staff Is Not Adequately Distinguishing Between Different Classes Of Sources In The Same Category

An equipment category subject to a BARCT landing rule may consist of multiple classes defined by different design criteria or operational factors. Examples might include throughput ratings, duty cycles, or usage level (e.g., low v. high use). Such classifications within a category are necessary to establish what is technologically feasible and cost-effective as required in the determination of BARCT. Staff must exercise caution when referencing or applying a BARCT determination for one class to another class in the same category. This issue is addressed in more detail in the following attachments:

- Attachment 1: July 3, 2018 comments from WSPA
- Attachment 6: October 11, 2017 comments from WSPA

13-5

Section 2 – Specific Comments Related To Proposed Amendments To 1146 Series

Staff's Preliminary NOx BARCT Recommendations For ≥75 MMBtu/hr

WSPA agrees with staff's preliminary recommendations for NOx BARCT at a 5 ppm emission limit for boilers, steam generators and process heaters greater than or equal to 75 MMBtu/hr (Rule 1146 Group I) burning natural gas. Original equipment manufacturers ("OEMs") agree that this endpoint is a technically feasible emission limit using Selective Catalytic Reduction ("SCR") on a retrofit basis. The limit corresponds with manufacturer guarantees and was previously echoed by Norton Engineering Consultants, Inc. in their SCAQMD NOx RECLAIM – BARCT Feasibility and Analysis Review, which stated: "With the exception of Gas Turbine installations (which have an equivalent emission level of 6 ppmv @ 3% O2) most low emission SCRs in service today, being built today and even those being designed today carry manufacturer's guarantees to meet a NOx limit of 5 ppmv @ 3% O2." (NEC letter to SCAQMD (Dr. Fine), Comments on Preliminary Draft Staff Report Proposed Amendments to Regulation XX Regional Clean Air Incentives Market (RECLAIM) NOx RECLAIM – SCRs for Fired Heaters & Boilers, Document No. 14-045-8, 4 Sept 2018).

13-6

Group II and Group III Fire-Tube Boilers

Staff have not demonstrated that the preliminary recommendation of a 7 ppm limit is technical feasible for all Group II and Group III fire-tube boiler retrofits using Ultra Low NOx Burners (ULNB). As stated in the SCAQMD Preliminary Draft Staff Report issued September, 2018 ("Staff Report"), no examples of units fired with natural gas with a permit limit of 7 ppm or below utilizing ULNB retrofits were identified by the SCAQMD using the EPA, CARB, BAAQMD, SMAQMD, or VCAPCD Clearinghouses. Only one new (i.e., not a retrofit) natural gas fired unit

13-7

utilizing only ULNB as control was identified within SCAQMD with a permit limit of 7 ppm. Furthermore, the Staff Report goes on to state that vendor discussions indicated that while retrofits on existing units could "potentially" meet 7 ppm or less, the report notes a number of potential caveats to that conclusion. These included furnace size, correct back and steam pressure, and additional required controls such as variable frequency drive and oxygen trim. Based on the Staff Report, it is unclear how the limitations listed by staff were taken into consideration in its analysis of existing fire-tube boilers in the SCAQMD. For example, if a fire tube boiler does not meet the size requirement for retrofitting to 7 ppm, replacement of basic equipment or retrofit with SCR will be required in order to meet the proposed rule limit. SCAQMD also purportedly bases the preliminary recommendation of 7 ppm on source test results. Those source tests reportedly suggested that only two of 73 retrofit Group III units (~3%) and only two of 44 retrofit Group II units (~5%) tested were found to be greater than 30% below the existing rule limit of 9 ppm. The Staff Report does not state whether these units are retrofit with ULNB.

13-7 (Cont'd)

Cost-Effectiveness Analysis

The cost-effectiveness determination in the Staff Report is based on an analysis using the average cost of equipment and installation for a range of sizes obtained from 5 vendors. This creates two issues:

- The Staff Report notes that the data include outliers that are factored into the average cost. These outliers may skew the cost-effectiveness determination. Therefore, the staff should provide all cost data from vendors so that stakeholders can understand how the outliers potentially impact cost-effectiveness.

- In addition, control costs vary significantly based on the size of the unit. Therefore, a single value average control cost does not adequately convey the range of control cost outcomes required for emission reductions. The staff's cost-effectiveness results (Staff Report, Table 4, Cost Effectiveness Analysis) should include a range or other distributional analysis/analyses so that Governing Board members and other stakeholders have a full understanding of the costs associated with the staff proposal.

13-8

Conclusion

Thank you for considering these comments. We look forward to continuing to work with you on these rulemakings which are critically important to stakeholders as well as the regional economy. If you have any questions, please contact me at (714) 755-8105 or by email at

michael.carroll@lw.com or Bridget McCann of WSPA at (310) 808-2146 or by email at bmccann@wspa.org.

Best regards,

Michael J. Carroll
Of LATHAM & WATKINS LLP

Attachments

cc: Clerk of the Boards, SCAQMD
Wayne Nastri, SCAQMD
Philip Fine, SCAQMD
Barbara Baird, SCAQMD
Bridget McCann, WSPA

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Response to Comment 13-1:
This comment introduces the party represented by the letter; no response to this the comment is necessary. SCAQMD staff appreciates your comments and participation throughout the rulemaking for the transition of the RECLAIM program to a command-and-control regulatory structure.

Response to Comment 13-2:
Refer to response to Comment Letter #12. Response to May 1, 2018 Letter from WSPA can be found in the Final SEA of this board package.

Response to Comment 13-3:
Refer to response 12-3

Response to Comment 13-4:
Refer to response 12-6

Response to Comment 13-5:
PAR 1146, 1146.1 and 1146.2 takes into account of different classes of equipment such as, but not limited to, heat input ratings, fuels, and usage levels. Commenter attached comment letters dated July 3, 2018 and October 11, 2017 from WSPA are not applicable to PAR 1146 series.

Response to Comment 13-6:
Staff's primary considerations for determining best available retrofit technology (BARCT) is applicability, feasibility and cost-effectiveness based off of the impacted universe of facilities. While the staff recommendation for boilers, steam generators and process heaters subject to PAR 1146 rated to >75 MMBtu/hr is at a 5 ppm NOx emission limit, it is important to clarify that units rated to >75 MMBtu/hr subject to other industry specific rules will be subject to separate BARCT assessments. Staff determinations for units subject to PAR 1146 does not determine BARCT limits for other rules.

Response to Comment 13-7:
The goal of staff's assessment of source test results is to determine the technological feasibility of a 7 ppm BARCT. The District's current limit is at 9 ppm, so majority of the units are not required to meet 7 ppm. From Table 2 of this staff report, two units in Group II and two units in Group III demonstrated the ability to meet >30% below permitted limit of 9 ppm from burner retrofits demonstrating the technical feasibility to meet 7 ppm. Clearinghouse databases are only as effective as the frequency of updates. They are utilized as possible sources of technology implementation, but do not necessarily reflect the most recent information. Limitations noted in this staff report are presented by equipment vendors and serve as precautionary insight in to possible challenges in certain case by case scenarios. To obtain examples of real world applications, SCAQMD staff reached out to staff of San Joaquin Valley Air Pollution Control District (SJVAPCD) which adopted Rule 4320 on October 16, 2008 implementing 7 ppm NOx emission limit for all natural gas fired units rated to >20 MMBtu/hr. From discussions with SJVAPCD staff, most of the units located in SJVAPCD are complying with the 7 ppm NOx limit. SCAQMD Staff has reviewed source test results from 708 units located SJVAPCD for units rated between 5 to 300 MMBtu/hr that demonstrate compliance with 7 ppm with ultra-low NOx burner only. In total over 740 source test results were reviewed to support the feasibility of a 7 ppm BARCT.

Response to Comment 13-8:
Cost data from vendors is presented in Figures 4 through 9 in this staff report. Each data point is the average vendor cost with outliers for a natural gas unit of a given size. Utilizing an average cost from all vendors for the cost-effectiveness analysis is a more accurate representation of the

potential impact on affected sources, since the capital cost that all stakeholders will actually have depends on the vendor selected. Since not all stakeholders will elect to contract with the vendor with the highest costs, the cost-effectiveness analysis should be based on the average cost of all vendors, which is a better indication of the actual impacts on stakeholders. Nonetheless, the range of capital costs based on the vendor estimates has been provided in the cost-effectiveness analysis presented in Chaper 2 of this staff report.

Staff agrees that control cost vary according to the size of the unit. Therefore, the staff report has been updated with a range of the capital cost and present worth value for each size category. The emission reductions for the cost-effectiveness analysis was based on the actual fuel usage for each individual unit in RECLAIM. Due to the limit number of units in certain group categories, cost-effectiveness calculated based on individual unit sizes would not have statistical significance. Variations in unit sizes are accounted for in the established size categories of Rule 1146 Group I (+75 MMBtu/hr), Group II (20 – 75 MMBtu/hr), Group III (5 – 20 MMBtu/hr), and Rule 1146.1 (2 – 5 MMBtu/hr). Since staff has based the cost-effectiveness analysis according to these size groupings, differences in unit sizes are accounted for in the cost-effectiveness results.

[i] RECLAIM BARCT as stated in Rule 2002 Table 3

ATTACHMENT L

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Socioeconomic Impact Assessment for

Proposed Amended Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters;
Proposed Amended Rule 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters;
Proposed Amended Rule 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and
Proposed Rule 1100 - Implementation Schedule for NOx Facilities

December 2018

Deputy Executive Officer
Planning, Rule Development, and Area Sources
Philip M. Fine, Ph.D.

Assistant Deputy Executive Officer
Planning, Rule Development, and Area Sources
Sarah Rees, Ph.D.

Authors:	Brian Vlasich, Air Quality Specialist Shah Dabirian, Ph.D., Program Supervisor Ryan Finseth, Air Quality Specialist Elaine Shen, Ph.D., Program Supervisor Anthony Oliver, Ph.D., Air Quality Specialist
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Reviewed By:	Mike Krause, Planning and Rules Manager Gary Quinn, P.E., Program Supervisor William Wong, Principal Deputy District Counsel Barbara Baird, Chief Deputy District Counsel

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

Chairman: DR. WILLIAM A. BURKE.
Speaker of the Assembly Appointee

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HILDA L. SOLIS
Supervisor, First District
County of Los Angeles

EXECUTIVE OFFICER:

WAYNE NASTRI

EXECUTIVE SUMMARY

A socioeconomic analysis was conducted to assess the potential impacts of Proposed Amended Rules (PAR) 1146, 1146.1, and 1146.2 (collectively referred to herein as the PAR 1146 series), and Proposed Rule (PR) 1100 on the four-county region of Los Angeles, Orange, Riverside, and San Bernardino. A summary of the analysis and findings is presented below.

Elements of Proposed Amendments	SCAQMD staff has begun the process of transitioning equipment at NOx Regional Clean Air Incentives Market (RECLAIM) facilities from a facility permit structure to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. PAR 1146 series will be amended to transition of equipment from the NOx RECLAIM program to a command-and-control regulatory structure while achieving Best Available Retrofit Control Technology (BARCT). PAR 1146 series would include proposed amendments to Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters. In addition, SCAQMD staff has developed PR 1100, an administrative rule which establishes the compliance schedule for facilities exiting the RECLAIM program.
Affected Facilities and Industries	Among the 259 facilities currently in the NOx RECLAIM program, approximately 103 RECLAIM facilities with at least one boiler or heater (a total of 291 permitted units) will be affected by PAR 1146 series and PR 1100. The PAR 1146 series could potentially affect non-RECLAIM facilities which also need to meet the BARCT limits. However, non-RECLAIM facilities, with the exception of the equipment category of thermal fluid heaters, would not need to demonstrate compliance with the lower emission limit until the unit's burner replacement or 15 years after rule amendment, whichever occurs earlier. Of these 103 RECLAIM facilities, 65 are located in Los Angeles County, 20 in Orange County, five in Riverside, and the remaining 13 facilities are in San Bernardino County. The PAR 1146 series would affect a wide variety of operations in many sectors of economy such as manufacturing and non-manufacturing sectors. Among the 103 affected RECLAIM facilities, the sectors affected the most are paper manufacturing (NAICS 322) with approximately 10%, pipeline transportation (NAICS 486) with approximately 9%, food manufacturing (NAICS 311) with approximately 8%, chemical manufacturing (NAICS 325) with approximately 8%, transportation equipment manufacturing (NAICS 336) with approximately 8%, utilities (NAICS 22) with approximately 7%, and textile mills manufacturing (NAICS 313), fabricated metals manufacturing (NAICS 332), and petroleum and coal product manufacturing (NAICS 324),

	and oil and gas extraction each with approximately 6% of the total affected facilities, respectively. The remaining 28% of the affected facilities are spread among a large number of sectors in the economy.
Assumptions of Analysis	The Final Socioeconomic Report for the 2005 RECLAIM amendment fully analyzed the socioeconomic impacts of installing selective catalytic reduction (SCR) units and ultra-low NOx burners (ULNB) (the same type of technologies) that are currently proposed under the PAR 1146 series. However, few of the RECLAIM facilities actually installed the control equipment, achieving required BARCT emission reductions in other ways. Thus, for many of these RECLAIM facilities, they will actually undertake these costs of installation for the first time. Costs of installation and the current socioeconomic conditions have changed since 2005. As a result, staff conservatively analyzed these socioeconomic impacts using, to the extent data is available, current costs under the current socioeconomic conditions. PAR 1146 and 1146.1 would require 65 out of 103 facilities to meet emission limits by the compliance date of 2022. Twenty out of these 103 facilities would be eligible to meet the lower emission limits upon burner replacement or 15 years from date of rule amendment, whichever occurs earlier. The remaining 18 facilities may be subject to a change in Monitoring and Reporting and Recording (MRR) requirements after they exit from the RECLAIM program.[1] Under PAR 1146 (Group I), it was assumed that two facilities would need to meet the NOx limits by SCR retrofits for three units. The average capital cost of a SCR unit is estimated at $1.4 million (including installation and permitting). Each SCR unit is assumed to last for 25 years. It was assumed that each SCR unit is due for a catalyst replacement every nine years. Under PAR 1146 (Group II), it is assumed that 30 facilities would need a SCR retrofit for 52 units with an average capital cost of $565,000 (including installation and permitting). For PAR 1146 (Group III), it is assumed that 36 facilities would need to meet the NOx limits with ULNBs. The average initial costs of retrofitting boilers with ULNBs are estimated at $134,000 (including installation and permitting) per unit for Group III. Each burner is assumed to last for 15 years. The incremental cost of monitoring is assumed to be negligible. PAR 1146 would require the affected owners of Group I, Group II, and Group III units to apply for permit modifications and pay a one-time permit application fee of $8,951, $8,368, and $5,641, respectively. Additional annual recurring costs specific to SCRs in PAR 1146 include operating and maintenance (O&M), catalyst replacement (every nine years), electricity, ammonia usage, monitoring,[2] and annual permit renewal fees.

[1] Changes to MRR requirements only apply to non-Title V facilities.

[2] Monitoring costs for ammonia slip tests are required quarterly in the first year for units down to 20 mmbtu/hr, and then annually if quarterly tests are passing.

	20 facilities in RECLAIM facilities may defer compliance in the PAR 1146 series, which specifies that compliance will be required 15 years after rule adoption or upon burner replacement (whichever occurs first). This category represents 74 units that are expected to undergo a burner replacement, and capital and permitting costs were included in this analysis. Staff made the conservative assumption that retrofits would take place in 2021. For non-RECLAIM facilities, the proposed 7 ppm NOx emission limits only apply to Rule 1146 Group II and Group III and Rule 1146.1 fire-tube boilers and the 12 ppm NOx emission limit applies to thermal fluid heaters. However, with the exception of those with thermal fluid heaters currently complying with a NOx emission limit greater than 20 ppm, non-RECLAIM facilities would not need to demonstrate compliance with the lower emission limit until the unit's burner replacement or 15 years after rule amendment, whichever occurs earlier. As of November 2018, there are 824 non-RECLAIM facilities that operate around 1,075 non-RECLAIM units subject to PAR 1146 and 732 non-RECLAIM units subject to PAR 1146.1 in the District (a total of 1,807). The proposed 7 ppm NOx emissions (which represents BARCT requirement) for Group II, Group III, and Rule 1146.1 units only applies to fire-tube boilers. While the number of affected fire-tube boilers cannot be quantified due to the lack of distinction in equipment category designations, it is assumed that the fraction of fire-tube units in RECLAIM is the same as that in non-RECLAIM, which is approximately 40% of the universe. In total, there are 722 units that are estimated to be impacted by PAR 1146 and 1146.1 within the non-RECLAIM universe. The additional annual O&M cost for each SCR for Group I and Group II unit is estimated at $7,100 and $2,800, respectively. The cost of electricity is assumed to be $0.13 per Kw/hr,[3] and is estimated at $51,800 and $11,900 for Group I and Group II SCR units, respectively. The annual cost of catalyst replacement is assumed to be $13,900 for Group I and $3,200 for Group II. Based on a 50% annual capacity and 8,760 hours of annual operation, costs of ammonia usage for Group I and Group II units is estimated at $23,100 and $5,300, respectively. Monitoring costs for both Group I and Group II are estimated at $3,400 annually, and permit renewal fees are estimated at $1,830 for SCRs in both groups. The cost savings estimated from the use of FGR is estimated at $14,700 for Group I SCRs, and $3,000 for Group II SCRs. Under PAR 1146.1, it was assumed that 10 affected RECLAIM facilities with 19 units will need to meet the NOx limits by ULNBs to achieve the existing rule limits. The average capital and installation costs of retrofitting boilers with

[3] $0.13 per kW/hr is rounded from $0.1268 per kW-hr based on the U.S. Energy Information Administration Electric Power Monthly Reports. Data for the monthly price of electricity for industrial sector in California was used to calculate the annual average for the months of June 2017 – June 2018.

	ULNBs is estimated at $61,000 per unit. Each burner is assumed to last for 15 years. PAR 1146.1 would require the owners of the affected units to apply for permit modifications and pay a one-time permit application fee of $3,567. Under PAR 1146.2, it was assumed that three facilities will need to need to meet the NOx limits by ULNBs. Due to the lack of information available on the universe of affected sources under PAR 1146.2, and to account for the potential cost impacts of those affected facilities with non-permitted units, staff has included additional ULNB costs for a total of 850 units (estimated based on the equipment data provided from facility responses of initial determination notifications as of April 2018) to account for the non-permitted units that could be impacted by PAR 1146.2. The average capital and installation cost of retrofitting a boiler with a ULNBs is estimated at $32,100 (including installation) within 1146.2. Each burner is assumed to last for 15 years. PR 1100 is an administrative rule and does not impose additional costs to affected facilities, as such, no additional costs or socioeconomic impacts were assumed here.
Compliance Costs	The main requirements of the PAR 1146 series that have cost impacts for affected facilities would include one-time costs and annual recurring costs. The one-time costs would include capital and installation of SCRs, ULNBs, and one-time permit modifications. Annual recurring cost estimates apply to 1146 Group I and Group II SCRs for catalyst replacement, additional electricity, ammonia usage, monitoring (ammonia slip tests), and annual permit renewal. The use of SCR retrofits assumes cost savings based on a reduction in flue-gas recirculation (FGR) use. The average annual cost of the PAR 1146 series is estimated at $5.6 million (low cost scenario) to $6.8 million (high cost scenario) between 2020 and 2045, depending on the real interest rate assumed (1% to 4%). Annual costs of installing SCRs and ULNBs would result in approximately $4.1 million (74%) to $5.4 million (78%) of overall annual compliance costs. The majority of the cost ($2.5 to $3.0 million or 44% and 43% low and high cost estimate, respectively) is expected to be incurred due to PAR 1146 Group II. The average annual costs of compliance for PAR 1146.1 is estimated to be $78,000 to $94,000 and that of PAR 1146.2 is estimated to be $2.0 to 2.5 million. The SCRs used in 1146 Group I and Group II have estimated annual recurring costs of $1.5 million (27% and 23% of total annualized costs in low and high cost estimates, respectively), which includes savings from a reduction in FGR use. Annual average recurring costs for SCR equipment by category are shown below in 2018 dollars.

	1146 Group I Annual Costs	1146 Group II Annual Costs
Electricity	$51,800	$11,900
Ammonia	$23,100	$5,300
Catalyst	$13,900	$3,200
O&M	$7,000	$2,800
Monitoring	$3,300	$3,300
Annual Permit Renewal	$1,800	$1,800
FGR Savings	$14,700 (savings)	$3,000 (savings)

The majority of the overall annual compliance costs are expected to be incurred by the beverage sector (13%), textile product mills (13%), pipeline transportation (11%), paper manufacturing (10%), and aerospace product and parts manufacturing (7%). The cost-effectiveness of the overall PAR 1146 series is estimated at $26,500 per ton per ton for Discounted Cash Flow (DCF).

In total, there are 722 units that are estimated to be impacted by PAR 1146 and 1146.1 within the non-RECLAIM universe. The total annualized cost of compliance for these fire-tube units is estimated at $862,000. Because there is inadequate data to identify the type, location, and the number of fire-tube units at these facilities, a breakdown of costs by industry type could not be determined, which is a key input for the regional macroeconomic model for a socioeconomic impacts analysis. Therefore, such an analysis could not be done for the non-RECLAIM universe for the PAR 1146 series.

Proposed Amendments	DCF ($/ton)
Rule 1146-Group I	$26,000
Rule 1146-Group II	$41,000
Rule 1146-Group III	$25,000
Rule 1146.1	$33,000
Rule 1146.2	$7,000
Average	**$26,500**

Jobs and Other Socioeconomic Impacts

Based on the above assumptions, the compliance cost of the PAR 1146 series, and the application of the Regional Economic Models, Inc. (REMI) model, it is projected that 57 to 72 jobs will be forgone annually, on average, between 2020 and 2045. The projected jobs loss impacts represent about 0.0021% of the total employment in the four-county region.

The sectors of textile mills and textile product mills (NAICS 313, 314), retail trade (NAICS 44-45), and food services (NAICS 722) are projected to incur a portion of compliance costs and thus experience some jobs forgone. The reduction in disposable income would dampen the demand for goods and services in the local economy, thus resulting in a small number of jobs forgone projected in sectors such as construction (NAICS 23) and wholesale trade (NAICS 42). The remainder of the projected reduction in employment would be across all major sectors of the economy from secondary and induced impacts of the PAR 1146 series.

Competitiveness	It is projected that the manufacturing sector, where most of the affected facilities belong, would experience a rise in its relative cost of production and its delivered price by 0.001% in 2035. While these changes are relatively small, it should be noted that the delivered price change is a change in the index of all prices in the manufacturing sector. Delivered prices that a facility may charge for specific goods or services may increase at a greater rate than this, allowing incurred cost to be passed through to downstream industries and end-users. The rest of the sectors would experience minor increases in the relative cost of production and relative delivered price with respect to their counterparts in the rest of the U.S.
Impacts of CEQA Alternatives	There are five CEQA alternatives associated with the PAR 1146 and 1146.1. Alternative A, the no project alternative, means that the current version of Rules 1146, 1146.1, and 1146.2 would remain in effect. Under Alternative B (less stringent), the compliance deadline for meeting the NOx emissions limits would be extended by one year. Under Alternative C (more stringent), the NOx emission limits would remain the same as the proposed project, but facilities would need to meet 100 percent compliance by January 1, 2021. Under Alternative D, the Group I units would need to meet 9 ppm or (0.011 lb/MMBtu) instead of 5 ppm (0.0062 lb/MMBtu) and as a result they are expected to meet the NOx limits by ULNBs instead of SCRs. Alternative D would also require PAR 1146 Group II units to meet 9 ppm (or 0.011 lb/MMBtu) instead of the proposed 5 ppm for Group II units with a NOx limit greater than 12 ppm or 7 ppm (or 0.00085 lb/MMBtu) for fire-tube boilers currently meeting a NOx limit less than or equal to 12 ppm. PAR 1146 Group III and 1146.1 units would be required to meet 9 ppm (or 0.011 lb/MMBtu) instead of the proposed 7 ppm (or 0.00085 lb/MMBtu) for fire-tube boilers. The NOx emission limit for thermal fluid heaters would also remain at 30 ppm (or 0.037 lb/MMBtu) instead of 12 ppm (0.015 lb/MMBtu). With Alternative E, the provisions are the same as Alternative D for PAR 1146 Group I, II, III, 1146.1, and thermal fluid heaters, except for three units in PAR 1146 Group I, which would be required to meet 5 ppm using SCR retrofits. Average annual compliance costs for the CEQA alternatives range from $4.1 to $5.7 million between 2020 and 2045. The cost-effectiveness of the PAR 1146 and 1146.1 and CEQA Alternatives range from $11,000 to $26,500 per ton of NOx reductions. Average annual jobs forgone for the CEQA alternatives range from 39 to 63 between 2020 and 2045.
Potential NOx RTC Market Impacts	If PAR 1146, 1146.1, and 1146.2 are adopted, 22 additional facilities are expected to receive an initial determination notification because, according to staff's evaluation, all of their permitted RECLAIM NOx source equipment will be subject to these rules once the proposed amendments are adopted. The 22 RECLAIM facilities will need to begin complying with the PAR 1146 series while in RECLAIM and through the transition out of RECLAIM. Facilities that received initial determination notifications and meet the proposed criteria to exit, would not receive a final determination notification to exit RECLAIM until key elements such as NSR and permitting are resolved. However, these

	facilities may request to opt-out of RECLAIM before these key elements are resolved, upon meeting specific conditions specified in subdivision (g) of Rule 2001. ~~Staff has committed to delay issuing a final determination notification to any facilities to exit them from RECLAIM until New Source Review (NSR) issues are resolved.~~ These 22 affected facilities currently account for only about 0.6% of annual NOx emissions and 0.8% of NOx RECLAIM trading credit (RTC) holdings in the NOx RECLAIM universe. As such, staff concludes that these facilities' compliance with Rule 2002(f)(10) would have a very small impact, if any, on the demand and supply of NOx RTC market. Specifically, while the transition of the 22 facilities out of the NOx RECLAIM program could potentially assert upward pressure on the discrete-year NOx RTC prices, it is unlikely to result in large price fluctuations in the NOx RTC market, nor is the transition expected to significantly affect the remaining NOx RECLAIM facilities that are not yet ready to exit the market-based program.

INTRODUCTION

As a result of control measure CMB-05 from the SCAQMD's 2016 Air Quality Management Plan (AQMP) and Assembly Bills (AB) 617 and 398, SCAQMD staff has been directed by the Governing Board to begin the process of transitioning equipment at NOx RECLAIM facilities from a facility permit structure to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards.

The PAR 1146 series in combination with PR 1100 will transition affected units at NOx RECLAIM facilities to a command-and-control regulatory structure. The PAR 1146 series would: 1) expand the applicability to include units that were not previously required to comply with Rules 1146/1146.1 because they were in the NOx RECLAIM program; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NOx concentration limits in Rules 1146/1146.1; 3) require the affected equipment to meet the applicable NOx concentration limit for all Rule 1146/1146.1 units for a minimum of 75 percent of the total heat input by January 1, 2021 and 100 percent of the total heat input by January 1, 2022; 4) require RECLAIM facilities replacing Rule 1146/1146.1 units to meet NOx limits by January 1, 2023; 5) require RECLAIM facilities with Rule 1146.2 units to meet the rule's NOx emission limits by December 31, 2023 if a more stringent BARCT limit as determined by a technology assessment is not applicable; 6) limit ammonia emissions on units with applicable air pollution control equipment and require quarterly source testing for the first 12 months of operation and annually thereafter when four consecutive quarterly source tests demonstrate compliance, or in lieu of source testing, an ammonia Continuous Emission Monitoring System (CEMS) under an approved SCAQMD; and 7) require certain units at non-RECLAIM facilities to meet new NOx emission limits according to the compliance schedules specified in Rules 1146 and 1146.1

In addition, SCAQMD staff has developed Proposed Rule (PR 1100), an administrative rule which establishes the compliance schedule for the PAR 1146 series facilities exiting the RECLAIM program. The compliance schedule for PAR 1146 and 1146.1 will be a two to three year period depending on the equipment size and number of affected units at each facility. Implementation of the proposed project is estimated to reduce NOx emissions by 0.27 ton per day by January 1, 2023.

LEGISLATIVE MANDATES

The socioeconomic impact assessments at SCAQMD have evolved over time to reflect the benefits and costs of regulations. The legal mandates directly related to the assessment of the proposed rule include the SCAQMD Governing Board resolutions and various sections of the California Health & Safety Code (H&SC).

SCAQMD Governing Board Resolutions

On March 17, 1989 the SCAQMD Governing Board adopted a resolution that calls for an economic analysis of regulatory impacts that includes the following elements:

- Affected industries

- Range of probable costs
- Cost effectiveness of control alternatives
- Public health benefits

Health & Safety Code Requirements

The state legislature adopted legislation that reinforces and expands the Governing Board resolutions for socioeconomic impact assessments. H&SC Sections 40440.8(a) and (b), which became effective on January 1, 1991, require that a socioeconomic analysis be prepared for any proposed rule or rule amendment that "will significantly affect air quality or emissions limitations." Specifically, the scope of the analysis should include:

- Type of affected industries
- Impact on employment and the regional economy
- Range of probable costs, including those to industry
- Availability and cost effectiveness of alternatives to the rule
- Emission reduction potential
- Necessity of adopting, amending or repealing the rule in order to attain state and federal ambient air quality standards

H&SC Section 40728.5, which became effective on January 1, 1992, requires the SCAQMD Governing Board to actively consider the socioeconomic impacts of regulations and make a good faith effort to minimize adverse socioeconomic impacts. It also expands Socioeconomic Impacts Assessments to include small business impacts, specifically:

- Type of industries or business affected, including small businesses
- Range of probable costs, including costs to industry or business, including small business

Finally, H&SC Section 40920.6, which became effective on January 1, 1996, requires that incremental cost effectiveness be performed for a proposed rule or amendment that imposes Best Available Retrofit Control Technology or "all feasible measures" requirements relating to ozone, carbon monoxide (CO), oxides of sulfur (SOx), oxides of nitrogen (NOx), and their precursors. Incremental cost effectiveness is defined as the difference in costs divided by the difference in emission reductions between a control alternative and the next more stringent control alternative.

The necessity analysis and the analysis of control alternatives and their incremental cost-effectiveness are presented in the Staff Report prepared for the proposed amendments.

REGULATORY HISTORY

Rule 1146, which was originally adopted in September 1988, established a 40 ppm NOx emission limit for units with an annual heat input greater than 90,000 therms. Since the original adoption, the rule has been amended four times. The January 1989 amendments lowered the NOx emission limit to 30 ppm for units with rated heat input greater or equal to 40 million Btu/hr. The costs associated with this amendment included the retrofitting cost of boilers and heaters with Selective

Catalytic Reduction (SCR) and Flue Gas Recirculation (FGR). The total annualized cost of this amendment was estimated at $44,500 to $445,400. The January 1989 amendment were estimated to reduce 0.5 ton of NOx per day with an average cost-effectiveness of $19,377 per ton of NOx reduced.

The May 1994 amendments added a tune-up procedure for natural-draft combustion units. The procedure had no cost or emission reductions associated with it because it had already been commonly used by operators of natural-draft units. In June 2000, Rule 1146 was amended to exempt one facility that exceeded the 90,000 therm fuel usage threshold from the NOx emission limit provided certain conditions were met. The amendment provided relief to the subject facility.

The rule amendments in November 2000 lowered the NOx limit from 40 to 30 ppm for units with rated heat input less than 40 million Btu/hr and burning gaseous fuel only, added annual testing requirement, and required fuel flow meters for all units. The total annualized cost of the proposed amendments was estimated at $790,900. The amendments resulted in a reduction of 91 tons of NOx emissions per year with a cost-effectiveness of $7,000 per ton of NOx reduced.

The September 2008 amendments lowered NOx emission limits from boilers, steam generators, and process heaters. Specifically, the amendments lowered NOx limits from 30 to 25 ppm for any units fired on landfill gas and 15 ppm for any units fired on digester gas. For units burning gaseous fuel other than digester and landfill gases, the amendments required NOx limits of 5 ppm for Group I (75 million Btu/hr or greater) units and 9 ppm for the Group II (at least 20 but less than 75 million Btu/hr) and Group III (from 5 to less than 20 million Btu/hr except atmospheric units) units, respectively. Atmospheric units were required to meet a 12 ppm NOx limit. It was expected that the amendments to reduce 1.2 tons per day of NOx emissions by 2015 will be achieved with an overall cost-effectiveness of $21,750 per ton of NOx reduced.

The PAR 1146 series will be amended to transition of equipment from the NOx RECLAIM program to a command-and-control regulatory structure while achieving BARCT. The Final Socioeconomic Report for the 2005 RECLAIM fully analyzed the socioeconomic impacts of installing SCRs and ULNBs; the same type of technologies which will be used to comply with the amendments currently proposed for the PAR 1146 series. However, few of the RECLAIM facilities actually installed the control equipment, achieving required BARCT emission reductions in other ways. Thus, for many of these RECLAIM facilities, they will actually undertake these costs of installation for the first time. Costs of installation have changed since 2005. As a result, staff will now analyze these economic impacts using, to the extent data is available, currents costs under current socioeconomic conditions.

The Final Socioeconomic Report for the 2016 AQMP fully analyzed the socioeconomic impacts for the 2016 AQMP, including the entire RECLAIM Transition project. CMB-05- *Further NOx Reductions from RECLAIM Assessment*, was presented in the Final Socioeconomic Report where the potential cost of reducing five tons per day NOx emissions were estimated and the associated regional economic impacts projected. Specifically, the costs presented were scaled from a thorough BARCT assessment conducted as part of the 2015 NOx RECLAIM Amendments, and the analysis conservatively assumed that the estimated cost per ton of NOx emission reduction would be 50% higher ($17,000 to $28,000) than the cost-per-ton estimate of installing all BARCT

control equipment identified in the 2015 NOx RECLAIM Amendments. That analysis is consistent with applicable Governing Board resolutions and statutory requirements.

Proposed Amendments to Rule 1146, 1146.1, 1146.2, and Proposed Rule 1100

The proposed amendments will affect Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters.

Rule 1146 applies to boilers, steam generators, and process heaters of equal to or greater than 5 million BTUs per hour of rated heat input capacity used in all industrial, institutional, and commercial operations and currently exempts boilers used by electric utilities to generate electricity (electricity generating facilities, or EGFs), boilers and process heaters with a rated heat input capacity greater than 40 million BTUs per hour that are used in petroleum refineries, sulfur reaction plant boilers, and units operated at RECLAIM facilities pertaining to NOx emissions only. The proposed amendments to Rule 1146 would exempt units that are, or will be, covered by a rule for an industry-specific category and subject to an applicable NOx emission limit. PAR 1146 will exempt any unit at a RECLAIM or former RECLAIM facility covered in an industry-specific category as defined in PR 1100. Currently, this includes energy generating boilers at electricity generating facilities (EGFs) and refinery boilers with applicable NOx limits specified in the corresponding rule. Additionally, PAR 1146 will exempt units at municipal sanitation service facilities when a sector specific REG XI rule specifying the applicable NOx emission limits for these units is adopted.

Rule 1146.1 applies to boilers, steam generators, and process heaters that are greater than 2 million BTUs per hour and less than 5 million BTUs per hour of rated heat input capacity used in any industrial, institutional or commercial operation. PAR 1146.1 will exempt any unit at a RECLAIM or former RECLAIM facility covered in an industry-specific category as defined in PR 1100 and units at municipal sanitation service facilities when a sector specific REG XI rule is adopted.

Rule 1146.2 applies to large water heaters and small boilers and process heaters with a rated heat input capacity up to and including 2,000,000 BTUs per hour. There are both manufacturer and end-user requirements contained in the rule. PAR 1146.2 will exempt units at any RECLAIM or former RECLAIM facility that are subject to a NOx emission limit in a different rule for an industry-specific category as defined in PR 1100 and units at municipal sanitation service facilities when a sector specific REG XI rule is adopted.

PR 1100 would establish the implementation schedule for Regulation XX NOx RECLAIM facilities that are transitioning to a command-and-control regulatory structure. PR 1100 would apply to units that would be subject to the emission requirements of PARs 1146 and 1146.1. Definitions for a Rule 1146 unit and a Rule 1146.1 unit are included in PR 1100 that make reference to the definition of boiler and process heater contained in both Rule 1146 and Rule 1146.1. In addition, a definition for Industry-Specific Category has been specified that would list the types of RECLAIM facilities that would not be subject to the requirements of PR 1100.

AFFECTED INDUSTRIES

Among the 259 facilities currently in the NOx RECLAIM program, approximately 103 RECLAIM facilities with at least one boiler or heater (a total of 291 permitted units) will be affected by PAR 1146 series and PR 1100. Of these 103 affected facilities, 65 are located in Los Angeles County, 20 in Orange County, five in Riverside, and the remaining 13 facilities are in San Bernardino County.

PAR 1146 and 1146.1 would require 65 out of 103 facilities to meet the emission limits for 148 pieces equipment by the compliance date of 2022 unless equipment is replaced. Twenty out of these 103 facilities that comply with the applicable RECLAIM BARCT limit of 12 ppm would not need to demonstrate compliance with the compliance dates specified in Rule 1100 until the unit's burner replacement or 15 years after rule amendment, whichever occurs earlier. The remaining 18 facilities would be subject to Monitoring, Reporting, and Recording (MRR) requirements of the PAR 1146 series which imposes no additional costs. Figure 1 identifies the industry sectors, as classified by the NAICS, and the number of respective units subject to PAR 1146 series and PR 1100.

The PAR 1146 series could potentially affect non-RECLAIM facilities which also need to meet the BARCT limits. However, non-RECLAIM facilities, with the exception of the equipment category of thermal fluid heaters, would not need to demonstrate compliance with the lower emission limit until the unit's burner replacement or 15 years after rule amendment, whichever occurs earlier. As of November 2018, there are approximately 1,075 non-RECLAIM units subject to PAR 1146 and 732 non-RECLAIM units subject to PAR 1146.1 operating in the District. Staff assumes that approximately 40% of non-RECLAIM units consist of fire-tube boilers. Due to the uncertainty with the actual time of the burner replacement, the number of affected sources and the associated cost impacts cannot be determined at this time. For thermal fluid heaters, due to the lack of distinction in their permits that set them apart from other process heaters, the number of thermal fluid heaters cannot be quantified in the non-RECLAIM universe. However, thermal fluid heaters make up a very small portion of the RECLAIM facilities, and is an estimated 76 of the 1,807 total units in the RECLAIM universe, or about 4.2%.

Figure 1 and Table 1 present the industry classification and number of affected facilities by industry types. Among the 103 affected facilities, the sectors affected the most are paper manufacturing (NAICS 322) with approximately 10%, textile miles manufacturing (NAICS 313) with approximately 9%, pipeline transportation (NAICS 486) with approximately 9%, transportation equipment manufacturing (NAICS 336), chemical manufacturing (NAICS 325) with approximately 8%, food manufacturing (NAICS 311) with approximately 8%, utilities (NAICS 22) with approximately 7%, and petroleum and coal product manufacturing with approximately 6% of the total affected facilities, respectively. The remaining 26% of the affected facilities are spread among a large number of sectors in the economy.

Figure 1: Distribution of Affected Facilities by Industries

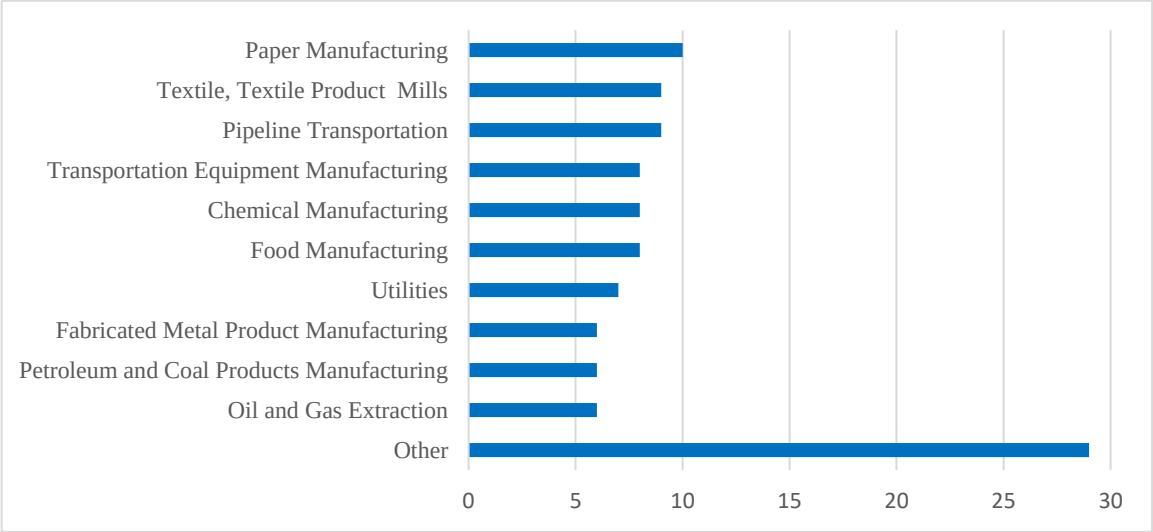


Table 1: Potentially Affected Facilities by Industry

Industry	NAICS	Number of Facilities
Accommodation	**721**	1
Real estate	**531**	1
Miscellaneous manufacturing	**339**	1
Nonmetallic mineral product manufacturing	**327**	1
Administrative and support services	**561**	1
Amusement, gambling, and recreation	**713**	1
Monetary authorities - central bank; Credit intermediation and related activities; Funds, trusts, & other financial vehicles	**521-522, 525**	1
Scenic and sightseeing transportation; Support activities for transportation	**487-488**	1
Professional, scientific, and technical services	**54**	1
Retail trade	**44-45**	2
Plastics and rubber product manufacturing	**326**	2
Beverage and tobacco product manufacturing	**312**	2
Personal and laundry services	**812**	3
Primary metal manufacturing	**331**	4
Computer and electronic product manufacturing	**334**	4
Oil and gas extraction	**211**	6
Petroleum and coal products manufacturing	**324**	6
Fabricated metal product manufacturing	**332**	6
Utilities	**22**	7
Food manufacturing	**311**	8
Chemical manufacturing	**325**	8
Other transportation equipment manufacturing	**3364-3369**	8
Pipeline transportation	**486**	9
Textile mills; Textile product mills	**313-314**	9
Paper manufacturing	**322**	10
Total		**103**

Small Businesses

SCAQMD defines a "small business" in Rule 102, for purposes of fees, as one which employs 10 or fewer persons and which earns less than $500,000 in gross annual receipts. SCAQMD also defines "small business" for the purpose of qualifying for access to services from SCAQMD's Small Business Assistance Office as a business with an annual receipt of $5 million or less, or with 100 or fewer employees. In addition to SCAQMDs definition of a small business, the federal Clean Air Act Amendments (CAAA) of 1990 and the federal Small Business Administration (SBA) also provide definitions of a small business.

The California Health and Safety Code § 42323 classifies a business as a "small business stationary source" if it: (1) is owned or operated by a person who employs 100 or fewer individuals, (2) is a small business as defined under the federal Small Business Act (15 U.S.C. Sec. 631, et seq.), and (3) emits less than 10 tons per year of any single pollutant and less than 20 tons per year of all pollutants. The SBA definitions of small businesses vary by six-digit North American Industrial Classification System (NAICS) codes. In general terms, a small business must have no more than 500 employees for most manufacturing industries, and no more than $7 million in average annual receipts for most nonmanufacturing industries.[4] A business with fewer than 500 employees is considered a small business by SBA.

Information on sales and employees for the 103 affected facilities were available in the 2018 Dun and Bradstreet Enterprise Database. Under SCAQMD's stringent definition of small business, there are 18 small businesses affected by the PAR 1146 series. There are 69 small businesses under the small business definition for the purpose of qualifying for access to services from SCAQMD's Small Business Assistance Office. Using the SBA definition of small business, 95 of the facilities are considered small businesses. Under the California Health and Safety Code § 42323 definition of small business, 40 of the facilities are classified as small businesses.

COMPLIANCE COST

The main requirements of the PAR 1146 series that have cost impacts for affected facilities would include one-time costs and annual recurring costs. The one-time costs would include capital and installation of SCRs, ULNBs, and one-time permit modifications. Annual recurring cost estimates include annual operating and maintenance (O&M) costs of SCRs, catalysts replacement, additional electricity, and ammonia usage.

The average annual cost of the PAR 1146 series is estimated at $5.6 to $6.8 million between 2020 and 2045 across all groups in the PAR 1146 series. SCR capital and recurring costs are estimated at $2.7 to $3.2 million (annualized capital and installation costs plus recurring costs of O&M, electricity, ammonia and catalyst, and monitoring and annual permit renewal) across facilities in PAR 1146 Group I and II. ULNB installations have an estimated annual compliance cost of $2.7 to $3.5 million. PAR 1146 Group II incurs the majority of the compliance cost with $2.4 to $2.9 million or 43% in both low and high cost estimates. The average annual compliance costs of PAR

[4] The latest SBA definition of small businesses by industry can be found at http://www.sba.gov/content/table-small-business-size-standards.

1146.1 is estimated at $79,000 to $95,000 and that of PAR 1146.2 is estimated at $2.0 to $2.6 million.

The majority of the overall annual compliance costs is expected to be incurred by the food and beverage sector (13%), textile product mills (12%), pipeline transportation by (11%), paper manufacturing (10%), utility sector (8%), air craft and transportation manufacturing (7%), and oil and gas extraction (6%).

Staff has used the following sources to estimate costs of capital, installation, operating and maintenance of SCRs and ULNBs:

1) Final Staff Report for Proposed Amended Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, September 5, 2008,
2) Final Staff Report for Proposed Amended Rule 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, September 5, 2008
3) Final Socioeconomic Report for Proposed Amended Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, September 5, 2008,
4) Final Staff Report to Proposed Amended Rule 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters May 5, 2006.
5) Vendors cost estimates[5]

PAR 1146

Under PAR 1146, it was assumed that 32 facilities would meet the NOx limits by SCR retrofits for 55 units.[6] The average capital cost of a SCR unit is estimated at $1.4 million and $565,000 (including installation and permitting) for SCRs in Group I and Group II, respectively. Each SCR unit is assumed to last for 25 years. One-time permitting costs are estimated at $8,951 and $8,368 for Group I and Group II SCRs, respectively. Additional annual costs of PAR 1146 would include incremental operating and maintenance, catalyst replacement (every nine years), incremental electricity (at $0.13 per Kw/hr), and ammonia usage for the applicable SCR units based on 50% annual capacity and 8,760 hours of annual operation. Monitoring costs in the first year require quarterly ammonia testing for units down to 20 mmbtu/hr, and then annually after the first year. Annual permit renewal costs are estimated at $1,826 for SCRs in both Group I and Group II. SCR units have an estimated recurring cost of $86,000 and $25,000 (including savings from FGR) from Group I and Group II, respectively.

[5] The following nine vendors and manufacturers (in alphabetical order) were contacted requesting cost information for ultra-low NOx burners and SCR systems: Alzeta, California Boiler, Heat Transfer Solutions, McGill AirClean, McKenna Boiler, Nationwide Boiler, Parker Boiler, RF MacDonald, Superior Boiler. The cost information used in this analysis was based on the cost estimates provided by five out of the nine vendors with responses.

[6] For the cost and job impacts analysis herein, staff used the initial conservative assumption of 55 SCR units by 32 facilities.

Under PAR 1146, it was also assumed that 67 units among 36 facilities would meet the NOx limits by ULNBs for Group III natural gas units. According to a recent vendors' cost estimate, the average capital and installation costs of retrofitting boilers with ULNBs are estimated at $134,000 per unit (including installation and initial permitting).[7] Each burner is assumed to last for 15 years. PAR 1146 would require the affected owners of Group III units to apply for permit modifications and pay a one-time permit application fee of $5,641.

The total average annual cost of PAR 1146 is estimated at $3.4 to $4.1 million across all affected facilities.

PAR 1146.1

Under PAR 1146.1, it was assumed that ten affected facilities would meet the NOx limits by ULNBs for 19 units. According to a recent vendors' cost estimate, the average capital and installation costs of retrofitting boilers with ULNBs is estimated at $61,000 (including installation) per unit. Each burner is assumed to last for 15 years. In addition, PAR 1146.1 would require the owners of the affected units to apply for permit modifications and pay a one-time permit application fee of $3,567. Annual permit renewal costs are unchanged, and therefore no additional recurring permit costs were assumed.

The annualized total cost of PAR 1146.1 is estimated at $78,000 to $94,000.

PAR 1146.2

Rule 1146.2 applies to large water heaters and small boilers and process heaters with a rated heat input capacity up to and including 2,000,000 BTUs per hour. There are both manufacturer and end-user requirements contained in the rule.

Rule 1146.2 units are exempt from SCAQMD permitting requirements per Rule 219 (Equipment Not Requiring a Written Permit Pursuant to Regulation II). Only a small portion of the Rule 1146.2 units are permitted due to unique circumstances, such as operators obtaining a lower emission factor for calculating the unit's potential to emit (PTE). Based on SCAQMD permit database, four of the permitted Rule 1146.2 RECLAIM units would be required to meet the NOx limits.

Due to the lack of information available on the universe of affected sources under PAR 1146.2, and to account for the potential cost impacts of those affected facilities with non-permitted units,

[7] Cost estimates for one RECLAIM facility using a specialty boiler fired on natural gas and process gas, categorized in PAR 1146 Group III, were received after the release of the November 6th Draft Socioeconomic Impact Assessment for the PAR 1146 series. Due to the short timeframe of the information provided, the cost estimates could not be verified through solicitations of costs from other vendors, nor was it possible to incorporate the estimates into a comprehensive cost analysis. However, staff conducted a sensitivity analysis accepting the provided estimates at face value, where the single facility's total cost for burner replacements totaled about $1.3 million, including $200,000 for tuning the existing system, and about $250,000 for contingency. The capital cost of equipment and installation was estimated at $500,000, and is about 70% higher than the high end of capital cost estimates in the Group III provided in the staff report. The cost-effectiveness estimated for PAR 1146 Group III changed from $25,000 per ton of NOx reduced to $28,000 per ton. Staff concludes that despite accounting for the cost of the specialized equipment that is not typical of other facilities in that category, it was nonetheless cost-effective across the PAR 1146 Group III category.

staff has included additional ULNB costs for a total of 850 units (estimated based on the equipment data provided from facility responses of initial determination notifications as of April 2018) to account for the non-permitted units that could be impacted by the PAR 1146.2. The average capital and installation cost of retrofitting a boiler with a ULNBs is estimated at $32,100 (including installation and permitting). Each burner is assumed to last for 15 years. No additional annual operating and maintenance costs were assumed. The total average annual cost of PAR 1146.2 is estimated at $2.0 to $2.6 million.

As presented in Table 2, PAR 1146 and PAR 1146.2 contribute to about $4.1 million (60%) and $2.6 million (38%) of the total annual costs, respectively.

Thermal Fluid Heaters

For the thermal fluid heaters category in PARs 1146 and 1146.1, which requires compliance by 2021 to 2023 for RECLAIM facilities, depending on the applicable compliance schedule in PR 1100, a one-time capital cost of $22,500 (2MMBtu/hr unit), $31,000 (5 MMBtu/hr unit), and $52,000 (10 MMBtu/hr unit) was assumed. Installation costs were estimated at $13,500, $16,500, and $32,500, respectively, and permitting costs were estimated at $3,567, $5,641, and $5,641, respectively. The total average annual compliance costs of thermal fluid heaters at RECLAIM facilities is estimated at $11,000 to $13,000.

Deferred Compliance for Burner Replacement in PAR 1146 series

Beyond the group of facilities subject to PAR 1146 for immediate equipment retrofits, there are an additional 95 units that will be subject to PAR 1146 and 21 units that will be subject to 1146.1 upon burner replacement or 15 years after rule adoption, whichever comes first. It cannot be known when the burner replacement for each unit will occur, but staff has conservatively estimated burner replacement costs by assuming the same 3 year implementation schedule (starting in 2021, 75% of costs in first year, 20% in second, and 5% in the final year) as the group scheduled for immediate compliance.

The units in this category are spread across PAR 1146 Group II, Group III, 1146.1 and Thermal Fluid Heaters. Capital costs for burner replacement of $21,000 for PAR 1146 Group II, $10,000 for PAR 1146 Group III and Thermal Fluid Heaters, and $3,000 for PAR 1146.1. A one-time permit modification fee of $8,368 for PAR 1146 Group II, $5,641 for PAR 1146 Group III and Thermal Fluid Heaters, and $3,567 for 1146.1. All cost estimates are in 2018 dollars. It is expected that the majority of this group will undergo a burner replacement later in the 15 year period, however, staff conservatively assumed an implementation schedule beginning in 2021.

PAR 1100

PR 1100 is an administrative rule and does not impose additional costs to affected facilities, as such, no additional costs or socioeconomic impacts were assumed here.

Table 2: Total and Average Annual Cost of the PAR 1146 Series by Types of Amendments

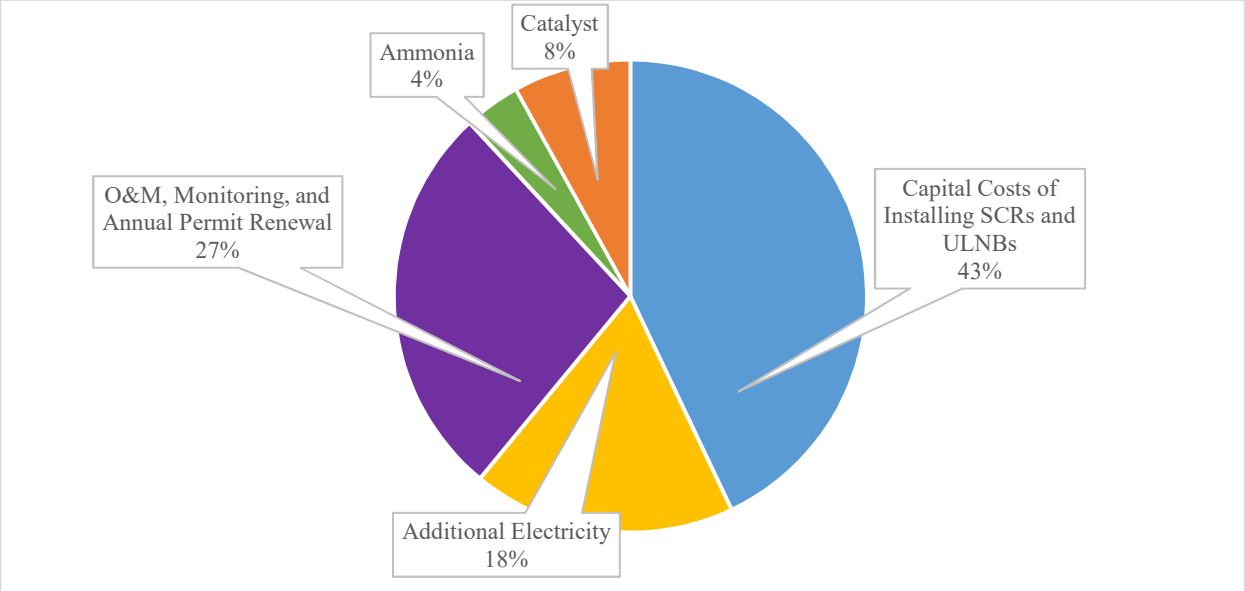
	Present Worth Value (2020)		Annual Average (2020-2045)	
Proposed Amendments	**1% Discount Rate**	**4% Discount Rate**	**1% Real Interest Rate**	**4% Real Interest Rate**
Rule 1146-Group I	$14,810,000	$10,781,000	$404,000	$468,000
Rule 1146-Group II	$72,261,000	$57,503,000	$2,408,000	$2,858,000
Rule 1146-Group III	$9,280,000	$8,431,000	$614,000	$743,000
Total PAR 1146	**$100,351,000**	**$76,715,000**	**$3,426,000**	**$4,069,000**
Rule 1146.1	$1,194,000	$1,085,000	$79,000	$96,000
Rule 1146.2	$28,313,000	$28,305,000	$2,041,000	$2,546,000
Thermal Fluid Heaters	$460,000	$418,000	$30,000	$37,000
Total	**$128,737,000**	**$105,081,000**	**$5,690,000**	**$6,874,000**

Table 3 and Figure 2 represent the distribution of the overall costs by selected cost categories. The majority of costs of the PAR 1146 series ($4.2 to $5.4 million or 74% to 78%, respectively) stem from the installation of SCRs and ULNBs. The additional costs of electricity are estimated at $0.7 million annually, and O&M, monitoring, and annual permit renewal are a combined $0.4 million annually. Ammonia and catalyst replacement are estimated at about $0.3 Million and $0.2 million, respectively.

Table 3: Total and Average Annual Cost of the PAR 1146 Series by Cost Categories

	Present Worth Value (2020)		Annual Average (2020-2045)	
Equipment Type	**1% Discount Rate**	**4% Discount Rate**	**1% Real Interest Rate**	**4% Real Interest Rate**
SCR	$33,056,348	$30,019,331	$1,375,727	$1,883,480
FGR Savings	-$7,473,845	-$4,916,605	-$181,404	-$181,404
ULNB	$39,645,151	$38,599,526	$2,790,908	$3,453,189
Electricity	$28,491,435	$18,742,847	$693,461	$693,461
O&M	$6,032,763	$3,968,602	$148,471	$148,471
Ammonia	$12,709,500	$8,360,836	$309,341	$309,341
Catalyst	$7,643,075	$5,027,932	$186,028	$186,028
Monitoring (including NH_3 testing)	$6,598,984	$4,341,085	$164,235	$164,235
Annual Permit Renewal	$3,614,924	$2,378,047	$89,968	$89,968
Total	**$130,318,000**	**$106,522,000**	**$5,577,000**	**$6,747,000**

Figure 2: Annual Estimated Costs of the PAR 1146 Series by Cost Categories



Cost Impacts from Non-RECLAIM Facilities

The proposed amendments to Rule 1146 and Rule 1146.1 will establish NOx emission limits for boilers and heaters at RECLAIM, former RECLAIM, and non-RECLAIM facilities. PARs 1146 and 1146.1 establish NOx emission limits representative of current BARCT requirements. Of the revised NOx emission limits, only the proposed 7 ppm NOx emission limit for Rule 1146 Group II and Group III and Rule 1146.1 fire-tube boilers and the 12 ppm NOx emission limit for thermal fluid heaters will impact non-RECLAIM facilities. However, the non-RECLAIM facilities, with the exception of those with thermal fluid heaters currently complying with a NOx emission limit greater than 20 ppm, would not need to demonstrate compliance with the lower emission limit until the unit's burner replacement or 15 years after rule amendment, whichever occurs earlier.

As of November 2018, there are 824 non-RECLAIM facilities that operate around 1,075 non-RECLAIM units subject to PAR 1146 and 732 non-RECLAIM units subject to PAR 1146.1 operating in the District (a total of 1,807). The proposed 7 ppm NOx emissions (which represents BARCT requirement) for Group II, Group III, and Rule 1146.1 units only applies to fire-tube boilers. Units designated as Group I or designated as non-fire-tubes will not be affected by the proposed amendments since the NOx emission limits for this category is not changing.

While the type of affected fire-tube boilers cannot be quantified due to the lack of distinction in equipment category designations, it is assumed that the fraction of fire-tube units in RECLAIM is the same as that in non-RECLAIM, which is approximately 40% of the universe. Table 4 presents the total units and potential cost impacts for each boiler category that will need to meet the lower emission limit upon burner replacement 15 years from rule adoption. In total, there are 722 units that are estimated to be impacted by PAR 1146 and 1146.1 within the non-RECLAIM universe. The total annualized cost of compliance for these fire-tube units is estimated at $861,751.

Table 4: Potential Cost impacts on Non-RECLAIM Units

Non-RECLAIM Group	Total # of Units	Estimated # of Fire-Tubes Units	One-Time Capital Cost of ULNB	One-time Permit Cost	Total Annualized Cost
Rule 1146 Group I	4	0[+]	----	----	----
Rule 1146 Group II	171	69	$21,000	$8,368	$182,256
Rule 1146 Group III	900	360	$10,000	$5,641	$506,437
Rule 1146.1	732	293	$3,000	$3,567	$173,058
Total	**1,807**	**722**			**$861,751**

*Rounded up to the nearest 1
[+]Group I units are not affected by proposed 7 ppm BARCT
**ULNB and Permitting costs were annualized over 15 years with four percent real interest rate.

Because there is inadequate data to identify the type, location, and the number of fire-tube units at these facilities, a breakdown of costs by industry type could not be determined, which is a key input for the regional macroeconomic model for a socioeconomic impacts analysis. Therefore, such an analysis could not be done for the PAR 1146 series.

PAR 1146 series would also affect thermal fluid heaters within the non-RECLAIM universe. It is not feasible to quantify the total number of affected units that are thermal fluid heaters within the non-RECLAIM universe. This is mainly due to the lack of distinction in their permits that set them apart from other process heaters. However, it is reasonable to assume the same fraction of thermal fluid heaters in RECLAIM applies to the non-RECLAIM universe. The total fraction of RECLAIM thermal fluid heaters makes up about 4.2% of the total universe. Since thermal fluid heaters are not limited in total heat input, the same fraction is applied to the total universe of 1,807 units which estimated at 76 total thermal fluid heaters in the non-RECLAIM universe. The capital cost for a non-RECLAIM retrofit is estimated at $50,000 for units reduced from 30 ppm to 12 ppm with a compliance date of January 1, 2022, and is estimated at $10,000 for units reduced from 20 ppm to 12 ppm upon burner replacement or 15 years from rule adoption, whichever occurs earlier. Based on the staff estimates, only a small fraction of the affected 76 thermal fluid heaters would be required to meet 12 ppm by 2022. As such, the cost impacts from this category is not expected to be substantial.

Cost-Effectiveness

As presented in Table 5, the cost-effectiveness of the PAR 1146 series is estimated to range from $7,000 to $41,000 per ton of NOx reduced by rule/group based on the Discount Cash Flow (DCF) method. DCF utilizes the present value, or a stream of all present and future costs discounted to and summed up in the same initial year, and cost-effectiveness is calculated as a function of present value costs versus emissions reduced during the life of the equipment. The cost-effectiveness of the overall PAR 1146 series is estimated at $26,500.

Table 5: Cost-Effectiveness[8]

Proposed Amendment	DCF ($/ton)
Rule 1146-Group I	$26,000
Rule 1146-Group II	$41,000
Rule 1146-Group III	$25,000
Rule 1146.1	$33,000
Rule 1146.2	$7,000
Average	**$26,500**

Table 6 presents the total and average annual compliance costs of the PAR 1146 series by industry types. The majority of the overall annual compliance costs is expected to be incurred by the beverage manufacturing sector (13%), textile product mills (12%), pipeline transportation (11%), paper manufacturing (10%), utility sector (8%), and aerospace products (7%).

[8] The cost-effectiveness values presented in this analysis differ slightly from that of the SCAQMD Staff report for PAR 1146. The analysis used in this Draft SIA assumes a staggered implementation costs from 2020 to 2023 where 75% of capital costs are assumed in the first year, 20% in the second year, and 5% in the final year of implementation. Cost effectiveness calculations will differ as a function of using DCF costs rather than static costs in the numerator of the equation: *Cost Effectiveness = (cost)/(annual emission reduction potential*years of life of equipment)*

Table 6: Projected Total and Average Annual Compliance Costs by Industry for Affected Facilities (2018 Dollars)

		Present Worth Value		Annual Average (2020-2045)	
Industry that Typically Uses the Equipment	**NAICS Codes**	**1% Discount Rate**	**4% Discount Rate**	**1% Real Interest Rate**	**4% Real Interest Rate**
Oil and gas extraction	211	$5,775,000	$5,003,000	$324,000	$393,000
Electric power generation, transmission, and distribution	2211	$6,812,000	$5,536,000	$288,000	$348,000
Natural gas distribution	2212	$400,000	$378,000	$27,000	$34,000
Water, sewage, and other systems	2213	$3,406,000	$2,768,000	$144,000	$174,000
Clay product and refractory manufacturing	3271	$199,000	$187,000	$14,000	$17,000
Steel product manufacturing from purchased steel	3312	$47,000	$44,000	$3,000	$4,000
Alumina and aluminum production and processing	3313	$397,000	$373,000	$27,000	$33,000
Nonferrous metal (except aluminum) production and processing	3314	$23,000	$22,000	$2,000	$2,000
Forging and stamping	3321	$2,529,000	$1,940,000	$75,000	$91,000
Boiler, tank, and shipping container manufacturing	3324	$2,532,000	$1,943,000	$75,000	$91,000
Coating, engraving, heat treating, and allied activities	3328	$222,000	$209,000	$15,000	$19,000
Other fabricated metal product manufacturing	3329	$3,893,000	$3,227,000	$177,000	$215,000
Communications equipment manufacturing	3342	$39,000	$37,000	$3,000	$3,000
Semiconductor and other electronic component manufacturing	3344	$5,167,000	$4,428,000	$274,000	$332,000
Aerospace product and parts manufacturing	3364	$6,987,000	$6,135,000	$388,000	$473,000
Other miscellaneous manufacturing	3399	$397,000	$373,000	$27,000	$33,000
Animal food manufacturing	3111	$23,000	$22,000	$2,000	$2,000
Dairy product manufacturing	3115	$2,529,000	$1,940,000	$75,000	$91,000
Animal slaughtering and processing	3116	$2,573,000	$1,981,000	$78,000	$94,000
Bakeries and tortilla manufacturing	3118	$596,000	$560,000	$41,000	$50,000
Other food manufacturing	3119	$44,000	$41,000	$3,000	$4,000
Beverage manufacturing	3121	$16,999,000	$13,646,000	$709,000	$848,000
Textile mills and textile product mills	313, 314	$16,916,000	$13,727,000	$695,000	$841,000
Pulp, paper, and paperboard mills	3221	$15,234,000	$11,968,000	$544,000	$654,000
Converted paper product manufacturing	3222	$2,532,000	$1,943,000	$75,000	$91,000
Petroleum and coal products manufacturing	324	$897,000	$843,000	$61,000	$75,000
Basic chemical manufacturing	3251	$5,394,000	$4,195,000	$173,000	$210,000
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	3252	$397,000	$373,000	$27,000	$33,000
Pharmaceutical and medicine manufacturing	3254	$2,573,000	$1,981,000	$78,000	$94,000
Plastics product manufacturing	3261	$4,393,000	$3,700,000	$221,000	$267,000
Retail trade	44-45	$794,000	$747,000	$54,000	$66,000
Pipeline transportation	486	$14,057,000	$11,478,000	$597,000	$723,000
Monetary authorities, credit intermediation, and related activities	521, 522	$90,000	$85,000	$6,000	$8,000
Real estate	531	$47,000	$44,000	$3,000	$4,000
Computer systems design and related services	5415	$397,000	$373,000	$27,000	$33,000
Office administrative services; Facilities support services	5611, 5612	$743,000	$698,000	$51,000	$62,000
Amusement, gambling, and recreation industries	713	$1,143,000	$1,075,000	$78,000	$95,000
Accommodation	721	$20,000	$18,000	$1,000	$2,000
Dry-cleaning and laundry services	8123	$3,104,000	$2,481,000	$114,000	$139,000
Total		**$130,320,000**	**$106,522,000**	**$5,576,000**	**$6,748,000**

JOBS AND OTHER SOCIOECONOMIC IMPACTS

The REMI model (PI+ v2.2) was used to assess the total socioeconomic impacts of a policy change (i.e., the proposed rule). The model links the economic activities in the counties of Los Angeles, Orange, Riverside, and San Bernardino, and for each county, it is comprised of five interrelated blocks: (1) output and demand, (2) labor and capital, (3) population and labor force, (4) wages, prices and costs, and (5) market shares.[9]

The assessment herein is performed relative to a baseline ("business as usual") where the proposed amendments would not be implemented. The proposed amendments would create a policy scenario under which the affected facilities would incur an average annual compliance costs totaling $5.6 to $6.8 million to comply with other requirements of the PAR 1146 series. Direct effects of the proposed amendments have to be estimated and used as inputs to the REMI model in order for the model to assess secondary and induced impacts for all the actors in the four-county economy on an annual basis and across a user-defined horizon (2020 to 2045). Direct effects of the proposed amendments include additional costs to the affected entities and additional sales, by local vendors, of equipment, devices, or services that would meet the proposed requirements.

While compliance expenditures may increase the cost of doing business for affected facilities, the purchase of additional SCRs and ULNBs combined with spending on operating and maintenance, may increase sales in other sectors. Table 7 lists the industry sectors modeled in REMI that would either incur cost or benefit from the compliance expenditures.[10]

[9] Within each county, producers are made up of 156 private non-farm industries, three government sectors, and a farm sector. Trade flows are captured between sectors as well as across the four counties and the rest of U.S. Market shares of industries are dependent upon their product prices, access to production inputs, and local infrastructure. The demographic/migration component has 160 ages/gender/race/ethnicity cohorts and captures population changes in births, deaths, and migration. (For details, please refer to REMI online documentation at http://www.remi.com/products/pi.)

[10] It is worth mentioning that improved public health due to reduced air pollution emissions may also result in a positive effect on worker productivity and other economic factors; however, public health benefit assessment requires the modeling of air quality improvements. Therefore, it is conducted for AQMPs and not for individual rules or rule amendments.

Table 7: Industries Incurring *vs.* Benefitting from Compliance Costs/Spending

Source of Compliance Costs	REMI Industries Incurring Compliance Costs (3 or 4-digit NAICS)	REMI Industries Benefitting from Compliance Spending (NAICS)
SCR and Ultra-Low NOx Burners	211 Oil and gas extraction 2211 Electric power generation, transmission, and distribution 2212 Natural gas distribution 2213 Water, sewage, and other systems 3271 Clay product and refractory manufacturing 3312 Steel product manufacturing from purchased steel 3313 Alumina and aluminum production and processing 3314 Nonferrous metal (except aluminum) production and processing 3321 Forging and stamping 3324 Boiler, tank, and shipping container manufacturing 3328 Coating, engraving, heat treating, and allied activities 3329 Other fabricated metal product manufacturing 3342 Communications equipment manufacturing 3344 Semiconductor and other electronic component manufacturing 3364 Aerospace product and parts manufacturing 3399 Other miscellaneous manufacturing 3111 Animal food manufacturing 3115 Dairy product manufacturing 3116 Animal slaughtering and processing 3118 Bakeries and tortilla manufacturing 3119 Other food manufacturing 3121 Beverage manufacturing 313, 314 Textile mills and textile product mills 3221 Pulp, paper, and paperboard mills 3222 Converted paper product manufacturing 324 Petroleum and coal products manufacturing 3251 Basic chemical manufacturing 3252 Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing 3254 Pharmaceutical and medicine manufacturing 3261 Plastics product manufacturing 44-45 Retail trade 486 Pipeline transportation 521, 522 Monetary authorities, credit intermediation, and related activities 531 Real estate 5415 Computer systems design and related services 5611, 5612 Office administrative services; Facilities support services 713 Amusement, gambling, and recreation industries 721 Accommodation 8123 Dry-cleaning and laundry services	*One-time-Capital:* Machinery Manufacturing (333414)
Catalyst		Machinery Manufacturing
SCR (Maintenance)		*Recurring Cost:* Professional, Scientific, and Technical Services (541)
Permit Modifications/Permit Renewal		*One-time-Capital:* Public Administration (92)[11]
Monitoring		*Recurring Cost:* Professional, Scientific, and Technical Services (541)
Utilities (Electricity)		*Recurring Cost:* Utilities (221)
Ammonia		*Recurring Cost:* Chemical Manufacturing (325)

[11] Instead of using the default "local government spending" policy variable in REMI, staff elected to use a "custom local government spending" policy variable that it considers to more accurately reflect the SCAQMD spending portfolio. This custom policy variable has a lower proportion of local government spending going into the construction industry and proportionately allocates the difference to local government and professional services sectors. The simulation using this custom policy variable results in a prediction of a lower net job gain than would have been found with the default policy variable. This follows the approach taken in the Socioeconomic Impact Assessment of the PAR Regulation III Fees from June 2017.

As discussed earlier, the total average (2020 to 2045) annual compliance costs for affected facilities by the PAR 1146 series was estimated to range from $5.6 to $6.8 million per year, depending on the real interest rate assumed (1% to 4%).

PAR 1146 series is expected to result in approximately 57 to 72 jobs forgone annually, on average between 2020 and 2045, depending on the real interest rate assumed (1% to 4%). The projected jobs loss impacts represent about 0.0021 percent of the total employment in the four-county region.

As presented in Table 8, in 2021, 162 additional jobs could be created in the overall economy. This is mainly due to additional purchase and spending on installation of SCRs and ULNBs provided by the industries of machinery industry, and construction, and professional and technical services sectors. As the cost of doing business kicks in and is maintained, and the positive impact of spending gradually subsides, jobs forgone are expected to begin.

Although the manufacturing sector (NAICS 31-33) would bear the majority of the estimated total compliance costs of the PAR 1146 series, the industry job impact is projected to be relatively small (annual average of 16 jobs foregone between 2020 and 2045). This is because other businesses in the manufacturing sector, specifically in the machinery manufacturing and fabricated metals industry, are expected to benefit from the increased sale of various types of control equipment (SCRs and ULNBs), thus offsetting the direct effect of compliance costs incurred by other manufacturing facilities. In earlier years, the sector of machinery, construction and professional and technical services (NAICS 541) are projected to gain jobs on an annual average from additional demand for equipment installation and maintenance made by the affected facilities.

The remainder of the projected reduction in employment would be across all major sectors of the economy from secondary and induced impacts of the proposed amendments. In earlier years positive job impacts from the expenditures made by the affected facilities would more than offset the jobs forgone from the additional cost of doing business. Jobs foregone in the later years are due to additional costs of doing business by affected facilities.

The sectors of pipeline transportation (486), textile mills and products (NAICS 313), transportation equipment (NAICS 336), food services (NAICS 311), are projected to incur portion of compliance costs and thus experience a minor share of jobs forgone. As the cost of doing business kicks in and is maintained, and positive impact of spending gradually subsides, jobs foregone are expected to begin. The reduction in disposable income would dampen the demand for goods and services in the local economy, thus resulting in a small number of jobs forgone projected in sectors such as construction (NAICS 23), retail trade (NAICS 44-45), wholesale (NAICS 42), and accommodation and food services (NAICS 72).

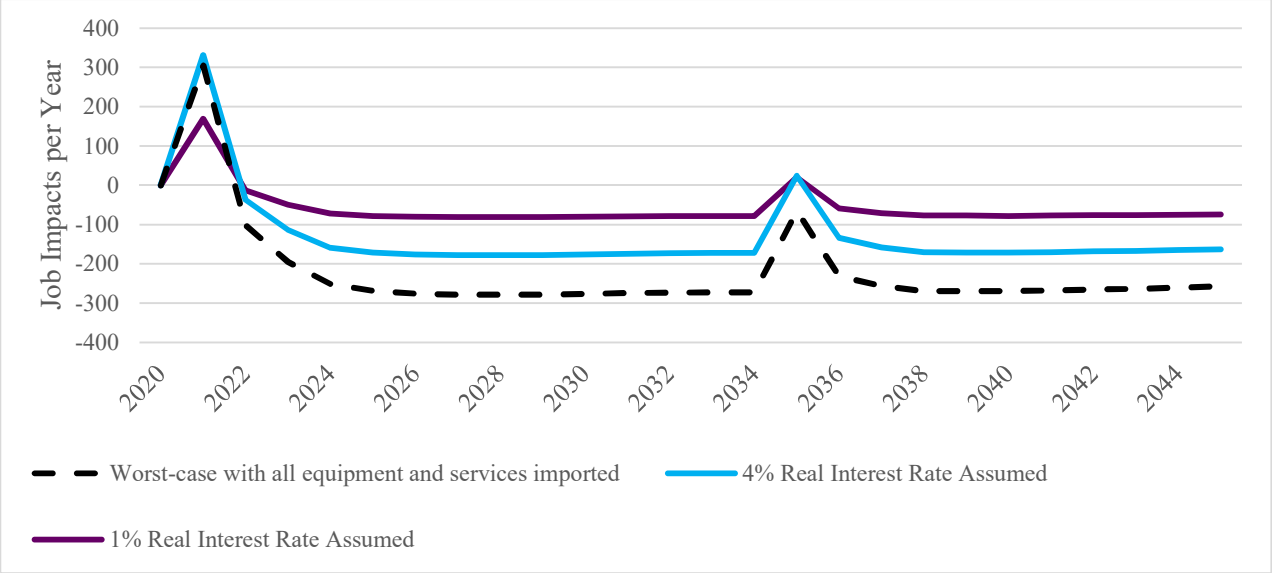
Table 8: Job Impacts of PAR 1146 Series

Industries (NAICS)	2020*	2021	2025	2035	2045	Average Annual Jobs (2020-2045)	Average Annual Baseline Jobs (2020-2045)	% Change from Baseline Jobs
Oil and gas extraction (211)	0	0	-1	-1	-1	-1	23,173	-0.0074%
Water, sewage, and other systems (2213)	0	0	0	-1	-1	0	1,786	-0.0023%
Construction (23)	0	58	-16	26	-4	-3	473,605	-0.0009%
Forging and stamping (3321)	0	0	0	0	0	0	5,690	-0.0018%
Boiler, tank, and shipping container manufacturing (3324)	0	0	0	0	0	0	2,732	-0.0032%
Coating, engraving, heat treating, and allied activities (3328)	0	0	0	0	0	0	10,652	-0.0004%
Other fabricated metal product manufacturing (3329)	0	0	-1	-1	-1	-1	14,134	-0.0008%
Aerospace product and parts manufacturing (3364)	0	0	0	0	0	0	47,115	-0.0011%
Animal food manufacturing (3111)	0	0	0	0	0	0	4,318	-0.0013%
Bakeries and tortilla manufacturing (3118)	0	0	0	0	0	0	17,926	-0.0014%
Other food manufacturing (3119)	0	0	0	0	0	0	11,168	-0.0029%
Beverage manufacturing (3121)	0	0	0	0	-1	0	12,733	-0.0006%
Tobacco manufacturing (3122)	0	0	0	0	0	0	23	-0.0015%
Textile mills and textile product mills (313, 314)	0	-2	-8	-12	-11	-10	13,518	-0.0009%
Apparel, leather and allied product manufacturing (315, 316)	0	0	-1	-1	-1	-1	48,486	-0.0038%
Pulp, paper, and paperboard mills (3221)	0	0	0	0	0	0	388	-0.0005%
Converted paper product manufacturing (3222)	0	0	0	0	0	0	10,571	-0.0711%
Petroleum and coal products manufacturing (324)	0	0	0	0	0	0	4,051	-0.0469%
Basic chemical manufacturing (3251)	0	0	0	0	0	0	1,263	-0.0041%
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing (3252)	0	0	0	0	0	0	1,108	-0.0007%
Pharmaceutical and medicine manufacturing (3254)	0	0	0	0	0	0	13,745	-0.0029%
Wholesale trade (42)	0	6	-4	0	-3	-3	480,708	-0.0006%
Retail trade (44-45)	0	7	-11	-4	-10	-9	987,522	-0.0016%
Pipeline transportation (486)	0	0	-1	-1	-1	-1	906	-0.0008%
Monetary authorities, credit intermediation, and related activities (521, 522)	0	2	-1	0	-1	-1	142,004	-0.0005%
Real estate (531)	0	4	-2	-1	-3	-2	575,156	-0.0003%
Accommodation (721)	0	1	-1	0	-1	-1	104,874	0.0000%
Food services and drinking places (722)	0	5	-4	-2	-6	-4	729,280	-0.0003%
State and Local Government (92)	0	13	-4	1	-6	-4	909,568	-0.0004%
Total	**0**	**162**	**-93**	**4**	**-89**	**-72**	**11,260,000**	**-0.0021%**

*There are no job impacts in 2020 since the PAR 1146 series implementation dates start from 2021. However, one of the CEQA Alternatives (Alternative C) assumed that affected facilities would install SCRs and ULNBs in 2020. For the purpose of consistency in comparing the CEQA Alternatives with the proposed amendments, average annual costs and associated job impacts were presented from 2020 to 2045.

Figure 3 presents a trend of job gain and losses over the 2020 to 2045 time frame. The upticks in positive jobs in 2021 and 2036 are due to additional spending on installation of ULNBs replacements. In addition, staff has analyzed an alternative scenario (worst case) where the affected facilities would not purchase any control or service from providers within the Basin. This scenario would result in an average of 68 jobs forgone annually.

Figure 3: Projected Regional Job Impact, 2020-2045



Competitiveness

The additional cost brought on by the PAR 1146 series would increase the cost of services rendered by the affected industries in the region. The magnitude of the impact depends on the size and diversification of, and infrastructure in a local economy as well as interactions among industries. A large, diversified, and resourceful economy would absorb the impact described above with relative ease.

Changes in production/service costs would affect prices of goods produced locally. The relative delivered price of a good is based on its production cost and the transportation cost of delivering the good to where it is consumed or used. The average price of a good at the place of use reflects prices of the good produced locally and imported elsewhere.

It is projected that the manufacturing sector, where most of the affected facilities belong, would experience a rise in its relative cost of production and its delivered price by 0.001% in 2035, respectively. While these changes are relatively small, it should be noted that the delivered price change is a change in the index of all prices in the manufacturing sector. Delivered prices that a facility may charge for specific goods or services may increase at a greater rate than this, allowing incurred cost to passed through to downstream industries and end-users.

CEQA ALTERNATIVES

There are five CEQA alternatives associated with the proposed amendments to the PAR 1146 series. Alternative A, the no project alternative, means that the current version of Rules 1146, 1146.1, and 1146.2 would remain in effect. Under Alternative B (less stringent, starting at 2022), the compliance deadline for meeting the NOx emissions limits would be extended by one year. Under Alternative C (more stringent), the NOx emission limits would remain the same as the proposed project, but facilities would need to meet 100 percent compliance by January 1, 2021.

Under Alternative D, the Group I units would need to meet 9 ppm or (0.011 lb/MMBtu) instead of 5 ppm (0.0062 lb/MMBtu) and as a result they are expected to meet the limits by ULNBs versus SCRs. Alternative D would also require PAR 1146 Group II units to meet 9 ppm (or 0.011 lb/MMBtu) instead of the proposed 5 ppm for Group II units with a NOx limit greater than 12 ppm or 7 ppm (or 0.00085 lb/MMBtu) for fire-tube boilers currently meeting a NOx limit less than or equal to 12 ppm. PAR 1146 Group III and 1146.1 units would be required to meet 9 ppm (or 0.011 lb/MMBtu) instead of the proposed 7 ppm (or 0.00085 lb/MMBtu) for fire-tube boilers. The NOx emission limit for thermal fluid heaters would also remain at 30 ppm (or 0.037 lb/MMBtu) instead of 12 ppm (0.015 lb/MMBtu). With Alternative E, the provisions are the same as Alternative D for PAR 1146 Group II, III, 1146.1, and thermal fluid heaters, except for PAR 1146 Group I, which would be required to meet 5 ppm using SCR retrofits.

Average annual compliance costs for the CEQA alternatives range from $4.1 to $5.7 million between 2020 and 2045, as shown in Table 9. The cost-effectiveness of the PAR 1146 series and CEQA Alternatives range from $11,000 to $26,500 per ton of NOx reductions. Jobs forgone for the CEQA alternatives range from 39 to 63 between 2020 and 2045.

Alternative B and Alternative C have the same cost-effectiveness and both would achieve the same emission reductions. Even though Alternative C has later compliance dates the cost-effectiveness evaluation is time neutral. Alternative D has the lower average annual cost and jobs forgone than the proposed amendments because under this alternative no SCRs are required. Alternative E uses ULNB to achieve most of the NOx reductions, and PAR 1146 Group I uses SCRs for 3 units in this alternative. The cost savings that apply to the use of FGR mitigates the cost impact for the SCR facilities, and renders Alternative E as slightly more cost-effective compared with Alternative D.

Table 9: Cost and Job Impacts of CEQA Alternatives (in millions of dollars)

Alternatives	Average Annual (2020-2045)		
	Cost	**Cost-Effectiveness $/ton (NOx)**	**Jobs**
Proposed Amendments	$6,748,000	$26,500	-72
Alternative A—No Project	$0.00	N/A	N/A
Alternative B—Implementation in 2022	$4,118,000	$26,500	-56
Alternative C—100% implementation in 2021	$4,466,000	$26,500	-63
Alternative D—No SCRs, smaller NOx reductions using only ULNB	$5,028,000	$11,000	-48
Alternative E—Lower Limits compared to Alt. D, 3 SCRs Group I	$5,786,000	$11,000	-39

UPDATED COST IMPACTS ASSESSMENT FOR COMPLIANCE WITH RULE 2002

Potential Impacts for NOx RECLAIM Facilities Ready to Exit

Rule 2002(f)(10) prohibits a RECLAIM facility from selling any future compliance year RTCs upon receipt of a final determination notification that it is ready to exit the NOx RECLAIM program. If PAR 1146, 1146.1, and 1146.2 are adopted, 22 facilities are expected to receive an initial determination notification because, according to staff's evaluation, all of their permitted RECLAIM NOx source equipment will be subject to these rules once adopted.[12] Facilities that received initial determination notifications and meet the proposed criteria to exit, would not receive a final determination notification to exit RECLAIM until key elements such as NSR and permitting are resolved. However, these facilities may request to opt-out of RECLAIM before these key elements are resolved, upon meeting specific conditions specified in subdivision (g) of Rule 2001.

~~Final determination notifications will not be issued, however, until New Source Review (NSR) issues are resolved. In addition, staff has amended Rules 2001 and 2002 that will allow a facility to remain in RECLAIM to allow time for the SCAQMD to address NSR and permitting for the transition from RECLAIM to a command-and-control regulatory structure.~~

All 22 facilities were allocated NOx RTCs (no cost or fee when RTCs were allocated) at the outset of the NOx RECLAIM program. The initial allocations for the 22 facilities amounted to approximately 1.821 tons per day (TPD). Due to past adjustments including reductions in allocations or "shaves," and more importantly, the sale of these initial allocations as infinite-year block (IYB) RTCs to other NOx RECLAIM facilities and brokers/investors, the total NOx RTCs currently held by these 22 facilities is 0.174 TPD for compliance years 2019 and later.[13] At the same time, total NOx emissions from these same facilities have declined to 0.120 TPD in 2016.

If these 22 facilities receive final determination notifications in 2018, they will not be able to sell their NOx RTCs for compliance year 2019 and onwards. For the purpose of this analysis, it is assumed that none of the 22 facilities would acquire additional NOx RTCs or sell their current NOx RTC holdings of 0.174 TPD before receiving a final determination notification. However, it is foreseeable that at least some of these NOx RTC holdings may be sold or transferred before they are frozen due to receipt of final determination notifications. In addition, staff has committed to not issuing any final determination notifications until NSR issues are resolved. Lastly, as they pertain to SCAQMD, RTCs are not property rights. It is known to all market participants that purchasing RTCs beyond the current compliance year is accompanied by known investment risks that are embedded within the RECLAIM programs. The risk factors include, but may not be

[12] An earlier version of the PARs 1146, 1146.1 and 1146.2, and PR 1100 Draft Socioeconomic Impact Assessment considered the impact of 62 facilities potential exit from RECLAIM. These 62 facilities included 26 PAR 1146 series facilities and 36 facilities expected to receive an initial determination notification as a result of the adoption of PAR 2001 and PAR 2002. Four PAR 1146 facilities have been removed from the analysis due to facility shutdown. We have also excluded all 36 PAR 2001 and 2002 facilities from the analysis to focus only on the effects of the adoption of the PAR 1146 series.

[13] According to the NOx RTC holdings data as of July 31, 2018 and excluding any transactions that may have occurred after this date.

limited to, programmatic allocation shaves, potential RTC trade freezes, and the eventual sunset of either RECLAIM program.

Since there were no costs associated with the initially allocated NOx RTCs for a RECLAIM facility, the facilities would not incur financial losses as a result of complying with Rule 2002(f)(10) if their frozen future compliance year NOx RTC holdings are at or below their respective adjusted initial allocations. However, it was estimated that, out of the total 0.174 TPD of future compliance year NOx RTCs currently held by the 22 facilities, at least 0.021 TPD were acquired by some of the affected facilities in addition to their initial allocations, either through purchases with positive prices or transfers at no cost. If these facilities continue to stay in the NOx RECLAIM program and their NOx emissions remain between 5% above and below their 2016 levels,[14] then 0.056 - 0.017 TPD of these additionally acquired RTCs were estimated to be used for compliance purposes, with the remaining 0.004 - 0.015 TPD being potential surplus RTCs available for sale or transfer. Applying the most recent 12-month rolling average NOx RTC price for compliance year 2017 of $2,530 per ton,[15] the total value of all potential surplus RTCs would be approximately $3,700 - $13,900 in RECLAIM compliance year 2019 and all subsequent RECLAIM compliance years. These facilities can elect to transfer or sell these RTCs prior to receiving a final determination notification. If the facility is holding these RTCs at or after the issuance of a final determination notification they will not be able to sell, use, or transfer the RTCs.

In addition, 6 - 7 out of the 22 facilities are estimated to have insufficient NOx RTC holdings if they were to continue to stay in the NOx RECLAIM program and their NOx emissions remain between 5% above and below their 2016 levels. By exiting the NOx RECLAIM program, these facilities would avoid the need to acquire about 0.012 - 0.015 TPD of NOx RTCs which, if valued at $2,530 per ton, would imply potential total cost-savings worth approximately $10,900 - $13,900 in RECLAIM compliance year 2019 and for all subsequent RECLAIM compliance years.[16]

The dollar figures for the potential costs and savings for facilities exiting RECLAIM are highly sensitive to the assumed RTC price of $2,530 per ton. In general, RTC prices are highly variable, with prices typically decreasing as their expiration dates approach and during the 60 days after expiration during which they can be traded. This general trend has been repeated every year since 1994 except for compliance years 2000 and 2001 (during the California energy crisis). Prices for NOx RTCs that expired in calendar year 2017 also followed this general trend. The general declining trend of RTC prices nearing and just past expiration indicates there was an adequate supply to meet RTC demand during the final reconciliation period following the end of the compliance years. Further uncertainty has been introduced due to the SCAQMD Governing Board's decision to transition to a command-and-control regulatory structure.

[14] In order to estimate the number of RTCs needed for compliance in future years, it is necessary to project the emissions levels of all affected facilities. We analyze three scenarios; 1) emissions are 5% below 2016 levels; 2) emissions remain at 2016 levels; and 3) emissions are 5% above 2016 levels.

[15] 12-month rolling average of Compliance Year 2017 NOx RTCs, as calculated from July 2017 to July 2018. See Table I of "Twelve-Month and Three-Month Rolling Average Price of Compliance Years 2017 and 2018 NOx and SOx RTCs," available at: http://www.aqmd.gov/docs/default-source/reclaim/nox-rolling-average-reports/nox-and-sox-rtcs-rolling-avg-price-cy-2017-18---jul-2018.pdf

[16] Cost savings vary based on the projected emissions in compliance year 2019. The range in cost savings presented represents 5% below/above 2016 emission levels.

Potential NOx RTC Market Impacts

Since the SCAQMD Governing Board's March 2017 adoption of the 2016 AQMP, which includes the sunset of NOx RECLAIM, the number of NOx IYB trades has decreased significantly. The IYB price has also declined rapidly, from a 12-month rolling average of $380,057 per ton in January 2017 to $20,103 per ton in July 2018, which largely reflects the remaining years of the NOx RECLAIM program life that is expected by the market participants. However, the short-term price impact of facility exit on the discrete-year RTC market may not go hand-in-hand with the overall impact of the NOx RECLAIM program transition on the IYB market, as evidenced by the surge in discrete-year NOx RTC prices in 2017.

The analysis below will focus on the potential impacts to the discrete-year NOx RTC market due to compliance with Rule 2002. The potential exit of the 22 facilities from the NOx RECLAIM program could possibly affect the demand and supply in the NOx RTC market for compliance year 2019 and beyond, as well as the future prevailing NOx RTC prices. Therefore, the remaining NOx RECLAIM facilities may be indirectly impacted as a result.

Table 10 reports the potentially foregone market demand and supply for three different NOx emission scenarios. The first scenario assumes future NOx emissions of the 22 facilities would be 5% below their respective 2016 levels; the second scenario assumes the same emission levels as in 2016; and the third scenario assumes their future NOx emissions would be 5% above their respective 2016 levels. These scenarios are consistent with the variations of overall NOx emissions from the RECLAIM universe, which had a maximum year-over-year difference of approximately 5% during the period of 2011 - 2016.

The foregone market demand, as estimated by the shortage of a facility's future compliance year NOx RTC holdings for NOx emissions reconciliation, would be about 0.012 - 0.015 TPD. At the same time, the potential foregone market supply from all facilities with potential surplus RTC holdings is estimated at 0.063 - 0.072 TPD, or about 317% - 507% greater than the estimated foregone market demand. However, some of these facilities with potential surplus NOx RTCs have never sold or transferred NOx RTCs to another NOx RECLAIM facility since the NOx RECLAIM program began in 1994. Therefore, it is reasonable to assume that they will not participate in the market even if they continue to stay in the NOx RECLAIM program. When estimated by the potential surplus NOx RTC holdings from only the facilities with a historical record of NOx RTC sales and/or transfers, the foregone market supply is estimated to be lower at 0.062 - 0.070 TPD, or about 309% - 494% greater than the estimated foregone market demand.

Additionally, when compared to the 7.00 TPD of discrete-year NOx RTCs traded in calendar year 2017, the estimated net foregone market supply of 0.048 - 0.060 TPD represents 0.6% - 0.8% of the total traded volume.[17]

[17] In calendar year 2017, a total of 2,556 tons of discrete year NOx RTCs were traded (2556 tons/365 days = 7.00 TPD). See page ES-2 of "Annual RECLAIM Audit Report for 2016 Compliance Year," available at http://www.aqmd.gov/docs/default-source/reclaim/reclaim-annual-report/2016-reclaim-report.pdf. Notice, however, that some of the RTCs might have been traded more than once in the same year.

Given the analysis above and the fact that the 22 facilities currently account for 0.6% of annual NOx emissions and 0.8% of the NOx RTC holdings in the NOx RECLAIM universe in compliance year 2019, the simultaneous transition of the 22 facilities out of the NOx RECLAIM program would have a very small impact, if any, on the demand and supply of NOx RTC market. Specifically, while the transition of the 22 facilities could potentially assert upward pressure on the discrete-year NOx RTC prices, it is unlikely to result in large price fluctuations in the NOx RTC market, nor is the transition expected to significantly affect the remaining NOx RECLAIM facilities that are not yet ready to exit.

There are currently procedures in place to intervene if the NOx RTC price becomes excessively high. Rule 2002(f)(1)(H) specifies that in the event that the NOx RTC price exceeds $22,500 per ton based on the 12-month rolling average, or exceeds $35,000 per ton based on the 3-month rolling average calculated pursuant to subparagraph (f)(1)(E), the Executive Officer will report the determination to the Governing Board. If the Governing Board finds that the 12-month rolling average RTC price exceeds $22,500 per ton or the 3-month rolling average RTC price exceeds $35,000 per ton, then the Non-tradable/Non-usable NOx RTCs, as specified in subparagraphs (f)(1)(B) and (f)(1)(C) valid for the period in which the RTC price is found to have exceeded the applicable threshold, shall be converted to Tradable/Usable NOx RTCs upon Governing Board concurrence.

Table 10: Potential Impacts on NOx RTC Market Demand and Supply

		NOx Emission Scenarios for Future Compliance Years		
		5% Below 2016 NOx Emissions	***Same as 2016 NOx Emissions***	***5% Above 2016 NOx Emissions***
A	**Foregone Market Demand**	0.012	0.013	0.015
B	**Foregone Market Supply** *– From All Facilities with Surplus RTC Holdings*	0.072	0.067	0.063
C	**Net Foregone Market Supply** (= *B* - *A*)	0.060	0.054	0.048
	Percent Difference: ***(Supply – Demand)/Demand*** (= *C* / *A*)	507%	402%	317%
D	**Foregone Market Supply** *– From Facilities with Surplus RTC Holdings & Historical Record of RTC Sales/Transfers*	0.070	0.066	0.062
E	**Net Foregone Market Supply** (= *D* - *A*)	0.058	0.052	0.047
	Percent Difference: ***(Supply – Demand)/Demand*** (= *E* / *A*)	494%	392%	309%

Note: The supply and demand of NOx RTCs are expressed in TPD and rounded to the nearest thousandth. Percent differences are rounded to the nearest integer.

It is possible that the vast majority of facilities will opt to remain in RECLAIM following the adoption of the PAR 1146 series. The decision to remain in RECLAIM coincides with more favorable NSR provisions and those facilities with surplus RTCs may wish to remain in order to sell excess credits. Conversely, those facilities with insufficient RTC holdings have incentive to opt out of RECLAIM and forego acquiring the necessary RTCs to comply with RECLAIM requirements. Under this scenario, the adoption of the PAR 1146 series could potentially result in a net cost savings as it pertains to the RTCs currently held by RECLAIM facilities.

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Attachment M

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Subsequent Environmental Assessment for Proposed Amended Rules 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and Proposed Rule 1100 – Implementation Schedule for NOx Facilities

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PREFACE

This document constitutes the Final Subsequent Environmental Assessment (SEA) for Proposed Amended Rules 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters (referred to herein as PARs 1146 series); and Proposed Rule 1100 – Implementation Schedule for NOx Facilities (PR 1100). A Draft SEA was circulated for a 45-day public review and comment period from April 3, 2018 to May 18, 2018 (referred to herein as the original Draft SEA) and four comment letters were received. Changes were made to the project description after the comment period for the original Draft SEA ended, SCAQMD staff revised the original Draft SEA and prepared a Revised Draft SEA which included a revised project description, a revised environmental analysis, the four comment letters received relative to the original Draft SEA and responses to the comments. The Revised Draft SEA, which superseded the original Draft SEA, was circulated for a 45-day public review and comment period from September 27, 2018 to November 13, 2018; no comment letters were received relative to the Revised Draft SEA. The comment letters and responses relative to the original Draft SEA have been included in Appendix G of this Final SEA.

Analysis of PARs 1146 series and PR 1100 in the original Draft SEA and the Revised Draft SEA indicated that while reducing NOx emissions is an environmental benefit, secondary significant adverse environmental impacts were also expected for the topic area of hazards and hazardous materials. Since significant adverse impacts were identified, an alternatives analysis and mitigation measures are required and are included in the Final SEA. [CEQA Guidelines Section 15252].

To facilitate identification of the changes between the original Draft SEA and the Revised Draft SEA, modifications to the document were included as underlined text and text removed from the document was indicated by ~~strikethrough~~. Subsequent to the release of the Revised Draft SEA for public review and comment, minor modifications were made to PARs 1146 series and PR 1100 and some of the revisions were made in response to verbal and written comments received during the rule development process. The minor modifications include: 1) the addition, revision, and removal of definitions for clarification; 2) rewording and renumbering of rule language; 3) the addition of requirements to conduct either quarterly or annual source tests (after a facility demonstrates compliance with four consecutive quarterly source tests) to demonstrate compliance with the ammonia emissions limit for new or modified air pollution control devices using ammonia; and 4) allowing units at municipal sanitation service facilities to maintain existing NOx emission limits until a Regulation XI rule is adopted or amended. To facilitate identification of these additional changes, modifications made in this Final SEA are included as double underlined text and text removed from the document is indicated by ~~double strikethrough~~. To avoid confusion, minor formatting changes are not shown in underline or strikethrough mode.

Staff has reviewed the modifications to PARs 1146 series and PR 1100 and concluded that none of the revisions: 1) constitute significant new information; 2) constitute a substantial increase in the severity of an environmental impact; or, 3) provide new information of substantial importance relative to the Revised Draft SEA. In addition, revisions to the proposed project in response to verbal or written comments during the rule development process would not create new, avoidable significant effects. As a result, these revisions do not require recirculation of the Revised Draft SEA pursuant to CEQA Guidelines Sections 15073.5 and 15088.5. Therefore, the Revised Draft SEA has been revised to include the aforementioned modifications such that is now the Final SEA for PARs 1146 series and PR 1100.

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EXECUTIVE SUMMARY

INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977[1] as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin) and portions of the Salton Sea Air Basin (SSAB) and Mojave Desert Air Basin. In 1977, amendments to the federal Clean Air Act (CAA) included requirements for submitting State Implementation Plans (SIPs) for nonattainment areas that fail to meet all federal ambient air quality standards (CAA Section 172), and similar requirements exist in state law (Health and Safety Code Section 40462). The federal CAA was amended in 1990 to specify attainment dates and SIP requirements for ozone, carbon monoxide (CO), nitrogen dioxide (NO2), and particulate matter with an aerodynamic diameter of less than 10 microns (PM10). In 1997, the United States Environmental Protection Agency (U.S. EPA) promulgated ambient air quality standards for particulate matter with an aerodynamic diameter less than 2.5 microns (PM2.5). The U.S. EPA is required to periodically update the national ambient air quality standards (NAAQS).

In addition, the California Clean Air Act (CCAA), adopted in 1988, requires the SCAQMD to achieve and maintain state ambient air quality standards for ozone, CO, sulfur dioxide (SO2), and NO2 by the earliest practicable date. (Health and Safety Code Section 40910.) The CCAA also requires a three-year plan review, and, if necessary, an update to the SIP. The CCAA requires air districts to achieve and maintain state standards by the earliest practicable date and for extreme non-attainment areas, to include all feasible measures pursuant to Health and Safety Code Sections 40913, 40914, and 40920.5. The term "feasible" is defined in the Title 14 of the California Code of Regulations, Section 15364, as a measure "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

By statute, the SCAQMD is required to adopt an air quality management plan (AQMP) demonstrating compliance with all federal and state ambient air quality standards for the areas under the jurisdiction of the SCAQMD[2]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP[3]. The AQMP is a regional blueprint for how the SCAQMD will achieve air quality standards and healthful air and the 2016 AQMP[4] contains multiple goals promoting reductions of criteria air pollutants, greenhouse gases (GHGs), and toxic air contaminants (TACs). In particular, the 2016 AQMP states that both NOx and volatile organic compounds (VOC) emissions need to be addressed, with the emphasis that NOx emission reductions are more effective to reduce the formation of ozone and PM2.5. Ozone is a criteria pollutant shown to adversely affect human health and is formed when VOCs react with NOx in the atmosphere. NOx is a precursor to the formation of ozone and PM2.5, and NOx emission reductions are necessary to achieve the ozone standard attainment. NOx emission reductions also contribute to attainment of PM2.5 standards.

In October 1993, the SCAQMD Governing Board adopted Regulation XX – Regional Clean Air Incentives Market (RECLAIM) to reduce NOx and oxides of sulfur (SOx) emissions from

[1] The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., Ch. 324 (codified at Health and Safety Code Section 40400-40540).
[2] Health and Safety Code Section 40460(a).
[3] Health and Safety Code Section 40440(a).
[4] SCAQMD, Final 2016 Air Quality Management Plan, March 2017. http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp

facilities. The RECLAIM program was designed to take a market-based approach to achieve emission reductions, as an aggregate. The RECLAIM program was created to be equivalent to achieving emissions reductions under a command-and-control approach, but by providing facilities with the flexibility to seek the most cost-effective solution to reduce their emissions. The market-based approach used in RECLAIM was based on using a supply-and-demand concept, where the cost to control emissions and reduce a facility's emissions would eventually become less than the diminishing supply of NOx RECLAIM trading credits (RTCs). However, analysis of the RECLAIM program over the long term has shown that the ability to achieve actual NOx emission reductions has diminished, due to a large amount of RTCs resulting from shutdowns being re-introduced into the market prior to amendments to Rule 2002 in October 2016 to address this issue.

In the 2016 AQMP, control measure CMB-05 - Further NOx Reductions from RECLAIM Assessment, committed NOx emission reductions of five tons per day to occur by 2025. The process of transitioning NOx RECLAIM facilities to a command-and-control regulatory structure will ensure that the affected equipment will meet Best Available Retrofit Control Technology (BARCT) level equivalency as soon as practicable.

The Governor approved Assembly Bill (AB) 617 on July 26, 2017, which addresses non-vehicular air pollution including criteria pollutants and TACs. AB 617 is a companion legislation to approved AB 398, which extends California's cap-and-trade program for reducing GHG emissions from stationary sources. AB 617 requires Air Districts to develop by January 1, 2019 an expedited schedule for the implementation of BARCT by December 31, 2023 for cap-and-trade facilities. A subset of RECLAIM facilities will be subject to the requirements of ABs 617 and 398. To address these requirements, SCAQMD staff completed an analysis of the RECLAIM equipment at each facility, giving a higher priority to older, higher polluting units that need to install retrofit controls. To have all units achieve BARCT level equivalency, it was concluded that command-and-control rules would need to be adopted and/or amended, along with an implementation schedule.

As a result of control measure CMB-05 from the 2016 AQMP and ABs 617 and 398, SCAQMD staff has been directed by the Governing Board to begin the process of transitioning equipment at NOx RECLAIM facilities from a facility permit structure to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. Thus, SCAQMD has begun this transition process by proposing amendments to Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters. Proposed Amended Rules (PAR) 1146, 1146.1, and 1146.2 (collectively referred to herein as the PARs 1146 series) ~~will be~~ is one of the first set of rules to be amended to ~~initiate the~~ transition of equipment from the NOx RECLAIM program to a command-and-control regulatory structure while achieving BARCT. As a result of the BARCT assessment conducted for PARs 1146 and 1146.1, some units at non-RECLAIM facilities will also be affected and will be required to meet BARCT NOx emissions equivalency according to the compliance schedule specified in PARs 1146 and 1146.1.

In addition, SCAQMD staff has developed Proposed Rule (PR 1100), an administrative rule which establishes the compliance schedule for the Rule 1146 and 1146.1 units at RECLAIM facilities~~PARs 1146 series facilities exiting the RECLAIM program~~. The compliance schedule for

PARs 1146 and 1146.1~~PARs 1146 series~~ will be a two ~~three~~five ~~-~~ to four~~six~~ -year period depending on the equipment size~~, and~~ number of affected units at each facility, and based on how the facility will meet the compliance schedule and NOx emission limits (e.g., burner retrofit, SCR system installation, or equipment replacement). In addition, facilities with multiple units subject to multiple source-specific landing rules (e.g., SCAQMD rules other than the PARs 1146 series) will also be taken into consideration. Implementation of the proposed project is estimated to reduce NOx emissions by 0.20 ton per day by January 1, 2021 and ~~0.23~~ 0.27 ton per day by January 1, 2023 and it is expected to be achieved by the installation of selective catalytic reduction (SCR) technology/systems and ultra-low NOx burners.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA) requires that all potential adverse environmental impacts of proposed projects be evaluated and that methods to reduce or avoid identified significant adverse environmental impacts of these projects be implemented, if feasible. The purpose of the CEQA process is to inform the SCAQMD Governing Board, public agencies, and interested parties of potential adverse environmental impacts that could result from implementing the proposed project and to identify feasible mitigation measures or alternatives, when an impact is significant.

Public Resources Code Section 21080.5 allows public agencies with regulatory programs to prepare a plan or other written documents in lieu of a negative declaration or environmental impact report once the secretary of the resources agency has certified the regulatory program. The SCAQMD's regulatory program was certified by the secretary of resources agency on March 1, 1989 and has been adopted as SCAQMD Rule 110 – Rule Adoption Procedures to Assure Protection and Enhancement of the Environment. Pursuant to Rule 110 (the rule which implements the SCAQMD's certified regulatory program), the SCAQMD typically prepares an Environmental Assessment (EA) to evaluate the environmental impacts for rule projects proposed for adoption or amendment.

PARs 1146 series and PR 1100 are considered a "project" as defined by CEQA. PARs 1146 series contains amendments that revise existing requirements included in Rules 1146 and 1146.1, as amended in September 2008 and November 2013, and Rule 1146.2 as amended in May 2006.

PARs 1146 series in combination with PR 1100 will transition affected units at NOx RECLAIM facilities to a command-and-control regulatory structure. NOx RECLAIM facilities with equipment subject to PARs 1146 and~~,~~ 1146.1~~, and 1146.2~~ will be required to meet the NOx emission limits in these rules in accordance with the implementation schedule outlined in PR 1100. In addition, a subset of units at non-RECLAIM facilities will be required to meet new NOx emission limits according to the compliance schedule specified in PARs 1146 and 1146.1. The decision to transition from NOx RECLAIM into a source-specific command-and-control regulatory structure was approved by the SCAQMD Governing Board as control measure CMB-05 in the 2016 AQMP and the potential environmental impacts associated with the 2016 AQMP, including CMB-05, were analyzed in the Final Program Environmental Impact Report (Program EIR) certified in March 2017[5].

[5] SCAQMD, Final Program Environmental Impact Report for the 2016 Air Quality Management Plan, March 2017. http://www.aqmd.gov/home/research/documents-reports/lead-agency-scaqmd-projects/scaqmd-projects---year-2017

Analysis of PARs 1146 and 1146.1 indicates that the estimated NOx emission reductions that were originally projected to be achieved as part of the September 2008 amendments to both Rules 1146 and 1146.1 will be greater than originally projected in the September 2008 Final Environmental Assessments (EAs)[6,7] because additional facilities that were originally subject to the NOx RECLAIM program will now be subject to the NOx emission limits contained in PARs 1146 and 1146.1.

Initial analysis of the baseline inventory for RECLAIM facilities with Rule 1146.2 units estimates NOx emissions to be minimal relative to the emission inventory from Rules 1146 and 1146.1 units, as indicated in Chapter 3, Table 3-1. However, it is important to note that Rule 1146.2 units are smaller units that are exempt from permitting requirements under Rule 219 - Equipment Not Requiring a Written Permit Pursuant to Regulation II. Non-RECLAIM facilities currently register Rule 1146.2 equipment from one up to and including two MMBtu per hour under Rule 222 - Filing Requirements For Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II. RECLAIM facilities are currently exempt from this provision. Additionally, the RECLAIM NOx emissions for combustion sources not requiring a written permit are reported on a quarterly basis as an aggregate sum for these devices. As a result, the permitted Rule 1146.2 universe may not fully represent the actual number of Rule 1146.2 units at RECLAIM facilities because the majority of the Rule 1146.2 units in RECLAIM are not currently registered or permitted with SCAQMD. Therefore, it is difficult to establish a precise inventory of the Rule 1146.2 units at RECLAIM facilities at this time. However, the additional Rule 1146.2 units (permitted and unpermitted) that will transition out of the NOx RECLAIM program and instead meet the NOx emissions limits in PAR 1146.2 were not projected in the May 2006 Final EA[8]. A RECLAIM facility with Rule 1146.2 units will be required to meet the applicable NOx concentration limit as specified in Rule 1146.2 by December 31, 2023. SCAQMD staff will conduct additional BARCT research along with obtaining updated emission inventory data if that is available. If the research shows that BARCT is more stringent so that significant additional NOx emissions reductions can be obtained, then staff will initiate a subsequent rule development process. Implementation of the proposed project is estimated to reduce NOx emissions by 0.20 ton per day by January 1, 2021 and ~~0.23~~ 0.27 ton per day by January 1, 2023.

SCAQMD staff has determined that PARs 1146 series and PR 1100 contain new information of substantial importance which was not known and could not have been known at the time: 1) the Final EAs were certified for the September 2008 amendments to Rules 1146 and 1146.1 (referred to herein as the September 2008 Final EAs for Rules 1146 and 1146.1); 2) the Final EA was certified for the May 2006 amendments to Rule 1146.2 (referred to herein as the May 2006 Final EA); and 3) the Final Program EIR was certified for the March 2017 adoption of the 2016 AQMP (referred to herein as the March 2017 Final Program EIR. However, PARs 1146 series is not expected to create new significant effects that were not discussed in the previous September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP.

[6] Final Environmental Assessment for Proposed Amended Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; SCH No. 2008011127; Certified September 5, 2008.

[7] Final Environmental Assessment for Proposed Amended Rule 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; SCH No. 2008071014; Certified September 5, 2008.

The September 2008 Final EA for Rule 1146 identified significant adverse environmental impacts in the areas of air quality and hazards and hazardous materials. The analysis in the September 2008 Final EA determined the amendments to Rule 1146 had the potential to create significant adverse hazards and hazardous materials impacts associated with the use and storage of aqueous ammonia. Mitigation measures were identified to minimize the significant, adverse hazards and hazardous materials impacts, but would not reduce the potentially significant impacts to a level of insignificance. No other feasible mitigation measures were identified. As such, mitigation measures were made a condition of the approval of this project. Findings, a Statement of Overriding Considerations, and Mitigation Monitoring Plan were adopted for this project.

The September 2008 Final EA for Rule 1146.1 concluded that September 2008 amendments to Rule 1146.1 would not generate any significant adverse environmental impacts. Since no significant adverse environmental impacts were identified, no alternatives analysis and no mitigation measures were required by CEQA. Mitigation measures were not made a condition of the approval of this project and a Mitigation Monitoring Plan was not adopted for this project. Findings were not made and a Statement of Overriding Considerations was not adopted for this project.

As with the September 2008 amendments to Rule 1146.1, the May 2006 Final EA for Rule 1146.2 also concluded that May 2006 amendments to Rule 1146.2 would not generate any significant adverse environmental impacts. Since no significant adverse environmental impacts were identified, no alternatives analysis and no mitigation measures were required by CEQA. Mitigation measures were not made a condition of the approval of this project and a Mitigation Monitoring Plan was not adopted for this project. Findings were not made and a Statement of Overriding Considerations was not adopted for this project.

The March 2017 Final Program EIR for the 2016 AQMP determined that the overall implementation of CMB-05 has the potential to generate adverse environmental impacts to seven topic areas – air quality, energy, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste and transportation. More specifically, the March 2017 Final Program EIR evaluated the impacts from installation and operation of additional control equipment and SCR or SNCR equipment potentially resulting in construction emissions increased electricity demand, hazards from additional ammonia transport and use, increase in water use and wastewater discharge, changes in noise volume, generation of solid waste from construction and disposal of old equipment and catalysts replacements, as well as changes in traffic patterns and volume. For the entire 2016 AQMP, the analysis concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measure for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia, (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. Since significant adverse environmental impacts were identified, mitigation measures were identified and applied. However, the March 2017 Final Program EIR concluded that the 2016 AQMP would have significant and unavoidable adverse environmental impacts even after mitigation measures were identified and applied. As such, mitigation measures were made a

condition of project approval and a Mitigation Monitoring and Reporting Plan was adopted. Findings were made and a Statement of Overriding Considerations was prepared and adopted for this project.

PAR 1146 is expected to have: 1) significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)); and 2) significant effects that were previously examined that will be substantially more severe than what was discussed in the September 2008 Final EA for Rule 1146 and the March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(B)).

Similarly, PAR 1146.1 is also expected to have significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146.1 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)). However, PAR 1146.2 is not expected to create new significant effects that were not discussed in the previous May 2006 Final EA for Rule 1146.2 and the March 2017 Final Program EIR for the 2016 AQMP.

Further, PARs 1146 series and PR 1100 contain new information of substantial importance as they relate to PARs 1146, 1146.1, and 1146.2, and control measure CMB-05. Thus, analysis of the proposed project indicates that the type of CEQA document appropriate for the proposed project is a Subsequent Environmental Assessment (SEA), in lieu of an EA. The SEA is a substitute CEQA document, prepared in lieu of a Subsequent Environmental Impact Report with significant impacts (CEQA Guidelines Section 15162(b)), pursuant to the SCAQMD's Certified Regulatory Program (CEQA Guidelines Section 15251(l); codified in SCAQMD Rule 110). The SEA is also a public disclosure document intended to: 1) provide the lead agency, responsible agencies, decision makers and the general public with information on the environmental impacts of the proposed project; and 2) be used as a tool by decision makers to facilitate decision making on the proposed project.

Because the new potentially significant adverse effects to hazards and hazardous materials that may result from implementing PARs 1146 and 1146.1 were not analyzed at the project level in the September 2008 Final EAs for Rules 1146 and 1146.1or the March 2017 Final Program EIR for the 2016 AQMP, and because PAR 1146.2 and PR 1100 contain new information that was not previously considered, the SCAQMD, as lead agency for the proposed project has prepared this SEA with significant impacts pursuant to its Certified Regulatory Program. Because PARs 1146 series and PR 1100 may have statewide, regional or areawide significance, a CEQA scoping meeting is required pursuant to Public Resources Code Section 21083.9(a)(2) and was held at the SCAQMD's Headquarters in conjunction with the Public Workshop on February 14, 2018. One oral, CEQA-related comment was made at the Public Workshop/CEQA scoping meeting relative to PARs 1146 series and PR 1100. The comment and response are included in Appendix F of this ~~Revised Draft~~ Final SEA. Further, pursuant to CEQA Guidelines Section 15252, since significant adverse impacts have been identified, an alternatives analysis and mitigation measures are required.

~~The~~A Draft SEA was~~has been~~ released and circulated for a 45-day public review and comment period from ~~Tuesday,~~ April 3, 2018 to May 18, 2018 (referred to herein as the original Draft SEA) ~~at 5:00 p.m~~. However, changes were made to the project description after the comment period ended. SCAQMD staff revised the environmental analysis in the original Draft SEA and prepared ~~this~~ a Revised Draft SEA which was ~~is now being~~ circulated for an additional 45-day public review and comment period. The Revised Draft SEA include~~s~~ a revised project description and a revised

analysis of potential adverse environmental impacts that could be generated from the proposed project. ~~This~~ The Revised Draft SEA ~~supersedes~~ superseded the original Draft SEA. Four c~~C~~omment letters were received relative to the original Draft SEA during the public comment period from April 3, 2018 to May 18, 2018 and responses ~~have been~~ were prepared. The comment letters and responses relative to the original Draft SEA ~~have been~~ were included in Appendix G of ~~this~~ the Revised Draft SEA~~relative to the analysis presented in this Draft SEA will be included in an appendix and responded to in the~~. The Revised Draft SEA was ~~has been~~ released for a 45-day public review and comment period from September 27, 2018 to November 13, 2018~~ at 5:00 pm.~~ and n~~N~~o ~~C~~comment letters were received~~during the new public comment period of September 27, 2018 to November 13, 2018 relative to the analysis presented in the Revised Draft SEA~~.

The September 2008 Final EA for Rule 1146, the September 2008 Final EA for Rule 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP upon which this SEA relies, are available from the SCAQMD's website at:

> September 2008 Final EA for Rule 1146: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146.pdf
>
> September 2008 Final EA for Rule 1146.1: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146-1.pdf
>
> May 2006 Final EA for Rule 1146.2: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2006/final-ea-for-proposed-amended-rule-1146-2.doc
>
> March 2017 Final Program EIR for the 2016 AQMP: http://www.aqmd.gov/home/research/documents-reports/lead-agency-scaqmd-projects/scaqmd-projects---year-2017

The above documents may also be obtained by visiting the Public Information Center at SCAQMD Headquarters located at 21865 Copley Drive, Diamond Bar, CA 91765; or by contacting Fabian Wesson, Public Advisor by phone at (909) 396-2039 or by email at PICrequests@aqmd.gov.

Subsequent to the release of the Revised Draft SEA for public review and comment, minor modifications were made to PARs 1146 series and PR 1100 and some of the revisions were made in response to verbal and written comments received ruing the rule development process. The minor modifications include: 1) the addition, revision, and removal of definitions for clarification; 2) rewording and renumbering of rule language; 3) quarterly source testing of the ammonia emissions limit for new or modified air pollution control devices using ammonia instead of annual source testing (if a facility demonstrates compliance with four consecutive quarterly source tests, the facility can source test annually); and 4) allowing units at municipal sanitation service facilities to maintain existing NOx emission limits until a Regulation XI rule is adopted or amended.

Staff has reviewed the modifications to PARs 1146 series and PR 1100 and concluded that none of the revisions: 1) constitute significant new information; 2) constitute a substantial increase in the severity of an environmental impact; or, 3) provide new information of substantial importance relative to the Revised Draft SEA. The Revised Draft SEA concluded significant adverse hazards and hazardous materials impacts for the storage and use of aqueous ammonia and the revisions to PARs 1146 series and PR 1100 in response to verbal or written comments from the rule

development process would not create new/additional or avoidable significant effects or make the aforementioned hazards and hazardous materials impacts worse. As a result, these minor revisions do not require recirculation of the Revised Draft SEA pursuant to CEQA Guidelines Sections 15073.5 and 15088.5. Therefore, the Revised Draft SEA has been revised to include the aforementioned modifications such that is now the Final SEA for PARs 1146 series and PR 1100.

Prior to making a decision on the adoption of PARs 1146 series and PR 1100, the SCAQMD Governing Board must review, consider, and certify the Final SEA, including responses to comments, as providing adequate information on the potential adverse environmental impacts that may occur as a result of adopting PARs 1146 series and PR 1100.

PREVIOUS CEQA DOCUMENTATION

This Final ~~Revised Draft~~ SEA is a comprehensive environmental document that analyzes potential environmental impacts from PARs 1146 series and PR 1100. SCAQMD rules, as ongoing regulatory programs, have the potential to be revised over time due to a variety of factors (e.g., regulatory decisions by other agencies, new data, and lack of progress in advancing the effectiveness of control technologies to comply with requirements in technology forcing rules, etc.). Rule 1146 was adopted in September 1988 and amended in January 1989, May 1994, June 2000, November 2000, September 2008, and November 2013. Rule 1146.1 was adopted in October 1990 and was amended July 1992, May 1994, September 2008, and November 2013. Rule 1146.2 was adopted January 1998 and amended January 2005 and May 2006. Several previous environmental analyses have been prepared that analyzed the past amendments to Rule 1146, 1146.1, and 1146.2. Also, the 2016 AQMP was adopted in March 2017 and an environmental analysis for the entire 2016 AQMP, including control measure CMB-05, was addressed in the March 2017 Final Program EIR. However, because PR 1100 is a new rule, there is no previous CEQA documentation available; but PR 1100 is integrally related to the PARs 1146 series, since PR 1100 simply specifies an implementation schedule for the PARs 1146 and 1146.1 ~~series~~.

The following summarizes the contents of the CEQA documents prepared for previous versions of Rules 1146, 1146.1, and 1146.2 and for the 2016 AQMP in reverse chronological order and are included for informational purposes. For the CEQA documents that were prepared after January 1, 2000, a link for downloading files from the SCAQMD's website is provided immediately following the summaries. In addition, hardcopies of these CEQA documents can be obtained by submitting a Public Records Act request to the SCAQMD's Public Records Unit.

Final Program Environmental Impact Report for the 2016 Air Quality Management Plan; March 2017 (2016071006): The 2016 AQMP identified control measures and strategies to bring the region into attainment with the revoked 1997 8-hour NAAQS (standard) (80 ppb) for ozone by 2024; the 2008 8-hour ozone standard (75 ppb) by 2032; the 2012 annual PM2.5 standard (12 $\mu g/m^3$) by 2025; the 2006 24-hour PM2.5 standard (35 $\mu g/m^3$) by 2019; and the revoked 1979 1-hour ozone standard (120 ppb) by 2023. The 2016 AQMP consists of three components: 1) the SCAQMD's Stationary, Area, and Mobile Source Control Measures; 2) State and Federal Control Measures provided by the California Air Resources Board; and 3) Regional Transportation Strategy and Control Measures provided by the Southern California Association of Governments. The 2016 AQMP includes emission inventories and control measures for stationary, area and mobile sources, the most current air quality setting, updated growth projections, new modeling techniques, demonstrations of compliance with state and federal Clean Air Act requirements, and an implementation schedule for adoption of the proposed control strategy. A Final Program EIR

was prepared for the project which identified potential adverse impacts that may result from implementing the project for the following environmental topic areas: 1) aesthetics; 2) air quality and GHGs; 3) energy; 4) hazards and hazardous materials; 5) hydrology and water quality; 6) noise; 7) solid and hazardous waste; and 8) transportation and traffic. The analysis concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measures for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia; (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. Since significant adverse environmental impacts were identified, an alternatives analysis was required by CEQA and prepared. The March 2017 Final Program EIR concluded that the project would have significant and unavoidable adverse environmental impacts even after mitigation measures were identified and applied. As such, mitigation measures were made a condition of the approval of the project and a Mitigation Monitoring and Reporting Plan was adopted. Findings were made and a Statement of Overriding Considerations was prepared and adopted. The SCAQMD Governing Board certified the Final Program EIR and approved the project on March 3, 2017.

Notice of Exemption From CEQA for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and, Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; November 2013: The November 2013 amendments to Rule 1146 and 1146.1 addressed a SIP approvability issue that was raised by the U.S. EPA regarding the use of source test data and portable analyzers test results to prove a violation of the emission standard. Also included in the November 2013 amendments were the following minor changes: 1) a clarification that Rules 1146 and 1146.1 do not apply to NOx sources subject to the SCAQMD's Regulation XX – RECLAIM; 2) the identification of certain equipment that are not included under boiler or steam generator category; 3) an enhanced description pertaining to the types of operations that would be subject to Rule 1146; 4) a clarification that low fuel usage equipment are only subject to periodic tune-up requirements; and 5) a prohibition from derating equipment to a level at or below two million British Thermal Units (MMBtu) per hour.

The project was reviewed pursuant to CEQA Guidelines Section 15002(k)(1) and SCAQMD staff concluded that it could be seen with certainty that there was no possibility that the project had the potential to create any significant adverse impacts on the environment. Therefore, the SCAQMD determined that the project was exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) - Review for Exemption. The project was approved on November 1, 2013 and a Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/notices/notices-of-exemption/2013/par1146noe.pdf.

Final Environmental Assessment for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; September 2008 (SCH No. 200811127/SCAQMD No. 01308BAR): SCAQMD staff concluded the project would result in significant adverse environmental impacts in the areas of hazards and hazardous materials and air quality. The September 2008 amendments reduced the allowable NOx emission limits for boilers, steam generators and process heaters from 30 parts per million (ppm) to either 12 ppm, nine ppm or five ppm, depending on equipment size and operational characteristics. The September 2008 amendments also added NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Other changes included: 1) establishing a weighted average formula for dual fueled co-fired units; 2) allowing existing units to be de-rated to no less than two MMBtu per hour per unit; 3) requiring compliance with a 30 ppm NOx limit for low fuel usage equipment by January 1, 2015 or burner replacement, whichever occurs later; 4) allowing a later compliance date for health facilities complying with seismic safety requirements; 5) establishing a staged compliance schedule over a multi-year period which varies by equipment size range and unit operation; 6) making the frequency of compliance testing compatible with sources subject to the RECLAIM program for the same equipment size range; and 7) allowing NOx emissions monitoring with a portable analyzer. The SCAQMD prepared a Draft EA, which identified significant adverse environmental impacts for air quality and hazards and hazardous materials. The Draft EA was released for a 45-day public review and comment period from June 13, 2008 to July 29, 2008 and one comment letter was received. The Final EA, including the comment letter and responses to comments, was certified by the SCAQMD Governing Board on September 5, 2008. Findings were made and a Statement of Overriding Considerations was also adopted for this project. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146.pdf.

Final Environmental Assessment for Proposed Amended Rule 1146.1– Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; September 2008 (SCH No. 2008071014/SCAQMD No. 070108BAR): The September 2008 amendments to Rule 1146.1 further reduced the NOx emission limits, included new NOx limits for atmospheric units to be 12 ppm or 0.015 pound per MMBtu, and units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. The amendments also: 1) established a weighted average formula for dual fueled co-fired units; 2) allowed existing units to be de-rated to no less than two MMBtu per hour per unit; 3) made the frequency of compliance testing compatible with RECLAIM sources for the same equipment size range; 4) allowed for monitoring of NOx and CO emissions with a portable analyzer; 5) for low-fuel usage units, required compliance with a 30 ppm NOx limit by January 1, 2015 or burner replacement, whichever occurs later; 6) allowed thermal fluid heaters to continue compliance with the 30 ppm NOx limits; and 7) allowed a later compliance date for health facilities complying with seismic safety requirements. The SCAQMD prepared a Draft EA, which identified no significant adverse environmental impacts, to evaluate potential adverse impacts from the project. The Draft EA was released for a 30-day public review period from July 2, 2008 to July 31, 2008 and no comments were received. The Final EA was certified by the SCAQMD Governing Board on September 5, 2008. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/final-environmental-assessment-for-proposed-amended-rule-1146-1.pdf.

Final Environmental Assessment for Proposed Amended Rule 1146.2– Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; May 2006 (SCAQMD No. 032206BAR): The May 2006 amendments to Rule 1146.2 were crafted to partially offset the NOx emission reductions foregone from the previous amendments to Rule 1146.2 that were adopted on January 7, 2005. The amendments required: 1) Type 2 units (equipment with heat input ratings greater than 400,000 Btu per hour) to meet a NOx emission limit of 20 ppm on or after January 1, 2010; and 2) Type 1 units (equipment with a heat input rating equivalent to or less than 400,000 Btu per hour) to meet a NOx emission limit of 20 ppm on or after January 1, 2012. Other changes included: 1) providing more detailed specifications for demonstrating compliance with an existing exemption from retrofit requirements for equipment operating less than 9,000 therms per year; 2) clarifying rule applicability; 3) a specific recordkeeping requirement for larger units; 4) enhancing compliance and enforceability; and 5) improving clarity. The SCAQMD prepared a Draft EA, which identified no significant adverse environmental impacts, to evaluate potential adverse impacts from the project. The Draft EA was released for a 30-day public review period from March 23, 2006 to April 21, 2006 and no comments were received. The Final EA was certified by the SCAQMD Governing Board on May 5, 2006. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2006/final-ea-for-proposed-amended-rule-1146-2.doc.

Final Environmental Assessment for Proposed Amended Rule 1146.2– Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; January 2005 (SCAQMD No. 120104KCS): The January 2005 amendments to Rule 1146.2 extended the compliance date from January 1, 2005 to January 1, 2006 for existing units with a rated heat input greater than one MMBtu per hour but less than or equal to two MMBtu per hour manufactured on or after January 1, 1992. Specifically, on or after January 1, 2006, no person would be allowed to operate any existing unit with a rated heat input greater than one MMBtu per hour but less than or equal to two MMBtu per hour more than 15 years old based on the date of manufacture, unless the certified NOx emissions are less than or equal to 30 ppm. Further, on or after January 1, 2006, no person would be allowed operate in the District any unit more than 15 years old, based on the original date of manufacture with a rated heat input greater than 400,000 Btu per hour, but less than or equal to one MMBtu per hour manufactured prior to January 1, 2000 unless the certified NOx emissions are less than or equal to 30 ppm.

The SCAQMD prepared a Draft EA, which identified significant adverse environmental impacts for air quality, to evaluate potential adverse impacts from the project. The Draft EA was released for a 45-day public review period from October 8, 2004 to November 23, 2004 and one comment letter was received. The Final EA, including the comment letter and responses to comments, was certified by the SCAQMD Governing Board on January 7, 2005. Findings were made and a Statement of Overriding Considerations was also adopted for this project. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2005/fea-1146/fea_1146.pdf.

Notice of Exemption From CEQA for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; November 2000: The November 2000 amendments to Rule 1146: 1) reduced the emission limit for gaseous fueled units to 30 ppm NOx; 2) reduced the emission limit for dual-fueled units to 30 ppm NOx or an average of 30 ppm to 40 ppm NOx weighted by fuel use; and 3) added annual emissions testing requirements and require totalizing fuel meters on all dual-fueled

units where operators elect to meet the fuel-weighted average. An air quality benefit of approximately 90 tons per year of NOx was estimated to result from implementation of the November 2000 amendments.

The project was reviewed pursuant to CEQA Guidelines Section 15002(k)(1). Because no substantial physical change to the existing setting was anticipated and no additional secondary control was required, the SCAQMD concluded that it could be seen with certainty that there was no possibility that the project had the potential to create any significant adverse impacts on the environment. Therefore, the SCAQMD determined that the project was exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) - Review for Exemption. The project was approved on November 17, 2000 and a Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/notices/notices-of-exemption/2000/noe-rule-1146.doc.

Final Environmental Assessment for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; June 2000 (SCAQMD No. 000502MK): The SCAQMD prepared a Draft EA, which identified no significant adverse environmental impacts, to evaluate potential adverse impacts from the proposed amendment to Rule 1146. The Draft EA was released for a 30-day public review period from May 1, 2000 to May 31, 2000 and no comments were received. The Final EA was certified by the SCAQMD Governing Board on June 16, 2000. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2000/final-ea-for-proposed-amended-rule-1146---emissions-of-oxides-of-nitrogen-from-industrial-institutional-and-commercial-boilers-steam-generators-and-process-heaters.doc.

Notice of Exemption From CEQA for Proposed Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; January 1998: The adoption of Rule 1146.2 established NOx emission limits for water heaters and small boilers with a rated heat input between 75,000 and two MMBtu per hour. Rule 1146.2 was estimated to reduce NOx emissions by nine tons per day. Rule 1146.2 was reviewed pursuant to CEQA Guidelines Section 15061(b)(3) and SCAQMD staff determined that the project would not have any significant adverse impacts to the environment. The project was approved on January 9, 1998 and a Notice of Exemption was filed with the country clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Notice of Exemption From CEQA for Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; May 1994: The May 1994 amendments to Rule 1146: 1) added a tune-up procedure for natural draft boilers; 2) added a provision to allow permit owners and operators to tune their equipment once per year, instead of twice per year, provided that the equipment is used for six continuous months or less per year; 3) added a provision to exempt units from tune-up requirements provided that they are not in use during the entire calendar year; 4) deleted the Alternate Emission Control Plan (AECP) provision since rule compliance dates have expired; and 5) extended the applicability of the rule to include solid fuels.

The project was reviewed pursuant to CEQA Guidelines Section 15061(b)(3) and SCAQMD staff determined that the project would not have any significant adverse impacts on the environment.

Further, SCAQMD staff also determined the project to be categorically exempt from CEQA pursuant to CEQA Guidelines Section 15308 – Actions by Regulatory Agencies for Protection of the Environment and CEQA Guidelines Section 15321 – Enforcement Actions by Regulatory Agencies. The project was approved on May 13, 1994 and a Notice of Exemption was filed with the country clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Notice of Exemption From CEQA for Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; May 1994: The May 1994 amendments to Rule 1146.1: 1) added a tune-up procedure for natural draft boilers; 2) added a provision to exempt units from tune-up requirements provided that they are not in use during the entire calendar year; and 3) extended the applicability of the rule to include solid fuels.

The project was reviewed pursuant to CEQA Guidelines Section 15061(b)(3) and SCAQMD staff determined that the project would not have any significant adverse impacts on the environment. Further, SCAQMD staff determined the project to be categorically exempt from CEQA pursuant to CEQA Guidelines Section 15308 – Actions by Regulatory Agencies for Protection of the Environment and CEQA Guidelines Section 15321 – Enforcement Actions by Regulatory Agencies. The project was approved on May 13, 1994 and a Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Notice of Exemption From CEQA for Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; July 1992: The July 1992 amendments to Rule 1146.1: 1) specified test methods; 2) required written approval of alternative test methods by the California Air Resources Board (CARB) and U.S. EPA; 3) provided a method to convert NOx concentrations to pounds of NOx per MMBtus, 4) limited the exemption period during startups and shutdowns to a maximum of six hours; and 5) clarified rule requirements.

The project was reviewed pursuant to District CEQA Guidelines Section 15061(b)(3) and SCAQMD staff determined that the project would not have any significant adverse impacts on the environment. The project was approved on July 10, 1992 and a Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Notice of Exemption From CEQA for Proposed Amended Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; October 1990: The October 1990 amendments to Rule 1146.1 established limits on NOx emissions from small industrial, institutional, and commercial boilers, steam generators, and process heaters with greater than two, but less than five MMBtu per hour heat input capacity. A "Notice of Intent to File a Determination of No Significant Impacts" (Determination), including the "Initial Study", was prepared in accordance with state and District CEQA Guidelines. SCAQMD staff determined that no potentially significant impacts to the environment would occur as a result of implementing the project. The Determination was circulated for public review from August 22, 1990 through September 11, 1990 and no comments were received.

Final Supplemental Environmental Impact Report: Proposed Amended Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; January 1989 (SCH No. 87110404): Pursuant to CEQA, the SCAQMD prepared a Draft Supplemental Environmental Impact Report (SEIR) for the January 1989 amendments to Rule 1146. The Draft SEIR was a supplement to the March 1988 Final EIR prepared for Rule 1146 (SCH No. 87110404) and was circulated for a 45-day public review and comment period. Findings were made and a Statement of Overriding Considerations was adopted for the project. The Final SEIR was certified by the SCAQMD Governing Board on January 6, 1989.

Final Environmental Impact Report for Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; September 1988 (SCH No. 87110404): Pursuant to CEQA, the SCAQMD prepared a Draft Environmental Impact Report (EIR) for the September 1988 adoption of Rule 1146. The Draft EIR for Rule 1146 and was circulated for a 45-day public review. Findings were made and a Statement of Overriding Considerations was adopted for the project. The Final EIR was certified by the SCAQMD Governing Board on September 9, 1988.

INTENDED USES OF THIS DOCUMENT

In general, a CEQA document is an informational document that informs a public agency's decision-makers and the public generally of potentially significant adverse environmental effects of a project, identifies possible ways to avoid or minimize the significant effects, and describes reasonable alternatives to the project (CEQA Guidelines Section 15121). A public agency's decision-makers must consider the information in a CEQA document prior to making a decision on the project. Accordingly, this Final ~~Revised Draft~~ SEA is intended to: a) provide the SCAQMD Governing Board and the public with information on the environmental effects of the proposed project; and b) be used as a tool by the SCAQMD Governing Board to facilitate decision-making on the proposed project.

Additionally, CEQA Guidelines Section 15124(d)(1) requires a public agency to identify the following specific types of intended uses of a CEQA document:

1. A list of the agencies that are expected to use the SEA in their decision-making;

2. A list of permits and other approvals required to implement the project; and

3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

In addition to the SCAQMD's Governing Board which will consider the SEA for PARs 1146 series and PR 1100 in their decision-making, the CARB, a state agency, and the U.S. EPA, a federal agency, will be reviewing PARs 1146 series and PR 1100 and all supporting documents, including the SEA, as part of the process for considering the inclusion of PARs 1146 series and PR 1100 into the SIP. Moreover, PARs 1146 series and PR 1100 is not subject to any other related environmental review or consultation requirements.

To the extent that local public agencies, such as cities, county planning commissions, et cetera, are responsible for making land use and planning decisions related to projects that must comply with the requirements in PARs 1146 series and PR 1100, they could possibly rely on this SEA during

their decision-making process. Similarly, other single purpose public agencies approving projects that utilize compliant equipment subject to PARs 1146 series and PR 1100 may rely on this SEA.

AREAS OF CONTROVERSY

CEQA Guidelines Section 15123(b)(2) requires a public agency to identify the areas of controversy in the CEQA document, including issues raised by agencies and the public. Over the course of developing the proposed project, concerns regarding PARs 1146 series and PR 1100 were expressed by representatives of industry and environmental groups, either in public meetings or in written comments, which are highlighted in Table 1-1.

Table 1-1
Areas of Controversy

Areas of Controversy	Topics Raised by the Public	SCAQMD Evaluation
New Source Review (NSR)	NSR issues related to the transition of RECLAIM facilities before BARCT rules are adopted or amended	Some industry stakeholders have requested that rulemaking with BARCT rule amendments should be suspended until NSR issues have been resolved. Staff believes that rulemaking should proceed while NSR issues are being addressed. State law (AB 617) requires implementation of BARCT for facilities in the state greenhouse gas cap and trade program by December 31, 2023. In addition, RECLAIM facilities will be able to begin implementing BARCT requirements while still in the RECLAIM program. Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx) was amended on October 5, 2018 to provide an option for RECLAIM facilities to remain in the RECLAIM program, until future provisions in Regulation XIII – New Source Review pertaining to RECLAIM are adopted. If an NSR event is triggered while the facilities elected to remain in RECLAIM, the facility will be subject to NSR provisions under Rule 2005 – New Source Review for RECLAIM.
Availability of Burner Retrofits	Availability of burner retrofits that can achieve a NOx limit of seven ppm	Some industry stakeholders have commented on the limited availability for ultra-low NOx burner retrofits that will be able to meet the proposed seven ppm NOx concentration limit. Staff has confirmed that three equipment vendors have burner retrofits that can achieve seven ppm. 708 units within the San Joaquin Valley Air Pollution Control District (SJVAPCD) are currently meeting a seven ppm NOx emission limit. Staff has also reviewed over 2,400 source test results from both SCAQMD and SJVAPCD to evaluate the feasibility of seven ppm BARCT.
Cost of Burner Retrofits	Cost associated with seven ppm burner retrofits (higher than staff estimates)	Some industry stakeholders have commented that the price quotations obtained from vendors for burner retrofits are higher than those of staff estimates. Staff's cost estimates are averages provided by five equipment vendors based on conventional equipment and standard installations. Facilities might experience higher than average costs if operators decide to stay with one specific vendor or retrofitting highly specialized units that would require specific engineering.

~~Compliance Dates~~	~~RECLAIM facility stakeholders raised concerns over the ability to comply with the proposed compliance dates in PARs 1146 series.~~	~~SCAQMD proposes a tiered approach to the compliance dates (75 percent compliance by January 1, 2021 and 100 percent compliance by January 1, 2022 or by January 1, 2023 for replacement units) to lessen the financial impact to businesses and consumers. In addition, units that are subject to Rules 1146 and 1146.1 have been grouped together in the compliance schedule to allow facilities to decide which units they can demonstrate compliance with by earlier (January 1, 2021). Thus, providing them more flexibility for demonstrating compliance. SCAQMD is proposing to extend the compliance date to submit a complete permit application by 12 months after the date of rule adoption. In addition, certain units will be allowed 15 years after the date of rule adoption or during burner replacement to meet the applicable NOx emissions limit.~~
~~New Source Review (NSR)~~	~~The availability of Emission Reduction Credits (ERCs) for NSR events~~	~~RECLAIM Facilities with a Potential to Emit (PTE) of less than four tons per year will have access to the SCAQMD's internal bank for any projects that require offsets under Regulation XIII – NSR. The NSR issues will be resolved for facilities with a PTE greater than or equal to four tons per year. For this reason, PARs 1146 series and PR 1100 will only allow facilities with a PTE of less than four tons per year to exit the RECLAIM program. Staff acknowledges that rulemaking regarding the transition has many complexities. However, staff has found it necessary to continue with the approach of amending command-and-control NOx rules concurrently with addressing NSR issues. The reason for this approach is to avoid delay in adopting implementation schedules for BARCT to give facilities adequate time to comply with command-and-control NOx emission limits. Resolving NSR is a significant issue as it requires involvement and approval from U.S. EPA. In the interim, facilities have two options. A facility that receives an initial determination notification can remain in RECLAIM and if there are emission increases that would trigger a New Source Review event, the facility would comply with RECLAIM NSR. Staff is committed to not exit facilities until the NSR issues are resolved. If however, a facility elects to exit before NSR issues are resolved if they had an emissions increase that would trigger a New Source Review event, the facility would need to purchase offsets in the open market.~~
~~Monitoring, Reporting and Recordkeeping (MRR) Requirements for Title V Facilities~~	~~The timeline for potentially eliminating some RECLAIM-specific MRR requirements~~	~~For Title V facilities, the U.S. EPA public review process is triggered by modifications on monitoring and recordkeeping requirements. The SCAQMD is committed to re-evaluate monitoring and recordkeeping requirements for Title V facilities. Staff is recommending that Title V facilities will maintain existing monitoring and recordkeeping requirements while the transition process proceeds.~~

Pursuant to CEQA Guidelines Section 15131(a), "[e]conomic or social effects of a project shall not be treated as significant effects on the environment." CEQA Guidelines Section 15131(b) states further, "[e]conomic or social effects of a project may be used to determine the significance of physical changes caused by the project." Physical changes that may be caused by PARs 1146

series and PR 1100 have been evaluated in Chapter 4 of this ~~Revised Draft~~ Final SEA. No direct or indirect physical changes resulting from economic or social effects have been identified as a result of implementing PARs 1146 series and PR 1100.

To date, no other controversial issues relevant to the CEQA analysis were raised as a part of developing the proposed project.

EXECUTIVE SUMMARY

CEQA Guidelines Section 15123 requires a CEQA document to include a brief summary of the proposed actions and their consequences. In addition, areas of controversy must also be included in the executive summary (see preceding discussion). This ~~Revised Draft~~Final SEA consists of the following chapters: Chapter 1 – Executive Summary; Chapter 2 – Project Description; Chapter 3 – Existing Setting, Chapter 4 – Potential Environmental Impacts and Mitigation Measures; Chapter 5 – Project Alternatives; and various appendices. The following subsections briefly summarize the contents of each chapter.

Summary of Chapter 1 – Executive Summary

Chapter 1 includes an introduction of the proposed project and a discussion of the legislative authority that allows the SCAQMD to amend and adopt air pollution control rules, identifies general CEQA requirements and the intended uses of this CEQA document, and summarizes the remaining four chapters that comprise this SEA.

Summary of Chapter 2 - Project Description

SCAQMD staff has been directed by the Governing Board to begin the process of transitioning equipment at facilities that are currently subject to facility permit requirements per SCAQMD Regulation XX – RECLAIM for NOx to instead be subject to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI. As such, SCAQMD staff has begun this process by proposing amendments to Rules 1146, 1146.1, and 1146.2 (e.g., PARs 1146 series) and to adopt PR 1100. PARs 1146 series and PR 1100 reflects the proposed project which is a culmination of recommendations made throughout the public engagement process including seven ~~six~~three working group meetings held at SCAQMD headquarters in Diamond Bar on November 30, 2017, January 16, 2018, ~~and~~ March 7, 2018, April 12, 2018, August 2, 2018, ~~and~~ August 29, 2018, and October 16, 2018. The working group is composed of representatives from the manufacturers, trade organizations, permit stakeholders, businesses, environmental groups, public agencies, consultants, and other interested parties. In addition, staff also discussed concepts for PARs 1146 series and PR 1100 at the RECLAIM working group meetings held on July 13, 2017, September 14, 2017, October 12, 2017, January 11, 2018, February 8, 2018, ~~and~~ March 8, 2018, April 12, 2018, June 14, 2018, July 12, 2018, and September 13, 2018. A Public Workshop and CEQA Scoping Meeting was held February 14, 2018. After changes were made to the proposed project evaluated in the original Draft SEA, another Public Workshop was held on September 20, 2018. PARs 1146 series and PR 1100 would require equipment at RECLAIM facilities that are not subject to a Regulation XI rule to meet current NOx emission limits and demonstrate BARCT NOx emissions equivalency, and transition from RECLAIM to an equipment-based command-and-control regulatory structure. PARs 1146 series would: 1) expand the applicability to include units at NOx RECLAIM facilities; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NOx concentration limits in Rules 1146 and 1146.1; 3) extend the compliance date for RECLAIM facilities replacing Rule 1146 or 1146.1 units and

require a permit application submittal for unit(s) being replaced; 4) require RECLAIM facilities with Rule 1146.2 units to meet applicable NOx emission limits by December 31, 2023, unless a more stringent BARCT limit is subsequently adopted; 5) limit ammonia emissions on new or modified units with applicable air pollution control equipment and require quarterly ~~annual~~ ammonia source testing (if four consecutive quarterly source tests demonstrate compliance, an annual source test may be conducted); ~~and~~ 6) require certain units at non-RECLAIM facilities to meet new NOx emission limits according to the compliance schedules specified in Rules 1146 and 1146.1; and 7) allow units at municipal sanitation service facilities to maintain existing NOx emission limits until a Regulation XI rule is adopted or amended. PR 1100 is an administrative rule which establishes the compliance schedule for RECLAIM facilities with Rule 1146 and/or 1146.1 units. ~~1) expand the applicability to include units that were not previously required to comply with Rules 1146 and 1146.1 because they were in the NOx RECLAIM program; 2) require RECLAIM facilities to submit a permit application within 12 months of the date of rule adoption for each unit that does not currently meet the NOx concentration limits in Rules 1146 and/or 1146.1; 3) require the affected equipment to meet the applicable NOx concentration limit for all Rule 1146 and Rule 1146.1 units for a minimum of 75 percent of the total heat input by January 1, 2021 and 100 percent of the total heat input by January 1, 2022; 4) require RECLAIM facilities replacing Rule 1146 or Rule 1146.1 units to notify the Executive Officer which unit(s) will be replaced; and 5) require RECLAIM facilities with Rule 1146.2 units to meet NOx emission limits by December 31, 2023 if a more stringent BARCT limit is not applicable. PR 1100 is an administrative rule which establishes the compliance schedule for facilities exiting the RECLAIM program and allows facilities with Rule 1146/1146.1 units until January 1, 2022 to retrofit all existing units and until January 1, 2023 to replace any existing units, upon notification to the Executive Officer.~~ Implementation of the proposed project is estimated to reduce NOx emissions by 0.20 ton per day by January 1, 2021 and ~~0.23~~ 0.27 ton per day by January 1, 2023. Other minor changes are also proposed for clarity and consistency throughout the rules. The analysis of the proposed project in the Revised Draft SEA indicated that while reducing NOx emissions is an environmental benefit, potentially secondary significant adverse environmental impacts ~~are~~ were also expected for the topic areas of air quality and hazards and hazardous materials. However, after the analysis was completed, only the topic of hazards and hazardous materials for the storage and use of aqueous ammonia was concluded in the Final SEA to have potentially significant adverse impacts.

A copy of PARs 1146, 1146.1, and 1146.2, and PR 1100 can be found in Appendix A of this ~~Revised Draft~~Final SEA.

Summary of Chapter 3 - Existing Setting

Pursuant to the CEQA Guidelines Section 15125, Chapter 3 – Existing Setting includes a description of the environmental topics areas as being potentially adversely affected by the proposed project. As previously explained, the proposed project is a revision to the previously approved projects that were analyzed in the September 2008 Final EAs for Rules 1146 and 1146.1 and May 2006 Final EA for Rule 1146.2. The September 2008 Final EA for Rule 1146 concluded that significant adverse air quality and hazards and hazardous materials impacts would occur. However, all other environmental topic areas analyzed in the September 2008 Final EA for Rule 1146 were shown to have less than significant or no significant impacts. Both the September 2008 Final EA for Rule 1146.1 and the May 2006 Final EA for Rule 1146.2 concluded that no significant adverse environmental impacts would occur not from the respective projects. Since the analysis of the proposed project in the Revised Draft SEA initially indicated~~s~~ that additional potentially

significant adverse air quality and hazards and hazardous materials impacts will occur, the focus of the analysis in ~~this~~ the Revised Draft SEA ~~is~~ was limited to the environmental topics of air quality and hazards and hazardous materials. The following discussion briefly highlights the existing setting for the topics of air quality and hazards and hazardous materials.

Air Quality

Air quality in the area of the SCAQMD's jurisdiction has shown substantial improvement over the last two decades. Nevertheless, some federal and state air quality standards are still exceeded frequently and by a wide margin. Of the NAAQS established for seven criteria pollutants (ozone, lead, sulfur dioxide, nitrogen dioxide, carbon monoxide, PM10 and PM2.5), the area within the SCAQMD's jurisdiction is only in attainment with the NAAQS for carbon monoxide, sulfur dioxide, and nitrogen dioxide. Chapter 3 provides a brief description of the existing air quality setting for each criteria pollutant, as well as the human health effects resulting from exposure to each criteria pollutant.

Hazards and Hazardous Materials

The 2016 AQMP contains control measures intended to improve overall air quality; however, the implementation of some control measures, such as CMB-05, may result in adverse hazards and hazardous materials impacts, either directly or indirectly. Hazard concerns are related to the potential for fires, explosions or the release of hazardous materials/substances in the event of an accident or upset conditions. The potential for hazards exist in the production, use, storage, and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Specifically, storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the Basin in large quantities via all modes of transportation including rail, highway, water, air, and pipeline. Incidents of harm to human health and the environment associated with hazardous materials have created a public awareness of the potential for adverse effects from careless handling and/or use of these substances. As a result, a number of federal, state, and local laws have been enacted to regulate the use, storage, transportation, and management of hazardous materials and wastes. Chapter 3 discusses the existing hazards and hazardous materials setting.

Summary of Chapter 4 - Environmental Impacts

CEQA Guidelines Section 15126(a) requires a CEQA document to identify and focus on the "significant environmental effects of the proposed project." Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. In addition, CEQA Guidelines Section 15126(b) requires a CEQA document to identify the significant environmental effects that cannot be avoided if the proposed project is implemented. CEQA Guidelines Section 15126(c) also requires a CEQA document to consider and discuss the significant irreversible environmental changes that would be involved if the proposed project is implemented. Further, CEQA Guidelines Section 15126(e) requires a CEQA document to consider and discuss mitigation measures proposed to minimize the significant effects. Finally, CEQA Guidelines Section 15130 requires a CEQA document to discuss whether the proposed project has cumulative impacts. Chapter 4

considers and discusses each of these requirements.

Potential Environmental Impacts Found To Be Significant

Air quality from construction activities and hazards and hazardous materials ~~are~~ were the only environmental topic areas that have been identified in ~~this~~ the Revised Draft SEA as having potentially significant adverse impacts if the proposed project is implemented. However, after the analysis was completed, only the topic of hazards and hazardous materials for the storage and use of aqueous ammonia was concluded in the Final SEA to have potentially significant adverse impacts. These environmental topic areas are analyzed in Chapter 4.

Potential Environmental Impacts Found Not To Be Significant

Because this SEA is a subsequent CEQA document to the September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP, this SEA relies on the conclusions reached in these documents as evidence for environmental areas where impacts were found not to be significant. All of these previous CEQA documents reviewed approximately 17 environmental topic areas and analyzed whether the respective projects would create potentially significant adverse impacts. While the analyses in the September 2008 Final EA for 1146.1 and May 2006 Final EA for Rule 1146.2 identified no significant adverse environmental impacts for any environmental topic area, the analysis in the September 2008 Final EA for Rule 1146 identified two environmental topic areas as having significant adverse environmental impacts: 1) air quality; and 2) hazards and hazardous materials.

Also, the analysis in the March 2017 Final Program EIR for the 2016 AQMP concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measures for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia; (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. It is important to note, however, that for these environmental topic areas, not all of the conclusions of significance are applicable to this currently proposed project, PARs 1146 series and PR 1100. Please see Chapter 4, Table 4-14, for a summary of the significant and unavoidable adverse environmental impacts identified in the March 2017 Final Program EIR and which ones apply to the proposed project.

PAR 1146 is expected to have: 1) significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)); and 2) significant effects that were previously examined that will be substantially more severe than what was discussed in the September 2008 Final EA for Rule 1146 and the March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(B)). Similarly, PAR 1146.1 is also expected to have significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146.1 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)). However, PAR 1146.2 is not expected to create new significant effects that were not discussed in

the previous May 2006 Final EA for Rule 1146.2 and the March 2017 Final Program EIR for the 2016 AQMP.

By preparing a SEA for the proposed project, since the topics of air quality and hazards and hazardous materials are the only environmental topic areas that would be affected by PARs 1146 series and PR 1100, no other environmental topic areas have been evaluated in this SEA.

Thus, the conclusions reached in this ~~Revised Draft~~ Final SEA are consistent with the conclusions reached in the previously certified CEQA documents (e.g., the September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP) that aside from the topic~~s~~ of ~~air quality during construction and~~ hazards and hazardous materials, there would be no other significant adverse effects from the implementation of the proposed project. Thus, the proposed project would have no significant or less than significant direct or indirect adverse effects on the following environmental topic areas:

- aesthetics
- air quality and greenhouse gases ~~during operation~~
- agriculture and forestry resources
- biological resources
- cultural resources
- energy
- geology and soils
- hydrology and water quality
- land use and planning
- mineral resources
- noise
- population and housing
- public services
- recreation
- solid and hazardous waste
- transportation and traffic

The September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP can be found using the links referenced in Chapter 2.

Other CEQA Topics

CEQA documents are also required to consider and discuss the potential for growth-inducing impacts (CEQA Guidelines Section 15126(d)) and to explain and make findings about the project's relationship between short-term and long-term environmental goals. (CEQA Guidelines Section 15065(a)(2).) Additional analysis confirms that the proposed project would not result in irreversible environmental changes or the irretrievable commitment of resources, foster economic

or population growth or the construction of additional housing. Further, implementation of the proposed project is not expected to achieve short-term goals to the disadvantage of long-term environmental goals.

Summary Chapter 5 - Alternatives

CEQA Guidelines Section 15126(e) requires a CEQA document to consider and discuss alternatives to the proposed project. Five alternatives to the proposed project are summarized in Table 1-2: 1) Alternative A - No Project; 2) Alternative B - Compliance Deadline Extension; 3) Alternative C - 100% of Units by January 1, 2021; 4) Alternative D - All Ultra-Low NOx Burners; and 5) Alternative E – NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits ~~Lowering Limit for ≥ 40 and < 75 MMBtu/hr~~. Table 1-3 shows the emission factors relevant to Rules 1146 and 1146.1, which have been extracted from Rule 2002 - Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx) Emission Factor Table 1 and 3. Air quality from construction activities and hazards and hazardous materials were the only environmental topic areas that were identified in the Revised Draft SEA as having potentially significant adverse impacts if the proposed project is implemented. Pursuant to the requirements in CEQA Guidelines Section 15126.6(b) to mitigate or avoid the significant effects that a project may have on the environment, a comparison of the potentially significant adverse impacts from air quality and hazards and hazardous materials from each of the project alternatives for the individual rule components that comprise the proposed project is provided in Table 1-4. Aside from potentially significant adverse impacts to air quality during construction and hazards and hazardous materials from the catastrophic failure of an aqueous ammonia tank, no other potentially significant adverse impacts were identified for the proposed project or any of the project alternatives. However, after the analysis was completed, within the proximity of sensitive receptors only the topic of hazards and hazardous materials for the storage and use of aqueous ammonia was concluded in the Final SEA to have potentially significant adverse impacts.

The proposed project is considered to provide the best balance between achieving NOx emission reductions and the secondary adverse environmental impacts that may occur due to activities associated with construction and the storage of hazardous materials associated with operating air pollution control equipment (e.g., SCR systems) while meeting the overall objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

Table 1-2
Summary of the Proposed Project and Alternatives

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project (for NOx RECLAIM facilities transitioning to command-and-control regulatory structure)		Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 *~~*~~(If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022))*	See Rule 2002 Emission Factor, Table 1 and 3~~**~~ *(Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factors Tables 1 and 3 and are shown in Table 1-3)*	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2022 and 100% by January 1, 2023	100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm				
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm				
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm				
1146	I	≥ 75 MMBtu/hr ~~(excluding Thermal Fluid Heaters)~~	Natural Gas	5 ppm or 0.0062 lb/MMBtu				
1146	II	≥ 20 and < 75 MMBtu/hr (All others)~~with an existing NOx limit >12 ppm~~ ~~(excluding Thermal Fluid Heaters)~~	Gaseous Fuel (excluding Landfill or Digester Gas)	5~~9~~ ppm or 0.0062~~11~~ lb/MMBtu				
1146	II	≥ 20 and < 75 MMBtu/hr (Fire-tube boilers with an existing NOx limit ~~≤~~< 9 ~~12~~ ppm and >5 ppm)	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu				
1146	II	≥ 20 and < 75 MMBtu/hr (All others with a previous NOx limit <12 ppm and >5 ppm)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu				
1146	III	≥ 5 and < 20 MMBtu/hr (Fire-tube boilers, ~~only~~ excluding units with a previous NOx limit >9 and ≤ 12 ppm) ~~(excluding Thermal Fluid Heaters, but including Units at Schools and Universities rated ≥ 5 MMBtu/hr)~~	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu				
1146	III	≥ 5 and < 20 MMBtu/hr (excluding Fire-tube boilers)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu				
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146	-	Low Fuel Usage (≤ 90,000 therms/year)	Any Fuel	12~~30~~ ppm, 15 years after the date of rule adoption~~by January 1, 2022~~ or when 50 percent or more of the unit's burners are replaced~~ment~~, whichever is earlier~~occurs later~~				
1146	-	≥ 5 MMBtu/hr Thermal Fluid Heaters	Natural Gas	12 ppm or 0.015 lb/MMBtu				

Table 1-2: Summary of the Proposed Project and Alternatives (continued)

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project		Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of units by January 1, 2021
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 *[*](If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022))*	See Rule 2002 Emission Factor, Table 1 and 3[**] *(Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factors Tables 1 and 3 and are shown in Table 1-3)*	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2022 and 100% by January 1, 2023	100% of units by January 1, 2021
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Fire-tube boilers, Atmospheric Units and Thermal Fluid Heaters)	Natural Gas	9 ppm or 0.011 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Any Fire-Tube Boilers, excluding units with a previous NOx limit >9 and < 12 ppm)	Natural Gas	7 ppm or 0.0085 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Thermal Fluid Heaters)	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier				
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023		-	No Change	No Change
1100	-	Rule 1146 and 1146.1 Units only	-	Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule		-	Compliance deadline would be extended by one year	Compliance deadline would be shortened by one year for 25% of units

Table 1-2: Summary of the Proposed Project and Alternatives (continued~~Concluded~~)

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	**Proposed Project** ~~(for NOx RECLAIM facilities transitioning to command-and-control regulatory structure)~~		**Alternative D:** All Ultra-Low NOx Burners	**Alternative E:** ~~Lowering Limit for~~ NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits~~≥ 40 and < 75 MMBtu/hr~~
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 ~~*~~*(If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022))*	No Change	No Change
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change
1146	I	≥ 75 MMBtu/hr ~~(excluding Thermal Fluid Heaters)~~	Natural Gas	5 ppm or 0.0062 lb/MMBtu		9 ppm or 0.011 lb/MMBtu~~; 75% of units by January 1, 2021 and 100% by January 1, 2022~~	No Change
1146	II	≥ 20 and < 75 MMBtu/hr (All others)~~with an existing NOx limit ≥12 ppm (excluding Thermal Fluid Heaters)~~	Gaseous Fuel (excluding Landfill or Digester Gas)	5~~9~~ ppm or 0.0062~~11~~ lb/MMBtu		9 ppm or 0.011 lb/MMBtu~~No Change No Change~~	9 ppm or 0.011 lb/MMBtu~~5 ppm for units > 40 MMBtu/hr No Change~~
1146	II	≥ 20 and < 75 MMBtu/hr with an existing NOx limit ~~<~~≤9 ~~12~~ ppm and >5 ppm)	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu			
1146	II	≥ 20 and < 75 MMBtu/hr (All others with a previous NOx limit ≤12 ppm and >5 ppm)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu			
1146	III	≥ 5 and < 20 MMBtu/hr (Fire-tube boilers only, excluding units with a previous NOx limit >9 and ≤ 12 ppm) ~~(excluding Thermal Fluid Heaters, but including Units at Schools and Universities rated ≥ 5 MMBtu/hr)~~	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu			
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu		No Change	No Change
1146	-	Low Fuel Usage (≤ 90,000 therms/year)	Any Fuel	12~~30~~ ppm, 15 years after the date of rule adoption ~~by January 1, 2022~~ or when 50 percent or more of the unit's burners are replaced~~ment~~, whichever is earlier~~occurs later~~		No Change	No Change
1146	-	≥ 5 MMBtu/hr Thermal Fluid Heaters	Natural Gas	12 ppm or 0.015 lb/MMBtu		30 ppm or 0.037 lb/MMBtu	30 ppm or 0.037 lb/MMBtu
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu		No Change	No Change

Table 1-2: Summary of the Proposed Project and Alternatives (concluded)

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project		Alternative D: All Ultra-Low NOx Burners	Alternative E: NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 ~~*~~*(If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022))*	No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Fire-tube boilers, Atmospheric Units and Thermal Fluid Heaters~~, but including at Schools/Universities~~)	Natural Gas	9 ppm or 0.011 lb/MMBtu		No Change	9 ppm or 0.011 lb/MMBtu~~No Change~~
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Any Fire-Tube Boilers, excluding units with a previous NOx limit >9 and ≤ 12 ppm)	Natural Gas	7 ppm or 0.0085 lb/MMBtu		9 ppm or 0.011 lb/MMBtu	
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Thermal Fluid Heaters)	Natural Gas	12 ppm or 0.015 lb/MMBtu		30 ppm or 0.037 lb/MMBtu	30 ppm or 0.037 lb/MMBtu
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier~~30 ppm by January 1, 2022 or burner replacement, whichever occurs later~~		No Change	No Change
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023		No Change	No Change
1100	-	Rule 1146 and 1146.1 Units only	-	Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule		No Change	No Change

~~***Note: Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factor Tables 1 and 3 and are shown in Table 1-3.~~

~~1146.1~~	~~-~~	~~> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Atmospheric Units and Thermal Fluid Heaters, but including at Schools/Universities)~~	~~Natural Gas~~	~~9 ppm or 0.011 lb/MMBtu~~				
~~1146.1~~	~~-~~	~~Low Fuel Usage (≤ 18,000 therms/year)~~	~~Any Fuel~~	~~30 ppm by January 1, 2022 or burner replacement, whichever occurs later~~				
~~1146.2~~	~~-~~	~~≤ 2 MMBtu/hr~~	~~Natural Gas~~	~~30 ppm, unless a more stringent limit is applicable, by December 31, 2023~~		~~-~~	~~No Change~~	~~No Change~~
~~1100~~	~~-~~	~~Rule 1146 and 1146.1 Units only~~	~~-~~	~~Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule~~		~~-~~	~~Compliance deadline would be extended by one year~~	~~Compliance deadline would be shortened by one year for 25% of units~~

Table 1-3
RECLAIM NOx Emission Factors[1,2]

Rule No.:	Heat Input	Fuel Type	Year 2000 (Tier 1) Ending NOx Emission Factor (lbs)	Fuel Throughput Units
1146/1146.1	> 2 MMBtu/hr	Natural Gas	47.57	Mmcf
1146/1146.1	> 2 MMBtu/hr	LPG, Propane, Butane	4.26	1,000 gallons
1146/1146.1	> 2 MMBtu/hr	Diesel Light Dist. (0.05% Sulfur)	6.21	1,000 gallons
1146/1146.1	> 2 MMBtu/hr	Refinery Gas	49.84	Mmcf
1146.1	> 2 MMBtu/hr and < 5 MMBtu/hr	Natural Gas	39.46	Mmcf
1146.1	> 2 MMBtu/hr and < 5 MMBtu/hr	Refinery Gas	41.34	Mmcf
1146.1	> 2 MMBtu/hr and < 5 MMBtu/hr	LPG, Propane, Butane	3.53	1,000 gallons
1146.1	> 2 MMBtu/hr and < 5 MMBtu/hr	Diesel Light Dist. (0.05% Sulfur)	5.15	1,000 gallons
1146	≥ 5 MMBtu/hr	Natural Gas	47.75	Mmcf
1146	≥ 5 MMBtu/hr	Refinery Gas	50.03	Mmcf
1146	≥ 5 MMBtu/hr	LPG, Propane, Butane	4.28	1,000 gallons
1146	≥ 5 MMBtu/hr	Diesel Light Dist. (0.05% Sulfur)	6.23	1,000 gallons
1146	< 90,000 Therms	Natural Gas	47.75	Mmcf
1146	< 90,000 Therms	Refinery Gas	50.03	Mmcf
1146	< 90,000 Therms	LPG, Propane, Butane	4.28	1,000 gallons
1146	< 90,000 Therms	Diesel Light Dist. (0.05% Sulfur)	6.23	1,000 gallons
1146.1	< 18,000 Therms	Natural Gas	39.46	Mmcf
1146.1	< 18,000 Therms	Refinery Gas	41.34	Mmcf
1146.1	< 18,000 Therms	LPG, Propane, Butane	3.53	1,000 gallons
1146.1	< 18,000 Therms	Diesel Light Dist. (0.05% Sulfur)	5.15	1,000 gallons
1146/1146.1	2 to 20 MMBtu/hr	Any	12 ppm or 0.015 lb/MMBtu	
1146	>20 MMBtu/hr	Any	9 ppm or 0.010 lb/MMBtu	

Note:
1. Some units that began allocations pursuant to Rule 2002(c)(1) may have higher emission factors; however the units met BACT limits effective at the time of installation.
2. Facilities were required to have either met the emission factors for their units or purchased RECLAIM trading credits (RTCs) for compliance.
3. Mmcf = million cubic feet

Table 1-4
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives

Category	Proposed Project	Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of Units by January 1, 2021	Alternative D: All Ultra-Low NOx Burners	Alternative E: ~~Lowering Limit for ≥ 40 and < 75 MMBtu/hr~~NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits
Air Quality	Expected to result in NOx emission reductions of 0.20 ton per day by January 1, 2021 and 0.27 ton per day by January 1, 2023. Affected RECLAIM facilities will transition to a command-and-control regulatory structure. Certain non-RECLAIM facilities will meet NOx emission limits during replacement or within 15 years of the date of rule adoption, whichever is earlier. Thermal fluid heaters currently permitted at >20 ppm must meet 12 ppm by January 1, 2022. All units will meet BARCT NOx emissions equivalency from the implementation of command-and control regulatory structure.	No new NOx emission reductions will be achieved. RECLAIM facilities would not transition to a command-and control regulatory structure and all (including some non-RECLAIM) units would not meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project except the reductions would be delayed by one year. Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all (including some non-RECLAIM) units will meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project, but emissions would be achieved sooner (by January 1, 2021). Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units (including some non-RECLAIM) will meet BARCT level equivalency.	Expected to result in lesser NOx emission reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and-control regulatory structure. Some facilities would not meet BARCT level equivalency.	Expected to result in less ~~more~~ NOx emissions reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and control regulatory structure, but ~~and~~ units ~~will be equal to or more stringent than~~ would not reach BARCT level equivalency.
Signifi-cance of Air Quality Impacts	Less than Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx during construction due to overlapping construction of SCR systems and ultra-low NOx burners, but these significant impacts will be reduced to less than significant levels because a concurrent operational air quality benefit would result due to the project's overall NOx emission reductions.	Not Significant: This would not result in an exceedance of SCAQMD's regional air quality CEQA significance threshold for NOx. The SCAQMD will not achieve any emissions reductions; thus, attainment for the SCAQMD for ozone is unlikely to occur.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx during construction due to overlapping construction of SCR systems and ultra-low NOx burners. While a concurrent operational air quality benefit would result due to the project's overall NOx emission reductions, ~~and these significantce is equivalent to the amount in the proposed project but with a~~ the delay in the operational benefit is may not fully reduce the overlapping construction emissions to less than significant levels.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx during construction due to the overlapping construction of SCR systems and ultra-low NOx burners, but these significant~~ce~~ impacts will be reduced to less than significant levels because a concurrent operational air quality benefit would result due to the project's overall NOx emission reductions This alternative is equivalent in benefit to the amount in the proposed project but achieves the operational benefits sooner which may cause peak daily construction emissions to be greater than the proposed project.	Less than ~~Not~~ Significant: This would result in an amount that is less significant than the proposed project and would not exceed SCAQMD's regional air quality CEQA significance threshold for NOx.	Less than Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx during construction~~. D~~ due to the overlapping construction of ~~additional~~ SCR systems and ultra-low NOx burners, but these significant impacts will be reduced to less than significant levels because a concurrent operational air quality benefit would result. However, to meet the current NOx emission limits, the impacts are at an amount that is less ~~more~~ significant than the proposed project and NOx emissions reductions would be less than the proposed project.~~but with more operational benefits.~~

Table 1-4
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (concluded)

Category	Proposed Project	Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of Units by January 1, 2021	Alternative D: All Ultra-Low NOx Burners	Alternative E: NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits
Significance of Hazards and Hazardous Materials Impacts	Significant: To operate, SCR systems require ammonia. Ammonia is considered a hazardous material. At ~~two~~32 facilities, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors would result in significant impacts.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. No hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance. The number of affected facilities would be the same as the proposed project. The level of significance in this alternative is equivalent to the amount in the proposed project.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance. The number of affected facilities would be the same as the proposed project. The level of significance in this alternative is equivalent to the amount in the proposed project.	Less than ~~Not~~ Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. All facilities with affected units would need to retrofit with ultra-low NOx burners; thus, n~~N~~o hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Less stringent NOx emission limits would result in fewer affected facilities constructing SCR systems; thus, a fewer number of ammonia storage tanks would be needed. However, d~~D~~epending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance and- thus still result in significant impacts, but at an equivalent amount of the proposed project. It is estimated four facilities would be affected from this alternative. ~~Additional facilities would be subject to the lower NOx emission limit. As a result, the construction of more SCR systems and ammonia storage tanks would occur. The significance is greater than the amount in the proposed project.~~

CHAPTER 2

PROJECT DESCRIPTION

Project Location

Project Background

Project Objectives

Project Description

Summary of Affected Equipment

PROJECT LOCATION

PARs 1146 series and PR 1100 applies to a RECLAIM facility with any unit subject to Rules 1146, 1146.1, and 1146.2. The proposed project will begin the process of transitioning equipment under RECLAIM to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, consisting of the four-county South Coast Air Basin (Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino counties), and the Riverside County portions of the Salton Sea Air Basin (SSAB) and Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. It includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. A federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of Riverside County and the SSAB that is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (see Figure 2-1).

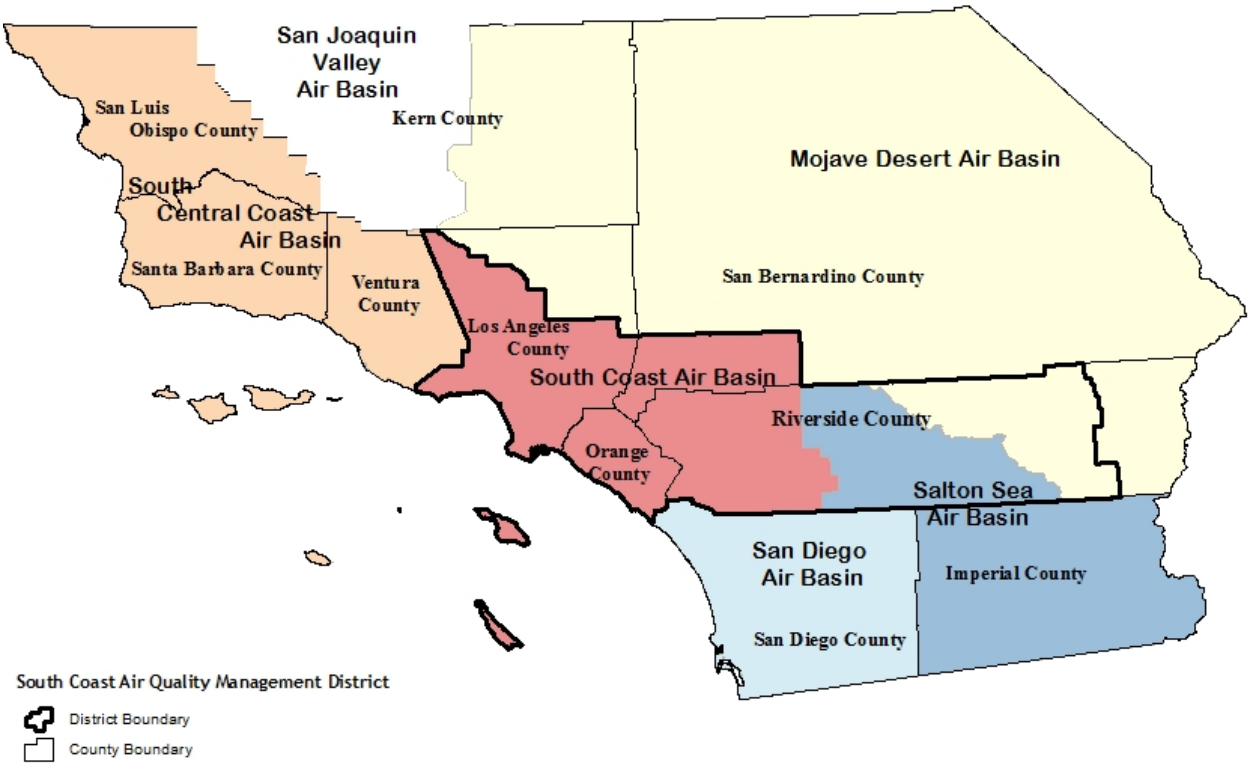

Figure 2-1
Southern California Air Basins

PROJECT BACKGROUND

Rules 1146, 1146.1, and 1146.2 impose NOx emission limits on various sizes of boilers, steam generators, and process heaters. Rule 1146 applies to boilers, steam generators, and process heaters used in industrial, institutional, and commercial operations, with a rated heat input capacity greater than or equal to five MMBtu per hour. However, Rule 1146 currently does not regulate NOx emissions from: 1) boilers operated at electric utilities to generate electricity; 2) boilers and process heaters with a rated heat input capacity greater than 40 MMBtu per hour that are used in petroleum refineries; ~~and; and~~ 3) sulfur plant reaction boilers; and 4) RECLAIM facilities (NOx only). Rule 1146 defines three groups (Group I, Group II, and Group III) of units burning natural gas or gaseous fuels. The current NOx emission limits in Rule 1146 vary by the rated heat input (Group number) ~~and the number of units at a facility~~. For example, a Group I unit includes any unit burning natural gas with a rated heat input greater than or equal to 75 MMBtu per hour, excluding thermal fluid heaters, and is required to meet a NOx emission limit of five ppm or 0.0062 pound per MMBtu by January 1, 2013. A Group II unit includes any unit burning gaseous fuels, excluding digester and landfill gases, and thermal heaters, with a rated heat input less than 75 MMBtu per hour and greater than or equal 20 MMBtu per hour, and is required to meet a NOx emission limit of nine ppm or 0.011 pound per MMBtu. A minimum of 75 percent of Group II units (by heat input) were required to meet the NOx emission limit by January 1, 2012 and 100 percent were required to meet the NOx emission limit by January 1, 2014. Group III units include any unit burning gaseous fuels, excluding digester and landfill gases, and thermal fluid heaters with a rated heat input less than 20 MMBtu per hour and greater than or equal to five MMBtu per hour and all units operated at schools and universities greater than or equal to five MMBtu per hour. Group III units are also required to meet a NOx emission limit of nine ppm or 0.011 pound per MMBtu with 75 percent or more units (by heat input) meeting the limit by January 1, 2013 and 100 percent meeting the limit by January 1, 2015. Rule 1146 also requires any units fired on non-gaseous fuels, landfill gas, or digester gas to meet a NOx emission limits of 40 ppm, 25 ppm, or 15 ppm, respectively. Finally, atmospheric units are required to meet a 12 ppm or 0.015 pound per MMBtu NOx emission limit.

Rule 1146.1 was adopted in October 1990 and established NOx emission limits for smaller units with a rated heat input capacity greater than two MMBtu per hour and less five MMBtu per hour. Similar to Rule 1146, units using landfill gas or digester gas are also required to meet a NOx emission limit of 25 ppm or 15 ppm, respectively. Under Rule 1146.1, atmospheric units are also required to meet a 12 ppm NOx emission limit and all other units fired on natural gas would need to meet a nine ppm or 0.011 pound per MMBtu NOx emission limit.

In September 2008, Rules 1146 and 1146.1 were amended to obtain NOx emission reductions by lowering the applicable NOx emission limits for various equipment, fuel and burner types. In November 2013, Rules 1146 and 1146.1 were amended to clarify that source test results showing emissions in excess of rule limits are considered a rule violation and allow diagnostic emissions checks for boiler maintenance purposes.

In January 1998, Rule 1146.2 was adopted to reduce NOx emissions from small boilers and large water heaters with a rated heat input capacity of less than or equal two MMBtu per hour. Rule 1146.2 included an exemption for units used in recreational vehicles and units subject to SCAQMD Rule 1121 - Control of Nitrogen Oxides from Residential Type, Natural Gas-Fired Water Heaters. Initially, the Rule 1146.2 required new water heaters, boilers, or process heaters with a rated heat input capacity less than or equal to 400,000 Btu per hour (also known as Type 1 units) to meet a

NOx emission limit of 55 ppm (at three percent oxygen (O2), dry) or 40 nanograms (ng) per Joule (J) of heat output. New water heaters, boilers, or process heaters with a rated heat input capacity greater than 400,000 Btu per hour and less than or equal to two MMBtu per hour (or Type 2 units) were required to meet a NOx emission limit of 30 ppm (at three percent O2, dry) and a CO emission limit of 400 ppm. However, Rule 1146.2 was amdned in January 2005 to address technical and cost issues associated with retrofitting existing units and to delay compliance dates for existing in-use equipment until an affected unit was 15 years old as of the equipment manufacture date. Rule 1146.2 was amended again in May 2006 to lower the NOx emission limit for new units to 20 ppm and set a compliance date of January 1, 2012 for new Type 1 units and January 1, 2010 for new Type 2 units. For pool heaters rated at less than or equal to 400,000 Btu per hour, the existing NOx emission limit of 55 ppm (or 40 ng per J heat output) remained unchanged.

In October 1993, the SCAQMD Governing Board adopted Regulation XX –RECLAIM to reduce NOx and SOx emissions from facilities. The RECLAIM program was designed to take a market-based approach to achieve emission reductions, as an aggregate. The RECLAIM program was created to be equivalent to achieving emissions reductions under a command-and-control approach, but by providing facilities with the flexibility to seek the most cost-effective solution to reduce their emissions. The market-based approach used in RECLAIM was based on using a supply-and-demand concept, where the cost to control emissions and reduce a facility's emissions would eventually become less than the diminishing supply of NOx RTCs. However, analysis of the RECLAIM program over the long term has shown that the ability to achieve actual NOx emission reductions has diminished.

In the 2016 AQMP, control measure CMB-05 - Further NOx Reductions from RECLAIM Assessment, committed to achieving NOx emission reductions of five tons per day by 2025, along with achieving BARCT level equivalency for all facilities through a command-and-control regulatory structure, while alleviating facilities from installing technology that would quickly become obsolete or serve as an intermediate technology. The process of transitioning NOx RECLAIM facilities to a command-and-control regulatory structure will ensure that the affected equipment will meet BARCT level equivalency as soon as practicable. As a result of control measure CMB-05 from the 2016 AQMP and ABs 617 and 398, SCAQMD staff has been directed by the Governing Board to begin the process of transitioning equipment at NOx RECLAIM facilities from a facility permit structure to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. SCAQMD staff has begun this transition process by proposing amendments to Rules 1146, 1146.1, and 1146.2 (e.g., the PARs 1146 series) and this is one of the first sets of rules to be amended to initiate the transition ~~of~~ equipment from the NOx RECLAIM program to a command-and-control regulatory structure, while achieving BARCT. ~~PARs 1146 series will transition 27 facilities out of the RECLAIM program.~~

In addition, SCAQMD staff has developed PR 1100 to establish the compliance schedule for Rules 1146 and 1146.1 units~~the PARs 1146 series~~ at RECLAIM facilities ~~exiting the RECLAIM program~~. It is important to note that the procedures for transitioning out of RECLAIM and addressing a facility's RTCs holdings are in Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx).

As part of the rule development process, a BARCT assessment was conducted for Rules 1146 and~~,~~ 1146.1~~, and 1146.2~~, which concluded that the current NOx emissions limits in Rules 1146 and 1146.1 represent BARCT for only some categories of equipment. However, SCAQMD staff's

analysis concluded that the NOx emission limits for other equipment categories subject to either Rules 1146 or 1146.1 would need to be lowered to meet BARCT level equivalency. In the 2006 amendments to Rule 1146.2, a technology assessment was conducted and SCAQMD staff determined that there is a potential that the NOx limits could be lowered pending further evaluation. In order to achieve NOx emission reductions at the earliest possible date, SCAQMD staff has focused their rule development efforts on the larger pieces of equipment which are subject to Rules 1146 and 1146.1. As such, PARs 1146 series and PR 1100 will require applicable equipment at RECLAIM facilities to meet proposed~~existing~~ NOx emission limits. SCR ~~technology/~~systems and ultra low-NOx burners are expected to be the main technologies employed to achieve the ~~current~~ NOx emission limits for equipment that will become subject to Rules 1146, 1146.1, and 1146.2. PR 1100 also includes a provision for allowing extra time (January 1, 2023) to comply with the existing NOx emission limits in Rules 1146 and 1146.1 for any operator that commits to fully replacing the affected equipment, in lieu of retrofitting existing equipment by installing ultra-low NOx burners or SCR systems.

If RECLAIM facilities elect to install equipment or air pollution control equipment in order to meet the current Rule 1146.2 NOx emission limits prior to amending Rule 1146.2 to incorporate lower NOx emission limits, the units might not comply with the final NOx limit that is incorporated into the rule. As such, facilities electing to install these units would run the risk of installing equipment that would likely need to be further modified in order to comply with the anticipated future amendments to Rule 1146.2. In order to consider the viability of lowering the NOx emission limits in Rule 1146.2, SCAQMD staff will conduct additional BARCT research along with obtaining updated emission inventory data if that is available. If the research shows BARCT is more stringent so that significant additional emissions reductions can be obtained, then staff will initiate a subsequent rule development process. ~~PAR 1146.2 will require affected facilities to exit RECLAIM. To assist in future rulemaking efforts, PAR 1146.2 will require RECLAIM facilities with units subject to Rule 1146.2 to provide equipment data to the Executive Officer by September 1, 2018.~~

In addition, PARs 1146 series and PR 1100 will exempt any unit at a RECLAIM facility subject to a NOx emission limit in a different rule for an industry-specific category, since BARCT requirements would be established in the industry-specific landing rule. ~~In addition, PARs 1146 series and PR 1100 are not expected to create additional monitoring, reporting, and recordkeeping requirements that differ from existing requirements at current RECLAIM facilities.~~

PROJECT OBJECTIVES

The main objectives of the PARs 1146 series are to transition various sizes of boilers, steam generators, process heaters, and large water heaters operating at RECLAIM facilities from a facility permit structure to an equipment-based command-and-control regulatory structure by requiring compliance with the applicable NOx emission limits in SCAQMD Rules 1146, 1146.1, 1146.2 to achieve BARCT NOx emissions equivalency for these units. Another objective of the proposed project is to implement control measure CMB-05 from the 2016 AQMP to achieve NOx emission reductions of five tons per day by 2025.

PROJECT DESCRIPTION

If adopted, PARs 1146 series would: 1) expand the applicability to include units at NOx RECLAIM facilities; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NOx concentration limits in Rules 1146 and 1146.1; 3) extend the

compliance date for RECLAIM facilities replacing Rule 1146 or 1146.1 units and require a permit application submittal for unit(s) being replaced; 4) require RECLAIM facilities with Rule 1146.2 units to meet applicable NOx emission limits by December 31, 2023, unless a more stringent BARCT limit is subsequently adopted; 5) limit ammonia emissions on new or modified units with applicable air pollution control equipment and require quarterly ~~annual~~ ammonia source testing (if four consecutive quarterly source tests demonstrate compliance, an annual source test may be conducted); ~~and~~ 6) require certain units at non-RECLAIM facilities to meet new NOx emission limits according to the compliance schedules specified in Rules 1146 and 1146.1; and 7) allow units at municipal sanitation service facilities to maintain existing NOx emission limits until a Regulation XI rule is adopted or amended. PR 1100 is an administrative rule which establishes the compliance schedule for RECLAIM facilities with Rule 1146 and/or 1146.1 units. Implementation of the proposed project is estimated to reduce NOx emissions by 0.20 ton per day by January 1, 2021 and 0.27 ton per day by January 1, 2023. ~~1) expand the applicability to include units that were not previously required to comply with Rules 1146 and 1146.1 because they were in the NOx RECLAIM program; 2) require RECLAIM facilities to submit a permit application within 12 months of the date of rule adoption for each unit that does not currently meet the NOx concentration limits in Rules 1146 and/or 1146.1; 3) require the affected equipment to meet the applicable NOx concentration limit for all Rule 1146 and Rule 1146.1 units for a minimum of 75 percent of the total heat input by January 1, 2021 and 100 percent of the total heat input by January 1, 2022; 4) require RECLAIM facilities replacing Rule 1146 or Rule 1146.1 units to notify the Executive Officer which unit(s) will be replaced; and 5) require RECLAIM facilities with Rule 1146.2 units to meet NOx emission limits by December 31, 2023 if a more stringent BARCT limit is not applicable. PR 1100 is an administrative rule which establishes the compliance schedule for facilities exiting the RECLAIM program and allows facilities with Rule 1146/1146.1 units until January 1, 2022 to retrofit all existing units and until January 1, 2023 to replace any existing units, upon notification to the Executive Officer. Implementation of the proposed project is estimated to reduce NOx emissions by 0.23 ton per day by January 1, 2023.~~

The following is a detailed summary of key elements contained in PARs 1146 series and PR 1100. A copy of PARs 1146, 1146.1, and 1146.2, and PR 1100 can be found in Appendix A.

PAR 1146

Applicability - Subdivision (a)

The exemptions contained in subdivision (a) are proposed to be moved to new subdivision (f) – Exemptions. ~~Upon the date of adoption, PAR 1146 will clarify that the exemption of RECLAIM (NOx emissions only) facilities applies only to any RECLAIM or former RECLAIM facility that is in an industry-specific category specified in Rule 1100 – Implementation Schedule for NOx Facilities.~~

Definitions - Subdivision (b)

New~~The~~ definitions of Fire-tube Boiler; Former RECLAIM Facility; Modification; Municipal Sanitation Services; Non-RECLAIM Facility; and RECLAIM Facility are proposed be added. The following definitions are proposed to be revised including: Annual Heat Input; Group I Unit; Group II Unit; Group III Unit; Heat Input; NOx Emissions; Rated Heat Input Capacity; and Thermal Fluid Heater. The definitions of Annual Capacity Factor and Standby Boiler are proposed to be removed.

Requirements - Subdivision (c)

Subdivision (c) proposes to require the owner or operator of any unit(s) subject to Rule 1146 to meet applicable emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), and (c)(4); notwithstanding the exemptions contained in Rule 2001 – Applicability, Table 1 – ~~Existing~~ Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018~~, of subdivision (j) of Rule 2001~~. ~~A change to paragraph (c)(1) proposes to require the owner or operator of a RECLAIM or former RECLAIM facility to comply with the applicable NOx emission limits specified in Table 1146-1 in accordance with the schedule specified in Rule 1100.~~

Table 1146-1 – ~~Standard~~ NOx Emission Limits and Compliance Schedule ~~Limits~~ is proposed to be modified to include new NOx emission limits and compliance schedules for certain Group II or Group III units and thermal fluid heaters. As such, the following subparagraphs have been changed as follows:

Rule Reference	**Category**	**Limit[1]**	**Compliance Schedule~~2~~ for NON-RECAIM Facilities**	**Compliance Schedule for RECLAIM and FORMER RECLAIM Facilities**
(c)(1)(G)	Group II Units (Fire-tube boilers with a previous NOx limit ≤ ~~12~~ 9 ppm and > 5 ppm prior to [date of amendment])~~with an existing NOx limit >12 ppm~~	7 ppm or 0.0085 lbs/ 10^6 Btu~~ ppm or 0.0062 lb/10^6 Btu~~	See (c)(7)(A)~~January 1, 2016~~	See PR 1100 – Implementation Schedule for NOx Facilities
(c)(1)(H)	Group II Units (All others with a previous NOx limit ≤ 12 ppm and > 5 ppm prior to [date of amendment]) ~~with an existing NOx limit < 12 ppm~~	~~7 ppm or 0.0085 lb/10^6 Btu for fire-tube boilers only;~~ 9 ppm or 0.011 lb/10^6 Btu for all others	January 1, 2014 ~~or See subparagraph (c)(7)(A)~~	
(c)(1)(I)	Group II Units (All Others)	5 ppm or 0.0062 lbs/10^6 Btu	Date of amendment	
(c)(1)(J)~~(I)~~	Group III Units (Fire-tube Boilers Only, excluding units with a previous NOx limit < 12 ppm and > 9 ppm prior to *[date of amendment]*)	7 ppm or 0.0085 lb/10^6 Btu	Date of amendment or See ~~subparagraph~~ (c)(7)(B) for units with a previous NOx limit < 9 ppm prior to *[date of amendment]*	
(c)(1)(K)~~(J)~~	Group III Units (All Others)~~(Excluding Fire-tube Boilers)~~	9 ppm or 0.001 lb/10^6 Btu	January 1, 2015 or See (c)(8) for units with a previous NOx limit ≤ 12 ppm prior to September 5, 2008	

Rule Reference	**Category**	**Limit[1]**	**Compliance Schedule[2] for NON-RECAIM Facilities**	**Compliance Schedule for RECLAIM and FORMER RECLAIM Facilities**
(c)(1)(L)~~(K)~~	Thermal Fluid Heaters	12 ppm or 0.015 lbs/10^6 Btu	Date of amendment or See ~~subparagraph~~ (c)(7)(C) for units with a previous ~~an existing~~ NOx limit ≤ 20 ppm prior to [*date of amendment*] or See ~~paragraph~~ (e)(2) for units with a previous ~~an existing~~ NOx limit >20 ppm prior to [*date of amendment*]~~≥ 20 ppm~~	
[1] All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.				

~~(c)(1)(K), as shown below is proposed to be added to Table 1146-1 – Standard Compliance Limits and Schedule.~~

~~**Rule Reference**~~	~~**Category**~~	~~**Limit**~~
~~(c)(1)(K)~~	~~RECLAIM Units~~	~~As specified in this Table~~

Paragraph (c)(2) is proposed to be removed and replaced with requirements for units with air pollution control equipment resulting in ammonia emissions in the exhaust. The ammonia emissions would be limited to less than five ppm (referenced at three percent volume stack gas oxygen on a dry basis averaged over a period of ~~15~~ 60 consecutive minutes), except for units complying with paragraph (c)(9).~~proposes to exempt a RECLAIM or former RECLAIM facility subject to Rule 1100, from the requirements in Table 1146-2. Requirements in Table 1146.2, which specify an enhanced compliance schedule would not apply for a RECLAIM facility subject to Rule 1100.~~

Paragraph (c)(3) clarifies that a weighted average emission limit calculated by Equation 1146-1 may be used in lieu of the emission limits of Table 1146-1f or dual fuel co-fired combustion units provided a totalizing fuel flow meter is installed pursuant to paragraph (c)(10).

Paragraph (c)(4) clarifies that the carbon monoxide (CO) emission limit of 400 ppm is referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

Paragraph (c)(5) proposes to allow a provision for low fuel usage units (a~~nnual~~ heat input less than or equal to 90,000 therms per year) that have been in operation prior to September 5, 2008 for non-RECLAIM facilities or in operation prior to 12 months from the date of rule adoption at a RECLAIM or former RECLAIM facility subject to Rule 1100, in lieu of complying with the applicable NOx emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), ~~and~~ (c)(4), (e)(1), and (e)(2).

Subparagraph (c)(5)(B) proposes to require the owner of any unit(s) selecting the tune-up option, to maintain records for a rolling 24-month period in order to verify that the required tune-ups have been performed.

~~Paragraph (c)(7) proposes to allow a RECLAIM or former RECLAIM facility that installs or modifies a Group III natural gas fired unit prior to the date of rule adoption and complying with the applicable BACT emission limit of 12 ppm or less of NOx to defer compliance with the compliance dates specified in Rule 1100 until the unit's burner(s) replacement.~~

Paragraph (c)(6) proposes notwithstanding the exemptions contained in Rule 2001 – Applicability, Table 1- ~~Existing~~ Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions~~, of subdivision (j) of Rule 2001~~ If Rule Was Adopted or Amended Prior to October 5, 2018, any unit with a rated heat input capacity greater than or equal to 40 million Btu per hour and with an annual heat input greater than 200 x 10^9 Btu per year to have a continuous in-stack nitrogen oxides monitor or equivalent verification system in compliance with to Rules 218 and 218.1, and 40 CFR Part 60 Appendix B Specification 2. Maintenance and emission records will be required to be maintained and made accessible for two years.

Paragraph (c)(7) proposes to allow an owner or operator ~~of a non-RECLAIM facility that~~ has ~~installed, or modified,~~ been issued a SCAQMD Permit to Construct or Permit to Operate for certain units prior to the date of rule adoption at a non-RECLAIM facility to defer compliance with the specified NOx emission limit until the replacement of at least 50 percent of the unit's burners or 15 years from the date of rule adoption, whichever is earlier. The units allowed to defer compliance include the following: Group II ~~units~~ fire-tube boilers subject to subparagraph (c)(1)(G) ~~(c)(2)(H)~~ complying with a previous NOx emission limit ~~of~~ less than or equal to nine ppm ~~or less as specified in a SCAQMD Permit to Operate~~; or Group III ~~units~~ fire-tube boilers subject to either subparagraph (c)(1)(J)~~(I)~~ or (c)(1)(K)~~(J)~~ complying with a previous NOx emission limit of less than or equal to 9 ~~12~~ ppm~~ or less as specified in a SCAQMD Permit to Operate~~; or thermal fluid heaters subject to subparagraph (c)(1)(L~~K~~) complying with a previous NOx emission limit of less than or equal to 20 ppm~~ or less as specified in a SCAQMD Permit to Operate~~.

Paragraph (c)(8) proposes to not allow an owner or operator that has been issued a SCAQMD Permit to Operate prior to September 5, 2008 for a Group III natural gas fired unit complying with a previous NOx emission limit of 12 ppm or less and greater than 9 ppm to operate in a manner that discharges NOx emissions (reference at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of 9 ppm, by [*15 years after the date of amendment*] or when 50 percent or more of the unit's burners are replaced, whichever is earlier.

Paragraph (c)(9)~~(8)~~ proposes to allow an owner or operator ~~of a non-RECLAIM facility~~ that has ~~installed or modified,~~ been issued a SCAQMD Permit to Construct or Permit to Operate prior to the date of rule adoption, for any unit(s) operating with ~~an~~ air pollution control equipment that results in ammonia emissions in the exhaust complying~~, as specified in a SCAQMD Permit to Operate and~~ with an emission limit greater than ~~five~~ 5 ppm, to defer compliance with the ammonia emission limit (as specified in paragraph (c)(2)) until the air pollution control equipment is replaced or modified and during the first 12 months of operation, demonstrate compliance according to the schedule specified in paragraph (d)(3).

Paragraph (c)(10)~~(9)~~ proposes to remove the reference to paragraph (c)(2), since it is no longer applicable.

Paragraph (c)(11)~~(10)~~ proposes to require units using landfill or digester gas (biogas) co-fired with natural gas ~~at a RECLAIM or former RECLAIM facility~~ to comply with emission limits in subparagraphs (c)(1)(C) or (c)(1)(D)~~Table 1146-1~~, provided that the facility monthly average biogas usage by the biogas units is 90 percent or more, based on the higher heating value of the fuels used.~~, by the applicable compliance date specified in Rule 1100.~~

Paragraph (c)(12) proposes, until a Regulation XI rule referenced in paragraph (f)(5) is adopted or amended and notwithstanding the NOx emission limits specified in Table 1146-1 of paragraphs (c)(1) and (e)(3), to require units at a municipal sanitation service facility to be limited to nine ppm for Group II and Group III units; or nine ppm, upon burner replacement, for Group III units that were installed or modified prior to September 5, 2008 complying with a previous NOx emission limit of 12 ppm or less; or 30 ppm for thermal fluid heaters; or 30 ppm for a thermal fluid heater, upon burner replacement, for any low-fuel use unit complying with paragraph (c)(5).

Compliance Determination - Subdivision (d)

Paragraphs (d)(1), (d)(4), and (d)(5) and subparagraph (d)(8)(A) propose to remove references to previous paragraph (c)(2), since it is no longer applicable.

Paragraph (d)(2) proposes to limit the time needed for start-ups or shut downs, to not last longer than necessary to reach stable conditions.

Paragraph (d)(3) proposes to require the owner or operator of ~~the~~ new or modified air pollution control equipment subject to the ammonia emission limit to conduct quarterly source testing to demonstrate compliance with the ammonia emission limit, within 12 months of unit operation ~~after the date of rule adoption~~ and annually within 12 months thereafter when four consecutive quarterly source tests demonstrate compliance with the ammonia emission limit, according to the procedures in District Source Test Method 207.1 for Determination of Ammonia Emissions from Stationary Sources. If an annual test is failed, four consecutive quarterly source tests will be required to demonstrate compliance with the ammonia emission limits prior to resuming annual source testing or an ammonia CEMS certified under an approved SCAQMD protocol could be utilized to demonstrate compliance with the ammonia emission limit.

Paragraph (d)(5) proposes to allow the owner of a unit, to select the lb/MMBtu heat input compliance option, in order to calculate the NOx and CO emissions according to the specified procedure and protocol.

Paragraph (d)(8) proposes to include an~~clarify that~~ exception for units subject to paragraph (c)(6) from conducting periodic monitoring for NOx emissions. ~~, any owner or operator subject to this rule is required to perform diagnostic emission checks of NOx emissions with a portable NOx, CO, and oxygen analyzer according to the Protocol for the Periodic Monitoring of NOx, CO, and Oxygen from Units Subject to SCAQMD Rules 1146 and 1146.1 by the applicable schedule specified in subparagraphs (d)(8)(A) to (d)(8)(D).~~Subparagraph (d)(8)(A) proposes new requirements for owners and operations checking NOx emissions of units subject to paragraphs (c)(1), (c)(3), or (c)(4). Subparagraph (d)(8)(B) proposes ~~on or after 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier,~~ to require owner or operators complying with the requirements in paragraph (c)(5) to verify NOx emissions according to the tune-up schedule specified in subparagraph (c)(5)(B).

~~Subparagraph (d)(8)(A) proposes to allow six months after the applicable compliance date specified in Rule 1100 for a RECLAIM or former RECLAIM facility to conduct periodic monitoring for NOx emissions.~~

Paragraph (d)(9) proposes to use the phrase "million Btu per hour" instead of "mmbtu/hr" to describe the units to provide consistency within the rule.

~~Subparagraph (d)(8)(B) proposes to allow a RECLAIM or former RECLAIM facility until the applicable compliance date specified in Rule 1100 or during a burner replacement, whichever occurs later, to conduct NOx emission checks for low fuel usage units according to the existing tune-up schedule contained in subparagraph (c)(5)(B).~~

Compliance Schedule - Subdivision (e)

~~Sub~~Pparagraph (e)(1) proposes to require the owner or operator of~~exempt~~ any unit(s) subject to paragraph (c)(1) at a RECLAIM or former RECLAIM facility to meet the applicable NOx emission limit in Table 1146-1 according to the~~subject to Rule 1100 from the compliance~~ schedule specified in PR 1100 ~~Table 1146-1~~.

~~Sub~~Ppparagraph (e)(2) proposes to require owners or operators of any thermal fluid heater at a non-RECLAIM facility with a NOx emission limit greater than 20 ppm to submit a complete SCAQMD permit application for each unit within 12 months from the date of rule adoption and by January 1, 2022 to meet the applicable NOx emission limit in Table 1146-1.

~~exempt units at a RECLAIM or former RECLAIM facility subject to Rule 1100 from the compliance schedule specified in Table 1146-2.~~

~~Sub~~Paragraph (e)(3) proposes to prohibit units complying with paragraph (c)(5) to discharge greater than 12 ppm in NOx emissions ~~on or after~~ by 15 years after the date of rule amendment ~~adoption~~ or when 50 percent of more of the unit's burners are replaced, whichever is earlier. ~~proposes to allow low fuel usage unit(s) at a RECLAIM or former RECLAIM facility until the applicable compliance date specified in Rule 1100 or during burner replacement, whichever occurs later, to install a burner meeting the NOx emission limit of 30 ppm as specified in Table 1146-1 or subparagraph (c)(1)(A).~~

Paragraph (e)(4) proposes that any unit complying with the requirements specified in paragraph (c)(5) that exceeds 90,000 therms of annual heat input from all fuels used in any 12 month period would constitute a violation of this rule. In addition, subparagraph (e)(4)(A) requires that within four months after exceeding 90,000 therms of annual heat input, the facility would be required to submit applications for Permits to Construct and Operate, and subparagraph (e)(4)(B) requires that within 18 months after exceeding 90,000 therms of annual heat input, the facility would be required to demonstrate compliance with paragraph (c)(4) (CO emissions) for the life of the unit.

Exemptions - Subdivision (f)

New subdivision (f) is proposing to exempt the following units: boilers used by electric utilities to generate electricity; boilers and process heaters with a rated heat input capacity greater than 40 million Btu per hour that are used in petroleum refineries; sulfur plant reaction boilers; and any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category defined in PR 1100; or any unit at a municipal sanitation service facility that is subject to a NOx emission limit in a Regulation XI rule adopted or amended after [*date of amendment*].

PAR 1146.1

Applicability - Subdivision (a)

The exemptions contained in subdivision (a) are proposed to be moved to new subdivision (f) – Exemptions.

~~Effective upon the date of adoption, PAR 1146.1 will clarify that the exemption of RECLAIM (NOx emissions only) facilities applies only to any RECLAIM facility or former RECLAIM facility that is in an industry-specific category specified in Rule 1100 – Implementation Schedule for NOx Facilities.~~

Definitions - Subdivision (b)

New~~The~~ definitions of Fire-Tube Boiler; Former RECLAIM Facility; Heat Input; Modification; Municipal Sanitation Services; Non-RECLAIM Facility; and RECLAIM Facility are proposed be added.

The following definitions are proposed to be modified: Annual Heat Input; Boiler or Steam Generator; NOx Emissions; Rated Heat Input Capacity; and Thermal Fluid Heater.

The definition of School is proposed to be removed.

Because of the addition of new definitions, the definitions in subdivision (b) have been renumbered; thus, a reference to a paragraph in the one of the definitions has been modified.

Requirements - Subdivision (c)

Subdivision (c) requires units to meet emission limits specified in paragraphs (c)(1) through (c)(3), notwithstanding the exemptions contained in ~~subdivision (j) of~~ Rule 2001 – Applicability, Table 1 – Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018.

~~Paragraph (c)(1) proposes to exempt units at a RECLAIM or former RECLAIM facility subject to Rule 1100 from the NOx emission limit of 30 ppm. However,~~ Pparagraph (c)(1~~2~~) is proposed to be removed and subsumed into Table 1146.1-1. Table 1146.1-1 is proposed to be changed as follows~~proposes to require the owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1100 to meet the applicable NOx emission limits specified in Table 1146.1-1 in accordance with the schedule specified in Rule 1100. As such the following is proposed to be added to Table 1146.1-1:~~.

Rule Reference	**Category**	**Limit[1]**	**Compliance Schedule for NON-RECLAIM Facilities**	**Compliance Schedule for RECLAIM and former RECLAIM Facilities**
(c)(1)(A)	All Other Units	30 ppm or for natural gas fired units 0.036 lb/10^6 Btu	September 5, 2008	See PR~~Rule~~ 1100 – Implementation Schedule for NOx Facilities
(c)(1)(B)	Any Units Fired on Landfill Gas	25 ppm	January 1, 2015	
(c)(1)(c)	Any Units Fired on Digester Gas	15 ppm	January 1, 2015	
(c)(1)(D)	Atmospheric Units	12 ppm or 0.015 lb/10^6 Btu	January 1, 2014	
(c)(1)(E~~e~~)	Any Units Fired on Natural Gas, excluding Fire-tube Boilers subject to (c)(1)(F), Atmospheric Units, and Thermal Fluid Heaters	9 ppm or 0.011 lb/10^6 Btu	January 1, 2014 or See ~~subparagraph~~ (c)(5)(A)	
(c)(2)(F)	Any Fire-tube Boilers Fired on Natural Gas, excluding units with a previous NOx limit >9 and ≤ 12 ppm prior to [*date of amendment*]	7 ppm or 0.0085 lb/10^6 Btu	Date of amendment or See (c)(6) for units with a previous NOx limit >9 and ≤ 12 ppm prior to September 5, 2008	
(c)(2)(G)	Thermal Fluid Heaters	12 ppm or 0.015 lb/10^6 Btu	Date of amendment or See~~ subparagraph~~ (c)(5)(B) for units with a previous ~~an existing~~ NOx limit ≤ 20 ppm prior to [date of amendment] or See~~ paragraph~~ (e)(2) for units with a previous ~~an existing~~ NOx limit >20 ppm prior to [*date of amendment*]~~≥ 20 ppm~~	
[1]All parts per million (ppm) emission limits are referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.				
~~RECLAIM Units~~	~~As specified in this Table~~			

Paragraph (c)(2) clarifies that a weighted average emission limit calculated by Equation 1146.1-1 may be used in lieu of the emission limits of Table 1146.1-1 provided a totalizing fuel flow meter is installed pursuant to paragraph (c)(6), for units burning a combination of bother fuels.

Paragraph (c)(3) proposes to specify that CO emissions will need to be referenced at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

Paragraph (c)(4~~5~~) proposes to relieve~~allow a provision for~~ low fuel usage unit(s) with an ~~(~~annual heat input of less than or equal to 18,000 therms per calendar year that have been~~)~~ in operation prior to September 5, 2008 for non-RECLAIM facilities or~~at a RECLAIM or former RECLAIM facility that has been~~ in operation 12 months prior to the date of rule amendment ~~adoption~~ for RECLAIM or former RECLAIM facilities, from having to otherwise~~in lieu of complying~~ comply with the applicable emission limits specified in paragraphs (c)(1), (c)(2), (c)(3), (e)(1), and (e~~c~~)(24).

Paragraph (c)(5~~6~~) proposes to allow an owner or operator of a non-RECLAIM facility that has ~~installed, or modified,~~ been issued a SCAQMD Permit to Construct or Permit to Operate prior to the date of rule adoption, fire-tube boilers fired on ~~a~~ natural gas~~-fired unit~~ subject to subparagraph ~~(c)(1)(E) or~~ (c)(1)(F) complying with a previous NOx emission limit of 9 ~~12~~ ppm or less, or a thermal fluid heater subject to subparagraph (c)(1)(G) complying with a previous NOx emission limit of 20 ppm or less to defer compliance with the applicable NOx emission limits until replacement of at least 50 percent of the unit's burners or 15 years from the date of rule adoption, whichever is earlier occurs.~~or former RECLAIM facility that installs or modifies a natural gas fired unit prior to the date of rule adoption and complying with the BACT emission limit of 12 ppm or less of NOx to defer compliance with paragraph (c)(2) or the compliance dates in Rule 1100 until the unit's burner(s) replacement.~~

Paragraph (c)(6) proposes to not allow an owner or operator that has been issued a SCAQMD Permit to Operate prior to September 5, 2008 for a natural gas fired unit complying with a previous NOx emission limit of 12 ppm or less and greater than 9 ppm to operate in a manner that discharges NOx emissions (reference at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of 9 ppm, by [*15 years after the date of amendment*] or when 50 percent or more of the unit's burners are replaced, whichever is earlier.

Paragraph (c)(8)~~(7)~~ proposes to remove the reference to the compliance date January 1, 2015 since the date has already passed. ~~proposes to require units using landfill or digester gas (biogas) co-fired with natural gas at a RECLAIM or former RECLAIM facility to comply with the emission limits in Table 1146.1-1, provided that the facility monthly average biogas usage by the biogas units is 90 percent or more, based on the higher heating value of the fuels used, by the applicable compliance date specified in Rule 1100.~~

Paragraph (c)(9) proposes until a Regulation XI rule referenced in paragraph (f)(2) is adopted or amended and, notwithstanding the NOx emission limits specified in Table 1146.1-1 of paragraphs (c)(1) and (e)(3), to require units at a municipal sanitation service facility to meet NOx emission limits of nine ppm for natural gas fired units; or nine ppm, upon burner replacement; for natural gas fired units that were installed or modified prior to September 5, 2008 complying with a previous NOx emission limit of 12 ppm or less; or 30 ppm for thermal fluid heaters; or 30 ppm, upon burner replacement, for any low-fuel use unit complying with paragraph (c)(4).

Compliance Determination - Subdivision (d)

Paragraph (d)(2) proposes to remove allowing start-up or shutdown intervals to last as long as necessary to reach stable temperatures.

Paragraph (d)(3) is proposed to be removed since Table 1146.1-1 is proposed to incorporate the requirement that the emission limits as ppm will be referenced at three percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.

Subparagraph (d)(6)(A) proposes to remove the compliance date that has passed and add paragraph (c)(2) for determining weighted average.

Subparagraph (d)(6)(B) proposes to require low fuel usage unit(s) complying with paragraph (c)(4) ~~on or after 15 years from the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier,~~ to verify NOx emissions according to the tune-up schedule in subparagraph (c)(4)(B).

Subparagraph (d)(7)(A) proposes to remove the reference to the compliance date July 1, 2009 since the date has already passed. ~~proposes to allow six months after the compliance date specified in Rule 1100 for a RECLAIM or former RECLAIM facility to conduct periodic monitoring for NOx emissions.~~

~~Subparagraph (d)(7)(B) proposes to allow a RECLAIM or former RECLAIM facility until the applicable compliance date specified in Rule 1100 or during a burner replacement, whichever occurs later, to conduct NOx emission checks for low fuel usage units according to the existing tune-up schedule contained in subparagraph (c)(5)(B).~~

Compliance Schedule – Subdivision (e)

Paragraph(e)(1) proposes to require a unit at a RECLAIM facility or former RECLAIM facility with any unit subject to paragraph (c)(1) to meet the applicable NOx emission limit in Table 1146.1-1 in accordance with the schedule specified with PR 1100.

Paragraph (e)(2) proposes to require~~allow~~ any thermal fluid heaters at a non-RECLAIM facility with an emission limit greater than 20 ppm to submit a complete permit application on or before 12 months from the date of rule adoption and to meet the NOx emission limit in Table 1146.1-1 as specified in subparagraph (c)(1)(G). ~~low fuel usage unit at a RECLAIM or former RECLAIM facility until the applicable compliance date specified in Rule 1100 during burner replacement, whichever occurs later, to install a burner meeting the NOx emission level of 30 ppm, as specified in paragraph (c)(1).~~

Paragraph (e)(3) proposes to prohibit NOx emissions in excess of 12 ppm, ~~on or after~~ by 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier.

Paragraph (e)(4) proposes that any unit complying with the requirements specified in paragraph (c)(4) that exceeds 18,000 therms of annual heat input from all fuels used would constitute a violation of this rule.

Exemptions - Subdivision (f)

New subdivision (f) is proposed to include an exemption of any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific

category as defined in PR 1100; or any unit at a municipal sanitation service facility that is subject to a NOx emission limit in a Regulation XI rule adopted or amended after [*date of amendment*].

PAR 1146.2

Definitions - Subdivision (b)
The definitions of Best Available Retrofit Control Technology (BARCT); Former RECLAIM Facility and RECLAIM Facility are proposed be added. The definitions of Fire-Tube Boiler; Heat Input; NOx Emissions; Thermal Fluid Heater are proposed to be modified.

Requirements - Subdivision (c)
Paragraph (c)(3) proposes to exempt units at a RECLAIM or former RECLAIM facility rated at a heat input capacity of greater than one MMBtu per hour but less than or equal to two MMBtu per hour that do not meet the NOx emission limit of 30 ppm (0.036 pound NOx per MMBtu) and 400 ppm of CO (at three percent oxygen (O2), dry) as specified in paragraph (c)(1).

Paragraph (c)(4) proposes to exempt units at a RECLAIM or former RECLAIM facility greater than 15 years old, based on the original date of manufacture, and with a rated heat input capacity of greater than one MMBtu per hour but less than or equal to two MMBtu per hour that do not meet the NOx emission limit of 30 ppm (0.036 pound NOx per MMBtu) and 400 ppm of CO (at three percent oxygen (O2), dry) as specified in paragraph (c)(1).

Paragraph (c)(5) proposes to exempt units at a RECLAIM or former RECLAIM facility greater than 15 years old, based on the original date of manufacture, and with a rated heat input capacity greater than 400,000 Btu per hour but less than or equal to one MMBtu per hour that do not meet the NOx emission limit of 30 ppm (0.036 pound NOx per MMBtu) and 400 ppm of CO (at three percent oxygen (O2), dry) as specified in paragraph (c)(1).

Paragraphs (c)(9) and (c)(10) propose to incorporate the exemptions currently contained in Rule 2001 – Applicability ~~subdivision (j)~~ and its accompanying Table 1 – Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018, which contains maintenance requirements for Type 2 units and a copy of all documents identifying the unit's rated heat input capacity, respectively.

Paragraph (c)(13) proposes to require a technology assessment to be conducted by January 1, 2022 to determine if the NOx emission limits in subdivision (c) represent BARCT. If the NOx emission limits are confirmed or verified that they represent BARCT, notwithstanding the exemptions contained in Rule 2001 – Applicability ~~subdivision (j~~) and its accompanying Table 1– Rules Not Applicable to RECLAIM Facilities for Requirements Pertaining to NOx Emissions If Rule Was Adopted or Amended Prior to October 5, 2018, units at RECLAIM or former RECLAIM facilities with any Type 2 units will be required to meet the NOx emission limits by December 21, 2023. However, if it is determined a more stringent BARCT requirement is needed, SCAQMD will be required to initiate rule development within six months of the completion of the technology assessment.

Exemptions - Subdivision (h)
Subparagraph (h)(1)(C) proposes to exempt units at a RECLAIM or former RECLAIM facility subject to a NOx emission limit in a different rule for an industry-specific category defined in Rule 1100 – Implementation Schedule for NOx Facilities.

Subparagraph (h)(1)(D) proposes to exempt units at a municipal sanitation service facility subject to a NOx emission limit in a Regulation XI rule adopted or amended after [*date of amendment*].

~~Paragraph (h)(3) is proposesd to exempt any RECLAIM facility or former RECLAIM facility, that is subject to a NOx emission limit in a different rule for in an industry-specific category specified in PRRule 1100 from the requirement to comply with NOx emissions limits contained in of paragraphs (c)(1) to (c)(5).~~

PR 1100

Purpose – Subdivision (a)
Subdivision (a) defines the purpose of Rule 1100 is to establish the implementation schedule for when Regulation XX NOx RECLAIM facilities transition to a command-and-control regulatory structure.

Applicability – Subdivision (b)
Subdivision (b) establishes the applicability to include any owner or operator of a RECLAIM or former RECLAIM facilities that owns or operates equipment that meets the applicability provisions specified in Rules 1146 and~~,~~ 1146.1~~, and 1146.2~~.

Definitions - Subdivision (c)
The following new definitions are proposed: Annual Heat Input; ~~Btu; Heat Input;~~ Former RECLAIM Facility; Heat Input; Industry-Specific Category; NOx Emissions, Rated Heat Input Capacity; RECLAIM Facility; Rule 1146 Unit; Rule 1146.1 Unit; and Title V Facility~~; and Rule 1146.2 Unit~~.

Rule 1146 and Rule 1146.1 Implementation Schedule - Subdivision (d)
Paragraph (d)(1) is proposed to establish the timing when an owner or operator of a RECLAIM facility with any Rule 1146 or any Rule 1146.1 units will need to comply with the following requirements:

- On or before 12 months after ~~from~~ the date of rule adoption, submit complete permit applications for Rule 1146 and Rule 1146.1 units that do not currently meet the NOx concentration limits established in Rules 1146 and 1146.1 at the facility;
- On or before January 1, 2021, meet the applicable NOx concentration limit for a minimum of 75 percent of the cumulative total rated heat input ~~for~~ capacity for~~of~~ all Rule 1146 and Rule 1146.1 units; and
- On or before January 1, 2022, meet the applicable NOx concentration limit of 100 percent of Rule 1146 and Rule 1146.1 units (by heat input) at the facility.

Paragraph (d)(2) proposes to allow u~~U~~nits that are not retrofitted and will undergo complete replacement ~~to~~can defer compliance until January 1, 2023 to meet the applicable NOx emission limits, provided the facility submits a complete permit application on or before 12 months after the date of rule adoption for any new Rule 1146 and/or Rule 1146.1 unit, as well as accepts a permit condition that identifies which unit(s) will be replaced and no longer operated when the new units are installed or after January 1, 2023, whichever is earlier; and replaces the existing unit on or before January 1, 2023. ~~notifies the Executive Officer (including Facility Name, Facility Identification Number, Permit Number for the unit(s) being replaced; size of the existing and new units (MMBtu/hr), and fuel type) within 12 months after the date of rule adoption; on or before 12~~

~~months of the date of rule adoption submits a complete permit application for the new Rule 1146 and Rule 1146.1 unit(s); and demonstrates that the heat input capacity of the new unit does not exceed the total heat input capacity of existing units being replaced~~.

~~Subp~~Paragraph (d)(3)~~1)(E)~~ is proposed to establish the applicable NOx concentration limits for units meeting the minimum compliance deadline of 75 percent of the cumulative total heat input for all Rule 1146 and Rule 1146.1 units by January 1, 2021 and 100 percent by January 1, 2022. Rules 1146 and 1146.1 units would be required to meet the NOx concentration limit in Rule 1146, Table 1146-1 and Rule 1146.1, Table 1146.1-1, respectively. ~~Rule 1146 units that meet the applicability provisions specified in Rule 1146 paragraph (c)(2) will also be required to meet the ammonia emission limit specified in Rule 1146 paragraph (c)(2). In addition Rule 1146.1 units meeting the applicability provisions in Rule 1146.1 paragraph (c)(78) will be required to meet the NOx concentration limit specified in Rule 1146.1 paragraph(c)(78).~~

Paragraph (d)(4) is proposed to allow owner or operators of unit(s) in operation prior to 12 months after the date of rule adoption, in lieu of complying with paragraph (d)(3), to meet NOx emission limits and source testing requirements as specified in the SCAQMD Permit to Operate as of the date of rule adoption for units that are 90,000 therms per year and complying with Rule 1146 paragraph (c)(5) or 18,000 therms per year and complying with Rule 1146.1 paragraph (c)(4).

Paragraph (d)(5~~4~~2) is proposed to require an owner or operator of a RECLAIM or former RECLAIM facility with any Rule 1146 or Rule 1146.1 unit that has been installed or modified prior to the date of rule adoption to meet the specified NOx emission limit within 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier. The following are Rule 1146 units:

- ~~Units subject to subparagraph (c)(1)(F) with a previous NOx emission limit of less than or equal to seven ppm or less as specified in a SCAQMD Permit to Operate; or~~

- Fire-tube boilers subject to Rule 1146 subparagraph (c)(1)(G) or (c)(1)(J) complying with a previous NOx emission limit that is less than or equal to 9 ppm and greater than 5 ppm; or

- Units subject to Rule 1146.1 subparagraph (c)(1)(E)complying with a previous NOx emission limit that is less than or equal to 12 ppm and greater than 9 ppm; or

- Fire-tube boilers fired on natural gas subject to Rule 1146.1 subparagraph (c)(1)(F) complying with a previous NOx emission limit that is less than or equal to 9 ppm; or

- Units subject to subparagraph ~~(c)(1)(G),~~ (c)(1)(H), or (c)(l)(K~~I~~) complying with a previous NOx emission limit of less than or equal to 12 ppm and greater than five ppm; or

- Thermal fluid heaters, as defined in Rule 1146 paragraph (b)(26~~27~~), subject to Rule 1146 subject to Rule 1146 subparagraph (c)(1)(L~~K~~) complying with a previous NOx emission limit of less than or equal to 20 ppm ~~or less as specified in SCAQMD Permit to Operate~~.

The following are Rule 1146.1 units:

- Units subject to Rule 1146.1 subparagraph (c)(1)(E) or (c)(1)(F) complying with a previous NOx emission limit of less than or equal to 12 ppm ~~or less as specified in a SCAQMD Permit to Operate~~; or

- Thermal fluid heaters, as defined in Rule 1146.1 subparagraph (c)(1)(G) complying with a previous NOx emission limit of less than or equal to 20 ppm ~~or less as specified in a SCAQMD Permit to Operate~~. ~~Rule 1146.2 Type 2 units to meet the NOx concentration limit specified in Rule 1146.2, paragraph (c)(1) unless a more stringent limit is applicable by December 31, 2023. A unit may be modified or demonstrated to meet the NOx emission limits pursuant to the provisions of Rule 1146.2, subdivision (e).~~

~~Paragraph (d)(5)3) proposes to exempt any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule foridentified in an industry-specific category identified.~~

Paragraph (d)(6) proposes for an owner or operator that has been issued a SCAQMD Permit to Construct or Permit to Operate prior to [*date of adoption*] for the following units, notwithstanding paragraph (d)(1), by [*15 years after the date of adoption*] or when 50 percent or more of the unit's burners are replaced, whichever is earlier, the units shall not operate in a manner that discharges NOx emissions (reference at 3 percent volume stack gas oxygen on a dry basis averaged over a period of 15 consecutive minutes) in excess of the following:

- 7 ppm for Rule 1146 Group I units operating without air pollution control equipment for the after treatment of the emissions in the exhaust complying with a previous NOx emission limit of 7 ppm or less and greater than 5 ppm; or

- 9 ppm for Rule 1146 Group III or Rule 1146.1 natural gas fired units complying with a previous NOx emission limit of 12 ppm or less and greater than 9 ppm.

Paragraph (d)(7) proposes to require the owner or operator of any Rule 1146 Group I unit complying with the requirements specified in subparagraph (d)(6)(A) that exceeds 300,000 therms of annual heat input from all fuels used shall:

- within 4 months after exceeding 300,000 therms of annual heat input, submit complete SCAQMD permit applications for the unit that does not meet the applicable NOx concentration limit specified in paragraph (d)(3); and

- within 18 months after exceeding 300,000 therms of annual heat input, demonstrate and maintain compliance with the applicable NOx concentration limit specified in paragraph (d)(3) for the life of the unit.

Paragraph (d)(8) proposes to allow any unit at a RECLAIM or former RECLAIM facility that is subject to a NOx emission limit in a different rule for an industry-specific category to not be subject to the requirements contained in this subdivision.

Monitoring, Reporting, and Recordkeeping Requirements - Subdivision (e)

Paragraph (e)(1)~~(d)(4) is~~ proposes~~d~~ to require Title V facilities to comply with the monitoring, reporting, and recordkeeping requirements specified in Rule 2012.

Paragraph (e)(2)~~(d)(5) is~~ proposes~~d~~ to require~~for a~~ non-Title V RECLAIM facilities~~y~~ that become~~s~~ ~~a~~ former RECLAIM facilities~~y~~ to comply with the monitoring, reporting, and recordkeeping requirements in the applicable rule(s) as specified in subdivision (b), upon the date the RECLAIM facility becomes a former RECLAIM facility.

SUMMARY OF AFFECTED EQUIPMENT

Among the 266 facilities currently in the NOx RECLAIM program, approximately 103~~111~~ RECLAIM facilities will be affected by PARs 1146 series and PR 1100. Of the 103~~111~~ RECLAIM facilities, overall 291 ~~323~~ permitted units will be affected by PARs 1146 series and PR 1100. Of the 291 permitted units, 148 units are projected to be retrofitted in order to meet the NOx emission limits. It is estimated PARs 1146 series and PR 1100 will reduce NOx by 0.20 ton per day by January 1, 2021 and ~~0.23~~ 0.27 ton per day by January 1, 2023. It is noteworthy that there are units at 824 non-RECLAIM facilities that are expected to be affected by PARs 1146 series and these units are projected to either be retrofitted or replaced. Certain units would need to meet the NOx emission limits either during burner replacement or 15 years after the date of rule adoption. Thermal fluid heaters currently permitted at greater than 20 ppm must submit a permit application within 12 months of rule adoption and must meet the NOx emission limit of 12 ppm by January 1, 2022. However, because the replacement of a burner or retrofitting a boiler would be dependent on facility-specific variables (e.g., age of burner, ability to retrofit, cost, etc.), it is difficult to quantify the number of units at non-RECLAIM facilities that would be affected by PARs 1146 series and PR 1100 and determine when a~~ny~~ burner replacements or boiler retrofits would occur.

~~predict and speculative when and the number of units at non-RECLAIM facilities that would be affected by PARs 1146 series.~~ Table 2-1 identifies the industry sectors, as classified by the North American Industry Classification System (NAICS) code, and the number of respective units at RECLAIM facilities subject to PARs 1146 series and PR 1100.

Table 2-1
Affected Industry Subject to PARs 1146 series and PR 1100

NAICS	NAICS Description	Count
111339	Apricot Farming	2
112111	Backgrounding, Cattle	1
115310	Cruising Timber	1
211111	Coal Gasification At Mine Site	3
211120	Crude Petroleum Extraction	4
212321	Common Sand Quarrying And/Or Beneficiating	1
221112	Electric Power Generation, Fossil Fuel (e.g., Coal, Oil, Gas)	4
221118	Electric Power Generation, Tidal	1
221210	Blue Gas, Carbureted, Production And Distribution	2
221310	Canal, Irrigation	9
221320	Collection, Treatment, And Disposal Of Waste Through A Sewer System	14
221330	Air-Conditioning Supply	1
236115	Cabin Construction General Contractors	1
236220	Addition, Alteration And Renovation For-Sale Builders, Commercial And Institutional Building	2
237110	Aqueduct Construction	1
237210	Building Lot Subdividing	7
237310	Abutment Construction	1
238110	Chimney, Concrete, Construction	1
238210	Airport Runway Lighting Contractors	1
238220	Air System Balancing And Testing	1
238320	Bridge Painting	1
238990	Artificial Turf Installation	4
311111	Animal Feed Mills, Dog And Cat, Manufacturing	4
311119	Alfalfa Meal, Dehydrated, Manufacturing	1
311224	Canola (Rapeseed) Oil, Cake And Meal, Made In Crushing Mills	1
311225	Canola (Rapeseed) Oil, Cake And Meal, Made From Purchased Oils	3
311411	Blast Freezing On A Contract Basis	3
311412	Chop Suey, Frozen, Manufacturing	6
311421	Artichokes, Canned, Manufacturing	6
311422	Baby Foods (Including Meats) Canning	2
311423	Bouillon Made In Dehydration Plants	1
311511	Acidophilus Milk Manufacturing	9
311513	Cheese (Except Cottage Cheese) Manufacturing	3
311520	Custard, Frozen, Manufacturing	1
311611	Abattoirs	1
311612	Bacon, Slab And Sliced, Made From Purchased Carcasses	6
311613	Animal Fats Rendering	2
311710	Cannery, Seafood	2

Table 2-1: Affected Industry Subject to PARs 1146 series and PR 1100 (continued)

NAICS	NAICS Description	Count
311811	Bakeries With Baking From Flour On The Premises, Retailing Not For Immediate Consumption	1
311812	Bagels Made In Commercial Bakeries	2
311824	Batters, Prepared, Made From Purchased Flour	2
311919	Cheese Curls And Puffs Manufacturing	2
311930	Beverage Bases Manufacturing	2
311941	Cheese Based Salad Dressing Manufacturing	3
311942	Chili Pepper Or Powder Manufacturing	1
311999	Almond Pastes Manufacturing	10
312111	Artificially Carbonated Waters Manufacturing	7
312112	Beverages, Naturally Carbonated Bottled Water, Manufacturing	2
312120	Ale Brewing	2
313210	Blankets And Bedspreads Made In Broadwoven Fabric Mills	5
313240	Bags And Bagging Fabrics Made In Warp Or Weft Knitting Mills	1
313310	Bleaching Textile Products, Apparel, And Fabrics	15
314110	Bath Mats And Bath Sets Made In Carpet Mills	3
315190	Athletic Clothing Made In Apparel Knitting Mills	1
321211	Hardwood Plywood Composites Manufacturing	1
321920	Ammunition Boxes, Wood, Manufacturing	1
322121	Absorbent Paper Stock Manufacturing	3
322130	Binder's Board Manufacturing	4
322211	Boxes, Corrugated And Solid Fiber, Made From Purchased Paper Or Paperboard	19
322212	Boxes, Folding (Except Corrugated), Made From Purchased Paperboard	1
322219	Bobbins, Fiber, Made From Purchased Paperboard	1
322299	Cards, Die-Cut (Except Office Supply) Made From Purchased Paper Or Paperboard	1
324121	Asphalt Paving Blocks Made From Purchased Asphaltic Materials	3
324122	Asphalt Roofing Cements Made From Purchased Asphaltic Materials	2
324191	Brake Fluids, Petroleum, Made From Refined Petroleum	3
325110	Acyclic Hydrocarbons (e.g., Butene, Ethylene, Propene) (Except Acetylene) Made From Refined Petroleum Or Liquid Hydrocarbons	1
325120	Acetylene Manufacturing	2
325180	Alkalis Manufacturing	7
325193	Denatured Alcohol Manufacturing	1
325211	Acetal Resins Manufacturing	5
325314	Compost Manufacturing	1
325320	Ant Poisons Manufacturing	1
325411	Acetylsalicylic Acid Manufacturing	2
325412	Adrenal Medicinal Preparations Manufacturing	9

Table 2-1: Affected Industry Subject to PARs 1146 series and PR 1100 (continued)

NAICS	NAICS Description	Count
325414	Agar Culture Media Manufacturing	2
325611	Bar Soaps Manufacturing	1
325612	Air Fresheners Manufacturing	1
325620	After-Shave Preparations Manufacturing	6
325991	Custom Compounding (I.E., Blending And Mixing) Of Purchased Plastics Resins	1
325998	Activated Carbon Or Charcoal Manufacturing	3
326113	Acrylic Film And Unlaminated Sheet (Except Packaging) Manufacturing	1
326130	Laminated Plastics Plate, Rod, And Sheet, Manufacturing	2
326140	Coolers Or Ice Chests, Polystyrene Foam, Manufacturing	4
326150	Cushions, Carpet And Rug, Urethane And Other Foam Plastics (Except Polystrene), Manufacturing	1
326199	Awnings, Rigid Plastics Or Fiberglass, Manufacturing	3
326299	Balloons, Rubber, Manufacturing	2
327120	Adobe Bricks Manufacturing	2
327213	Beer Bottles, Glass, Manufacturing	1
327331	Architectural Block, Concrete (e.g., Fluted, Ground Face, Screen, Slump, Split), Manufacturing	2
327390	Architectural Wall Panels, Precast Concrete, Manufacturing	7
331210	Boiler Tubes, Wrought, Made From Purchased Iron	1
331222	Barbed And Twisted Wire Made In Wire Drawing Plants	1
331315	Aluminum Foil Made By Flat Rolling Purchased Aluminum	1
331492	Alloying Purchased Nonferrous Metals (Except Aluminum, Copper)	2
331512	Foundries, Steel Investment	1
332111	Cold Forgings Made From Purchased Iron Or Steel, Unfinished	2
332431	Aerosol Cans, Light Gauge Metal, Manufacturing	1
332811	Annealing Metals And Metal Products For The Trade	1
332812	Aluminum Coating Of Metal Products For The Trade	2
332813	Anodizing Metals And Metal Products For The Trade	8
332996	Bends, Pipe, Made From Purchased Metal Pipe	1
332999	Aluminum Freezer Foil Not Made In Rolling Mills	2
333241	Bakery Machinery And Equipment Manufacturing	2
333318	Adding Machines Manufacturing	2
333414	Baseboard Heating Equipment Manufacturing	1
334220	Airborne Radio Communications Equipment Manufacturing	3
334412	Circuit Boards, Printed, Bare, Manufacturing	1
334413	Diodes, Solid-State (e.g., Germanium, Silicon), Manufacturing	2
334418	Loaded Computer Boards Manufacturing	1
334510	Arc Lamp Units, Electrotherapeutic (Except Infrared, Ultraviolet), Manufacturing	3

Table 2-1: Affected Industry Subject to PARs 1146 series and PR 1100 (continued)

NAICS	NAICS Description	Count
335312	Armature Rewinding On A Factory Basis	1
336411	Aircraft Conversions (I.E., Major Modifications To System)	6
336412	Aircraft Engine And Engine Parts (Except Carburetors, Pistons, Piston Rings, Valves) Manufacturing	2
336413	Aircraft Assemblies, Subassemblies, And Parts (Except Engines) Manufacturing	4
336414	Developing And Producing Prototypes For Complete Guided Missiles And Space Vehicles	1
336419	Airframe Assemblies For Guided Missiles Manufacturing	2
339112	Anesthesia Apparatus Manufacturing	1
339991	Coaxial Mechanical Face Seals Manufacturing	1
339992	Accordions And Parts Manufacturing	1
339999	Amusement Machines, Coin-Operated, Manufacturing	1
423110	All-Terrain Vehicles (ATVs) Merchant Wholesalers	1
423220	Antique Home Furnishing Merchant Wholesalers	1
423720	Boilers (e.g., Heating, Hot Water, Power, Steam) Merchant Wholesalers	1
423840	Abrasives Merchant Wholesalers	2
423920	Children's Vehicles (Except Bicycles) Merchant Wholesalers	1
423990	Ammunition (Except Sporting) Merchant Wholesalers	1
424130	Bags, Paper And Disposable Plastics, Merchant Wholesalers	3
424310	Apparel Trimmings Merchant Wholesalers	1
424410	General-Line Groceries Merchant Wholesalers	1
424420	Bakery Products, Frozen, Merchant Wholesalers	1
424430	Butter Merchant Wholesalers	3
424470	Cutting Of Purchased Carcasses (Except Boxed Meat Cut On An Assembly-Line Basis) Merchant Wholesalers	1
424480	Berries, Fresh, Merchant Wholesalers	4
424490	Baby Foods, Canned, Merchant Wholesalers	7
424590	Animal Hair Merchant Wholesalers	1
424690	Acids Merchant Wholesalers	4
424710	Bulk Gasoline Stations	1
424910	Agricultural Chemicals Merchant Wholesalers	1
424950	Calcimines, Merchant Wholesalers	2
424990	Art Goods Merchant Wholesalers	1
441110	Automobile Dealers, New Only Or New And Used	1
443142	Audio Equipment Stores (Except Automotive)	1
444190	Building Materials Supply Dealers	5
445110	Commissaries, Primarily Groceries	6
445299	Coffee And Tea (I.E., Packaged) Stores	1
447190	Gasoline Stations Without Convenience Stores	1

Table 2-1: Affected Industry Subject to PARs 1146 series and PR 1100 (continued)

NAICS	NAICS Description	Count
448120	Apparel Stores, Women's And Girls' Clothing	1
448150	Apparel Accessory Stores	1
448190	Bridal Gown Shops (Except Custom)	2
452111	Department Stores (Except Discount Department Stores)	1
453220	Balloon Shops	2
453910	Feed Stores, Pet	1
453998	Art Supply Stores	1
454390	Bazaars (I.E., Temporary Stands)	4
481111	Air Commuter Carriers, Scheduled	1
484110	Bulk Mail Truck Transportation, Contract, Local	4
484121	Bulk Mail Truck Transportation, Contract, Long-Distance (Tl)	2
485113	Bus Line, Local (Except Mixed Mode)	1
486110	Booster Pumping Station, Crude Oil Transportation	4
486210	Booster Pumping Station, Natural Gas Transportation	3
486910	Booster Pumping Station, Refined Petroleum Products Transportation	2
488111	Air Traffic Control Services (Except Military)	1
488190	Aircraft Ferrying Services	1
488210	Freight Car Cleaning Services	2
488320	Loading And Unloading Services At Ports And Harbors	1
488490	Bridge, Tunnel, And Highway Operations	1
488999	Arrangement Of Car Pools And Vanpools	1
493190	Automobile Dead Storage	1
512110	Animated Cartoon Production	3
512131	Cinemas	1
519120	Archives	2
522110	Banks, Commercial	2
522120	Associations, Savings And Loan	1
522310	Agencies, Loan	1
523991	Administrators Of Private Estates	1
523999	Clearinghouses, Commodity Exchange Or Securities Exchange	1
524113	Accidental Death And Dismemberment Insurance Carriers, Direct	1
524114	Dental Insurance Carriers, Direct	1
524210	Agencies, Insurance	2
525920	Bankruptcy Estates	1
531110	Apartment Building Rental Or Leasing	7
531120	Arena, No Promotion Of Events, Rental Or Leasing	16
531190	Agricultural Property Rental Leasing	1
531210	Agencies, Real Estate	25
531312	Commercial Property Managing	4

Table 2-1: Affected Industry Subject to PARs 1146 series and PR 1100 (continued)

NAICS	NAICS Description	Count
532411	Aircraft Rental And Leasing	1
532412	Bulldozer Rental Or Leasing Without Operator	1
532490	Agricultural Machinery And Equipment Rental Or Leasing	1
541330	Acoustical Engineering Consulting Services	1
541380	Acoustics Testing Laboratories Or Services	2
541511	Applications Software Programming Services, Custom Computer	1
541611	Administrative Management Consulting Services	4
541618	Telecommunications Management Consulting Services	2
541711	Biotechnology Research And Development Laboratories Or Service In Botany	1
541990	Appraisal (Except Real Estate) Services	3
551112	Agreement Corporation (Except International Trade Financing)	2
561110	Administrative Management Services	6
561210	Base Facilities Operation Support Services	2
561450	Commercial Credit Reporting Bureaus	1
561499	Address Bar Coding Services	4
561720	Aircraft Janitorial Services	3
561990	Auctioneers, Independent	4
562211	Acid Waste Disposal Facilities	1
562212	Dumps, Nonhazardous Solid Waste (e.g., Trash)	3
562213	Combustors, Nonhazardous Solid Waste	1
562219	Compost Dumps	3
562910	Asbestos Abatement Services	1
611110	Academies, Elementary Or Secondary	40
611210	Academies, Junior College	15
611310	Academies, College Or University	20
611519	Air Traffic Control Schools	2
611699	Bible Schools (Except Degree Granting)	1
621111	Acupuncturists' (MDs Or DOs) Offices (e.g., Centers, Clinics)	9
621310	Chiropractors' Offices (e.g., Centers, Clinics)	1
621399	Acupuncturists' (Except MDs Or DOs) Offices (e.g., Centers, Clinics)	1
621491	Group Hospitalization Plans Providing Health Care Services	3
621493	Ambulatory Surgical Centers And Clinics, Freestanding	2
621511	Bacteriological Laboratories, Diagnostic	2
621610	Home Care Of Elderly, Medical	1
621999	Blood Pressure Screening Facilities	5
622110	Children's Hospitals, General	71
622210	Alcoholism Rehabilitation Hospitals	3
622310	Cancer Hospitals	5
623110	Convalescent Homes Or Convalescent Hospitals (Except Psychiatric)	5

Table 2-1: Affected Industry Subject to PARs 1146 series and PR 1100 (continued)

NAICS	NAICS Description	Count
623220	Alcoholism Rehabilitation Facilities (Except Licensed Hospitals), Residential	1
623311	Assisted-Living Facilities With On-Site Nursing Facilities	2
623990	Boot Camps For Delinquent Youth	1
624110	Adoption Agencies	1
624120	Activity Centers For Disabled Persons, The Elderly, And Persons Diagnosed With Intellectual And Developmental Disabilities	1
624410	Babysitting Services In Provider's Own Home, Child Day Care	1
711212	Automobile Racetracks	1
711310	Air Show Managers With Facilities	3
712110	Art Galleries (Except Retail)	3
713110	Amusement Parks (e.g., Theme, Water)	2
713910	Country Clubs	1
713940	Aerobic Dance And Exercise Centers	3
721110	Alpine Skiing Facilities With Accommodations (I.E., Ski Resort)	22
722310	Airline Food Services Contractors	2
722330	Beverage Stands, Nonalcoholic, Mobile	1
722410	Alcoholic Beverage Drinking Places	1
722511	Bagel Shops, Full Service	6
722513	Carryout Restaurants	2
811111	Automotive Engine Repair And Replacement Shops	3
811192	Automotive Detailing Services (I.E., Cleaning, Polishing)	2
811198	Automotive Air-Conditioning Repair Shops	1
811219	Dental Equipment Repair And Maintenance Services	2
811310	Agricultural Machinery And Equipment Repair And Maintenance Services	3
811490	Bicycle Repair And Maintenance Shops Without Retailing New Bicycles	2
812310	Automatic Laundries, Coin-Operated	1
812320	Agents, Laundry And Dry cleaning	5
812331	Apron Supply Services	24
812332	Clean Room Apparel Supply Services	9
812930	Automobile Parking Garages Or Lots	1
812990	Astrology Services	2
813110	Bible Societies	5
813212	Disease Awareness Fundraising Organizations	1
813410	Alumni Associations	2
813990	Athletic Associations, Regulatory	7
921110	Advisory Commissions, Executive Government	8
921120	Advisory Commissions, Legislative	1
921190	Auditor's Offices, Government	7
922110	Administrative Courts	3

Table 2-1: Affected Industry Subject to PARs 1146 series and PR 1100 (Concluded)

NAICS	NAICS Description	Count
922120	Alcohol, Tobacco, And Firearms Control	5
922130	Attorney Generals' Offices	1
922140	Correctional Boot Camps	7
922150	Pardon Boards And Offices	1
922160	Ambulance And Fire Service Combined	2
923120	Cancer Detection Program Administration	1
923130	Community Social Service Program Administration	1
924110	Enforcement Of Environmental And Pollution Control Regulations	4
926110	Arts And Cultural Program Administration, Government	1
926120	Aircraft Inspection, Government	1
928110	Air Force	3
Unknown	#N/A	24
	Total	927

~~**Table 2-1**~~

~~**Affected Industry Subject to PARs 1146 series and PR 1100 (Concluded)**~~

~~NAICS Code~~	~~Description of Industry~~	~~Number of Units~~
~~211111~~	~~Oil and Gas Extraction~~	~~78~~
~~211120~~	~~Crude Petroleum Extraction~~	~~78~~
~~221112~~	~~Fossil Fuel Electric Power Generation~~	~~54~~
~~221210~~	~~Natural Gas Distribution~~	~~3~~
~~221330~~	~~Steam and Air-Conditioning Supply~~	~~69~~
~~311111~~	~~Dog and Cat Food Manufacturing~~	~~1~~
~~311511~~	~~Fluid Milk Manufacturing~~	~~2~~
~~311611~~	~~Animal (except Poultry) Slaughtering~~	~~3~~
~~311613~~	~~Rendering and Meat Byproduct Processing~~	~~38~~
~~311812~~	~~Commercial Bakeries~~	~~3~~
~~311824~~	~~Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour~~	~~5~~
~~311930~~	~~Flavoring Syrup and Concentrate Manufacturing~~	~~1~~
~~312120~~	~~Breweries~~	~~67~~
~~313210~~	~~Broadwoven Fabric Mills~~	~~65~~
~~313310~~	~~Textile and Fabric Finishing Mills~~	~~12~~
~~314110~~	~~Carpet and Rug Mills~~	~~12~~
~~322110~~	~~Pulp Mills~~	~~1~~
~~322121~~	~~Paper (except Newsprint) Mills~~	~~4~~
~~322130~~	~~Paperboard Mills~~	~~67~~
~~322211~~	~~Corrugated and Solid Fiber Box Manufacturing~~	~~5~~
~~324110~~	~~Petroleum Refineries~~	~~4~~
~~324121~~	~~Asphalt Paving Mixture and Block Manufacturing~~	~~612~~
~~324122~~	~~Asphalt Shingle and Coating Materials Manufacturing~~	~~712~~
~~324191~~	~~Petroleum Lubricating Oil and Grease Manufacturing~~	~~4~~

325120	Chemical Manufacturing	6
325180	Other Basic Inorganic Chemical Manufacturing	3
325211	Plastics Material and Resin Manufacturing	2
325411	Medicinal and Botanical Manufacturing	1
325412	Pharmaceutical Preparation Manufacturing	12

NAICS Code	Description of Industry	Number of Units
325414	Biological Product (except Diagnostic) Manufacturing	2
326140	Polystyrene Foam Product Manufacturing	6
327120	Clay Building Material and Refractories Manufacturing	1
331222	Steel Wire Drawing	2
331315	Aluminum Sheet, Plate, and Foil Manufacturing	2
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	2
331529	Other Nonferrous Metal Foundries (except Die-Casting)	1
332111	Iron and Steel Forging	3
332431	Metal Can Manufacturing	3
332811	Metal Heat Treating	1
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	2
332996	Fabricated Pipe and Pipe Fitting Manufacturing	5
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	25
334412	Bare Printed Circuit Board Manufacturing	2
334413	Semiconductor and Related Device Manufacturing	7
336411	Aircraft Manufacturing	3237
336412	Aircraft Engine and Engine Parts Manufacturing	2
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	3
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	2
339991	Gasket, Packing, and Sealing Device Manufacturing	2
445110	Supermarkets and Other Grocery (except Convenience) Stores	4
486110	Pipeline Transportation of Crude Oil	78
486210	Pipeline Transportation of Natural Gas	9
486910	Pipeline Transportation of Refined Petroleum Products	3
488111	Air Traffic Control	2
522120	Savings Institutions	1
531210	Offices of Real Estate Agents and Brokers	2
541511	Custom Computer Programming Services	2
541990	All Other Professional, Scientific, and Technical Services	1
561110	Office Administrative Services	3
713110	Amusement and Theme Parks	19
721110	Hotels (except Casino Hotels) and Motels	24
812331	Linen Supply	35
812332	Industrial Launderers	2
	Total	291323

CHAPTER 3

EXISTING SETTING

Introduction

Existing Setting

Air Quality

Hazards and Hazardous Materials

INTRODUCTION

In order to determine the significance of the impacts associated with a proposed project, it is necessary to evaluate the project's impacts against the backdrop of the environment as it exists at the time the environmental analysis is commenced. The CEQA Guidelines define "environment" as "the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance." (CEQA Guidelines Section 15360; *see also* Public Resources Code Section 21060.5.) Furthermore, a CEQA document must include a description of the physical environment in the vicinity of the project, as it exists at the time the environmental analysis is commenced, from both a local and regional perspective. (CEQA Guidelines Section 15125.) Therefore, the "environment" or "existing setting" against which a project's impacts are compared consists of the immediate, contemporaneous physical conditions at and around the project site. (Remy, et al; 1996.)

The following sections summarize the existing setting for control measure CMB-05 and the existing rules that will be affected by the proposed project (e.g., PARs 1146 series) as well as the regional existing setting for air quality and hazards and hazardous materials which were the only environmental topics identified that may be adversely affected by the proposed project.

The March 2017 Final Program EIR for the 2016 AQMP also contains comprehensive information on existing and projected regional environmental settings for the topic of air quality and hazards and hazardous materials. The March 2017 Final Program EIR for the 2016 AQMP can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2016/2016aqmpfProgram EIR.pdf.

Hard copies of the above referenced document as well as the other documents referenced in the following sections are also available by visiting the SCAQMD's Public Information Center at SCAQMD Headquarters located at 21865 Copley Drive, Diamond Bar, CA 91765; by contacting Fabian Wesson, Public Advisor by calling (909) 396-2039 or by emailing at PICrequests@aqmd.gov.

EXISTING SETTNG

In general, Rules 1146, 1146.1, and 1146.2 were developed to reduce NOx emissions from boilers, steam generators, process heaters, and natural gas-fired water heaters. Control measure CMB-05 in the 2016 AQMP was also developed to identify a series of approaches that can be explored to ensure equivalency with equipment-based command-and-control regulations implementing BARCT, and to generate further NOx emission reductions at RECLAIM facilities. The following summarizes the existing setting for control measure CMB-05 as well as the current version of Rules 1146, 1146.1, and 1146.2.

CMB-05

The 2016 AQMP identifies control measures and strategies to bring the region into attainment with the revoked 1997 8-hour NAAQS (standard) (80 parts per billion (ppb)) for ozone by 2024; the 2008 8-hour ozone standard (75 ppb) by 2032; the 2012 annual PM2.5 standard (12 microgram per cubic meter (ug/m3) by 2025; the 2006 24-hour PM2.5 standard (35 ug/m3) by 2019; and the revoked 1979 1-hour ozone standard (120 ppb) by 2023. The 2016 AQMP consists of three

components: 1) the SCAQMD's Stationary, Area, and Mobile Source Control Measures; 2) State and Federal Control Measures provided by the CARB; and 3) Regional Transportation Strategy and Control Measures provided by the Southern California Association of Governments. The 2016 AQMP includes emission inventories and control measures for stationary, area and mobile sources, the most current air quality setting, updated growth projections, new modeling techniques, demonstrations of compliance with state and federal Clean Air Act requirements, and an implementation schedule for adoption of the proposed control strategy. Control measure CMB-05, one of several components in the 2016 AQMP, was developed to identify a series of approaches that can be explored to ensure equivalency with command-and-control regulations implementing BARCT, and to generate five tons per day of further NOx emission reductions at RECLAIM facilities as soon as feasible, and no later than 2025, and to transition to a command-and-control regulatory structure requiring BARCT level controls as soon as practicable. Because many of the RECLAIM program's original advantages appeared to be diminishing, CMB-05 prescribed an orderly sunset of the RECLAIM program to create more regulatory certainty and reduce compliance burdens for RECLAIM facilities, while also achieving more actual and SIP creditable emissions reductions. A NOx RECLAIM re-assessment working group was convened to examine the functionality, benefits, and challenges of the RECLAIM program and options for an orderly transition to a command-and-control structure. The conclusion from these working groups indicated a necessity to first amend Rules 1146, 1146.1 and 1146.2 as the first step in achieving the goals of CMB-05.

The analysis in the March 2017 Final Program EIR for the 2016 AQMP identified potential adverse impacts that may result from implementing the various components in the plan for the following environmental topic areas: 1) aesthetics; 2) air quality and GHGs; 3) energy; 4) hazards and hazardous materials; 5) hydrology and water quality; 6) noise; 7) solid and hazardous waste; and 8) transportation and traffic. The analysis concluded that significant and unavoidable adverse environmental impacts were expected to occur after implementing mitigation measures for the following topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: a) increased flammability of solvents; b) storage, accidental release and transportation of ammonia (which is specific to CMB-05); c) storage and transportation of liquefied natural gas (LNG); d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. Mitigation measures for the potentially significant impacts were required and were made a condition of the approval. Findings, a Statement of Overriding Considerations, and a Mitigation Monitoring Program were adopted.

Rule 1146

Specifically, Rule 1146 applies to boilers, steam generators, and process heaters used at industrial, institutional, and commercial operations with a rated heat input capacity greater than or equal to five MMBtu per hour. Rule 1146 does not regulate NOx emissions from boilers used by electric utilities to generate electricity, boilers and process heaters with a rated heat input capacity greater than 40 MMBtu per hour, and sulfur plant reactor boilers. Rule 1146 establishes three groups (Group I, Group II, and Group III) for units burning natural gas or gaseous fuels. Group I unit includes any unit burning natural gas with a rated heat input greater than or equal to 75 MMBtu per hour, excluding thermal fluid heaters, and is required to meet a NOx emission limit of five

ppm or 0.0062 pound per MMBtu. Group II unit includes any unit burning gaseous fuels, excluding digester and landfill gases, with a rated heat input less than 75 MMBtu per hour and greater than or equal 20 MMBtu per hour, excluding thermal heaters. Group III units include any unit burning gaseous fuels, excluding digester and landfill gases~~, and thermal fluid heaters~~ with a rated heat input less than 20 MMBtu per hour and greater than or equal to five MMBtu per hour and all units operated at schools and universities greater than or equal to five MMBtu per hour, excluding atmospheric units and thermal fluid heaters. Group II and Group III units are required to meet a NOx emission limit of nine ppm or 0.011 pound per MMBtu. Rule 1146 also establishes that any units fired on non-gaseous fuels, landfill gas, or digester gas are required to meet NOx emission limits of 40 ppm, 25 ppm, or 15 ppm, respectively. Atmospheric units are required to meet a 12 ppm or 0.015 pound per MMBtu NOx emission limit.

The most recent two amendments to Rule 1146 were in September 2008 and November 2013. In the September 2008 amendments to Rule 1146, the allowable NOx emission limits for boilers, steam generators and process heaters were reduced from 30 ppm to either 12 ppm, nine ppm or five ppm, depending on equipment size and operational characteristics. The September 2008 amendments also added NOx compliance limits for units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. Other changes included: 1) establishing a weighted average formula for dual fueled co-fired units; 2) allowing existing units to be de-rated to no less than two MMBtu per hour per unit; 3) requiring compliance with a 30 ppm NOx limit for low fuel usage equipment by January 1, 2015 or burner replacement, whichever occurs later; 4) allowing a later compliance date for health facilities complying with seismic safety requirements; 5) establishing a staged compliance schedule over a multi-year period which varies by equipment size range and unit operation; 6) making the frequency of compliance testing compatible with sources subject to the RECLAIM program for the same equipment size range; and 7) allowing NOx emissions monitoring with a portable analyzer. The analysis in the September 2008 Final EA for Rule 1146 concluded that the project would achieve NOx emission reductions of approximately 1.17 tons per day of NOx emissions by 2016 by relying on currently available NOx control technologies (e.g., low NOx burners and SCR systems). The September 2008 Final EA for Rule 1146 also concluded that the project would have a significant effect on the environment for air quality during construction (before applying the NOx emission reductions) and hazards and hazardous materials associated with the use and storage of aqueous ammonia. Mitigation measures for the potentially significant hazards and hazardous materials impacts were required and were made a condition of the approval. Findings, a Statement of Overriding Considerations, and a Mitigation Monitoring Program were adopted.

The November 2013 amendments to Rule 1146 addressed a SIP approvability issue that was raised by the U.S. EPA regarding the use of source test data and portable analyzers test results to prove a violation of the emission standard. Also included in the November 2013 amendments were the following minor changes: 1) a clarification that Rules 1146 and 1146.1 do not apply to NOx sources subject to the SCAQMD's Regulation XX – RECLAIM; 2) the identification of certain equipment that are not included under boiler or steam generator category; 3) an enhanced description pertaining to the types of operations that would be subject to Rule 1146; 4) a clarification that low fuel usage equipment are only subject to periodic tune-up requirements; and, 5) a prohibition from derating equipment to a level at or below two million MMBtu per hour. No NOx emission reductions were attributed to the November 2013 amendments to Rule 1146. The project was reviewed pursuant to CEQA Guidelines Section 15002(k)(1) and SCAQMD staff concluded that it could be seen with certainty that there was no possibility that the project had the

potential to create any significant adverse impacts on the environment. Therefore, the SCAQMD determined that the project was exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) - Review for Exemption. A Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Rule 1146.1

As with Rule 1146, Rule 1146.1 also applies to boilers, steam generators, and process heaters at industrial, institutional, and commercial operations, but for units with a rated heat input capacity greater than two but~~and~~ less than five MMBtu per hour. Similar to Rule 1146, units using landfill gas or digester gas would also need to meet the NOx emission limit of 25 ppm or 15 ppm, respectively. Atmospheric units would also be required to meet a 12 ppm NOx emission limit. All other units, excluding thermal fluid heaters, fired on natural gas would need to meet a nine ppm or 0.011 pound per MMBtu NOx emission limit.

The most recent two amendments to Rule 1146.1 were also in September 2008 and November 2013. Similar to Rule 1146, but applicable to units with smaller rated heat inputs, the September 2008 amendments to Rule 1146.1 further reduced the NOx emission limits, included new NOx limits for atmospheric units to be 12 ppm or 0.015 pound per MMBtu, and units burning landfill or digester gases at 25 ppm and 15 ppm, respectively. The amendments also: 1) established a weighted average formula for dual fueled co-fired units; 2) allowed existing units to be de-rated to no less than two MMBtu per hour per unit; 3) made the frequency of compliance testing compatible with RECLAIM sources for the same equipment size range; 4) allowed for monitoring of NOx and CO emissions with a portable analyzer; 5) for low-fuel usage units, required compliance with a 30 ppm NOx limit by January 1, 2015 or burner replacement, whichever occurs later; 6) allowed thermal fluid heaters to continue compliance with the 30 ppm NOx limits; and, 7) allowed a later compliance date for health facilities complying with seismic safety requirements. The analysis in the September 2008 Final EA for Rule 1146.1 concluded that the project would achieve NOx emission reductions of approximately 0.28 tons per day by 2015 by relying on currently available NOx control technologies (e.g., low NOx burners). The September 2008 Final EA for Rule 1146.1 identified no significant adverse environmental impacts for any environmental topic areas. Since there were no significant adverse environmental impacts identified, mitigation measures were not required and Findings, a Statement of Overriding Considerations, and a Mitigation Monitoring Program were not adopted.

The November 2013 amendments to Rule 1146.1 were combined with the November 2013 amendments to Rule 1146, and addressed a SIP approvability issue that was raised by the U.S. EPA regarding the use of source test data and portable analyzers test results to prove a violation of the emission standard. Also included in the November 2013 amendments were the following minor changes: 1) a clarification that Rules 1146 and 1146.1 do not apply to NOx sources subject to the SCAQMD's Regulation XX – RECLAIM; 2) the identification of certain equipment that are not included under boiler or steam generator category; 3) an enhanced description pertaining to the types of operations that would be subject to Rule 1146; 4) a clarification that low fuel usage equipment are only subject to periodic tune-up requirements; and, 5) a prohibition from derating equipment to a level at or below two million MMBtu per hour. No NOx emission reductions were attributed to the November 2013 amendments to Rule 1146. The project was reviewed pursuant to CEQA Guidelines Section 15002(k)(1) and SCAQMD staff concluded that it could be seen with certainty that there was no possibility that the project had the potential to create any significant adverse impacts on the environment. Therefore, the SCAQMD determined that the project was

exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) - Review for Exemption. A Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Rule 1146.2

Rule 1146.2 addresses natural gas-fired water heaters, boilers, and process heaters less than or equal to two MMBtu per hour. Rule 1146.2 exempts units used in recreational vehicles and units subject to SCAQMD Rule 1121. Rule 1146.2 requires new Type 2 units (rated heat input capacity greater than 400,000 Btu per hour and less than or equal to two MMBtu per hour) and Type 1 (rated heat input capacity less than or equal to 400,000 Btu per hour) to meet a NOx emission limit of 30 ppm and 20 ppm, respectively. Pool heaters rated at less than or equal to 400,000 Btu per hour are required to meet the NOx emission limit of 55 ppm (or 40 ng per J heat output). However, the current amendments to Rule 1146.2 will not require RECLAIM facilities to meet NOx emission limits in Rule 1146.2 by December 31, 2023 unless a more stringent BARCT limit is applicable.

The most recent amendments to Rule 1146.2 occurred in May 2006 and partially offset the NOx emission reductions foregone from the January 2005 amendments to Rule 1146.2. The May 2006 amendments to Rule 1146.2 required: 1) Type 2 units (equipment with heat input ratings greater than 400,000 Btu per hour) to meet a NOx emission limit of 20 ppm on or after January 1, 2010; and 2) Type 1 units (equipment with a heat input rating equivalent to or less than 400,000 Btu per hour) to meet a NOx emission limit of 20 ppm on or after January 1, 2012. Other changes included: 1) providing more detailed specifications for demonstrating compliance with an existing exemption from retrofit requirements for equipment operating less than 9,000 therms per year; 2) clarifying rule applicability; 3) a specific recordkeeping requirement for larger units; 4) enhancing compliance and enforceability; and, 5) improving clarity. The analysis in the May 2006 Final EA for Rule 1146.2 concluded that the project would achieve annual NOx emission reductions beginning in 2010, culminating in an overall reduction of 1.8 tons per day of NOx emissions by January 1, 2027 by relying on currently available NOx control technologies (e.g., low NOx burners). The May 2006 Final EA for Rule 1146.2 identified no significant adverse environmental impacts for any environmental topic areas. Since there were no significant adverse environmental impacts identified, mitigation measures were not required and Findings, a Statement of Overriding Considerations, and a Mitigation Monitoring Program were not adopted.

NOx Emission Inventory for Rules 1146, 1146.1 and 1146.2

The total baseline NOx emission inventory for equipment at RECLAIM facilities subject to Rules 1146 and 1146.1 are summarized in Table 3-1 and is estimated to be 0.42~~41~~~~36~~ ton per day based on the SCAQMD RECLAIM inventory database from calendar year 2016. The inventory excludes facilities that would be subject to sector specific command-and-control regulation (electricity generating facilities and refineries). Thirty-two Rule 1146.2 units are currently permitted in the RECLAIM program with most of the units (29~~28~~ out of 32) meeting the Rule 1146.2 NOx emission limits. Three~~Four~~ of the 32 units do not meet the NOx emission limits and these units would require retrofitting or replacement by December 31, 2023 under the proposed project. However, it is important to note that Rule 1146.2 units are smaller units that are exempt from permitting requirements under Rule 219 -Equipment Not Requiring a Written Permit Pursuant to Regulation II. Non-RECLAIM facilities currently register Rule 1146.2 equipment from one up to and including two MMBtu per hour under Rule 222 - Filing Requirements For Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II. RECLAIM facilities are currently exempt from this provision. Additionally, the RECLAIM NOx emissions for combustion

sources not requiring a written permit are reported on a quarterly basis as an aggregate sum for these devices. As a result, the permitted Rule 1146.2 universe may not fully represent the actual number of Rule 1146.2 units at RECLAIM facilities because the majority of the Rule 1146.2 units in RECLAIM are not currently registered or permitted with SCAQMD. Therefore, it is difficult to establish a precise inventory of the Rule 1146.2 units at RECLAIM facilities at this time. To aid in assessing the baseline emissions for future rulemaking efforts, RECLAIM facilities are required to submit their inventory of all small boilers and process heaters that would be subject to Rule 1146.2 requirements for Type 2 units as part of the initial determination notification process, pursuant to Rule 2002, paragraph (f)(6). The proposed amendments to Rules 1146, 1146.1, and 1146.2 affect a wide variety of RECLAIM facilities. For the lists of industry sectors and number of units affected by the proposed amendments to Rules 1146, 1146.1, and 1146.2, see Table 2-1.

Table 3-1
NOx Baseline Emission Inventory for Rules 1146, 1146.1, and 1146.2 Units in RECLAIM

Category	**NOx Baseline Emission Inventory** (tons/day)	**Number of Affected Units**
Rule 1146 – Group I (≥ 75 MMBtu/hour)	0.085	3
Rule 1146 – Group II (≥ 20 to < 75 MMBtu/hour)	0.2119	52
Rule 1146 – Group III (≥ 5 to < 20 MMBtu/hour)	0.10	69
Rule 1146 – Thermal Fluid Heaters	0.0030	2
Rule 1146.1 (> 2 to < 5 MMBtu/hour)	0.0112	19
Rule 1146.2 (≤ 2 MMBtu/hour)	0.008087	3
Total Emission Inventory	**0.4236**	**148149**

Over half the NOx emissions inventory can be attributed to Rule 1146 units in Group II. The Rule 1146 Group I units contribute to 2013 percent of NOx baseline emissions., however, on average each unit accounts for more than double the amount of emissions than a Rule 1146 Group II unit. The Rule 1146 Group III units make up 248 percent of the emissions inventory, which is equivalent towith 0.10 ton per day of NOx. A majority of the NOx baseline emission inventory comes from larger units subject to Rule 1146. Rule 1146.1 units make up the second majority of NOx baseline emissions inventory. Units subject to Rule 1146.2 make up thea smallest amount of the emission inventory. Thus, the compliance deadlines as proposed in Rule 1100 are expected to achieve greater NOx emissions reductions earlier from units subject to Rule 1146 and 1146.1.

AIR QUALITY

It is the responsibility of SCAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, CO, NO2, PM10, PM2.5, SO2, and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards and in the case of PM10 and SO2, far more stringent. California has also established standards for sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. The state and NAAQS for each of these pollutants and their effects on health are summarized in Table 3-2. SCAQMD monitors levels of various criteria pollutants at 38 monitoring stations. The 2016 air quality data (the latest data available) from SCAQMD's monitoring stations are presented in Table 3-3.

Table 3-2
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard[a]	Federal Primary Standard[b]	Most Relevant Effects
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m3)	0.12 ppm	(a) Short-term exposures: 1) Pulmonary function decrements and localized lung edema in humans and animals; and 2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; and (d) Property damage.
	8-hour	0.070 ppm (137 µg/m3)	0.070 ppm (137 µg/m3)	
Suspended Particulate Matter (PM10)	24-hour	50 µg/m3	150 µg/m3	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; and (b) Excess seasonal declines in pulmonary function, especially in children.
	Annual Arithmetic Mean	20 µg/m3	No Federal Standard	
Suspended Particulate Matter (PM2.5)	24-hour	No State Standard	35 µg/m3	(a) Increased hospital admissions and emergency room visits for heart and lung disease; (b) Increased respiratory symptoms and disease; and (c) Decreased lung functions and premature death.
	Annual Arithmetic Mean	12 µg/m3	12 µg/m3	
Carbon Monoxide (CO)	1-Hour	20 ppm (23 mg/m3)	35 ppm (40 mg/m3)	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses.
	8-Hour	9 ppm (10 mg/m3)	9 ppm (10 mg/m3)	

Table 3-2 (Concluded)
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard[a]	Federal Primary Standard[b]	Most Relevant Effects
Nitrogen Dioxide (NO2)	1-Hour	0.18 ppm (339 µg/m3)	0.100 ppm (188 µg/m3)	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration.
	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	0.053 ppm (100 µg/m3)	
Sulfur Dioxide (SO2)	1-Hour	0.25 ppm (655 µg/m3)	75 ppb (196 µg/m3)–	Broncho-constriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
	24-Hour	0.04 ppm (105 µg/m3)	No Federal Standard	
Sulfates	24-Hour	25 µg/m3	No Federal Standard	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and (f) Property damage
Hydrogen Sulfide (H2S)	1-Hour	0.03 ppm (42 µg/m3)	No Federal Standard	Odor annoyance.
Lead (Pb)	30-Day Average	1.5 µg/m3	No Federal Standard	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction.
	Calendar Quarter	No State Standard	1.5 µg/m3	
	Rolling 3-Month Average	No State Standard	0.15 µg/m3	
Visibility Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more due to particles when relative humidity is less than 70 percent.	No Federal Standard	The statewide standard is intended to limit the frequency and severity of visibility impairment due to regional haze. This is a visibility based standard not a health based standard. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent.
Vinyl Chloride	24-Hour	0.01 ppm (26 µg/m3)	No Federal Standard	Highly toxic and a known carcinogen that causes a rare cancer of the liver.

ppb = parts per billion parts of air, by volume
ppm = parts per million parts of air, by volume
µg/m3 = micrograms per cubic meter
mg/m3 = milligrams per cubic meter

[a] The California ambient air quality standards for O3, CO, SO2 (1-hour and 24-hour), NO2, PM10, and PM2.5 are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

[b] The national ambient air quality standards, other than O3 and those based on annual averages are not to be exceeded more than once a year. The O3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standards is equal to or less than one.

Table 3-3
2016 Air Quality Data – South Coast Air Quality Management District

CARBON MONOXIDE (CO)[a]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. in ppm, 8-hour
LOS ANGELES COUNTY				
1	Central Los Angeles	361	1.9	1.4
2	Northwest Coastal Los Angeles County	366	2.2	1.1
3	Southwest Coastal Los Angeles County	362	1.6	1.3
4	South Coastal Los Angeles County 1	--	--	--
4	South Coastal Los Angeles County 2	--	--	--
4	South Coastal Los Angeles County 3	363	3.3	2.2
4	I-710 Near Road##	--	--	--
6	West San Fernando Valley	366	2.4	1.9
8	West San Gabriel Valley	366	1.5	1
9	East San Gabriel Valley 1	366	1.3	1.2
9	East San Gabriel Valley 2	364	1.1	1
10	Pomona/Walnut Valley	361	1.7	1.3
11	South San Gabriel Valley	366	2.8	1.7
12	South Central Los Angeles County	366	4.4	3.9
13	Santa Clarita Valley	366	1.3	1.1
ORANGE COUNTY				
16	North Orange County	366	3.1	1.5
17	Central Orange County	355	2.6	2.1
17	I-5 Near Road##	360	3.7	2.2
18	North Coastal Orange County	366	2.1	1.7
19	Saddleback Valley	353	1.3	0.7
RIVERSIDE COUNTY				
22	Corona/Norco Area	--	--	--
23	Metropolitan Riverside County 1	359	1.7	1.3
23	Metropolitan Riverside County 3	366	1.9	1.4
24	Perris Valley	--	--	--
25	Elsinore Valley	298*	1.2	0.6
26	Temecula Valley	--	--	--
29	San Gorgonio Pass	--	--	--
30	Coachella Valley 1**	361	3.1	1.5
30	Coachella Valley 2**	--	--	--
30	Coachella Valley 3**	--	--	--
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	366	1.7	1.3
33	I-10 Near Road##	366	1.7	1.3
33	CA-60 Near Road##	--	--	--
34	Central San Bernardino Valley 1	359	1.7	1
34	Central San Bernardino Valley 2	358	2.2	1.7
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
DISTRICT MAXIMUM			**4.4**	**3.9**
SOUTH COAST AIR BASIN			**4.4**	**3.9**

ppm = parts per million
-- = Pollutant not monitored
= Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710.
**Salton Sea Air Basin
*Incomplete Data

[a] The federal 8-hour standard (8-hour average CO > 9 ppm) and state 8-hour standard (8-hour average CO > 9.0 ppm) were not exceeded. The federal and state 1-hour standards (35 ppm and 20 ppm) were not exceeded either.

Table 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

OZONE (O3)

Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hr	Max. Conc. in ppm 8-hr	4th High Conc. ppm 8-hr	No. Days Standard Exceeded				
						Federal			State	
						Old > 0.124 ppm 1-hr	Current > 0.070 ppm 8-hr*	2008 > 0.075 ppm 8-hr	Current > 0.09 ppm 1-hr	Current > 0.070 ppm 8-hr
LOS ANGELES COUNTY										
1	Central LA	364	0.103	0.078	0.071	0	4	1	2	4
2	Northwest Coastal LA County	365	0.085	0.073	0.066	0	2	0	0	2
3	Southwest Coastal LA County	361	0.087	0.08	0.067	0	2	1	0	3
4	South Coastal LA County 1	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 2	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 3	365	0.079	0.059	0.055	0	0	0	0	0
4	I-710 Near Road##	--	--	--	--	--	--	--	--	--
6	West San Fernando Valley	364	0.122	0.098	0.086	0	23	14	9	23
8	West San Gabriel Valley	358	0.126	0.09	0.082	1	18	15	12	19
9	East San Gabriel Valley 1	366	0.146	0.106	0.095	4	39	25	30	40
9	East San Gabriel Valley 2	362	0.148	0.114	0.098	6	52	31	38	55
10	Pomona/Walnut Valley	360	0.127	0.092	0.087	1	26	14	20	29
11	South San Gabriel Valley	359	0.111	0.081	0.074	0	6	2	9	6
12	South Central LA County	365	0.098	0.071	0.064	0	1	0	1	1
13	Santa Clarita Valley	366	0.13	0.115	0.1	2	57	35	29	59
ORANGE COUNTY										
16	North Orange County	365	0.103	0.078	0.075	0	6	3	3	7
17	Central Orange County	354	0.103	0.074	0.071	0	4	0	2	4
17	I-5 Near Road##	--	--	--	--	--	--	--	--	--
18	North Coastal Orange County	366	0.09	0.069	0.065	0	0	0	0	0
19	Saddleback Valley	365	0.122	0.093	0.079	0	13	6	5	13
RIVERSIDE COUNTY										
22	Corona/Norco Area	--	--	--	--	--	--	--	--	--
23	Metropolitan Riverside County 1	357	0.142	0.104	0.097	1	69	47	33	71
23	Metropolitan Riverside County 3	365	0.14	0.106	0.095	1	65	43	34	70
24	Perris Valley	366	0.131	0.098	0.092	1	55	30	23	56
25	Elsinore Valley	360	0.124	0.093	0.087	0	44	25	15	45
26	Temecula Valley	355	0.092	0.081	0.077	0	19	6	0	20
29	San Gorgonio Pass	358	0.128	0.106	0.094	1	52	39	26	54
30	Coachella Valley 1**	363	0.103	0.092	0.087	0	46	20	6	48
30	Coachella Valley 2**	331	0.099	0.089	0.081	0	27	12	3	29
30	Coachella Valley 3**	--	--	--	--	--	--	--	--	--
SAN BERNARDINO COUNTY										
32	Northwest San Bernardino Valley	366	0.156	0.116	0.11	10	88	65	53	89
33	I-10 Near Road##	--	--	--	--	--	--	--	--	--
33	CA-60 Near Road##	--	--	--	--	--	--	--	--	--
34	Central San Bernardino Valley 1	362	0.139	0.105	0.098	3	49	39	34	52
34	Central San Bernardino Valley 2	366	0.158	0.118	0.114	10	106	76	70	108
35	East San Bernardino Valley	364	0.145	0.119	0.103	3	97	71	55	100
37	Central San Bernardino Mountains	365	0.163	0.121	0.116	9	101	80	64	103
38	East San Bernardino Mountains	--	--	--	--	--	--	--	--	--
DISTRICT MAXIMUM			**0.163**	**0.121**	**0.116**	**10**	**106**	**80**	**70**	**108**
SOUTH COAST AIR BASIN			**0.163**	**0.121**	**0.116**	**17**	**132**	**103**	**83**	**132**

ppm = parts per million
-- = Pollutant not monitored
= Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710.
**Salton Sea Air Basin
*Incomplete data

Table 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

NITROGEN DIOXIDE (NO2)[b]					
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	1-hour Max. Conc. ppb, 1,	1-hour 98th Percentile Conc. ppb,	Annual Average AAM Conc. ppb
LOS ANGELES COUNTY					
1	Central LA	366	64.7	61	20.8
2	Northwest Coastal LA County	366	54.5	49.3	11.6
3	Southwest Coastal LA County	348	81.5	54.7	10.1
4	South Coastal LA County 1	--	--	--	--
4	South Coastal LA County 2	--	--	--	--
4	South Coastal LA County 3	366	75.6	66.3	18.5
4	I-710 Near Road##	366	95.3	76.6	23.9
6	West San Fernando Valley	355	55.5	45.9	12.9
8	West San Gabriel Valley	366	71.9	58.4	15.4
9	East San Gabriel Valley 1	366	74.2	58.3	16.6
9	East San Gabriel Valley 2	365	65.4	45.7	11.6
10	Pomona/Walnut Valley	360	69.3	62.5	20.1
11	South San Gabriel Valley	361	63.2	60.1	20
12	South Central LA County	366	63.7	58.4	15.6
13	Santa Clarita Valley	361	46.4	39.4	10.2
ORANGE COUNTY					
16	North Orange County	359	60.4	51.5	14.7
17	Central Orange County	354	64.3	56.7	14.8
17	I-5 Near Road##	357	75.2	60.1	23.4
18	North Coastal Orange County	349	59.8	51.2	10.1
19	Saddleback Valley	--	--	--	--
RIVERSIDE COUNTY					
22	Corona/Norco Area	--	--	--	--
23	Metropolitan Riverside County 1	366	73.1	52.2	14.9
23	Metropolitan Riverside County 3	366	64.9	48.3	13.6
24	Perris Valley	--	--	--	--
25	Elsinore Valley	345*	51.3	35.6	8.1
26	Temecula Valley	--	--	--	--
29	San Gorgonio Pass	348	46.9	42.6	7.9
30	Coachella Valley 1**	363	42.6	34.4	6
30	Coachella Valley 2**	--	--	--	--
30	Coachella Valley 3**	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	366	70.1	55.1	16.5
33	I-10 Near Road##	362	93.4	74.3	29.3
33	CA-60 Near Road##	361	89.8	71.3	31
34	Central San Bernardino Valley 1	357	71.7	56.4	18.2
34	Central San Bernardino Valley 2	355	60.1	51.4	16.6
35	East San Bernardino Valley	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM			**95.3**	**76.6**	**31**
SOUTH COAST AIR BASIN			**95.3**	**76.6**	**31**

ppb = parts per billion
AAM = Annual Arithmetic Mean
-- = Pollutant not monitored
**Salton Sea Air Basin
= Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710.

[b] The NO2 federal 1-hour standard is 100 ppb and the annual standard is annual arithmetic mean NO2 > 0.0534 ppm (53.4 ppb). The state 1-hour and annual standards are 0.18 ppm (180 ppb) and 0.030 ppm (30 ppb).

Table 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

SULFUR DIOXIDE (SO2)[c]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Maximum Conc. ppb, 1-hour	99th Percentile Conc. ppb, 1-hour
LOS ANGELES COUNTY				
1	Central LA	366	13.4	2.5
2	Northwest Coastal LA County	--	--	--
3	Southwest Coastal LA County	363	9.7	5.7
4	South Coastal LA County 1	--	--	--
4	South Coastal LA County 2	--	--	--
4	South Coastal LA County 3	366	17.8	12
4	I-710 Near Road##	--	--	--
6	West San Fernando Valley	--	--	--
8	West San Gabriel Valley	--	--	--
9	East San Gabriel Valley 1	--	--	--
9	East San Gabriel Valley 2	--	--	--
10	Pomona/Walnut Valley	--	--	--
11	South San Gabriel Valley	--	--	--
12	South Central LA County	--	--	--
13	Santa Clarita Valley	--	--	--
ORANGE COUNTY				
16	North Orange County	--	--	--
17	Central Orange County	--	--	--
17	I-5 Near Road##	--	--	--
18	North Coastal Orange County	366	3.3	2.1
19	Saddleback Valley	--	--	--
RIVERSIDE COUNTY				
22	Corona/Norco Area	--	--	--
23	Metropolitan Riverside County 1	366	5.6	2
23	Metropolitan Riverside County 3	--	--	--
24	Perris Valley	--	--	--
25	Elsinore Valley	--	--	--
26	Temecula Valley	--	--	--
29	San Gorgonio Pass	--	--	--
30	Coachella Valley 1**	--	--	--
30	Coachella Valley 2**	--	--	--
30	Coachella Valley 3**	--	--	--
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	--	--	--
33	I-10 Near Road##	--	--	--
33	CA-60 Near Road##	--	--	--
34	Central San Bernardino Valley 1	363	6.3	2
34	Central San Bernardino Valley 2	--	--	--
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
DISTRICT MAXIMUM			**17.8**	**12**
SOUTH COAST AIR BASIN			**17.8**	**12**

ppb = parts per billion ** Salton Sea Air Basin
-- = Pollutant not monitored
= Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710.

[c] The federal SO2 1-hour standard is 75 ppb (0.075 ppm). The state standards are 1-hour average SO2 > 0.25 ppm (250 ppb) and 24-hour average SO2 > 0.04 ppm (40 ppb).

Table 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

SUSPENDED PARTICULATE MATTER PM10[d]						
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. µg/m^3, 24-hour	No. (%) Samples Exceeding Standard		Annual Average AAM Conc.[e] µg/m^3
				Federal > 150 µg/m^3, 24-hour	State > 50 µg/m^3, 24-hour	
LOS ANGELES COUNTY						
1	Central LA	277*	67	0	18(6%)	32.4
2	Northwest Coastal LA County	--	--	--	--	--
3	Southwest Coastal LA County	60	43	0	0(0%)	21.6
4	South Coastal LA County 1	--	--	--	--	--
4	South Coastal LA County 2	60	56	0	3(5%)	27.8
4	South Coastal LA County 3	59	75	0	8(14%)	31.9
4	I-710 Near Road[##]	--	--	--	--	--
6	West San Fernando Valley	--	--	--	--	--
8	West San Gabriel Valley	--	--	--	--	--
9	East San Gabriel Valley 1	60	74	0	12(20%)	33.7
9	East San Gabriel Valley 2	362	74	0	21(6%)	29.8
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	--	--	--	--	--
12	South Central LA County	--	--	--	--	--
13	Santa Clarita Valley	60	96	0	1(2%)	23.4
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	353	74	0	3(1%)	24.4
17	I-5 Near Road[##]	--	--	--	--	--
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	59	59	0	1(2%)	21
RIVERSIDE COUNTY						
22	Corona/Norco Area	51*	62	0	7(14%)	31.7
23	Metropolitan Riverside County 1	302*	82	0	58(19%)	36.9
23	Metropolitan Riverside County 3	356[+]	116	0	175(49%)	49
24	Perris Valley	57	76	0	5(9%)	32.2
25	Elsinore Valley	366	99	0	4(1%)	21.4
26	Temecula Valley	--	--	--	--	--
29	San Gorgonio Pass	57	65	0	3(5%)	24
30	Coachella Valley 1**	355[+]	113	0	6(2%)	20.8
30	Coachella Valley 2**	313*[+]	137	0	56(18%)	36.9
30	Coachella Valley 3**	272*[+]	150	0	76(28%)	43
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	363	72	0	5(1%)	25
33	I-10 Near Road[##]	--	--	--	--	--
33	CA-60 Near Road[##]	--	--	--	--	--
34	Central San Bernardino Valley 1	61	94	0	15(25%)	38.1
34	Central San Bernardino Valley 2	333*	91	0	33(10%)	33.1
35	East San Bernardino Valley	56	72	0	4(7%)	27.8
37	Central San Bernardino Mountains	61	46	0	0(0%)	17.1
38	East San Bernardino Mountains	--	--	--	--	--
DISTRICT MAXIMUM			**150[+]**	**0[+]**	**175[+]**	**49.0[+]**
SOUTH COAST AIR BASIN			**116[+]**	**0[+]**	**181[+]**	**49.0[+]**

µg/m^3 = micrograms per cubic meter of air
AAM = Annual Arithmetic Mean
-- = Pollutant not monitored
**Salton Sea Air Basin
*Incomplete Data

[##] = Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710.
+ = High PM10 (≥ 155 µg/m^3) data recorded in Coachella Valley (due to high winds) and the Basin (due to Independence Day fireworks) are excluded in accordance with the U.S. EPA Exceptional Event Rule.

[d] Federal Reference Method (FRM) PM10 samples were collected every 6 days at all sites except for Stations 4144 and 4157, where samples were collected every 3 days. PM10 statistics listed above are for the FRM data only. Federal Equivalent Method (FEM) PM10 continuous monitoring instruments were operated at some of the above locations. Max 24-hour average PM10 at sites with FEM monitoring was 152 µg/m3, at Indio.

[e] State standard is annual average (AAM) > 20 µg/m3. Federal annual PM10 standard (AAM > 50 µg/m3) was revoked in 2006.

Table 3-3 (Continued)
2016 Air Quality Data – South Coast Air Quality Management District

SUSPENDED PARTICULATE MATTER PM2.5 [f]						
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. µg/m³, 24-hour	98th Percentile Conc. in µg/m³ 24-hr	No. (%) Samples Exceeding Federal Std > 35 µg/m³, 24-hour	Annual Average AAM Conc.[g] µg/m³
LOS ANGELES COUNTY						
1	Central LA	357	44.39	27.3	2(0.6%)	11.83
2	Northwest Coastal LA County	--	--	--	--	--
3	Southwest Coastal LA County	--	--	--	--	--
4	South Coastal LA County 1	356	29.37	23.56	0	10.36
4	South Coastal LA County 2	350	28.93	22.05	0	9.62
4	South Coastal LA County 3	--	--	--	--	--
4	I-710 Near Road##	352	33.31	26.09	0	12.03
6	West San Fernando Valley	113	30.05	24.59	0	9.23
8	West San Gabriel Valley	119	29.21	25.38	0	9.59
9	East San Gabriel Valley 1	122	32.17	29.01	0	10.15
9	East San Gabriel Valley 2	--	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	120	46.59	25.13	2(1.7%)	11.75
12	South Central LA County	115	36.35	26.35	1(0.9%)	11.13
13	Santa Clarita Valley	--	--	--	--	--
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	349	44.45	24.02	1(0.3%)	9.47
17	I-5 Near Road##	--	--	--	--	--
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	117	24.79	13.41	0	7.36
RIVERSIDE COUNTY						
22	Corona/Norco Area	--	--	--	--	--
23	Metropolitan Riverside County 1	357+	39.12	31.65	4(1.1%)	12.54
23	Metropolitan Riverside County 3	352+	45.64	35.14	6(1.7%)	14.02
24	Perris Valley	--	--	--	--	--
25	Elsinore Valley	--	--	--	--	--
26	Temecula Valley	--	--	--	--	--
29	San Gorgonio Pass	--	--	--	--	--
30	Coachella Valley 1**	112	14.71	12.43	0	5.53
30	Coachella Valley 2**	115	25.84	15.04	0	7.74
30	Coachella Valley 3**	--	--	--	--	--
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	--	--	--	--	--
33	I-10 Near Road##	--	--	--	--	--
33	CA-60 Near Road##	347*+	44.14	33.02	6(1.7%)	14.73
34	Central San Bernardino Valley 1	111+	30.45	26.25	0	12.04
34	Central San Bernardino Valley 2	113+	32.54	27.12	0	10.84
35	East San Bernardino Valley	--	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--	--
38	East San Bernardino Mountains	55	28.42	22.14	0	6.83
DISTRICT MAXIMUM			**46.6+**	**35.1+**	**6+**	**14.73+**
SOUTH COAST AIR BASIN			**46.6+**	**35.1+**	**9+**	**14.73+**

µg/m³ = micrograms per cubic meter of air
AAM = Annual Arithmetic Mean
-- = Pollutant not monitored
**Salton Sea Air Basin
*Incomplete Data

= Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710
\+ = High PM10 (≥ 155 µg/m³) data recorded in Coachella Valley (due to high winds) and the Basin (due to Independence Day fireworks) are excluded in accordance with the U.S. EPA Exceptional Event Rule.

[f] PM2.5 samples were collected every 3 days at all sites except for station numbers 072, 077, 087, 3176, 4144 and 4165, where samples were taken daily, and station number 5818 where samples were taken every 6 days. PM2.5 statistics listed above are for the FRM data only. FEM PM2.5 continuous monitoring instruments were operated at some of the above locations for special purposes studies.

[g] Both federal and state standards are annual average (AAM) > 12.0 µg/m³.

Table 3-3 (Concluded)
2016 Air Quality Data – South Coast Air Quality Management District

Source Receptor Area No.	Location of Air Monitoring Station	LEAD[h] Max. Monthly Average Conc. [m] µg/m³	LEAD[h] Max. 3-Month Rolling Average [m] µg/m³	SULFATES (SOx)[i] No. Days of Data	SULFATES (SOx)[i] Max. Conc. µg/m³, 24-hour
LOS ANGELES COUNTY					
1	Central LA	0.016	0.01	58	5.8
2	Northwest Coastal LA County	--	--	--	--
3	Southwest Coastal LA County	0.006	0.01	58	6.2
4	South Coastal LA County 1	--	--	--	--
4	South Coastal LA County 2	0.008	0.01	59	6.3
4	South Coastal LA County 3	--	--	57	7.4
4	I-710 Near Road##	--	--	--	--
6	West San Fernando Valley	--	--	--	--
8	West San Gabriel Valley	--	--	--	--
9	East San Gabriel Valley 1	--	--	58	9.5#
9	East San Gabriel Valley 2	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--
11	South San Gabriel Valley	0.011	0.01	--	--
12	South Central LA County	0.016	0.01	--	--
13	Santa Clarita Valley	--	--	59	4.1
ORANGE COUNTY					
16	North Orange County	--	--	--	--
17	Central Orange County	--	--	59	5.3#
17	I-5 Near Road##	--	--	--	--
18	North Coastal Orange County	--	--	--	--
19	Saddleback Valley	--	--	58	3.7
RIVERSIDE COUNTY					
22	Corona/Norco Area	--	--	50	8.2#
23	Metropolitan Riverside County 1	0.007	0.01	114	15.2#
23	Metropolitan Riverside County 3	--	--	118	13.6#
24	Perris Valley	--	--	55	6.0#
25	Elsinore Valley	--	--	--	--
26	Temecula Valley	--	--	--	--
29	San Gorgonio Pass	--	--	56	4.0#
30	Coachella Valley 1**	--	--	51	3.9
30	Coachella Valley 2**	--	--	113	4.1
30	Coachella Valley 3**	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	0.007	0.01	--	--
33	I-10 Near Road##	--	--	--	--
33	CA-60 Near Road##	--	--	--	--
34	Central San Bernardino Valley 1	--	--	59	17.1#
34	Central San Bernardino Valley 2	0.01	0.01	55	16.0#
35	East San Bernardino Valley	--	--	56	12.1#
37	Central San Bernardino Mountains	--	--	59	3.9#
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM		**0.016++**	**0.01++**		**17.1#**
SOUTH COAST AIR BASIN		**0.016++**	**0.01++**		**17.1#**

µg/m³ = micrograms per cubic meter of air
-- =Pollutant not monitored
**Salton Sea Air Basin
*Incomplete Data
= Four near-road sites measuring one or more of the pollutants PM2.5, CO, and/or NO2 are operating near the following freeways: I-1, I-10, CA-60, and I-710.

\+ = High PM10 (≥ 155 µg/m³) data recorded in Coachella Valley (due to high winds) and the Basin (due to Independence Day fireworks) are excluded in accordance with the U.S. EPA Exceptional Event Rule.
++ = Higher lead concentrations were recorded at near-source monitoring sites immediately downwind of stationary lead sources. Maximum monthly and 3-month rolling averages recorded were 0.88 µ/m³ and 0.06 µ/m³.

[h] Federal lead standard is 3-months rolling average > 0.15 µg/m3; state standard is monthly average ≥ 1.5 µg/m3. .Lead standards were not exceeded.

[i] Sulfate data is not available at this time. State sulfate standard is 24-hour ≥ 25 µg/m3. There is no federal standard for sulfate.

Carbon Monoxide

CO is a primary pollutant, meaning that it is directly emitted into the air, not formed in the atmosphere by chemical reaction of precursors, as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the Basin exhibit large spatial and temporal variations due to variations in the rate at which CO is emitted and in the meteorological conditions that govern transport and dilution. Unlike ozone, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late night during the coolest, most stable portion of the day.

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise and electrocardiograph changes indicative of worsening oxygen supply to the heart.

Inhaled CO has no direct toxic effect on the lungs but exerts its effect on tissues by interfering with oxygen transport by competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses, and patients with chronic hypoxemia (oxygen deficiency) as seen in high altitudes.

Reductions in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels. These include preterm births and heart abnormalities.

CO concentrations were measured at 25 locations in the Basin and neighboring Salton Sea Air Basin areas in 2016. CO concentrations did not exceed the standards in 2016. The highest 1-hour average CO concentration recorded (4.4 ppm in the South Central Los Angeles County area) was 13 percent of the federal 1-hour CO standard of 35 ppm and 22 percent of the state 1-hour standard of 20 ppm. The highest 8-hour average CO concentration recorded (3.9 ppm in the South Central Los Angeles County area) was 43 percent of the federal and state 8-hour CO standard of 9.0 ppm.

In 2004, SCAQMD formally requested the U.S. EPA to re-designate the Basin from nonattainment to attainment with the CO NAAQS. On March 24, 2007, U.S. EPA published in the Federal Register its proposed decision to re-designate the Basin from nonattainment to attainment for CO. The comment period on the re-designation proposal closed on March 16, 2007 with no comments received by the U.S. EPA. On May 11, 2007, U.S. EPA published in the Federal Register its final decision to approve SCAQMD's request for re-designation from non-attainment to attainment for CO, effective June 11, 2007.

On August 12, 2011 U.S. EPA issued a decision to retain the existing NAAQS for CO, determining that those standards provided the required level of public health protection. However, U.S. EPA added a monitoring requirement for near-road CO monitors in urban areas with population of one million or more, utilizing stations that would be implemented to meet the 2010 NO2 near-road monitoring requirements. The two new CO monitors are at the I-5 near-road site, located in Orange County near Anaheim, and the I-10 near-road site, located near Etiwanda Avenue in San Bernardino County near Ontario, Rancho Cucamonga, and Fontana.

Ozone

Ozone (O3), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone transport is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (e.g., from 0.03 ppm to 0.05 ppm).

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells and ambient ozone concentrations in the Basin are frequently sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection.

Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for ozone effects. Short-term exposures (lasting for a few hours) to ozone at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in high ozone communities. Elevated ozone levels are also associated with increased school absences.

Ozone exposure under exercising conditions is known to increase the severity of the above mentioned observed responses. Animal studies suggest that exposures to a combination of pollutants which include ozone may be more toxic than exposure to ozone alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

In 2016, SCAQMD regularly monitored ozone concentrations at 29 locations in the Basin and the Coachella Valley portion of the Salton Sea Air Basin. Maximum ozone concentrations (fourth highest concentration ppm 8-hour) for all areas monitored were below the stage 1 episode level (0.20 ppm) and below the health advisory level (0.15 ppm) (see Table 3-3). All counties in the Basin, as well as the Coachella Valley, exceeded the level of the new 2015 (0.070 ppm), the former 2008 (0.075 ppm), and/or the 1997 (0.08 ppm) 8-hour ozone NAAQS in 2016. While not all stations had days exceeding the previous 8-hour standards, all monitoring stations except two (South Coastal LA County 3 and North Coastal Orange County) had at least one day over the 2015 federal ozone standard (70 ppb).

In 2016, the maximum ozone concentrations in the Basin continued to exceed federal standards by wide margins. Maximum 1-hour and 8-hour average ozone concentrations were 0.163 ppm and 0.121 ppm, respectively (the maximum 1-hour and 8-hour average was recorded in the Central San Bernardino Mountain area). The maximum 8-hour concentration of 0.121 ppm was 173 percent of the new federal standard (0.070 ppm). The maximum 1-hour concentration was 181 percent of the 1-hour state ozone standard of 0.09 ppm. The 8-hour average concentration was 173 percent of the 8-hour state ozone standard of 0.070 ppm.

Nitrogen Dioxide

NO2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N2) and oxygen (O2) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO2. NO2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO2, are referred to collectively as NOx. In the presence of sunlight, NO2 reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO3) which reacts further to form nitrates, components of PM2.5 and PM10.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposures to NO2 at levels found in homes with gas stoves, which are higher than ambient levels found in Southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma and/or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these subgroups. More recent studies have found associations between NO2 exposures and cardiopulmonary mortality, decreased lung function, respiratory symptoms, and emergency room asthma visits.

In animals, exposure to levels of NO2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of ozone and NO2.

In 2016, nitrogen dioxide concentrations were monitored at 27 locations. No area of the Basin or SSAB exceeded the federal or state standards for NO2. The Basin has not exceeded the federal standard for NO2 (0.0534 ppm) since 1991, when the Los Angeles County portion of the Basin recorded the last exceedance of the standard in any county within the United States. The current 1-hour average NO2 NAAQS (100 ppb) was last exceeded on two days in 2014 in the South Coastal Los Angeles County area at the Long Beach-Hudson air monitoring station. However, the 98th percentile form of the standard was not exceeded, and the 2013-2015 design value is not in violation of the NAAQS. The higher relative concentrations in the Los Angeles area are indicative of the concentrated emission sources, especially heavy-duty vehicles. NOx emission reductions continue to be necessary because it is a precursor to both ozone and PM (PM2.5 and PM10) concentrations.

With the revised NO2 federal standard in 2010, near-road NO2 measurements were required to be phased in for larger cities. The four near-road monitoring stations are: (1) I-5 near-road, located in Orange County near Anaheim; (2) I-710 near-road, located at Long Beach Blvd. in Los Angeles County near Compton and Long Beach; (3) SR-60 near-road, located west of Vineyard Avenue near the San Bernardino/Riverside County border near Ontario, Mira Loma, and Upland; and (4) I-10 near-road, located near Etiwanda Avenue in San Bernardino County near Ontario, Rancho Cucamonga, and Fontana.

The longest operating near-road station in the Basin, adjacent to I-5 in Orange County, has not exceeded the level of the 1-hour NO2 NAAQS (100 ppb) since the measurements began on January 1, 2014. The peak 1-hour NO2 concentration at that site in 2014 was 78.8 ppb and the peak

concentration for 2015 was 70.2 ppb. This can be compared to the annual peak values measured at the nearest ambient monitoring station in Central Orange County (Anaheim station), where the 2014 and 2015 peaks were 75.8 and 59.1, respectively.

Sulfur Dioxide

SO2 is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H2SO4), which contributes to acid precipitation, and sulfates, which are components of PM10 and PM2.5. Most of the SO2 emitted into the atmosphere is produced by burning sulfur-containing fuels.

Exposure of a few minutes to low levels of SO2 can result in airway constriction in some asthmatics. All asthmatics are sensitive to the effects of SO2. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, is observed after acute higher exposure to SO2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO2.

Animal studies suggest that despite SO2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO2 levels. In these studies, efforts to separate the effects of SO2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

No exceedances of federal or state standards for sulfur dioxide occurred in 2016 at any of the six locations monitored the Basin. The maximum 1-hour SO2 concentration was 17.8 ppb, as recorded in the South Coastal Los Angeles County area. The 99th percentile of 1-hour SO2 concentration was 12 ppb, as recorded in South Coastal Los Angeles County area. Though SO2 concentrations remain well below the standards, SO2 is a precursor to sulfate, which is a component of fine particulate matter, PM10, and PM2.5. Historical measurements showed concentrations to be well below standards and monitoring has been discontinued.

Particulate Matter (PM10 and PM2.5)

Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter (PM10)) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis, and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient fine particulate matter (PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks, and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by PM2.5 and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children, and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to particulate matter. In addition to children, the elderly and people with preexisting respiratory and/or cardiovascular disease appear to be more susceptible to the effects of PM10 and PM2.5.

SCAQMD monitored PM10 concentrations at 23 locations in 2016. The federal 24-hour PM10 standard (150 µg/m3) was not exceeded in 2016. The Basin has remained in attainment of the PM10 NAAQS since 2006. The maximum three-year average 24-hour PM10 concentration of 150 µg/m3 was recorded in the Coachella Valley area and was 100 percent of the federal standard and 300 percent of the much more stringent state 24-hour PM10 standard (50 µg/m3). The state 24-hour PM10 standard was exceeded at several of the monitoring stations. The maximum annual average PM10 concentration of 49 µg/m3 was recorded in Metropolitan Riverside County. The federal annual PM10 standard has been revoked. The much more stringent state annual PM10 standard (20 µg/m3) was exceeded in most stations in each county in the Basin and in the Coachella Valley.

In 2016, PM2.5 concentrations were monitored at 19 locations throughout the Basin. U.S. EPA revised the federal 24-hour PM2.5 standard from 65 µg/m3 to 35 µg/m3, effective December 17, 2006. In 2016, the maximum PM2.5 concentrations in the Basin exceeded the new federal 24-hour PM2.5 standard in seven out of 19 locations. The maximum 24-hour PM2.5 concentration of 46.6 µg/m3 was recorded in the South San Gabriel Valley area. The 98th percentile 24-hour PM2.5 concentration of 35.1 µg/m3 was recorded in the Metropolitan Riverside County, which barely exceeds the federal standard of 35 µg/m3. The maximum annual average concentration of 14.73 µg/m3 was recorded in San Bernardino County, which represents 98 percent of the 2006 federal standard of 15 µg/m3.

On December 14, 2012, U.S. EPA strengthened the annual NAAQS for PM2.5 to 12 µg/m3 and, as part of the revisions, a requirement was added to monitor near the most heavily trafficked roadways in large urban areas. Particle pollution is expected to be higher along these roadways as a result of direct emissions from cars and heavy-duty diesel trucks and buses. SCAQMD has installed the two required PM2.5 monitors by January 1, 2015, at locations selected based upon the existing near-roadway NO2 sites that were ranked higher for heavy-duty diesel traffic. The locations are: (1) I-710, located at Long Beach Blvd. in Los Angeles County near Compton and Long Beach; and (2) SR-60, located west of Vineyard Avenue near the San Bernardino/Riverside County border near Ontario, Mira Loma, and Upland. These near-road sites measure PM2.5 daily with FRM filter-based measurements.

Lead

Lead in the atmosphere is present as a mixture of a number of lead compounds. Leaded gasoline and lead smelters have been the main sources of lead emitted into the air. Due to the phasing out of leaded gasoline, there was a dramatic reduction in atmospheric lead in the Basin over the past three decades.

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central

nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

Lead poisoning can cause anemia, lethargy, seizures, and death. It appears that there are no direct effects of lead on the respiratory system. Lead can be stored in the bone from early-age environmental exposure, and elevated blood lead levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland), and osteoporosis (breakdown of bone tissue). Fetuses and breast-fed babies can be exposed to higher levels of lead because of previous environmental lead exposure of their mothers.

The state standards for lead were not exceeded in any area of the SCAQMD in 2016. There have been no violations of these standards at SCAQMD's regular air monitoring stations since 1982, as a result of removal of lead from gasoline. However, monitoring at two stations immediately adjacent to stationary sources of lead recorded exceedances of the standard in Los Angeles County over the 2007-2009-time period. These data were used for designations under the revised standard that also included new requirements for near-source monitoring. As a result, a nonattainment designation was finalized for much of the Los Angeles County portion of the Basin when the current standard was implemented.

The current lead concentrations in Los Angeles County are now below the NAAQS. The maximum quarterly average lead concentration (0.01 µg/m3 at several monitoring) was seven percent of the federal quarterly average lead standard (0.15 µg/m3). The maximum monthly average lead concentration (0.016 µg/m3 in South Central Los Angeles County) was one percent of the state monthly average lead standard. As a result of the 2012-2014 design value below the NAAQS, SCAQMD will be requesting that U.S. EPA re-designate the nonattainment area as attaining the federal lead standard. Stringent SCAQMD rules governing lead-producing sources will help to ensure that there are no future violations of the federal standard. Furthermore, one business that had been responsible for the highest measured lead concentrations in Los Angeles County has closed and is in the process of demolition and site clean-up.

Sulfates

Sulfates are chemical compounds which contain the sulfate ion and are part of the mixture of solid materials which make up PM10. Most of the sulfates in the atmosphere are produced by oxidation of SO2. Oxidation of sulfur dioxide yields sulfur trioxide (SO3), which reacts with water to form sulfuric acid, which then contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM10 and PM2.5.

Most of the health effects associated with fine particles and SO2 at ambient levels are also associated with sulfates. Thus, both mortality and morbidity effects have been observed with an increase in ambient sulfate concentrations. However, efforts to separate the effects of sulfates from the effects of other pollutants have generally not been successful.

Clinical studies of asthmatics exposed to sulfuric acid suggest that adolescent asthmatics are possibly a subgroup susceptible to acid aerosol exposure. Animal studies suggest that acidic particles such as sulfuric acid aerosol and ammonium bisulfate are more toxic than nonacidic particles like ammonium sulfate. Whether the effects are attributable to acidity or to particles remains unresolved.

The most current preliminary data available for sulfates is for 2016. In 2016, the state 24-hour sulfate standard (25 µg/m3) was not exceeded in any of the 19 monitoring locations in the Basin. The maximum 24-hour sulfate concentration was 17.1 ppb, as recorded in the Central San Bernardino Valley. There are no federal sulfate standards.

Vinyl Chloride

Vinyl chloride is a colorless, flammable gas at ambient temperature and pressure. It is also highly toxic and is classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as A1 (confirmed carcinogen in humans) and by the International Agency for Research on Cancer (IARC) as 1 (known to be a human carcinogen). (Air Gas, 2010.) At room temperature, vinyl chloride is a gas with a sickly-sweet odor that is easily condensed. However, it is stored as a liquid. Due to the hazardous nature of vinyl chloride to human health there are no end products that use vinyl chloride in its monomer form. Vinyl chloride is a chemical intermediate, not a final product. It is an important industrial chemical chiefly used to produce polymer polyvinyl chloride (PVC). The process involves vinyl chloride liquid fed to polymerization reactors where it is converted from a monomer to a polymer PVC. The final product of the polymerization process is PVC in either a flake or pellet form. Billions of pounds of PVC are sold on the global market each year. From its flake or pellet form, PVC is sold to companies that heat and mold the PVC into end products such as PVC pipe and bottles.

In the past, vinyl chloride emissions have been associated primarily with sources such as landfills. Risks from exposure to vinyl chloride are considered to be localized impacts rather than regional impacts. Because landfills in the SCAQMD are subject to Rule 1150.1 – Control of Gaseous Emissions from Municipal Solid Waste Landfills, which contain stringent requirements for landfill gas collection and control, potential vinyl chloride emissions are expected to be below the level of detection. Therefore, SCAQMD does not monitor for vinyl chloride at its monitoring stations.

Volatile Organic Compounds

It should be noted that there are no state or NAAQS for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because limiting VOC emissions reduces the rate of photochemical reactions that contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM10 and lower visibility levels.

Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOCs because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

Non-Criteria Pollutants

Although SCAQMD's primary mandate is attaining the state and NAAQS for criteria pollutants within the Basin, SCAQMD also has a general responsibility pursuant to Health and Safety Code Section 41700 to control emissions of air contaminants and prevent endangerment to public health. Additionally, state law requires SCAQMD to implement airborne toxic control measures (ATCM)

adopted by CARB and to implement the Air Toxics "Hot Spots" Act. As a result, SCAQMD has regulated pollutants other than criteria pollutants such as TACs, GHGs, and stratospheric ozone depleting compounds. SCAQMD has developed a number of rules to control non-criteria pollutants from both new and existing sources. These rules originated through state directives, Clean Air Act (CAA) requirements, or the SCAQMD rulemaking process.

In addition to promulgating non-criteria pollutant rules, SCAQMD has been evaluating AQMP control measures as well as existing rules to determine whether or not they would affect, either positively or negatively, emissions of non-criteria pollutants. For example, rules in which VOC components of coating materials are replaced by a non-photochemically reactive chlorinated substance would reduce the impacts resulting from ozone formation, but could increase emissions of toxic compounds or other substances that may have adverse impacts on human health.

The following subsections summarize the existing setting for the two major categories of non-criteria pollutants: compounds that contribute to TACs, global climate change, and stratospheric ozone depletion.

Air Quality – Toxic Air Contaminants (TACs)

Federal

Under Section 112 of the CAA, U.S. EPA is required to regulate sources that emit one or more of the 187 federally listed hazardous air pollutants (HAPs). HAPs are toxic air pollutants identified in the CAA, which are known or suspected of causing cancer or other serious health effects. The federal HAPs are listed on the U.S. EPA website at http://www.epa.gov/ttn/atw/orig189.html. In order to implement the CAA, approximately 100 National Emission Standards for Hazardous Air Pollutants (NESHAPs) have been promulgated by U.S. EPA for major sources (sources emitting greater than 10 ton per year (tpy) of a single HAP or greater than 25 tpy of multiple HAPs). SCAQMD can either directly implement NESHAPs or adopt rules that contain requirements at least as stringent as the NESHAP requirements. However, since NESHAPs often apply to sources in the Basin that are controlled, many of the sources that would have been subject to federal requirements already comply or are exempt.

In addition to the major source NESHAPs, U.S. EPA has also controlled HAPs from urban areas by developing Area Source NESHAPs under their Urban Air Toxics Strategy. U.S. EPA defines an area source as a source that emits less than 10 tons annually of any single hazardous air pollutant or less than 25 tons annually of a combination of hazardous air pollutants. The CAA requires the U.S. EPA to identify a list of at least 30 air toxics that pose the greatest potential health threat in urban areas. U.S. EPA is further required to identify and establish a list of area source categories that represent 90 percent of the emissions of the 30 urban air toxics associated with area sources, for which Area Source NESHAPs are to be developed under the CAA. U.S. EPA has identified a total of 70 area source categories with regulations promulgated for more than 30 categories so far.

The federal toxics program recognizes diesel engine exhaust (diesel particulate matter or DPM) as a health hazard; however, DPM itself is not one of their listed TACs. Rather, each toxic compound in the speciated list of compounds in exhaust is considered separately. Although there are no specific NESHAP regulations for DPM, DPM reductions are realized through federal regulations including diesel fuel standards and emission standards for stationary, marine, and locomotive engines; and idling controls for locomotives.

State

The California air toxics program was based on the CAA and the original federal list of hazardous air pollutants. The state program was established in 1983 under the Toxic Air Contaminant Identification and Control Act, Assembly Bill (AB) 1807, Tanner. Under the state program, TACs are identified through a two-step process of risk identification and risk management. This two-step process was designed to protect residents from the health effects of toxic substances in the air.

Control of TACs under the TAC Identification and Control Program: California's TAC identification and control program, adopted in 1983 as AB 1807, is a two-step program in which substances are identified as TACs and ATCMs are adopted to control emissions from specific sources. CARB has adopted a regulation designating all 188 federal hazardous air pollutants (HAPs) as TACs.

ATCMs are developed by CARB and implemented by SCAQMD and other air districts through the adoption of regulations of equal or greater stringency. Generally, the ATCMs reduce emissions to achieve exposure levels below a determined health threshold. If no such threshold levels are determined, emissions are reduced to the lowest level achievable through the best available control technology unless it is determined that an alternative level of emission reduction is adequate to protect public health.

Under California law, a federal NESHAP automatically becomes a state ATCM, unless CARB has already adopted an ATCM for the source category. Once a NESHAP becomes an ATCM, CARB and each air pollution control or air quality management district have certain responsibilities related to adoption or implementation and enforcement of the NESHAP/ATCM.

Control of TACs under the Air Toxics "Hot Spots" Act: The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588) establishes a statewide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with the emissions. Facilities are phased into the AB 2588 program based on their emissions of criteria pollutants or their occurrence on lists of toxic emitters compiled by SCAQMD. Phase I consists of facilities that emit over 25 tpy of any criteria pollutant and facilities present on SCAQMD's toxics list. Phase I facilities entered the program by reporting their TAC emissions for calendar year 1989. Phase II consists of facilities that emit between 10 and 25 tpy of any criteria pollutant and submitted air toxic inventory reports for calendar year 1990 emissions. Phase III consists of certain designated types of facilities which emit less than 10 tpy of any criteria pollutant and submitted inventory reports for calendar year 1991 emissions. Inventory reports are required to be updated every four years under the state law.

Air Toxics Control Measures: As part of its risk management efforts, CARB has passed state ATCMs to address air toxics from mobile and stationary sources. Some key ATCMs for stationary sources include reductions of benzene emissions from service stations, hexavalent chromium emissions from chrome plating, perchloroethylene emissions from dry cleaning, ethylene oxide emissions from sterilizers, and multiple air toxics from the automotive painting and repair industries.

Many of CARB's recent ATCMs are part of the CARB Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Diesel Risk Reduction Plan), which

was adopted in September 2000 (http://www.arb.ca.gov/diesel/documents/rrpapp.htm) with the goal of reducing DPM emissions from compression ignition engines and associated health risk by 75 percent by 2010 and 85 percent by 2020. The Diesel Risk Reduction Plan includes strategies to reduce emissions from new and existing engines through the use of ultra-low sulfur diesel fuel, add-on controls, and engine replacement. In addition to stationary source engines, the plan addresses DPM emissions from mobile sources such as trucks, buses, construction equipment, locomotives, and ships.

OEHHA Health Risk Assessment Guidelines: In 2003, OEHHA developed and approved its Health Risk Assessment Guidance document (2003 OEHHA Guidelines) and prepared a series of Technical Support Documents, reviewed and approved by the Scientific Review Panel (SRP), that provided new scientific information showing that early-life exposures to air toxics contribute to an increased estimated lifetime risk of developing cancer and other adverse health effects, compared to exposures that occur in adulthood. As a result, OEHHA developed the Revised OEHHA Guidelines in March 2015, which incorporated this new scientific information. The new method utilizes higher estimates of cancer potency during early life exposures. There are also differences in the assumptions on breathing rates and length of residential exposures.

SCAQMD

SCAQMD has regulated criteria air pollutants using either a technology-based or an emissions limit approach. The technology-based approach defines specific control technologies that may be installed to reduce pollutant emissions. The emissions limit approach establishes an emission limit, and allows industry to use any emission control equipment, as long as the emission requirements are met. The regulation of TACs often uses a health risk-based approach, but may also require a regulatory approach similar to criteria pollutants, as explained in the following subsections.

Rules and Regulations: Under SCAQMD's toxic regulatory program there are 26 source-specific rules that target toxic emission reductions that regulate over 10,000 sources such as metal finishing, spraying operations, dry cleaners, film cleaning, gasoline dispensing, and diesel-fueled stationary engines to name a few. In addition, other source-specific rules targeting criteria pollutant reductions also reduce toxic emissions, such as Rule 461 – Gasoline Transfer and Dispensing, which reduces benzene emissions from gasoline dispensing, and Rule 1124 – Aerospace Assembly and Component Manufacturing Operations, which reduces perchloroethylene, trichloroethylene, and methylene chloride emissions from aerospace operations.

New and modified sources of TACs in the SCAQMD are subject to Rule 1401 - New Source Review (NSR) of Toxic Air Contaminants and Rule 212 - Standards for Approving Permits. Rule 212 requires notification of SCAQMD's intent to grant a permit to construct a significant project, defined as a new or modified permit unit located within 1000 feet of a school (a state law requirement under AB 3205), a new or modified permit unit posing a maximum individual cancer risk of one in one million (1×10^6) or greater, or a new or modified facility with criteria pollutant emissions exceeding specified daily maximums. Distribution of notice is required to all addresses within a quarter mile radius, or other area deemed appropriate by SCAQMD. Rule 1401 currently controls emissions of carcinogenic and non-carcinogenic (health effects other than cancer) air contaminants from new, modified and relocated sources by specifying limits on cancer risk and hazard index (explained further in the following discussion), respectively. The rule lists nearly

300 TACs that are evaluated during SCAQMD's permitting process for new, modified, or relocated sources. During the past decade, more than ten compounds have been added or had risk values amended. The addition of DPM from diesel-fueled internal combustion engines as a TAC in March 2008 was the most significant of recent amendments to the rule. Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools sets risk thresholds for new and relocated facilities near schools. The requirements are more stringent than those for other air toxics rules in order to provide additional protection to school children.

Air Toxics Control Plan: On March 17, 2000, the SCAQMD Governing Board approved the Air Toxics Control Plan (2000 ATCP), which was the first comprehensive plan in the nation to guide future toxic rulemaking and programs. The ATCP was developed to lay out SCAQMD's air toxics control program which built upon existing federal, state, and local toxic control programs as well as co-benefits from implementation of SIP measures. The concept for the plan was an outgrowth of the Environmental Justice principles and the Environmental Justice Initiatives adopted by SCAQMD Governing Board on October 10, 1997. Monitoring studies and air toxics regulations that were created from these initiatives emphasized the need for a more systematic approach to reducing TACs. The intent of the plan was to reduce exposure to air toxics in an equitable and cost-effective manner that promotes clean, healthful air in the SCAQMD. The plan proposed control strategies to reduce TACs in the SCAQMD implemented between years 2000 and 2010 through cooperative efforts of SCAQMD, local governments, CARB, and U.S. EPA.

Cumulative Impact Reduction Strategies (CIRS): The CIRS was presented to the SCAQMD Governing Board on September 5, 2003, as part of the White Paper on Regulatory Options for Addressing Cumulative Impacts from Air Pollution Emissions. The resulting 25 cumulative impacts strategies were a key element of the Addendum to March 2000 Final Draft Air Toxics Control Plan for Next Ten Years (2004 Addendum). The strategies included rules, policies, funding, education, and cooperation with other agencies. Some of the key SCAQMD accomplishments related to the cumulative impacts reduction strategies were:

- Rule 1401.1, which set more stringent health risk requirements for new and relocated facilities near schools
- Rule 1470 – Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines, which established DPM emission limits and other requirements for diesel-fueled engines
- Rule 1469.1 – Spraying Operations Using Coatings Containing Chromium, which regulated chrome spraying operations
- Rule 410 – Odor from Transfer Stations and Material Recovery Facilities which addresses odors from transfer stations and material recovery facilities
- Intergovernmental Review comment letters for CEQA documents
- SCAQMD's land use guidance document
- Additional protection in toxics rules for sensitive receptors, such as more stringent requirements for chrome plating operations and diesel engines located near schools

2004 Addendum: The 2004 Addendum was adopted by the SCAQMD Governing Board on April 2, 2004, and served as a status report regarding implementation of the various mobile and stationary source strategies in the 2000 ATCP and introduced new measures to further address air toxics. The main elements of the 2004 Addendum were to address the progress made in the implementation of the 2000 ATCP control strategies; provide a historical perspective of air toxic

emissions and current air toxic levels; incorporate the CIRS approved in 2003 and additional measures identified in the 2003 AQMP; project future air toxic levels to the extent feasible; and summarize future efforts to develop the next ATCP. Significant progress had been made in implementing most of SCAQMD strategies from the 2000 ATCP and the 2004 Addendum. CARB has also made notable progress in mobile source measures via its Diesel Risk Reduction Plan, especially for goods movement related sources, while the U.S. EPA continued to implement their air toxic programs applicable to stationary sources.

Clean Communities Plan: On November 5, 2010, the SCAQMD Governing Board approved the 2010 Clean Communities Plan (CCP). The CCP was an update to the 2000 ATCP and the 2004 Addendum. The objective of the 2010 CCP was to reduce exposure to air toxics and air-related nuisances throughout the SCAQMD, with emphasis on cumulative impacts. The elements of the 2010 CCP are community exposure reduction, community participation, communication and outreach, agency coordination, monitoring and compliance, source-specific programs, and nuisance. The centerpiece of the 2010 CCP is a pilot study through which SCAQMD staff works with community stakeholders to identify and develop solutions community-specific to air quality issues in two communities: (1) the City of San Bernardino; and (2) Boyle Heights and surrounding areas.

Control of TACs under the Air Toxics "Hot Spots" Act: On October 2, 1992, the SCAQMD Governing Board adopted public notification procedures for Phase I and II facilities. These procedures specify that AB 2588 facilities must provide public notice when exceeding the following risk levels:

- Maximum Individual Cancer Risk: greater than 10 in one million (10×10^6)
- Total Hazard Index: greater than 1.0 for TACs except lead, or greater than 0.5 for lead

Public notice is to be provided by letters mailed to all addresses and all parents of children attending school in the impacted area. In addition, facilities must hold a public meeting and provide copies of the facility risk assessment in all school libraries and a public library in the impacted area.

The AB 2588 Toxics “Hot Spots” Program is implemented through Rule 1402 - Control of Toxic Air Contaminants from Existing Sources. SCAQMD continues to review health risk assessments submitted. Notification is required from facilities with a significant risk under the AB 2588 program based on their initial approved health risk assessments and will continue on an ongoing basis as additional and subsequent health risk assessments are reviewed and approved.

There are currently about 361 facilities in SCAQMD’s AB 2588 program. Since 1992 when the state Health and Safety Code incorporated a risk reduction requirement in the program, SCAQMD has reviewed and approved over 335 HRAs; 50 facilities were required to do a public notice and 24 facilities were subject to risk reduction. Currently, over 96 percent of the facilities in the program have cancer risks below ten in a million and over 97 percent have acute and chronic hazard indices of less than one. (SCAQMD, 2015a.)

CEQA Intergovernmental Review Program: SCAQMD staff, through its Intergovernmental Review (IGR), provides comments to lead agencies on air quality analyses and mitigation measures in CEQA documents. The following are some key programs and tools that have been

developed more recently to strengthen air quality analyses, specifically as they relate to exposure of mobile source air toxics:

- SCAQMD's Mobile Source Committee approved the "Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions" (August 2002). This document provides guidance for analyzing cancer risks from DPM from truck idling and movement (e.g., truck stops, warehouse and distribution centers, or transit centers), ship hoteling at ports, and train idling.
- CalEPA and CARB's "Air Quality and Land Use Handbook: A Community Health Perspective" (April 2005), provides recommended siting distances for incompatible land uses.
- Western Riverside Council of Governments' Regional Air Quality Task Force developed a policy document titled "Good Neighbor Guidelines for Siting New and/or Modified Warehouse/Distribution Facilities" (September 2005). This document provides guidance to local government on preventive measures to reduce neighborhood exposure to TACs from warehousing facilities.

Environmental Justice (EJ): Environmental justice has long been a focus of SCAQMD. In 1990, SCAQMD formed an Ethnic Community Advisory Group that was restructured as the Environmental Justice Advisory Group (EJAG) in 2008. EJAG's mission is to advise and assist SCAQMD in protecting and improving public health in SCAQMD's most impacted communities through the reduction and prevention of air pollution.

In 1997, the SCAQMD Governing Board adopted four guiding principles and ten initiatives (http://www.aqmd.gov/ej/history.htm) to ensure environmental equity. Also in 1997, the SCAQMD Governing Board expanded the initiatives to include the "Children's Air Quality Agenda" focusing on the disproportionate impacts of poor air quality on children. Some key initiatives that have been implemented were the Multiple Air Toxics Exposure Studies (MATES, MATES II, MATES III, and MATES IV); the Clean Fleet Rules; CIRS; funding for lower emitting technologies under the Carl Moyer Program; the Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning; a guidance document on Air Quality Issues in School Site Selection; and the 2000 ATCP and its 2004 Addendum. Key initiatives focusing on communities and residents include the Clean Air Congress; the Clean School Bus Program; Asthma and Air Quality Consortium; Brain and Lung Tumor and Air Pollution Foundation; air quality presentations to schools and community and civic groups; and Town Hall meetings. Technological and scientific projects and programs have been a large part of SCAQMD's EJ program since its inception. Over time, the EJ program's focus on public education, outreach, and opportunities for public participation have greatly increased. Public education materials and other resources for the public are available on SCAQMD's website (www.aqmd.gov).

AB 2766 Subvention Funds: AB 2766 subvention funds, money collected by the state as part of vehicle registration and passed through to SCAQMD, is used to fund projects in local cities that reduce motor vehicle air pollutants. The Clean Fuels Program, funded by a surcharge on motor vehicle registrations in SCAQMD, reduces TAC emissions through co-funding projects that develop and demonstrate low-emission clean fuels and advanced technologies, and to promote commercialization and deployment of promising or proven technologies in Southern California.

Carl Moyer Program: Another program that targets diesel emission reductions is the Carl Moyer Program, which provides grants for projects that achieve early or extra emission reductions beyond

what is required by regulations. Examples of eligible projects include cleaner on-road, off-road, marine, locomotive, and stationary agricultural pump engines. Other endeavors of SCAQMD's Technology Advancement Office help to reduce DPM emissions through co-funding research and demonstration projects of clean technologies, such as low-emitting locomotives.

Control of TACs with Risk Reduction Audits and Plans: Senate Bill (SB) 1731, enacted in 1992 and codified in Health and Safety Code Section 44390 et seq., amended AB 2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan that will reduce the risk below a defined significant risk level within specified time limits. SCAQMD Rule 1402 was adopted on April 8, 1994, to implement the requirements of SB 1731. In addition to the TAC rules adopted by SCAQMD under authority of AB 1807 and SB 1731, SCAQMD has adopted source-specific TAC rules, based on the specific level of TAC emitted and the needs of the area. These rules are similar to the state's ATCMs because they are source-specific and only address emissions and risk from specific compounds and operations.

Multiple Air Toxics Exposure Studies

Multiple Air Toxics Exposure Study (MATES): In 1986, SCAQMD conducted the first MATES report to determine the Basin-wide risks associated with major airborne carcinogens. At the time, the state of technology was such that only 20 known air toxic compounds could be analyzed and diesel exhaust particulate did not have an agency accepted carcinogenic health risk value. TACs are determined by U.S. EPA, and by CalEPA, including OEHHA and CARB. For purposes of MATES, the California carcinogenic health risk factors were used. The maximum combined individual health risk for simultaneous exposure to pollutants under the study was estimated to be 600 to 5,000 in one million.

Multiple Air Toxics Exposure Study II (MATES II): At its October 10, 1997 meeting, the SCAQMD Governing Board directed staff to conduct a follow up to the MATES report to quantify the magnitude of population exposure risk from existing sources of selected air toxic contaminants at that time. MATES II included a monitoring program of 40 known air toxic compounds, an updated emissions inventory of TACs (including microinventories around each of the 14 microscale sites), and a modeling effort to characterize health risks from hazardous air pollutants. The estimated Basin-wide carcinogenic health risk from ambient measurements was 1,400 per million people. About 70 percent of the Basin-wide health risk was attributed to DPM emissions; about 20 percent to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde); about 10 percent of Basin-wide health risk was attributed to stationary sources (which include industrial sources and other certain specifically identified commercial businesses such as dry cleaners and print shops.)

Multiple Air Toxics Exposure Study III (MATES III): MATES III was part of the SCAQMD Governing Board's 2003-04 Environmental Justice Workplan approved on September 5, 2003. The MATES III report consisted of several elements including a monitoring program, an updated emissions inventory of TACs, and a modeling effort to characterize carcinogenic health risk across the Basin. Besides toxics, additional measurements included organic carbon, elemental carbon, and total carbon, as well as, Particulate Matter (PM), including PM2.5. It did not estimate mortality or other health effects from particulate exposures. MATES III revealed a general downward trend in air toxic pollutant concentrations with an estimated Basin-wide lifetime carcinogenic health risk of 1,200 in one million. Mobile sources accounted for 94 percent of the basin-wide lifetime carcinogenic health risk with diesel exhaust particulate contributing to 84

percent of the mobile source Basin-wide lifetime carcinogenic health risk. Non-diesel carcinogenic health risk declined by 50 percent from the MATES II values.

Multiple Air Toxics Exposure Study IV (MATES IV): MATES IV, the current version, includes a monitoring program, an updated emissions inventory of TACs, and a modeling effort to characterize risk across the Basin. The study focuses on the carcinogenic risk from exposure to air toxics but does not estimate mortality or other health effects from particulate exposures. An additional focus of MATES IV is the inclusion of measurements of ultrafine particle concentrations. MATES IV incorporates the updated health risk assessment methodology from OEHHA. Compared to previous studies of air toxics in the Basin, this study found decreasing air toxics exposure, with the estimated Basin-wide population-weighted risk down by about 57 percent from the analysis done for the MATES III time period. The ambient air toxics data from the ten fixed monitoring locations also demonstrated a similar reduction in air toxic levels and risks. On average, diesel particulate contributes about 68 percent of the total air toxics risk. This is a lower portion of the overall risk compared to the MATES III estimates of about 84 percent.

Health Effects

Carcinogenic Health Risks from TACs: One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of causing cancer. It is currently estimated that about one in four deaths in the United States is attributable to cancer. The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods.

Non-Cancer Health Risks from TACs: Unlike carcinogens, for most non-carcinogens it is believed that there is a threshold level of exposure to the compound below which it will not pose a health risk. CalEPA's OEHHA develops Reference Exposure Levels (RELs) for TACs which are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The non-cancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

HAZARDS AND HAZARDOUS MATERIALS

PARs 1146 series and PR 1100 is intended to improve overall air quality; however, it may have direct or indirect hazards associated with the implementation. The reduction of NOx emissions from PARs 1146 series may affect the use, storage, and transport of hazards and hazardous materials, specifically when SCR systems ~~technology is~~ are being used. New (or modifications to existing) air pollution control equipment and related components are expected to be installed at some of the affected facilities such that their operations may increase the quantity of hazardous materials generated by the control equipment and may increase the quantity of ammonia used. It is anticipated some facilities will need to install SCR ~~technology~~ system(s) to meet NOx emission limits and in doing so, may result in the overall increase in the amount of ammonia injected, increase the amount of ammonia stored, create ammonia slip emissions, and increase the amount of spent catalyst.

Hazard concerns are related to the potential for fires, explosions or the release of hazardous materials/substances in the event of an accident or upset conditions. The potential for hazards exist in the production, use, storage, and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Specifically, storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the Basin in large quantities via all modes of transportation including rail, highway, water, air, and pipeline.

Hazardous Materials Regulations

Incidents of harm to human health and the environment associated with hazardous materials have created a public awareness of the potential for adverse effects from careless handling and/or use of these substances. As a result, a number of federal, state, and local laws have been enacted to regulate the use, storage, transportation, and management of hazardous materials and wastes. The most relevant hazardous materials laws and regulations are summarized in the following subsection of this section.

A number of properties may cause a substance to be hazardous, including toxicity, ignitability, corrosivity, and reactivity. The term "hazardous material" is defined in different ways for different regulatory programs. For the purposes of this SEA, the term "hazardous materials" refers to both hazardous materials and hazardous wastes. A hazardous material is defined as hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local regulatory agency or if it has characteristics defined as hazardous by such an agency. The (H&S) Section 25501(k) defines hazardous material as follows:

> "Hazardous material" means any material that because of its quantity, concentrations, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include but are not limited to hazardous substances, hazardous waste, and any material which a handler or the administering agency has a

reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Examples of the types of materials and wastes considered hazardous are hazardous chemicals (e.g., toxic, ignitable, corrosive, and reactive materials), radioactive materials, and medical (infectious) waste. The characteristics of toxicity, ignitability, corrosivity, and reactivity are defined in Title 22, California Code of Regulations (CCR), Section 66261.20-66261.24 and are summarized below:

Toxic Substances: Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability, or even death. For example, such substances can cause disorientation, acute allergic reactions, asphyxiation, skin irritation, or other adverse health effects if human exposure exceeds certain levels. (The level depends on the substances involved and are chemical-specific.) Carcinogens (substances that can cause cancer) are a special class of toxic substances. Examples of toxic substances include benzene (a component of gasoline and a suspected carcinogen) and methylene chloride (a common laboratory solvent and a suspected carcinogen).

Ignitable Substances: Ignitable substances are hazardous because of their ability to burn. Gasoline, hexane, and natural gas are examples of ignitable substances.

Corrosive Materials: Corrosive materials can cause severe burns. Corrosives include strong acids and bases such as sodium hydroxide (lye) or sulfuric acid (battery acid).

Reactive Materials: Reactive materials may cause explosions or generate toxic gases. Explosives, pure sodium or potassium metals (which react violently with water), and cyanides are examples of reactive materials.

Federal Regulations

The U.S. EPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment from pollution into air, water, and land. The U.S. EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The U.S. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and Indian tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Since 1970, Congress has enacted numerous environmental laws that pertain to hazardous materials, for the U.S. EPA to implement as well as to other agencies at the federal, state and local level, as described in the following subsections.

Toxics Substances Control Act: The Toxic Substances Control Act (TSCA) was enacted by Congress in 1976 (see 15 U.S.C. §2601 et seq.) and gave the U.S. EPA the authority to protect the public from unreasonable risk of injury to health or the environment by regulating the manufacture, sale, and use of chemicals currently produced or imported into the United States. The TSCA, however, does not address wastes produced as byproducts of manufacturing. The types of chemicals regulated by the act fall into two categories: existing and new. New chemicals are defined as "any chemical substance which is not included in the chemical substance list compiled and published under [TSCA] section 8(b)." This list included all of chemical substances

manufactured or imported into the United States prior to December 1979. Existing chemicals include any chemical currently listed under section 8 (b). The distinction between existing and new chemicals is necessary as the act regulates each category of chemicals in different ways. The U.S. EPA repeatedly screens both new and existing chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. The U.S. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

Emergency Planning and Community Right-to-Know Act: The Emergency Planning and Community Right-to-Know Act (EPCRA) is a federal law adopted by Congress in 1986 that is designed to help communities plan for emergencies involving hazardous substances. EPCRA establishes requirements for federal, state and local governments, Indian tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment. There are four major provisions of EPCRA:

1. Emergency Planning (§§301 – 303) requires local governments to prepare chemical emergency response plans, and to review plans at least annually. These sections also require state governments to oversee and coordinate local planning efforts. Facilities that maintain Extremely Hazardous Substances (EHS) on-site (see 40 Code of Federal Regulations (CFR) Part 355 for the list of EHS chemicals) in quantities greater than corresponding "Threshold Planning Quantities" must cooperate in the preparation of the emergency plan.

2. Emergency Release Notification (§304) requires facilities to immediately report accidental releases of EHS chemicals and hazardous substances in quantities greater than corresponding Reportable Quantities (RQs) as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to state and local officials. Information about accidental chemical releases must be made available to the public.

3. Hazardous Chemical Storage Reporting (§§311 – 312) requires facilities that manufacture, process, or store designated hazardous chemicals to make Safety Data Sheets (SDSs, formerly referred to as material safety data sheets or MSDSs) describing the properties and health effects of these chemicals available to state and local officials and local fire departments. These sections also require facilities to report to state and local officials and local fire departments, inventories of all on-site chemicals for which SDSs exist. Lastly, information about chemical inventories at facilities and SDSs must be available to the public.

4. Toxic Chemical Release Inventory (§313) requires facilities to annually complete and submit a Toxic Chemical Release Inventory Form for each Toxic Release Inventory (TRI) chemical that are manufactured or otherwise used above the applicable threshold quantities.

Implementation of EPCRA has been delegated to the State of California. The California Emergency Management Agency requires facilities to develop a Hazardous Materials Business Plan if they handle hazardous materials in quantities equal to or greater than 55 gallons, 500 pounds, or 200 cubic feet of gas or extremely hazardous substances above the threshold planning quantity. The Hazardous Materials Business Plan is provided to state and local emergency response agencies and includes inventories of hazardous materials, an emergency plan, and implements a training program for employees.

Hazardous Materials Transportation Act: The Hazardous Material Transportation Act (HMTA), adopted in 1975 (see 49 U.S.C. §§5101 – 5127), gave the Secretary of Transportation the regulatory and enforcement authority to provide adequate protection against the risks to life and property inherent in the transportation of hazardous material in commerce. The United States Department of Transportation (U.S. DOT) (see 49 CFR Parts 171-180) oversees the movement of hazardous materials at the federal level. The HMTA requires that carriers report accidental releases of hazardous materials to U.S. DOT at the earliest practical moment. Other incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000. The hazardous material regulations also contain emergency response provisions which include incident reporting requirements. Reports of major incidents go to the National Response Center, which in turn is linked with CHEMTREC, a public service hotline established by the chemical manufacturing industry for emergency responders to obtain information and assistance for emergency incidents involving chemicals and hazardous materials.

Hazardous materials regulations are implemented by the Research and Special Programs Administration (RSPA) branch of the U.S. DOT. The regulations cover the definition and classification of hazardous materials, communication of hazards to workers and the public, packaging and labeling requirements, operational rules for shippers, and training. These regulations apply to interstate, intrastate, and foreign commerce by air, rail, ships, and motor vehicles, and also cover hazardous waste shipments. The Federal Aviation Administration Office of Hazardous Materials Safety is responsible for overseeing the safe handling of hazardous materials aboard aircraft. The Federal Railroad Administration oversees the transportation of hazardous materials by rail. The U.S. Coast Guard regulates the bulk transport of hazardous materials by sea. The Federal Highway Administration (FHWA) is responsible for highway routing of hazardous materials and issuing highway safety permits.

Hazardous Materials and Waste Regulations

Resource Conservation and Recovery Act: The Resource Conservation and Recovery Act (RCRA) of 1976 authorizes the U.S. EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste. Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. In 1984, RCRA was amended with addition of the Hazardous and Solid Waste Amendments, which authorized increased enforcement by the U.S. EPA, stricter hazardous waste standards, and a comprehensive underground storage tank program. Likewise, the Hazardous and Solid Waste Amendments focused on waste reduction and corrective action for hazardous releases. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Amendments. Individual states may implement their own hazardous waste programs under RCRA, with approval by the U.S. EPA. California has been delegated authority to operate its own hazardous waste management program.

CERCLA: CERCLA, which is often commonly referred to as Superfund, is a federal statute that was enacted in 1980 to address abandoned sites containing hazardous waste and/or contamination. CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act, and by the Small Business Liability Relief and Brownfields Revitalization Act of 2002.

CERCLA contains prohibitions and requirements concerning closed and abandoned hazardous waste sites; establishes liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified. The trust fund is funded largely by a tax on the chemical and petroleum industries. CERCLA also provides federal jurisdiction to respond directly to releases or impending releases of hazardous substances that may endanger public health or the environment.

CERCLA also enabled the revision of the National Contingency Plan (NCP) which provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the National Priorities List, which identifies hazardous waste sites eligible for long-term remedial action financed under the federal Superfund program.

Prevention of Accidental Releases and Risk Management Programs: Requirements pertaining to the prevention of accidental releases are promulgated in §112 (r) of the CAA Amendments of 1990 [42 U.S.C. §7401 et. seq.]. The objective of these requirements was to prevent the accidental release and to minimize the consequences of any such release of a hazardous substance. Under these provisions, facilities that produce, process, handle or store hazardous substance have a duty to: 1) identify hazards which may result from releases using hazard assessment techniques; 2) design and maintain a safe facility and take steps necessary to prevent releases; and 3) minimize the consequence of accidental releases that occur.

In accordance with the requirements in Section 112 (r), U.S. EPA adopted implementing guidelines in 40 CFR Part 68. Under this part, stationary sources with more than a threshold quantity of a regulated substance shall be evaluated to determine the potential for and impacts of accidental releases from any processes subject to the federal risk management requirements. Under certain conditions, the owner or operator of a stationary source may be required to develop and submit a Risk Management Plan (RMP). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program. At the local level, RMPs are implemented by the local fire departments.

Hazardous Material Worker and Public Safety Requirements

Occupational Safety and Health Administration Regulations: The federal Occupational Safety and Health Administration (OSHA) is an agency of the United States Department of Labor that was created by Congress under the Occupational Safety and Health Act in 1970. OSHA is the agency responsible for assuring worker safety in the handling and use of chemicals in the workplace. Under the authority of the Occupational Safety and Health Act of 1970, OSHA has adopted numerous regulations pertaining to worker safety (see 29 CFR Part 1910). These regulations set standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries. Some OSHA regulations contain standards relating to

hazardous materials handling to protect workers who handle toxic, flammable, reactive, or explosive materials, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. For example, facilities which use, store, manufacture, handle, process, or move hazardous materials are required to conduct employee safety training, have available and know how to use safety equipment, prepare illness prevention programs, provide hazardous substance exposure warnings, prepare emergency response plans, and prepare a fire prevention plan.

Procedures and standards for safe handling, storage, operation, remediation, and emergency response activities involving hazardous materials and waste are promulgated in 29 CFR Part 1910, Subpart H. Some key subsections in 29 CFR Part 1910, Subpart H are §1910.106 -Flammable Liquids and §1910.120 - Hazardous Waste Operations and Emergency Response. In particular, the Hazardous Waste Operations and Emergency Response regulations contain requirements for worker training programs, medical surveillance for workers engaging in the handling of hazardous materials or wastes, and waste site emergency and remediation planning, for those who are engaged in specific clean-up, corrective action, hazardous material handling, and emergency response activities (see 29 CFR Part 1910 Subpart H, §1910.120 (a)(1)(i-v) and §1926.65 (a)(1)(i-v)).

Process Safety Management: As part of the numerous regulations pertaining to worker safety adopted by OSHA, specific requirements that pertain to Process Safety Management (PSM) of Highly Hazardous Chemicals were adopted in 29 CFR Part 1910 Subpart H, §1910.119 and 8 CCR §5189 to protect workers at facilities that have toxic, flammable, reactive or explosive materials. PSM program elements are aimed at preventing or minimizing the consequences of catastrophic releases of chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan. Specifically, the PSM program requires facilities that use, store, manufacture, handle, process, or move hazardous materials to conduct employee safety training; have an inventory of safety equipment relevant to potential hazards; have knowledge on use of the safety equipment; prepare an illness prevention program; provide hazardous substance exposure warnings; prepare an emergency response plan; and prepare a fire prevention plan.

Emergency Action Plan: An Emergency Action Plan (EAP) is a written document required by OSHA standards promulgated in 29 CFR Part 1910, Subpart E, §1910.38 (a) to facilitate and organize a safe employer and employee response during workplace emergencies. An EAP is required by all that are required to have fire extinguishers. At a minimum, an EAP must include the following: 1) a means of reporting fires and other emergencies; 2) evacuation procedures and emergency escape route assignments; 3) procedures to be followed by employees who remain to operate critical plant operations before they evacuate; 4) procedures to account for all employees after an emergency evacuation has been completed; 5) rescue and medical duties for those employees who are to perform them; and 6) names or job titles of persons who can be contacted for further information or explanation of duties under the plan.

National Fire Regulations: The National Fire Codes (NFC), Title 45, published by the National Fire Protection Association (NFPA) contains standards for laboratories using chemicals, which are not requirements, but are generally employed by organizations in order to protect workers. These standards provide basic protection of life and property in laboratory work areas through prevention and control of fires and explosions, and also serve to protect personnel from exposure to non-fire

health hazards.

In addition to the NFC, the NFPA adopted a hazard rating system which is promulgated in NFPA 704 - Standard System for the Identification of the Hazards of Materials for Emergency Response. NFPA 704 is a "standard (that) provides a readily recognized, easily understood system for identifying specific hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative hazards of a material. It addresses the health, flammability, instability, and related hazards that may be presented as short-term, acute exposures that are most likely to occur as a result of fire, spill, or similar emergency." In addition, the hazard ratings per NFPA 704 are used by emergency personnel to quickly and easily identify the risks posed by nearby hazardous materials in order to help determine what, if any, specialty equipment should be used, procedures followed, or precautions taken during the first moments of an emergency response. The scale is divided into four color-coded categories, with blue indicating level of health hazard, red indicating the flammability hazard, yellow indicating the chemical reactivity, and white containing special codes for unique hazards such as corrosivity and radioactivity. Each hazard category is rated on a scale from 0 (no hazard; normal substance) to 4 (extreme risk). Table 3-4 summarizes what the codes mean for each hazards category.

In addition to the information in Table 3-4, a number of other physical or chemical properties may cause a substance to be a fire hazard. With respect to determining whether any substance is classified as a fire hazard, SDS lists the NFPA 704 flammability hazard ratings (e.g., NFPA 704). NFPA 704 is a standard that provides a readily recognized, easily understood system for identifying flammability hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative flammability hazards of a material.

Table 3-4
NFPA 704 Hazards Rating Code

Hazard Rating Code	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
4 = Extreme	Very short exposure could cause death or major residual injury (extreme hazard).	Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily. Flash point below 73°F.	Readily capable of detonation or explosive decomposition at normal temperatures and pressures.	W = Reacts with water in an unusual or dangerous manner.
3 = High	Short exposure could cause serious temporary or moderate residual injury.	Liquids and solids that can be ignited under almost all ambient temperature conditions. Flash point between 73°F and 100°F.	Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water, or will detonate if severely shocked.	**OXY** = Oxidizer
2 = Moderate	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.	Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur. Flash point between 100°F and 200°F.	Undergoes violent chemical change at elevated temperatures and pressures, reacts violently with water, or may form explosive mixtures with water.	**SA** = Simple asphyxiant gas (includes nitrogen, helium, neon, argon, krypton, and xenon).
1 = Slight	Exposure would cause irritation with only minor residual injury.	Must be heated before ignition can occur. Flash point over 200°F.	Normally stable, but can become unstable at elevated temperatures and pressures.	Not applicable
0 = Insignificant	Poses no health hazard, no precautions necessary.	Will not burn.	Normally stable, even under fire exposure conditions, and is not reactive with water.	Not applicable

Although substances can have the same NFPA 704 Flammability Ratings Code, other factors can make each substance's fire hazard very different from each other. For this reason, additional chemical characteristics, such as auto-ignition temperature, boiling point, evaporation rate, flash point, lower explosive limit (LEL), upper explosive limit (UEL), and vapor pressure, are also considered when determining whether a substance is fire hazard. The following is a brief description of each of these chemical characteristics.

Auto-ignition Temperature: The auto-ignition temperature of a substance is the lowest temperature at which it will spontaneously ignite in a normal atmosphere without an external source of ignition, such as a flame or spark.

Boiling Point: The boiling point of a substance is the temperature at which the vapor pressure of the liquid equals the environmental pressure surrounding the liquid. Boiling is a process in which molecules anywhere in the liquid escape, resulting in the formation of

vapor bubbles within the liquid.

Evaporation Rate: Evaporation rate is the rate at which a material will vaporize (evaporate, change from liquid to a vapor) compared to the rate of vaporization of a specific known material. This quantity is a represented as a unit less ratio. For example, a substance with a high evaporation rate will readily form a vapor which can be inhaled or explode, and thus have a higher hazard risk. Evaporation rates generally have an inverse relationship to boiling points (i.e., the higher the boiling point, the lower the rate of evaporation).

Flash Point: Flash point is the lowest temperature at which a volatile liquid can vaporize to form an ignitable mixture in air. Measuring a liquid's flash point requires an ignition source. At the flash point, the vapor may cease to burn when the source of ignition is removed. There are different methods that can be used to determine the flashpoint of a solvent but the most frequently used method is the Tagliabue Closed Cup standard (ASTM D56), also known as the TCC. The flashpoint is determined by a TCC laboratory device which is used to determine the flash point of mobile petroleum liquids with flash point temperatures below 175 degrees Fahrenheit (79.4 degrees Centigrade).

Flash point is a particularly important measure of the fire hazard of a substance. For example, the Consumer Products Safety Commission (CPSC) promulgated Labeling and Banning Requirements for Chemicals and Other Hazardous Substances in 15 U.S.C. §1261 and 16 CFR Part 1500. Per the CPSC, the flammability of a product is defined in 16 CFR Part 1500.3 (c)(6) and is based on flash point. For example, a liquid needs to be labeled as: 1) "Extremely Flammable" if the flash point is below 20 degrees Fahrenheit; 2) "Flammable" if the flash point is above 20 degrees Fahrenheit but less than 100 degrees Fahrenheit; or 3) "Combustible" if the flash point is above 100 degrees Fahrenheit up to and including 150 degrees Fahrenheit.

Lower Explosive Limit (LEL): The lower explosive limit of a gas or a vapor is the limiting concentration (in air) that is needed for the gas to ignite and explode or the lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). If the concentration of a substance in air is below the LEL, there is not enough fuel to continue an explosion. In other words, concentrations lower than the LEL are "too lean" to burn. For example, methane gas has a LEL of 4.4 percent (at 138 degrees Centigrade) by volume, meaning 4.4 percent of the total volume of the air consists of methane. At 20 degrees Centigrade, the LEL for methane is 5.1 percent by volume. If the atmosphere has less than 5.1 percent methane, an explosion cannot occur even if a source of ignition is present. When the concentration of methane reaches 5.1 percent, an explosion can occur if there is an ignition source.

Upper Explosive Limit (UEL): The upper explosive limit of a gas or a vapor is the highest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). Concentrations of a substance in air above the UEL are "too rich" to burn.

Vapor Pressure: Vapor pressure is an indicator of a chemical's tendency to evaporate into gaseous form.

Health Hazards Guidance: In addition to fire impacts, health hazards can also be generated due to exposure of chemicals present in both conventional as well as reformulated products. Using available toxicological information to evaluate potential human health impacts associated with conventional solvents and potential replacement solvents, the toxicity of the conventional solvents can be compared to solvents expected to be used in reformulated products. As a measure of a chemical's potential health hazards, the following values need to be considered: the Threshold Limit Values established by the American Conference of Governmental Industrial Hygiene, OSHA's Permissible Exposure Limits, the Immediately Dangerous to Life and Health levels recommended by the National Institute for Occupational Safety and Health (NIOSH), and health hazards developed by the National Safety Council. The following is a brief description of each of these values.

Threshold Limit Values (TLVs): The TLV of a chemical substance is a level to which it is believed a worker can be exposed day after day for a working lifetime without adverse health effects. The TLV is an estimate based on the known toxicity in humans or animals of a given chemical substance, and the reliability and accuracy of the latest sampling and analytical methods. The TLV for chemical substances is defined as a concentration in air, typically for inhalation or skin exposure. Its units are in parts per million (ppm) for gases and in milligrams per cubic meter (mg/m^3) for particulates. The TLV is a recommended guideline by ACGIH.

Permissible Exposure Limits (PEL): The PEL is a legal limit, usually expressed in ppm, established by OSHA to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. A PEL is usually given as a time-weighted average (TWA), although some are short-term exposure limits (STEL) or ceiling limits. A TWA is the average exposure over a specified period of time, usually eight hours. This means that, for limited periods, a worker may be exposed to concentrations higher than the PEL, so long as the average concentration over eight hours remains lower. A short-term exposure limit is one that addresses the average exposure over a 15 to 30-minute period of maximum exposure during a single work shift. A ceiling limit is one that may not be exceeded for any period of time, and is applied to irritants and other materials that have immediate effects. The OSHA PELs are published in 29 CFR 1910.1000, Table Z1.

Immediately Dangerous to Life and Health (IDLH): IDLH is an acronym defined by NIOSH as exposure to airborne contaminants that is "likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment." IDLH values are often used to guide the selection of breathing apparatus that are made available to workers or firefighters in specific situations.

State Regulations

Hazardous Materials and Waste Regulations

California Hazardous Waste Control Law: The California Hazardous Waste Control Law is administered by CalEPA to regulate hazardous wastes within the State of California. While the California Hazardous Waste Control Law is generally more stringent than RCRA, both the state and federal laws apply in California. The California Department of Toxic Substances Control

(DTSC) is the primary agency in charge of enforcing both the federal and state hazardous materials laws in California. The DTSC regulates hazardous waste, oversees the cleanup of existing contamination, and pursues avenues to reduce hazardous waste produced in California. The DTSC regulates hazardous waste in California under the authority of RCRA, the California Hazardous Waste Control Law, and the H&S. Under the direction of the CalEPA, the DTSC maintains the Cortese List and Envirostor databases of hazardous materials and waste sites as specified under Government Code §65962.5. The Cortese List consists of the following:

1. **Subsection 65962.5. (a)**
   List provided by DTSC that includes:
   a. All hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code.
   b. All land designated as hazardous waste property or border zone property pursuant to Article 11 (commencing with Section 25220) of Chapter 6.5 of Division 20 of the Health and Safety Code.
   c. All information received by the Department of Toxic Substances Control pursuant to Section 25242 of the Health and Safety Code on hazardous waste disposals on public land.
   d. All sites listed pursuant to Section 25356 of the Health and Safety Code.
   e. All sites included in the Abandoned Site Assessment Program.
2. **Subsection 65962.5. (b)**
   The State Department of Health lists of all public drinking water wells that contain detectable levels of organic contaminants and that are subject to water analysis pursuant to Section 116395 of the Health and Safety Code.
3. **Subsection 65962.5. (c)**
   The State Water Resources Control Board shall list of all of the following:
   a. All underground storage tanks for which an unauthorized release report is filed pursuant to Section 25295 of the Health and Safety Code.
   b. All solid waste disposal facilities from which there is a migration of hazardous waste and for which a California regional water quality control board has notified the Department of Toxic Substances Control pursuant to subdivision (e) of Section 13273 of the Water Code.
   c. All cease and desist orders issued after January 1, 1986, pursuant to Section 13301 of the Water Code, and all cleanup or abatement orders issued after January 1, 1986, pursuant to Section 13304 of the Water Code, that concern the discharge of wastes that are hazardous materials.
4. **Subsection 65962.5. (d)**
   The appropriate local enforcement agency will list of all solid waste disposal facilities from which there is a known migration of hazardous waste.

The Hazardous Waste Control Law (22 CCR Chapter 11, Appendix X) also lists 791 chemicals and approximately 300 common materials which may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Occupational Safety and Health Administration: The California Occupational Safety and Health Administration (CalOSHA) is the primary agency responsible for worker safety

in the handling and use of chemicals in the workplace. The CalOSHA requires the employer to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. CalOSHA standards are generally more stringent than federal regulations.

Hazardous Materials Release Notification: Many state statutes require emergency notification of a hazardous chemical release, including:

- H&S §25270.7, §25270.8, and §25507;
- California Vehicle Code §23112.5;
- California Public Utilities Code §7673 (General Orders #22-B, 161);
- California Government Code §51018 and §8670.25.5(a);
- California Water Code §13271 and §13272; and
- California Labor Code §6409.1(b)10.

California Accident Release Prevention (CalARP) Program: The California Accident Release Prevention Program (19 CCR Division 2, Chapter 4.5) requires the preparation of RMPs. CalARP requires stationary sources with more than a threshold quantity of a regulated substance to be evaluated to determine the potential for and impacts of accidental releases from any processes on-site (not transport) subject to state risk management requirements. RMPs are documents prepared by the owner or operator of a stationary source containing detailed information including: (1) regulated substances held onsite at the stationary source; (2) offsite consequences of an accidental release of a regulated substance; (3) the accident history at the stationary source; (4) the emergency response program for the stationary source; (5) coordination with local emergency responders; (6) hazard review or process hazard analysis; (7) operating procedures at the stationary source; (8) training of the stationary source's personnel; (9) maintenance and mechanical integrity of the stationary source's physical plant; and (10) incident investigation. The CalARP Program is implemented at the local government level by Certified Unified Program Agencies (CUPAs) also known as Administering Agencies (AAs). Typically, local fire departments are the administering agencies of the CalARP Program because they frequently are the first responders in the event of a release. California is proposing modifications to the CalARP Program along with the state's PSM program in response to an accident at the Chevron Richmond Refinery. The proposed regulations were released for public comment on July 15, 2016 and the public comment period closed on September 15, 2016.

Hazardous Materials Disclosure Program: The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) as promulgated by CalEPA in CCR, Title 27, Chapter 6.11 requires the administrative consolidation of six hazardous materials and waste programs (program elements) under one agency, a CUPA. The Unified Program administered by the State of California consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for the state's environmental and emergency management programs, which include Hazardous Waste Generator

and On-Site Hazardous Waste Treatment Programs ("Tiered Permitting"); Above ground SPCC Program; Hazardous Materials Release Response Plans and Inventories (business plans); the CalARP Program; the UST Program; and the Uniform Fire Code Plans and Inventory Requirements. The Unified Program is implemented at the local government level by CUPAs.

Hazardous Materials Management Act: The State of California (H&S Division 20, Chapter 6.95) requires any business that handles more than a specified amount of hazardous or extremely hazardous materials, termed a "reportable quantity," to submit a Hazardous Materials Business Plan to its CUPA. Business plans must include an inventory of the types, quantities, and locations of hazardous materials at the facility. Businesses are required to update their business plans at least once every three years and the chemical portion of their plans every year. Also, business plans must include emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. These plans need to identify the procedures to follow for immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information for all company emergency coordinators, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel. The requirements for hazardous materials business plans are specified in the H&S and 19 CCR.

Hazardous Materials Transportation in California: California regulates the transportation of hazardous waste originating or passing through the State in Title 13, CCR. The California Highway Patrol (CHP) and Caltrans have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. The CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. Caltrans has emergency chemical spill identification teams at locations throughout the state.

California Fire Code: While NFC Standard 45 and NFPA 704 are regarded as nationally recognized standards, the California Fire Code (24 CCR) also contains state standards for the use and storage of hazardous materials and special standards for buildings where hazardous materials are found. Some of these regulations consist of amendments to NFC Standard 45. State Fire Code regulations require emergency pre-fire plans to include training programs in first aid, the use of fire equipment, and methods of evacuation.

Local Regulations

Los Angeles County: The Office of Emergency Management is responsible for organizing and directing the preparedness efforts of the Emergency Management Organization of Los Angeles County. Los Angeles County's policies towards hazardous materials management include enforcing stringent site investigations for factors related to hazards; limiting the development in high hazard areas, such as floodplains, high fire hazard areas, and seismic hazard zones; facilitating safe transportation, use, and storage of hazardous materials; supporting lead paint abatement; remediating Brownfield sites; encouraging the purchase of homes on the FEMA Repeat Hazard list and designating the land as open space; enforcing restrictions on access to important energy sites; limiting development downslope from aqueducts; promoting safe alternatives to chemical-

based products in households; and prohibiting development in floodways. The county has defined effective emergency response management capabilities to include supporting county emergency providers with reaching their response time goals; promoting the participation and coordination of emergency response management between cities and other counties at all levels of government; coordinating with other county and public agency emergency planning and response activities; and encouraging the development of an early warning system for tsunamis, floods and wildfires.

Orange County: Orange County's Hazardous Materials Program Office is responsible for facilitating the coordination of various parts of the County's hazardous materials program; assisting in coordinating county hazardous materials activities with outside agencies and organizations; providing comprehensive, coordinated analysis of hazardous materials issues; and directing the preparation, implementation, and modification of the county's Hazardous Waste Management Plan (HWMP). Orange County is responsible for its own emergency plans concerning a nuclear power plant accident, and the Incident Response Plan is updated regularly.

The regulatory agency responsible for enforcement, as well as inspection of pipelines transporting hazardous materials, is the California State Fire Marshal's Office, Hazardous Liquid Pipeline Division. The Orange County Health Care Agency (OCHCA) has been designated by the Board of Supervisors as the agency to enforce the underground storage tank (UST) program. The OCHCA UST Program regulates approximately 7,000 of the 9,500 underground tanks in Orange County. The program includes conducting regular inspections of underground tanks; oversight of new tank installations; issuance of permits; regulation of repair and closure of tanks; ensuring the mitigation of leaking USTs; pursuing enforcement action; and educating and assisting the industries and general public as to the laws and regulations governing USTs. Under mandate from the California HSC, the Orange County Fire Authority is the designated agency to inventory the distribution of hazardous materials in commercial or industrial occupancies, develop and implement emergency plans, and require businesses that handle hazardous materials to develop emergency plans to deal with these materials.

San Bernardino County: San Bernardino County's HWMP serves as the primary planning document for the management of hazardous waste in San Bernardino County. The HWMP identifies the types and amounts of wastes generated; establishes programs for managing these wastes; identifies an application review process for the siting of specified hazardous waste facilities; identifies mechanisms for reducing the amount of waste generated; and identifies goals, policies, and actions for achieving effective hazardous waste management. One of the county's stated goals is to minimize the generation of hazardous waste and reduce the risk posed by storage, handling, transportation, and disposal of hazardous wastes. In addition, the county will protect its residents and visitors from injury and loss of life and protect property from fires by deploying firefighters and requiring new land developments to prepare site-specific fire protection plans.

Riverside County: Through its membership in the Southern California Hazardous Waste Management Authority (SCHWMA), the County of Riverside has agreed to work on a regional level to solve problems involving hazardous waste. SCHWMA was formed through a joint powers agreement between Santa Barbara, Ventura, San Bernardino, Orange, San Diego, Imperial, and Riverside Counties and the Cities of Los Angeles and San Diego. Working within the concept of "fair share," each SCHWMA county has agreed to take responsibility for the treatment and disposal of hazardous waste in an amount that is at least equal to the amount generated within that county. This responsibility can be met by siting hazardous waste management facilities (transfer,

treatment, and/or repository) capable of processing an amount of waste equal to or larger than the amount generated within the county, or by creating intergovernmental agreements between counties to provide compensation to a county for taking another county's waste, or through a combination of both facility siting and intergovernmental agreements. When and where a facility is to be sited is primarily a function of the private market. However, once an application to site a facility has been received, the county will review the requested facility and its location against a set of established siting criteria to ensure that the location is appropriate and may deny the application based on the findings of this review. The County of Riverside does not presently have any of these facilities within its jurisdiction and, therefore, must rely on intergovernmental agreements to fulfill its fair share responsibility to SCHWMA.

Emergency Response to Hazardous Materials and Waste Incidents

California Emergency Management Agency: The California Emergency Management Agency (Cal EMA) exists to enhance safety and preparedness in California through strong leadership, collaboration, and meaningful partnerships. The goal of Cal EMA is to protect lives and property by effectively preparing for, preventing, responding to, and recovering from all threats, crimes, hazards, and emergencies. Cal EMA under the Fire and Rescue Division coordinates statewide implementation of hazardous materials accident prevention and emergency response programs for all types of hazardous materials incidents and threats. In response to any hazardous materials emergency, Cal EMA is called upon to provide state and local emergency managers with emergency coordination and technical assistance.

Pursuant to the Emergency Services Act, California has developed an Emergency Response Plan to coordinate emergency services provided by federal, state, and local government agencies and private persons. Response to hazardous materials incidents is one part of this Emergency Response Plan. The Emergency Response Plan is administered by Cal EMA which coordinates the responses of other agencies. Six mutual aid and Local Emergency Planning Committee (LEPC) regions have been identified for California that are divided into three areas of the state designated as the Coastal (Region II, which includes 16 counties with 151 incorporated cities and a population of about eight million people.), Inland (Region III, Region IV and Region V, which includes 31 counties with 123 incorporated cities and a population of about seven million people), and Southern (Region I and Region VI, which includes 11 counties with 226 incorporated cities and a population of about 22 million people). The SCAQMD jurisdiction covers portions of Region I and Region VI.

In addition, pursuant to the Hazardous Materials Release Response Plans and Inventory Law of 1985, local agencies are required to develop "area plans" for response to releases of hazardous materials and wastes. These emergency response plans depend to a large extent on the business plans submitted by persons who handle hazardous materials. An area plan must include pre-emergency planning of procedures for emergency response, notification, coordination of affected government agencies and responsible parties, training, and follow-up.

Hazardous Materials Incidents

Hazardous materials move through the region by a variety of modes: Truck, rail, air, ship, and pipeline. The movement of hazardous materials implies a degree of risk, depending on the materials being moved, the mode of transport, and numerous other factors (e.g., weather and road conditions). According to the Office of Hazardous Materials Safety (OHMS) in the U.S. DOT,

hazardous materials shipments can be regarded as equivalent to deliveries, but any given shipment may involve one or more movements or trip segments, which may occur by different routes (e.g., rail transport with final delivery by truck). According to the Commodity Flow Survey data[9] there were approximately 2.6 billion tons of hazardous materials shipments in the United States in 2012 (the last year for which data are available). Table 3-5 indicates that trucks move more than 50 percent and pipeline accounts for approximately 24 percent of all hazardous materials shipped from a location in the United States. By contrast, rail accounts for only 4.3 percent of shipments[10].

Table 3-5
Hazardous Material Shipments in the United States in 2012

Mode	Total Commercial Freight (thousand tons)	Hazardous Materials Shipped (thousand tons)	Percent of Total Hazardous Materials Shipped by Mode of Transportation	Percent of Total Commercial Freight Shipped that is Hazardous
Truck	8,060,166	1,531,405	59.4%	19.0%
Rail	1,628,537	110,988	4.3%	6.8%
Water	575,996	283,561	11.0%	49.2%
Pipeline	635,975	626,652	24.3%	98.5%
Other	398,735	27,547	1.1%	6.9%
Total	**11,299,409**	**2,580,153**	**100.0%**	**22.8%**

Source: U.S. DOT[11,12]

The movement of hazardous materials through the U.S. transportation system represents about 22.8 percent of total tonnage for all freight shipments as measured by the Commodity Flow Survey. Comparatively, the total commercial freight moved in 2012 in California by all transportation modes was 718,345 thousand tons[13].

California Hazardous Materials Incident Reporting System: The California Hazardous Materials Incident Reporting System (CHMIRS) is a post incident reporting system to collect data on incidents involving the accidental release of hazardous materials in California. Information on accidental releases of hazardous materials are reported to and maintained by Cal EMA. While information on accidental releases are reported to Cal EMA, Cal EMA no longer conducts statistical evaluations of the releases, e.g., total number of releases per year for the entire State, or data by county. The U.S. DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) provides access to retrieve data from the Incident Reports Database, which also includes non-pipeline incidents, e.g., truck and rail events. Incident data and summary statistics, e.g., release

[9] USDOT, 2015. United States: 2012; 2012 Economic Census and 2012 Commodity Flow Survey. Issued March 2015. Available at http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/ec12tcf-us.pdf

[10] USDOT, 2015. United States: 2012; 2012 Economic Census and 2012 Commodity Flow Survey. Issued March 2015. Available at http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/ec12tcf-us.pdf

[11] USDOT, 2016. Table 1a. Hazardous Material Shipment Characteristics by Mode of Transportation for the United States: 2012. Accessed July 25. 2016. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/commodity_flow_survey/2012/hazardous_materials/table1a

[12] USDOT, 2016a. Table 1a. Shipment Characteristics by Mode of Transportation for the United States: 2012. Accessed July 25, 2016. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/ files/publications/commodity_flow_survey/2012/united_states/table1

[13] USDOT, 2016b. Table 3: Weight of Outbound Commodity Flows by State of Origin: 2012. Accessed July 25, 2016. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/commodity_flow_survey/2012/state_summaries/tables/table3

date, geographical location (state and county) and type of material released, are available online from the Hazmat Incident Database.

Table 3-6 provides a summary of the reported hazardous material incidents for Los Angeles, Orange, Riverside, and San Bernardino counties for 2012 through 2014 from the Hazmat Incident Database[14]. Data presented is for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

Table 3-6
Reported Hazardous Materials Incidents for 2012 - 2014

County	2012	2013	2014
Los Angeles	286	337	287
Orange	270	63	88
Riverside	55	43	50
San Bernardino	261	348	351
Total	**872**	**791**	**776**

In 2012, there were a total of 872 incidents reported for Los Angeles, Orange, Riverside and San Bernardino counties. In 2013, there were a total of 791 incidents reported for Los Angeles, Orange, Riverside and San Bernardino counties, and in 2014 a total of 776 incidents for these four counties. Over the three-year period, San Bernardino and Los Angeles counties accounted for the largest number of incidents, followed by Orange and Riverside counties. As noted in Table 3-6, the number of incidents has reduced over the years.

Hazards Associated with Air Pollution Control

The SCAQMD has evaluated the hazards associated with previous AQMPs, proposed SCAQMD rules, and non-SCAQMD projects where the SCAQMD is the Lead Agency pursuant to CEQA. Add-on pollution control technologies, such as SCR, have been previously analyzed for hazards. The use of add-on pollution control equipment may concentrate or utilize hazardous materials. A malfunction or accident when using add-on pollution control equipment could potentially expose people to hazardous materials, explosions, or fires. The SCAQMD has determined that the transport, use, and storage of ammonia, both aqueous and anhydrous, (used in SCR systems) may have significant hazard impacts in the event of an accidental release. Further analyses have indicated that the use of aqueous ammonia (instead of anhydrous ammonia) can usually reduce the hazards associated with ammonia use in SCR systems to less than significant.

Ammonia

Ammonia is the primary hazardous chemical identified with the use of SCR systems ~~technology~~. Ammonia, though not a carcinogen, can have chronic and acute health impacts. Therefore, a potential increase in the use of ammonia may increase the current existing risk setting associated with deliveries (e.g., truck and road accidents) and onsite or offsite spills for each facility that currently uses or will begin to use ammonia. Exposure to a toxic gas cloud is the potential hazard associated with this type of control equipment. A toxic gas cloud is the release of a volatile chemical such as anhydrous ammonia that could form a cloud that migrates off-site, thus exposing

[14] Pipeline and Hazardous Materials Safety Administration (PHMSA), 2015. Incident Reports Database Search. Accessed, November 17, 2015 at https://hazmatonline.phmsa.dot.gov /IncidentReportsSearch/Welcome.aspx

individuals. Anhydrous ammonia is heavier than air such that when released into the atmosphere, it would form a cloud at ground level rather than be dispersed. "Worst-case" conditions tend to arise when very low wind speeds coincide with the accidental release, which can allow the chemicals to accumulate rather than disperse. Though there are facilities that may be affected by the 2016 AQMP control measures that are currently permitted to use anhydrous ammonia, for any new construction, however, current SCAQMD policy no longer allows the use of anhydrous ammonia. Instead, to minimize the hazards associated with ammonia used in the SCR or SNCR process, aqueous ammonia, 19 percent by volume, is typically required as a permit condition associated with the installation of SCR or SNCR equipment for the following reasons: 1) 19 percent aqueous ammonia does not travel as a dense gas like anhydrous ammonia; and 2) 19 percent aqueous ammonia is not on any acutely hazardous materials lists unlike anhydrous ammonia or aqueous ammonia at higher percentages. Also, if released, aqueous ammonia is likely to pool in liquid form and would be captured in a surrounding berm. As such, the release impacts of an aqueous ammonia release are not as great as anhydrous ammonia release.

CHAPTER 4

ENVIRONMENTAL IMPACTS

INTRODUCTION

The CEQA Guidelines require environmental documents to identify significant environmental effects that may result from a proposed project. [CEQA Guidelines Section 15126.2(a)]. Direct and indirect significant effects of a project on the environment should be identified and described, with consideration given to both short- and long-term impacts. The discussion of environmental impacts may include, but is not limited to, the resources involved; physical changes; alterations of ecological systems; health and safety problems caused by physical changes; and other aspects of the resource base, including water, scenic quality, and public services. If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible. [CEQA Guidelines Section 15126.4].

The categories of environmental impacts to be studied in a CEQA document are established by CEQA (Public Resources Code Section 21000 et seq.), and the CEQA Guidelines, as codified in Title 14 California Code of Regulations Section 15000 *et seq.* Under the CEQA Guidelines, there are approximately 17 environmental categories in which potential adverse impacts from a project are evaluated.

The CEQA Guidelines also indicate that the degree of specificity required in a CEQA document depends on the type of project being proposed. [CEQA Guidelines Section 15146]. The detail of the environmental analysis for certain types of projects cannot be as great as for others. As explained in Chapter 1, the analysis of PARs 1146 series and PR 1100 indicated that the type of CEQA document appropriate for the proposed project is a SEA.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This document is a SEA to the: 1) September 2008 Final EA for Rule 1146; 2) September 2008 Final EA for Rule 1146.1; 3) May 2006 Final EA for Rule 1146.2; and 4) March 2017 Final Program EIR for the 2016 AQMP. The previous environmental analyses in the September 2008 Final EA for Rule 1146.1 and the May 2006 Final EA for Rule 1146.2 contained an environmental checklist and concluded that none of the 17 environmental topic areas would have potentially significant adverse impacts at the time the September 2008 and May 2006 amendments to Rules 1146.1 and 1146.2, respectively, were adopted. However, the previous environmental analysis in the September 2008 Final EA for Rule 1146 concluded that the September 2008 amendments to Rule 1146 would have potentially significant adverse impacts for the environmental topic of air quality and hazards and hazardous materials.

The March 2017 Final Program EIR for the 2016 AQMP determined that the overall implementation of CMB-05 has the potential to generate adverse environmental impacts to seven topic areas – air quality, energy, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste, and transportation. More specifically, the March 2017 Final Program EIR evaluated the impacts from installation and operation of additional control equipment and SCR or SNCR equipment potentially resulting in construction emissions, increased electricity demand, hazards from additional ammonia transport and use, increase in water use and wastewater discharge, changes in noise volume, generation of solid waste from construction and disposal of old equipment and catalysts replacements, as well as changes in traffic patterns and volume.

For the entire 2016 AQMP, the analysis concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measures for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia; (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. Since significant adverse environmental impacts were identified, mitigation measures were identified and applied. However, the March 2017 Final Program EIR concluded that the 2016 AQMP would have significant and unavoidable adverse environmental impacts even after mitigation measures were identified and applied. As such, mitigation measures were made a condition of project approval and a Mitigation Monitoring and Reporting Plan was adopted. Findings were made and a Statement of Overriding Considerations was prepared and adopted for this project.

PARs 1146 series ~~and PR 1100~~ propose to~~ respectively~~ establish BARCT limits~~ and an implementation schedule for~~ reducing NOx emissions at RECLAIM facilities with units subject to Rules 1146, 1146.1, and 1146.2. This will be one of the first ~~set of~~ rules that will help transition RECLAIM facilities to a command-and-control regulatory structure. PR 1100 has been~~,~~ specifically crafted to~~,~~ contain~~s~~ the implementation schedule for Rule 1146 and 1146.1 units to meet the NOx emissions limits. Units at RECLAIM facilities subject to Rule 1146 and 1146.1 will be required to meet the applicable NOx concentration limit for a minimum of 75 percent of the cumulative total heat input by January 1, 2021 and 100 percent by January 1, 2022. For PARs 1146 and 1146.1, similar to the September 2008 amendments to Rules 1146 and 1146.1, compliance is expected to be achieved through the installation of SCR systems ~~technology~~ or ultra-low NOx burners. ~~Additionally, P~~permit applications would need to be submitted for units at RECLAIM facilities not currently meeting the applicable NOx concentration limit for units subject to Rules 1146 and 1146.1 before 12 months after the date of rule adoption. Certain units~~ at non-RECLAIM facilities~~ subject to Rules 1146 and 1146.1 would be allowed ~~to defer having~~ to comply with the NOx emission limits during ~~unti~~l burner replacement or 15 years after the date of rule adoption, whichever is earlier. Thermal fluid heaters currently permitted at 20 ppm must meet the NOx emission limit of 12 ppm by January 1, 2022. Additionally, air pollution control equipment on units subject to Rule 1146 that result in ammonia emissions will be subject to a five ppm ammonia limit and will be required to undergo a source test within 12 months of unit operation after the date of rule adoption and annually thereafter. PARs 1146 series and PR 1100 are expected to result in NOx emission reductions of 0.20 ton per day by January 1, 2021 and ~~0.23~~ 0.27 ton per day by 2023. The proposed project emission reductions are expected to improve overall air quality in the District and further the progress towards attaining and maintaining state and NAAQS for ozone, PM10, and PM2.5. However, the implementation of the proposed project could create both direct and indirect air quality and hazards and hazardous materials impacts from those sources that install SCR ~~technology~~ system(s) or ultra-low NOx burners. In the Revised Draft SEA, t~~T~~he construction of air pollution control equipment in order to reduce NOx emissions, was ~~is~~ expected to exceed the SCAQMD's significance threshold for air quality. Based on the analysis, using EPA RMP*Comp the location of the ammonia storage tanks at some facilities and their vicinity to sensitive receptors could potentially have a significant impact from hazards and hazardous

materials. However, after the construction of SCR systems is completed, the operation of the systems would reduce NOx emissions; thus, reducing the significant impact to air quality during overlap of construction and operation phases to less than significant levels. Nonetheless, the implementation of PARs 1146 series and PR 1100 would be expected to have significant adverse hazards and hazardous materials impacts from the storage and use of ammonia to operate SCR systems. The proposed changes contained in PARs 1146 series are considered to contain new information of substantial importance, which was not known and could not have been known at the time the previous CEQA documents for Rules 1146 and 1146.1 (e.g., the September 2008 Final EAs), Rule 1146.2 (e.g., the May 2006 Final EA), and the 2016 AQMP (e.g., the March 2017 Final Program EIR) were certified. Specifically, the units subject to Rules 1146 and 1146.1 at RECLAIM facilities were not discussed in these previously certified CEQA documents. In the Revised Draft SEA, PARs 1146 series and PR 1100 were expected to ~~will~~ create new significant effects to air quality during construction and hazards and hazardous materials that need to be further evaluated in this SEA per CEQA Guidelines Section 15162(a)(3)(A). Thus, only the topics of air quality and hazards and hazardous materials have been analyzed in this SEA. However, after the analysis was completed, within the proximity of sensitive receptors only the topic of hazards and hazardous materials for the storage and use of aqueous ammonia was concluded in the Final SEA to have potentially significant adverse impacts.

The environmental impact analysis for this environmental topic area incorporates a "worst-case" approach. This approach entails the premise that whenever the analysis requires that assumptions be made, those assumptions that result in the greatest adverse impacts are typically chosen. This method ensures that all potential effects of the proposed project are documented for the decision-makers and the public. Accordingly, the following analyses use a conservative "worst-case" approach for analyzing the potentially significant adverse air quality and hazards and hazardous materials impacts associated with the implementation of the PARs 1146 series and PR 1100.

AIR QUALITY IMPACTS

Significance Criteria

The environmental analysis assumes that installation of NOx control technologies (e.g., ultra-low NOx burners and SCR systems) for the affected sources will reduce NOx emissions overall, but construction activities associated with both the installation of new control devices and the modification of existing control devices will create secondary air quality impacts (e.g., emissions), which can adversely affect local and regional air quality. A project may generate emissions both during the period of its construction and through ongoing daily operations. During installation of or modification existing NOx control devices, emissions may be generated by onsite construction equipment and by offsite vehicles used for worker commuting. After construction activities are completed, additional emissions may be generated from the increased electricity use of the SCR systems (as GHGs) and offsite vehicles (as criteria pollutants and GHGs) used for delivering fresh materials (e.g., chemicals, fresh catalyst, etc.) needed for operations and hauling away solid waste for disposal or recycling (e.g., spent catalyst). To determine whether air quality impacts from adopting and implementing PARs 1146 series and PR 1100 are significant, impacts will be evaluated and compared to the following criteria. If impacts exceed any of the significance thresholds in Table 4-1, they will be considered significant. All feasible mitigation measures will be identified and implemented to reduce significant impacts to the maximum extent feasible. PARs 1146 series and PR 1100 will be considered to have significant adverse air quality impacts

if any one of the thresholds in Table 4-1 are equaled or exceeded. In general, the SCAQMD makes significance determinations for construction and operational impacts based on the maximum or peak daily emissions during the construction or operation period, which provides a "worst-case" analysis of the construction and operational emissions. The type of emission reduction projects that may be or expected to be undertaken to comply with PARs 1146 series and 1100 are primarily the installation of SCR systems ~~technology~~ and ultra-low NOx burners on existing boilers, steam generators, and process heaters; thus, this will be analyzed in this SEA.

The physical changes involved with the type of emission control strategies that could be implemented focus on the installation of ultra-low NOx burners and SCR systems ~~technology~~ at existing stationary combustion sources to reduce NOx emissions. To optimize their equipment overall, facility owners or operators may also employ other burner and flue gas configurations that would be considered to improve the efficiency of the combustion process. However, these optimization activities would not require construction activities, per se, that would involve construction equipment and related emissions. In addition, of the differing control equipment likely to be installed or modified, past projects involving SCR systems ~~technology~~ installation have been shown to typically generate the greatest amount of construction emissions for an individual project (i.e., potentially significant) and thus, are considered a conservative "worst-case" assumption for the analysis in this SEA. This is especially true when the installation of SCR systems ~~technology~~ is compared to other control technologies such as ultra-low NOx burners, which have much less environmental impacts when installed and operated. Further, when considering the installation of SCR equipment, SCR systems utilize ammonia which may also require the installation of one or more ammonia storage tanks, depending on each affected facility's storage availability. Since ammonia is a chronic and acutely hazardous TAC, the installation of ammonia storage tanks must also be considered when evaluating the overall construction and operational activities.

Table 4-1
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds [a]		
Pollutant	**Construction** [b]	**Operation** [c]
NO_x	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
SO_x	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs), Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 MT/yr CO_2eq for industrial facilities	
Ambient Air Quality Standards for Criteria Pollutants [d]		
NO_2 1-hour average annual arithmetic mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM_{10} 24-hour average annual average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation) 1.0 μg/m^3	
$PM_{2.5}$ 24-hour average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation)	
SO_2 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal – 99th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 μg/m^3 (state)	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day Average Rolling 3-month average	1.5 μg/m^3 (state) 0.15 μg/m^3 (federal)	

[a] Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
[b] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[c] For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
[d] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[e] Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lbs/day = pounds per day ppm = parts per million μg/m^3 = microgram per cubic meter ≥ = greater than or equal to
MT/yr CO_2eq = metric tons per year of CO_2 equivalents > = greater than

Revision: March 2015

Project-Specific Air Quality Impacts During Construction

Construction-related emissions can be distinguished as either onsite or offsite. Onsite emissions generated during construction principally consist of exhaust emissions (NOx, SOx, CO, VOC, PM2.5 and PM10) from heavy-duty construction equipment operation, fugitive dust (primarily as PM10) from disturbed soil, and VOC emissions from asphaltic paving and painting. Offsite emissions during the construction phase normally consist of exhaust emissions and entrained paved road dust (primarily as PM10) from worker commute trips, material delivery trips, and haul truck material trips to and from the construction site. In general, limited construction emissions from site preparation activities, which may include earthmoving/grading, are anticipated because the sites, typically, have already been graded and paved. Further, operators at each affected facility who construct NOx control equipment that utilize chemicals as part of the NOx control equipment operations, such as a new ammonia or storage tank, may also need to build a containment berm large enough to hold 110 percent of the tank capacity in the event of an accidental release, pursuant to U.S. EPA's spill prevention control and countermeasure regulations.

To estimate the "worst-case" construction- and operational-related emissions associated with installing ultra-low NOx burners or SCR systems in order to comply with the NOx emission limits and transition timing in PARs 1146 series and PR 1100, assumptions were made to estimate combustion emissions from construction emissions onsite, off-site on-road emissions from worker trips and deliveries, on-site fugitive dust emissions, and operational emissions.

The original Draft SEA analyzed the impacts from five facilities operating eight boilers each rated at greater than 75 MMBtu per hour (Group I), and these units are not expected to be able to comply with the NOx emission limits because they are not currently equipped with NOx emission control technology. However, after the release of the original Draft SEA for public review and comment, changes were made to the project description after the comment period ended which altered the universe of facilities and the units that may be affected by the proposed project. As an example, in the previous analysis, one facility (previously known as Facility A) had three boilers which have since been decommissioned and have permits that have been inactivated. A subsequent environmental analysis has been conducted based on new information and changes to the project description since the release of the Draft SEA to determine the environmental impacts and ~~is~~ was included in ~~this~~ the Revised Draft SEA. The analysis in the Revised Draft SEA was based on 32 RECLAIM facilities operating 56 boilers that would be retrofitted with SCR systems. However, after the release of the Revised Draft SEA for public review and comment, the number of boilers dropped to 55, but the number of affected RECLAIM facilities remained the same (32 facilities). By analyzing 56 units instead of 55, the analysis conducted in the Revised Draft SEA presents more impacts than what may actually occur. Thus, the reduced number of affected equipment in this Final SEA do not constitute an increase in the severity of an environmental impact.

Of the RECLAIM facilities that will affected by PARs 1146 series and PR 1100, there are 32~~five~~ facilities operating 55 ~~56eight~~ boilers that are each rated greater than 20~~75~~ MMBtu per hour (Group I and Group II) and these boilers currently cannot meet the NOx emission limits of 5 ppm or 7 ppm, respectively, because they are either not equipped with NOx emission control technology or have older SCR systems ~~technology~~ that are not capable of meeting the NOx emission limits. While facilities that do not have NOx emission control technology may first consider employing ultra-low NOx burners to achieve the NOx emission limits for their boilers, steam generators, and process heaters due to the relative ease of installation, operation, control efficiency, and overall

cost when compared to SCR systems ~~technology~~, retrofitting these larger units with ultra-low NOx burners alone may not meet the requirement to achieve the final 100 percent compliance with the NOx emission limits by January 1, 2022. For this reason, the environmental analysis in this SEA assumes that SCR systems ~~technology~~ or new improved SCR systems ~~technology~~ for boilers with existing SCR systems ~~technology~~, will be installed on the larger units, which is expected to result in the "worst-case" emissions. Thus, for the 32~~five~~ facilities operating 55 ~~56eight~~ boilers, ~~eight~~ 55 ~~56~~ SCR systems are assumed to be installed (e.g., one SCR for each boiler).

Ammonia or urea is necessary to operate SCR systems ~~technology~~, and tanks to store these chemicals would also need to be installed. Since SCR systems utilize ammonia in the NOx reduction process, as many as one aqueous ammonia storage tank per SCR installation ~~(i.e., eight ammonia storage tanks)~~ could potentially be installed to support the new SCR systems. Two of the 55 ~~56~~ affected units at RECLAIM facilities currently have SCR systems ~~technology~~ installed with the associated ammonia storage tanks. This analysis assumes that each facility will install one new SCR and one new aqueous ammonia storage tank (e.g., 55 ~~56~~ new SCR units plus 55 ~~56~~ new ammonia tanks would be installed). However, f~~F~~or any operator installing more than one SCR system at one facility, this analysis assumes that only one large aqueous ammonia storage tank would be installed in lieu of multiple, smaller storage tanks, because it is likely and expected the facilities would want to simplify their delivery schedule. For example, several ~~of the~~ RECLAIM facilities have two or three ~~eight~~ boilers that are expected to utilize new SCR systems ~~technology~~, ~~three boilers are located at one facility~~ so it is possible that the facility operator of these~~is~~ facilities~~y~~ would elect to install one larger aqueous ammonia storage tank, in lieu of two or three smaller tanks, to service the two or three SCR systems ~~units~~ to simplify the ammonia delivery schedule. Also by assuming that one larger storage tank would be installed in lieu of multiple smaller storage tanks the impacts of hazards associated with the use and storage of ammonia would represent the "worst-case". The size of each ammonia tank needed to supply ammonia to each of the 55 ~~56eight~~ SCR systems has been estimated to range between 250 and 10,000 gallons in capacity.

Each facility is expected to have sufficient space to install new NOx control equipment or retrofit existing equipment. However, because installation of larger NOx air pollution control equipment may need to occupy the space of previous equipment, demolition activities were assumed to occur prior to the equipment installation to remove any existing equipment or structures (as applicable), remove the old piping and electrical connections, and break up the old foundation with a demolition hammer. For these reasons, digging, earthmoving, grading, slab pouring, or paving activities are anticipated and were analyzed.

The type of construction-related activities attributable to installing new NOx control equipment or retrofitting existing equipment would consist predominantly of deliveries of steel, piping, wiring, chemicals, catalysts, and other materials, and would also involve maneuvering the materials within the site via a variety of off-road equipment such as a crane, forklift et cetera or on-road equipment such as haul trucks, delivery trucks, and passenger vehicles for construction workers. If a new foundation is not needed, to establish footings or structure supports, some concrete cutting and digging may be necessary in order to re-pour new footings prior to building above the existing foundation. Because the affected equipment are operating at existing facilities, the analysis assumes that no more than one acre of area would need to be disturbed at a single facility at a given time. Construction was assumed to consist of four phases: 1) demolition; 2) site preparation; 3) paving; and, 4) installing the NOx control equipment along with supporting devices and structures.

Based on previous analyses of an SCR system installation, the typical equipment that may be needed to complete each construction phase at a single affected facility is presented in Table 4-2.

Table 4-2
Construction Equipment That May Be Needed to Install One SCR system at One Facility

Construction Phase	Off-Road Equipment Type	Amount	Daily Usage Hours
Building Construction	Cranes	1	6
Building Construction	Forklifts	1	6
Building Construction	Generator Sets	1	8
Building Construction	Tractors/Loaders/Backhoes	1	6
Building Construction	Welders	2	8
Building Construction	Aerial Lifts	1	8
Demolition	Concrete/Industrial Saws	1	8
Demolition	Rubber Tired Dozers	1	8
Demolition	Tractors/Loaders/Backhoes	1	8
Demolition	Cranes	1	8
Paving	Cement and Mortar Mixers	1	6
Paving	Paving Equipment	1	8
Paving	Plate Compactors	1	6
Paving	Tractors/Loaders/Backhoes	1	8
Site Preparation	Rubber Tired Dozers	1	7
Site Preparation	Tractors/Loaders/Backhoes	1	8
Site Preparation	Trenchers	1	8

Construction emissions associated with installing one ~~the eight~~ SCR system~~s~~ at one ~~the five~~ facility~~ies~~ were estimated using the California Emission Estimator Model (CalEEMod), version 2016.3.2. To estimate what the impacts would be for installing one SCR system and associated ammonia storage tank, the following general assumptions were made:

- To provide a "worst-case" analysis, each SCR system and associated ammonia storage tank installation will require its own construction crew and equipment. For any facility with multiple boilers, the installation of SCR systems and associated ammonia storage tanks are assumed to occur in sequential order with the same construction crew and equipment in order to avoid all boilers being offline at the same time.
- The four phases are assumed to occur sequentially during a traditional work week (e.g., five days) and each phase is assumed the following number of days: demolition – five days; site preparation – two days; installation of NOx control equipment – 250 days; and paving – five days.
- During the construction, it is expected for each SCR system for each day of each phase the following number of round-trip trips would occur from the off-road equipment: demolition - 15 trips; site preparation – eight trips; installation of NOx control equipment – 18 trips; and paving – 13 trips. In addition, seven vendor trips are estimated to be needed during the installation of the SCR system~~NOx control equipment~~. It was assumed five hauling trips would occur during the Demolition phase.
- Since each facility will need to meet the applicable NOx concentration limit for a minimum of 75 percent of the cumulative total heat input for all Rules 1146 and 1146.1 units by

January 1, 2021, and 100 percent by January 1, 2022, and taking into account the lead time needed to procure contracts, order equipment and obtain SCAQMD permits, construction is expected to begin in 2019 at the earliest. Further, depending on the facility, construction could last from six months to over one year or more if multiple SCR systems will be installed at one facility. The most SCR systems expected to be installed at one facility is fourthree. In order for the facility with four units to meet the compliance deadline, at least three of the four SCR systems would need to be installed at this facility by January 1, 2021. The amount of NOx emission reductions that is expected to be achieved by installing 75 percent of the SCR systems (e.g., 42) by January 1, 2021 represents approximately 0.15 ton per day or 300 pounds per day.

Table 4-3 presents the peak daily emissions from construction activities to install one SCR at one facility. The implementation of PARs 1146 series and PR 1100 would result inOf the 55 56eight affected units at 32 facilities and each unit is assumed to need an SCR system installed.,- Eighteen facilities have more than one unit and thus require more than oneultiple SCR systems are assumed to be installed at two facilities. For these 18two facilities, however, the installations of SCR systems are assumed towill occur sequentially (e.g., one SCR system at a time) in order to avoid all boilers being offline simultaneously and to maintain operations at each facility. Because tThe proposal provides substantial lead time approximately three years (compliance date of January 1, 2022) in order for facilities to take the necessary actions to achieve compliance, construction of each SCR system at the 32five affected facilities couldis not likely to occur on the same day. The construction would likely be staggered amongst the 32five affected facilities, because of the lead time needed to procure contracts, order equipment, and obtain SCAQMD permits prior to beginning construction. Thus, the analysis assumes that not all 32 facilities would begin construction on the exact same day and maintain the exact same schedule. However, but it is possible that some overlap of the construction phases would occur. Table 4-3 presents the peak daily emissions for the construction of one SCR system at one facility. Appendix B contains the CalEEMod output files for the annual, summer, and winter construction emissions for the construction of one SCR system at one facility.

Table 4-3
Peak Daily Emissions from Construction Activities of One SCR System at One Facility

Peak Daily Construction Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Installation of 1 SCR	2.30	17.49	23.04	0.03	6.48	3.95
Significance Threshold for Construction	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

While unlikely, Although it is possible that there could be overlapping construction activities at more than one facility, but it is impossible to predict with any accuracy which construction phases would overlap at which facilities. The analysis assumes that five facilities will undergo construction and that these construction activities will overlap. For this reason, the analysis conservatively assumes that five SCR systems would be constructed or have overlapping construction phases occurring on a peak day. At the time of the original Draft SEA was released for public review and comment, five facilities were assumed to install eight SCR systems. Table

4-4 presents the peak daily emissions if construction occurs simultaneously at each of the five affected facilities.

Table 4-4
Peak Daily Emissions from Construction Activities of Five SCR Systems

Peak Daily Construction Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Installation of 5 SCR~~s~~ Systems (Unmitigated)	11.51	87.46	115.22	0.15	32.42	19.77
Significance Threshold for Construction	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**YES***	**NO**	**NO**	**NO**

* This conclusion of significance does not take into account the concurrent NOx emission reductions that are expected to occur after each SCR system is constructed and becomes operational.

As shown in Table 4-4, the peak daily construction emissions of five SCR systems being installed at five facilities would exceed the SCAQMD's significance threshold for NOx and thus, result in significant adverse air quality impacts. However, since the amount of NOx emission reductions that is expected to be achieved by installing 75 percent of the SCR systems by January 1, 2021 represents approximately 0.15 ton per day or 300 pounds per day, the peak daily construction emissions of five SCR systems being installed at five facilities would be offset by these concurrent emission reductions such that the SCAQMD's significance threshold for NOx would no longer be exceeded. Thus, the construction air quality impacts from installing five SCR systems on a peak day would be at less than significant levels.

However, in ~~this~~ the Revised Draft SEA, the universe of affected facilities increased and the number of new SCR systems to be installed increased from eight to 55 ~~56~~. To adjust for the increased number of affected facilities and corresponding installation of SCR systems, that could potentially have overlapping construction activities, the analysis was adjusted to ~~assume that~~ illustrate the construction of 16 SCR systems ~~could potentially~~ if they were to occur on the same day. As shown in Table 4-5, the peak daily construction emissions of 16 SCR systems being installed at 16 facilities would exceed the SCAQMD's significance threshold for NOx and PM2.5; thus, resulting in significant adverse air quality impacts. However, given the three-year compliance deadline, different phases of construction, length of time needed to construct a SCR system, and option to replace the boiler instead of constructing an SCR system, it is unlikely all 16 units would be constructed on the same peak day. Further is it unlikely that all 16 units would be constructed on the same day for those facilities requiring multiple SCR system installations since the construction of those systems would occur sequentially, not concurrently.

Table 4-5
Peak Daily Emissions from Construction Activities of 16 SCR Systems

Peak Daily Construction Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Installation of 16 SCR Systems (Unmitigated)	36.80	279.84	368.64	0.48	103.68	63.20
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**YES***	**NO**	**NO**	**YES**

* This conclusion of significance does not take into account the concurrent NOx emission reductions that are expected to occur after each SCR system is constructed and becomes operational.

In addition to the installation at RECLAIM facilities of SCR systems for boilers, steam generators, or process heaters rated above 20 ~~75~~ MMBtu per hour (Group I and Group II boilers), the proposed project is expected to result in other facilities installing 93 ~~211~~ ultra-low NOx burners on 93 ~~211~~ boilers, steam generators, or process heaters rated greater than two or less than ~~or equal to~~ 20 ~~75~~ MMBtu per hour (Group III includes Rule 1146 and Rule 1146.1) and thermal fluid heaters in order to meet the applicable NOx emission limit and compliance deadlines. From a construction point of view, the installation of ultra-low NOx burners on these smaller boilers, steam generators and process heaters (i.e., Group II and Group III units), is a relatively straightforward process, especially when compared to the construction activities and equipment needed to retrofit boilers, steam generators, and process heaters rated above 20 ~~75~~ MMBtu per hour with SCR systems. Specifically, operators of affected facilities who choose to replace existing burners with ultra-low NOx burners will first need to pre-order and purchase the appropriate size, style and number of burners, shut down the combustion unit to let it cool, and change out the burners. The burner change out may involve a contractor or vendor to remove the bolts, possibly cut and re-weld metal seals and re-fire the burners for equipment start-up. Burner replacements would most likely entail the use of hand tools. Thus, in general, heavy-duty construction activities or equipment are not anticipated for installing ultra-low NOx burners. Once the ultra-low NOx burners are in place, the combustion equipment can be fired up and can operate with lower NOx emissions. Thus, minimal secondary construction impacts are anticipated from the installation of the majority ultra-low NOx burners. To estimate what the impacts would be for installing ultra-low NOx burners, the following assumptions were made:

- 93 ~~211~~ units will be retrofitted with ultra-low NOx burners, with 75 percent occurring by January 1, 2021 and 100 percent completed by the January 1, 2022.
- To meet the 75 percent compliance date (January 1, 2021), approximately 70 ~~160~~ units would need to be retrofitted with ultra-low NOx burners and at least 35 ~~80~~ would be installed during the first year for (e.g., 2019) and the remainder would be installed during the second year (e.g., 2020). The amount of NOx emission reductions that are expected to be achieved from installing ultra-low NOx burners by January 1, 2021 represents approximately 0.05 ton per day or 100 pounds per day.
- Since up to six months may be needed to assess the equipment, arrange for a vendor or contractor, and permits application; installation of the ultra-low NOx burners and operation will begin in year 2019.
- Per unit, installation of ultra-low NOx burners will take one day.

- For a "worst-case" analysis, 10 units will have ultra-low NOx burners installed within the same day based on similar analysis conducted from the September 2008 Final EA for Rule 1146.
- One contractor/vendor plus one welder per unit will be needed to retrofit the affected equipment with ultra-low NOx burners.

In addition, certain units at non-RECLAIM facilities may defer compliance with the new specified NOx emission limits until the replacement of the unit's burners or 15 years from the date of rule adoption, whichever is earlier. Thermal fluid heaters currently permitted at greater than 20 ppm must meet the NOx emission limit of 12 ppm by January 1, 2022. It is difficult to predict when a unit at a non-RECLAIM facility would incur burner replacement (if sooner than 15 years) and thus, required to meet the new NOx emissions limits, because it is a facility-based decision (e.g., cost, long-term planning, etc.) that is dependent on the status of the unit (e.g., unit operation schedule, unit age, and maintenance of the unit, etc.). Units at non-RECLAIM facilities meet current NOx emission limits. To meet the new NOx emissions limits, units at non-RECLAIM facilities would do so by installing ultra-low NOx burners on units during burner replacement or 15 years from the date of rule adoption, whichever is earlier. Construction emissions for units at non-RECLAIM facilities would be identical to the construction emissions for the affected units at RECLAIM facilities. As stated earlier as a "worst-case" analysis, 10 units would have ultra-low NOx burners installed within the same day based on similar and past analyses. As a conservative estimate, the peak emissions would be in construction Year 2019, because it is the earliest year a unit at a non-RECLAIM facility could be replacing a unit's burner. The lowest emissions from construction would occur if the non-RECLAIM facility installed an ultra-low NOx burner on a unit 15 years later.

Table 4-6~~5~~ summarizes the peak daily construction emissions from retrofitting the affected equipment with ultra-low NOx burners. Appendix B contains the detailed construction estimates and calculations for installing ultra-low NOx burners on the affected equipment.

Table 4-6~~5~~
Peak Daily Construction Emissions from Retrofitting Equipment with Ultra-Low NOx Burners

Peak Construction by Year	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
2019						
Total for 1 unit in one day	0.17	1.24	0.46	0.003	0.05	0.01
Peak Daily Total for 10 units installed in one day	1.70	12.42	4.56	0.03	0.55	0.13
~~Peak Total for 80 units installed in one year~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
2020						
Total for 1 unit in one day	0.16	1.15	0.43	0.0003	0.05	0.01
Peak Daily TOTAL for 10 units installed in one day	1.56	11.52	4.25	0.03	0.52	0.13
~~Peak Total for 80 units installed in one year~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
2021						
Total for 1 unit in one day	0.14	1.09	0.40	0.003	0.05	0.01
Peak Daily Total for 10 units installed in one day	1.44	10.85	3.96	0.03	0.49	0.13
~~Peak Total for 51 units installed in one year~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

As shown in Table 4-6~~5~~, the peak daily construction emissions of retrofitting the equipment with ultra-low NOx burners would not exceed any of the SCAQMD's significance thresholds for one unit on a peak day as well as for 10 units on a peak day for construction years 2019, 2020, and 2021. Of the three construction years, the highest peak daily emissions occur in 2019.

~~Because of the compliance timing in the proposed project; it is unlikely that the c~~Construction of SCR systems ~~technology~~ will overlap the retrofitting of units~~equipment~~ with ultra-low NOx burners. Table 4-7~~6~~ presents a summary of the peak daily construction emissions from the overlapping installations of five SCR systems and ten ultra-low NOx burners.

Table 4-7~~6~~
Peak Daily Construction Emissions from Overlapping Installations of SCR Systems and Ultra-low NOx Burners

Total Peak Daily Construction Emissions^	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Peak Daily Total for Installation of 5 SCR systems (from Table 4-4)	11.51	87.46	115.22	0.15	32.42	19.77
Peak Daily Total for Installation of 10 Ultra-low NOx burners (from Table 4-6~~5~~)	1.70	12.42	4.56	0.03	0.55	0.13
Total for SCR systems and Ultra-Low NOx Burners	13	100	120	0	33	20
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**YES***	**NO**	**NO**	**NO**

^Year 2019 was chosen because it represents the highest emissions of the three construction years.
* This conclusion of significance does not take into account the concurrent NOx emission reductions that are expected to occur after each SCR system and ultra-low NOx burners are constructed and become operational.

As shown in Table 4-7~~6~~, the peak daily construction emissions of concurrently installing five SCR systems being installed at five facilities while also retrofitting 10 units with ultra-low NOx burners would also exceed the SCAQMD's significance threshold for NOx and thus, result in significant adverse air quality impacts during construction.

As presented in Tables 4-3, 4-4, 4-6 and 4-7, the construction air quality impacts can range from less than significant for all criteria air pollutants to significant levels for NOx, depending on the number of equipment under construction on a peak day, and whether the construction activities for multiple equipment overlap on a peak day. For example, while the initial construction of one SCR system would result in a temporary increase in construction emissions, the quantity of emissions would not exceed any of the air quality significance thresholds on a peak day and the same is true for the initial construction of one to 10 ultra-low NOx burners on a peak day. However, under the circumstance where the construction of five SCR systems overlap construction of 10 ultra-low NOx burners, the NOx emissions from these overlapping construction activities are shown to exceed the SCAQMD's significance threshold for NOx. However, these significant impacts will be reduced to less than significant levels by implementation of the proposed project, by design, because a concurrent operational air quality benefit would result due to the overall NOx emissions reductions of 0.20 ton per day (405 pounds per day) that are expected to occur by January 1, 2021, or 0.27 ton per day (540 pounds per day) that are expected to occur by January 1, 2023 as the installation of SCR systems and ultra-low NOx burners occur over time. In particular, the amount of NOx emission reductions that is expected to be achieved by installing 75 percent of the SCR systems (e.g., 42) by January 1, 2021 represents approximately 0.15 ton per day or 300 pounds per day. Similarly, the amount of NOx emission reductions that are expected to be achieved from installing 75 percent of the ultra-low NOx burners (e.g., 70) by January 1, 2021 represents approximately 0.05 ton per day or 100 pounds per day.

Thus, as construction is completed for each SCR system or ultra-low NOx burner, there will be immediate, corresponding NOx emission reductions from the operation of each new SCR system or ultra-low NOx burner, and these NOx emission reductions will continue to accumulate and are expected to substantially offset any significant increase of NOx emissions to less than significant levels in the event that there are overlapping construction activities of five SCR systems and 10 ultra-low NOx burners on a peak day. For these reasons, the construction air quality impacts from implementing the proposed project would be reduced to less than significant levels from concurrent NOx emission reductions.

Rule 1146.2 units

Twenty-nine~~eight~~ out of 32 Rule 1146.2 units currently permitted in the RECLAIM program meet the Rule 1146.2 NOx emission limits. Three~~Four~~ of the~~units~~ 32 units do not meet the NOx emission limits and would require retrofit equipment such as an ultra-low NOx burner or replacement by December 31, 2023 under the proposed rule amendment. The current Rule 1146.2 units at~~in~~ RECLAIM facilities are~~is~~ largely underrepresented. However, RECLAIM facilities with Rule 1146.2 units have until December 31, 2023 to retrofit or replace their equipment. Because the process of retrofitting a boiler with a burner replacement kit on smaller, Rule 1146.2, units is identical to the process of installing ultra-low NOx burners on medium to large units, the construction emissions presented in Table 4-6~~5~~ can also be attributed to the process of retrofitting a boiler with a burner replacement kit. As shown in Table 4-6~~5~~, the peak daily construction emissions from retrofitting equipment with ultra-low NOx burners would not exceed any of the SCAQMD's significance thresholds for one unit on a peak day as well as for 10 units on a peak day for construction years 2019, 2020, and 2021. Of the three construction years, the highest peak daily emissions occur in year 2019 and the emissions decrease each subsequent year. Thus, for any burner replacement kits that are installed on Rule 1146.2 units, less than significant air quality impacts would also be expected.

Complete Replacement of Existing Boilers, Heaters, or Steam Generators

While PARs 1146 series does not require equipment replacement, i~~I~~n lieu of installing SCR systems or retrofitting existing equipment with ultra-low NOx burners, facility operators may consider completely replacing their existing boilers, heaters, or steam generators for reasons including, but not limited to age, high maintenance and operating costs, fuel efficiency issues, and/or the lack of replacement parts. The proposed project contains a provision that will allow any facility operator that commits to replacing Rules 1146 and 1146.1 equipment with new equipment ~~that can achieve the applicable NOx emission limit(s) to continue to operate the existing equipment and defer compliance~~ until January 1, 2023 to achieve the applicable NOx emission limit(s). Because of the deferred compliance option, any replacement would not be expected to overlap the construction activities associated with installing SCR systems and ultra-low NOx burners for equipment subject to Rules 1146 and 1146.1.

~~In addition, certain units at non-RECLAIM facilities may defer compliance with the specified NOx emission limits until the replacement of the unit's burners or 15 years from the date of rule adoption, whichever is earlier. Thermal fluid heaters currently permitted at greater than 20 ppm must meet the NOx emission limit of 12 ppm by January 1, 2022. It is impossible to predict when this would occur for the affected units, because it is a facility-based decision (e.g., cost, long-term planning, etc.) that is dependent on the status of the unit (e.g., unit operation schedule, unit age, and maintenance of the unit, etc.).~~

Should a complete replacement occur, this analysis assumes that a worse-case would be if a large boiler (rated at greater than 75 MMBtu per hour) is replaced because of its large overall footprint. The following assumptions were made for the replacement of a large boiler:

- Before dismantling can occur, the existing boiler would need to be shut down and allowed to cool. The dismantling and demolition process is estimated to take 20 days and then it would take approximately 3,000 hours or 75 days to install a new boiler, which includes five days of site preparation, 65 days of building construction, and five days of paving.
- Eight workers would be needed to install the new boiler.
- The following equipment would be needed to replace the boiler: one cement/mortar mixer; one concrete/industrial saw; one crane; one rubber tired dozer; one tractor/loader/backhoe; and one welder. They would be used eight hours a day, except for the crane which is expected to be used two hours per day for removing the existing boiler and moving the replacement boiler into place.
- The footprint of the existing boiler is assumed to be 1,000 square feet and the facility operator is assumed to replace the unit with equipment of the same size and footprint.
- Once the new replacement unit becomes operational, the NOx emissions are expected to be fewer than the existing unit and the fuel usage of the new unit will use eight to 10 percent less fuel than the existing unit from improved efficiency.
- No additional employees are expected to be needed to operate and maintain the new unit. The operation and maintenance are expected to be similar for the new unit.

Construction emissions associated with removing one large boiler and replacing it with a new unit of comparable size were estimated using CalEEMod version 2016.3.2. Appendix B contains the detailed construction estimates for a large boiler replacement. Table 4-8~~7~~ summarizes the peak daily construction emissions from replacing a large boiler with a new unit.

Table 4-8~~7~~
Peak Daily Construction Emissions from Replacing a Large Boiler

Construction Emissions	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Replacement of One Large Boiler	6.33	44.67	58.31	0.07	8.42	5.77
Significance Threshold	75	550	100	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

As shown in Table 4-8~~7~~, the construction emissions from the replacement of a large boiler (greater than 75 MMBtu per hour) is less than SCAQMD's significance threshold. Any Rule 1146.2 unit operating at a RECLAIM facility would be required to either meet a NOx emission limit of 30 ppm if retrofitted with a burner replacement kit or 20 ppm if the unit is replaced. It is difficult to determine which facilities would choose to replace or retrofit a particular unit since there are a variety of factors to be considered. One factor is the useful life of the equipment since an average boiler is estimated to have a useful life of 25 years; however, some units have been known to run effectively for more than 30 years and many have been in operation for over 40 years. Another

factor is that a larger unit substantial maintenance for the refractory; thus, a facility operator may opt to replace a unit with a smaller unit that is less maintenance-intensive. Some facility operators may also elect to downsize if replacing an old unit with a new unit because the operations have changed over the years or they are seeking to improve operational efficiency. Further, some facility operators may also determine that it is more cost-effective to retrofit a unit rather than replace it. Overall, the decision as whether to replace a unit with a new unit is dependent upon costs, the ability to retrofit the old unit with ultra-low NOx burners, equipment age and size, and the facility's operational needs.

Should a facility operator elect to replace a small boiler (e.g., Rule 1146.2 unit at two MMBtu per hour), in lieu of installing a burner retrofit kit, the construction activities would also be expected to result in fewer emissions than the boiler replacement emissions presented in Table 4-~~8~~7 because the replacement of a smaller unit would require less workers, fewer hours to install, and fewer and smaller heavy-duty equipment. Thus, the construction emissions from replacing a small Rule 1146.2 boiler would also be less than the SCAQMD's significance thresholds.

Construction Mitigation: ~~Except for~~ The analysis shows that the peak daily NOx emissions would ~~, no other criteria pollutant emissions~~ exceed the significant thresholds during construction if there is ~~or more facilities have~~ overlapping construction occurring on a peak day. However, these significant impacts will be reduced to less than significant levels by implementation of the proposed project, by design, because a concurrent operational air quality benefit would result due to the overall NOx emissions reductions. In particular, the incremental amount of NOx emission reductions that is expected to be achieved by installing 75 percent of the SCR systems (e.g., 42) by January 1, 2021 represents approximately 0.15 ton per day or 300 pounds per day. Similarly, the amount of NOx emission reductions that are expected to be achieved from installing 75 percent of the ultra-low NOx burners (e.g., 70) by January 1, 2021 represents approximately 0.05 ton per day or 100 pounds per day. ~~However,~~ Upon full implementation, the proposed project would ~~however~~ result in the overall NOx emissions reductions of 0.20 ~~173~~ ton per day (405 ~~345~~ pounds per day) by January 1, 2021, or ~~0.23~~ 0.27 ton per day (540 ~~460~~ pounds per day) by January 1, 2023. Thus, the analysis indicates that there will be an overall reduction in NOx emissions during construction, because the construction and operational phases will likely overlap. As construction is completed for each SCR system, there will be overall NOx emission reductions from the operation of each SCR system and the same is true for when ultra-low NOx burners are installed. ~~The initial construction of one SCR system would result in an increase in emissions; however, the emissions would not be exceed the significance threshold as seen in Table 4-3. The completion of construction and operation of the first SCR system would result in immediate NOx emission reductions and in effect reduce the peak daily NOx emissions below the significance threshold.~~ Because the net result of concurrent operational NOx emission reductions are offsetting the construction NOx emissions, no significant impacts remain. As such, no construction mitigation is required. Thus, no significant adverse air quality impacts during construction are expected to remain ~~during the construction phase of the SCR systems~~.

Remaining Construction Impacts After Mitigation: The air quality analysis concluded that significant adverse air quality impacts could be created by the proposed project because the construction activities will produce emissions that would exceed the SCAQMD's significant threshold for NOx per day during construction. However, the analysis further indicates that there will be an overall reduction in NOx emission during both construction and operational phases of

the proposed project. Therefore, no significant adverse air quality impacts are expected to remain during the construction of the SCR systems.

Project-Specific Air Quality Impacts During Operation

The incremental amount of NOx emission reductions that is expected to be achieved by installing 75 percent of the SCR systems (e.g., 42) by January 1, 2021 represents approximately 0.15 ton per day or 300 pounds per day. Similarly, the amount of NOx emission reductions that are expected to be achieved from installing 75 percent of the ultra-low NOx burners (e.g., 70) by January 1, 2021 represents approximately 0.05 ton per day or 100 pounds per day. Upon full implementation, t~~T~~he proposed project is expected to result in direct air quality benefits from the reduction of 0.20 ton per day by January 1, 2021 and ~~0.23~~ 0.27 ton per day of NOx emissions by January 1, 2023. Implementation is expected to be achieved by installing ultra-low NOx burners and SCR systems on boilers, steam generators, and process heaters. However, secondary criteria pollutant emissions may be generated as part of operation activities associated with operating and maintaining the air pollution control equipment after it is installed. In particular, the following activities may be sources of secondary criteria pollutant emissions during operation: 1) vehicle trips via heavy-duty for periodic ammonia/urea deliveries for each SCR system installed; 2) vehicle trips via heavy-duty trucks for periodic deliveries of catalyst as well as spent catalyst hauling after the SCR system is installed; and 3) vehicle trips via light-duty trucks for quarterly source testing after each SCR system is installed.

The following assumptions were made about the operation of SCR systems:

- The construction of one ammonia storage tank is assumed to require two one-way truck deliveries of 19 percent aqueous ammonia. Ammonia delivery trucks can deliver approximately 7,000 gallons at any one time.
- Each facility with only one SCR system will have only one ammonia delivery once per month, but the quantity delivered will vary by the size of the storage tank needed. For the facilities that have more than one SCR system that will be installed, it is assumed that the facility will also install one large ammonia storage tank in lieu of multiple smaller storage tanks to save money and space at the facility. ~~(Facility A) that~~ Even with a total of 18 facilities with multiple SCR systems, only one facility would require greater than a 7,000 gallons delivery. At this facility (Facility 6), a 10,000 gallon tank would be required to service all three SCR systems; thus, two ammonia truck deliveries will be needed each month.
- Since the ammonia tanks will be pressurized, no ammonia emissions are expected from filling the storage tanks.
- As a conservative estimate, it is assumed ~~T~~the peak daily trips associated with ammonia/urea deliveries will be one truck per facility ~~per month~~ for all facilities except Facility 6~~A~~ which will have~~be~~ two ammonia delivery trucks ~~per month~~. The delivery distance of one ammonia truck is assumed to be 100 miles round-trip.
- The initial construction of one SCR unit is assumed to require two one-way truck deliveries of catalyst modules. All initial catalyst deliveries are assumed to occur on the same peak day for all the affected facilities. Catalyst modules are expected to be replaced every two to three years. When spent catalyst removal and replacement becomes necessary, two one-

way trucks will be needed to remove the catalyst and two one-way trucks will be needed to deliver the fresh catalyst modules.

- Peak daily trips assume truck trip distances to deliver catalyst would be similar to ammonia and are assumed to be 100 miles round-trip. It is assumed the catalyst delivery vehicles would be similar to the ammonia delivery trucks (heavy-duty).
- No additional employees are anticipated to be needed to operate the new SCR systems because the existing work force per affected facility is expected to be sufficient. As such, no additional emissions from new workers are anticipated from the operation of the new SCR systems.
- ~~Two~~60 RECLAIM facilities installing either SCR systems or ultra-low NOx burners are located within ¼- mile of sensitive receptors (e.g., schools, residences, etc.).
- Facilities with units installing SCR systems would be required to conduct quarterly source testing. It is assumed that each source test would require one gasoline-fueled light duty truck driving approximately 40 miles per day, round trip. As a conservative analysis, each facility has been assumed to conduct one source test on a peak day. Thus, the 32 affected facilities would conduct a source test on the same day.

A summary of the heavy-duty truck trips from ammonia and catalyst deliveries are presented in Table 4-9~~8~~.

Table 4-9~~8~~
Heavy-Duty Truck Trips from Ammonia and Catalyst Deliveries

Heavy-Duty Truck Trips	NH3/Urea Delivery Trips	Catalyst Delivery Trips	Total Trips
Annual	396 ~~72~~	56 ~~8~~	452 ~~80~~
Peak Daily	33 ~~6~~	32 ~~5~~	65 ~~11~~

When taking into account the arrangements that need to be made in order to coordinate with a contractor to conduct the required source tests, and the availability of source test contractors in the District, it is unlikely that all 32 affected facilities will conduct the source tests on the same day. However, to illustrate what the emission effects would be if all 32 facilities conducted the required source testing on the same day; Table 4-10 presents the emissions from 32 light duty trucks employed on a peak day. Although there will be 55 SCR systems that are expected to be installed from the proposed project; it is assumed that a facility would only conduct one source test at a time and in one day. Thus, if all the facilities completed their quarterly source testing for the ammonia emissions limit, a maximum of 224 source tests (and corresponding vehicle round-trips) would occur each year.

Secondary operational emissions from the 32~~five~~ facilities were estimated using EMFAC2017~~4~~ emission factors and are presented in Table 4-10~~9~~. Appendix B contains the detailed emissions calculations from the operational activities from the installation of all of the SCR systems.

Table 4-109
Peak Daily Operational Emissions from all the Facilities ~~Five Facilities~~

Operational Activity	CO (lb/day)	NOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	VOC (lb/day)	SOX (lb/day)
Increased Delivery Trucks (Ammonia and Catalysts)	~~1.55~~ 19.25	~~13.82~~ 30.43	~~78.40~~ 2.18	~~8.18~~ 1.22	~~0.50~~ 4.54	~~0.03~~ 0.12
Source Testing Trucks	5.12	0.43	0.13	0.06	0.54	0.002
TOTAL	**24.37** **~~1.5519.25~~**	**30.86** **~~13.8230.43~~**	**2.31** **~~78.402.18~~**	**1.28** **~~8.181.22~~**	**5.08** **~~0.504.54~~**	**0.12** **~~0.03~~**
Significance Threshold for Operation	550	55	150	55	55	150
Exceed Significance?	**No**	**No**	**No**	**No**	**No**	**No**

As a conservative estimate, Facility 6 ~~A~~ was used as the facility that would have the peak daily number of heavy-duty truck trips that would occur at one year at one facility. If the facility receives two ammonia delivery trucks each month and three catalyst deliveries (assuming each SCR system construction was staggered through the year and would require a catalyst delivery each time a SCR system was completed), the peak daily number of heavy-duty truck trips that may occur in one year at one facility (Facility 6 ~~A~~) is 27. Heavy-duty trucks are prohibited from idling for more than five minutes at any one location as regulated by the Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling[15], but they can move to multiple locations and idle at each location for up to five minutes. Thus, as a conservative analysis, this analysis assumes that the trucks may idle for up to a total of 15 minutes per trip. Therefore, a peak of approximately 6.75 hours of idling may occur at one facility in one year. The CARB emission factor for an idling heavy-duty diesel truck is 1.67 grams per hour of diesel particulate matter (DPM). Therefore, a conservative estimate of 0.025 pound of diesel particulate exhaust per year would be generated at a facility. Based on the Tier III methodology described in the SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1 and 212, Version 8.0 (March 2016), 0.025 pound of DPM per year would generate a health risk of 0.05 in one million, which is less than the significance threshold of an increased probability of 10 cancer cases in one million. Appendix C contains the Tier III risk assessment calculations.

SCR systems reduce NOx emissions by using ammonia, which is considered a TAC. Unreacted ammonia emissions generated from these units are referred to as ammonia slip. Ammonia slip is limited to five ppm through permit conditions for new SCR installations. Based on the November 2015 Final Program Environmental Analysis for Proposed Amended Regulation XX - RECLAIM[16] the concentration at a receptor located 25 meters from a stack would be much less

[15] CARB, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, September 2016. https://www.arb.ca.gov/msprog/truck-idling/13ccr2485_09022016.pdf

[16] SCAQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX -RECLAIM, November 2015. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/regxxfinalpeaplusappendices.pdf

than one percent of the concentration at the release from the exit of the stack. Thus, the peak concentration of ammonia at a receptor located 25 meters from a stack is calculated by assuming a dispersion of one percent. While ammonia does not have an OEHHA approved cancer potency value, it does have non-carcinogenic chronic (200 microgram (µg) per cubic meter) and acute (3,200 µg per cubic meter) reference exposure levels (RELs). Table 4-11~~10~~ summarizes the calculated non-carcinogenic chronic and acute hazard indices for ammonia and compared these values to the respective significance thresholds; both were shown to be less than significant.

Table 4-11~~10~~
Health Risk from the Facilities Using Ammonia

Ammonia Slip Concentration at the Exit of the Stack (ppm)	**Peak Concentration at a Receptor 25 m from the Stack** ($\mu g/m^3$)	**Acute REL** ($\mu g/m^3$)	**Chronic REL** ($\mu g/m^3$)	**Acute Hazard Index**	**Chronic Hazard Index**
5	35	3,200	200	**0.01**	**0.17**
		Significance Threshold		**1.0**	**1.0**
		Exceed Significance?		**NO**	**NO**

Even if multiple SCR systems are installed at one facility, the locations of all the stacks would generally not be situated in the same place within the affected facility's property. For a facility with space limitations and multiple SCR installations, the exhaust would likely be routed to one stack which would still be limited to five ppm ammonia slip. As such, even with multiple SCR system installations, the acute and chronic hazard indices would not be expected to exceed the significance threshold.

PM Impacts from Ammonia Usage

In a SCR system the ammonia is injected into the flue gas stream and reacts with NOx to form elemental nitrogen (N2) and water in the cleaned exhaust gas. A small amount of unreacted ammonia (ammonia slip) may pass through. The SCAQMD through permit conditions limits ammonia slip to five ppm. In the November 2015 Final Program EA for NOx RECLAIM[17], SCAQMD staff conducted a series of regional simulations to determine the impacts of reducing NOx while increasing the potential for creating ammonia slip due to increased use of ammonia needed for the operation of SCR controls. In the analysis, 14 tons per day of NOx emission reductions at RECLAIM facilities were estimated while ammonia slip emissions from the same facilities would increase by 1.63 tons per day. The simulations were run for the 2021 draft baseline emissions inventory to estimate what the impacts would be at full implementation of the 14 tons per day decrease in NOx emissions. The effect of decreasing 14 tons per day of NOx would result in a decrease of annual PM2.5 of approximately 0.7 µg per cubic meter. However, since the usage of ammonia is necessary to achieve the NOx emission reductions (via SCR systems ~~technology~~), the ammonia usage would cause a concurrent increase in annual PM2.5 of approximately 0.6 µg

[17] SCAQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX -RECLAIM, November 2015. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/regxxfinalpeaplusappendices.pdf

per cubic meter. Thus, increasing the amount of ammonia slip would result in a net average 0.1 µg per cubic meter decrease in annual PM2.5. Further, the simulations showed that there would be no change in ozone levels compared to what would occur if there was no increase in ammonia slip. The overall decrease in annual PM2.5 would occur provided that all 14 tons per day of NOx emissions would be reduced, which in turn would reduce PM2.5 emissions overall, even if some PM2.5 emissions are generated from ammonia slip. In summary, the impacts to regional PM2.5 and ozone due to increased ammonia slip in these simulations was concluded to not create a significant adverse impact. Because this proposed project would have substantially less ammonia slip emissions than what was analyzed in the regional simulations. Thus, the impacts to regional PM2.5 and ozone due to increased ammonia slip from the proposed project would not create a significant impact.

Odor Impacts

For the installation of new SCR systems, under normal operating and permitted conditions, ammonia slip emissions will be limited to five ppm in accordance with BACT. Because exhaust gases are hot, any ammonia slip emissions from operating a SCR would be quite buoyant and would rapidly rise to higher altitudes without any possibility of lingering at ground level. The odor threshold of ammonia is one to five ppm, but because of the buoyancy of ammonia emissions combined with an average prevailing wind velocity of six miles per hour in the Basin, it is unlikely that ammonia slip emissions would exceed the odor threshold. In addition, during construction, there will be odors associated with the operation of diesel-fueled construction equipment used to install the SCR systems. All diesel-fueled vehicles that may be utilized during operation activities at the facilities will be required to have a low sulfur content (e.g. 15 ppm by weight or less in accordance with SCAQMD Rule 431.2 - Sulfur Content of Liquid Fuels. The use of diesel-fueled trucks as part of operation activities will not be allowed to idle longer than fifteen minutes onsite, so odors would not be expected. Further, because of the relatively small number of pieces of diesel-fueled equipment operating at any one affected site and because construction will only be short-term, odor impacts are not expected to be significant.

Greenhouse Gas Impacts

Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of GHG emissions in the atmosphere. GHGs trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. The emission of GHGs through the combustion of fossil fuels (i.e., fuels containing carbon) in conjunction with other human activities, appears to be closely associated with global warming. State law defines GHG to include the following: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6) (Health and Safety Code Section 38505(g)). The most common GHG that results from human activity is CO2, followed by CH4 and N2O.

Traditionally, GHGs and other global warming pollutants are perceived as solely global in their impacts and that increasing emissions anywhere in the world contributes to climate change anywhere in the world. A study conducted on the health impacts of CO2 "domes" that form over

urban areas cause increases in local temperatures and local criteria pollutants, which have adverse health effects[18].

The analysis of GHGs is a different analysis than the analysis of criteria pollutants for the following reasons. For criteria pollutants, the significance thresholds are based on daily emissions because attainment or non-attainment is primarily based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short-term exposure effects on human health (e.g., one-hour and eight-hour standards). Since the half-life of CO2 is approximately 100 years, for example, the effects of GHGs occur over a longer term which means they affect the global climate over a relatively long-time frame. As a result, the SCAQMD's current position is to evaluate the effects of GHGs over a longer timeframe than a single day (i.e., annual emissions). GHG emissions are typically considered to be cumulative impacts because they contribute to global climate effects. GHG emission impacts from implementing the proposed project were calculated at the project-specific level during construction and operation. For example, installation of NOx control equipment has the potential to increase the use of electricity, fuel, and water and the generation of wastewater which will in turn increase CO2 emissions.

The SCAQMD convened a "Greenhouse Gas CEQA Significance Threshold Working Group" to consider a variety of benchmarks and potential significance thresholds to evaluate GHG impacts. On December 5, 2008, the SCAQMD adopted an interim CEQA GHG Significance Threshold for projects where SCAQMD is the lead agency (SCAQMD, 2008). This interim threshold is set at 10,000 metric tons of CO2 equivalent emissions (MTCO2eq) per year. The SCAQMD prepared a "Draft Guidance Document – Interim CEQA GHG Significance Thresholds" that outlined the approved tiered approach to determine GHG significance of projects (SCAQMD, 2008, pg. 3-10). The first two tiers involve: 1) exempting the project because of potential reductions of GHG emissions allowed under CEQA; and, 2) demonstrating that the project's GHG emissions are consistent with a local general plan. Tier 3 proposes a limit of 10,000 MTCO2eq per year as the incremental increase representing a significance threshold for projects where SCAQMD is the lead agency (SCAQMD, 2008, pg. 3-11). Tier 4 (performance standards) is yet to be developed. Tier 5 allows offsets that would reduce the GHG impacts to below the Tier 3 brightline threshold. Projects with incremental increases below this threshold will not be cumulatively considerable.

As indicated in Chapter 3, combustion processes generate GHG emissions in addition to criteria pollutants. The following analysis mainly focuses on directly emitted CO2 because this is the primary GHG pollutant emitted during the combustion process and is the GHG pollutant for which emission factors are most readily available. CO2 emissions were estimated from CalEEMod for the SCR systems and EMFAC2014 for the ultra-low NOx burners.

Installation of NOx control equipment as part of implementing the proposed project is expected to generate construction-related CO2 emissions. In addition, based on the type and size of equipment affected by the proposed project, CO2 emissions from the operation of the NOx control equipment are likely to increase from current levels due to using electricity, fuel and water and generating more wastewater. The proposed project will also result in an increase of GHG operational

[18] Jacobsen, Mark Z. "Enhancement of Local Air Pollution by Urban CO2 Domes," Environmental Science and Technology, as describe in Stanford University press release on March 16, 2010 available at: http://news.stanford.edu/news/2010/march/urban-carbon-domes-031610.html

emissions produced from additional truck hauling and deliveries necessary to accommodate the additional solid waste generation and increased use of chemicals and supplies.

For the purposes of addressing the potential GHG impacts of the proposed project, the overall impacts of CO2e emissions from the project were estimated and evaluated from the earliest possible initial implementation of the proposed project with construction beginning in 2019. Once the proposed project is fully implemented, the potential NOx emission reductions would continue through the end of the useful life of the equipment. The analysis estimated CO2e emissions from all sources subject to the proposed project (construction and operation) from the beginning of the proposed project (2019) to the end of the project (January 1, 2022). The beginning of the proposed project was assumed to be no sooner than 2019, since installing NOx control equipment takes considerable advance planning and engineering. The incremental amount of NOx emission reductions that is expected to be achieved by installing 75 percent of the SCR systems (e.g., 42) by January 1, 2021 represents approximately 0.15 ton per day or 300 pounds per day. Similarly, the amount of NOx emission reductions that are expected to be achieved from installing 75 percent of the ultra-low NOx burners (e.g., 70) by January 1, 2021 represents approximately 0.05 ton per day or 100 pounds per day. Upon full implementation, t~~T~~he proposed project is expected to achieve 0.20 ton per day by January 1, 2021 and ~~0.23~~ 0.27 ton per day of the NOx emission reduction, such that any installed or modified NOx controls could be constructed and operational by December 31, 2023. Thus, once construction is complete and the equipment is operational, CO2e emissions will remain constant.

Table 4-12~~11~~ summarizes the GHG emissions during the construction of the ultra-low NOx burners. The peak total for 35 ~~80~~ units installing ultra-low NOx burners in one year is approximately five~~12~~ amortized metric tons per year (MT/year). The significance threshold is not exceeded for the construction of ultra-low NOx burners.

Table 4-12~~11~~
GHG Emissions During Construction of Ultra-Low NOx Burners

Peak Construction by Year	CO2 (lbs/day)	CO2 (lbs/yr)	CO2 (MT/yr)
2019			
Total for 1 unit in one day	329.54	n/a	n/a
Peak Daily Total for 10 units installed in one day	3295.39	n/a	n/a
Peak Total for 35~~80~~ units installed in one year	n/a	11,533.85 ~~26363.08~~	5.23 ~~11.96~~
Significance Threshold	n/a	n/a	10,000
Exceed Significance?	**n/a**	**n/a**	**NO**

As summarized in Table 4-13~~12~~, GHG emissions from the installation of SCR systems and ultra-low NOx burners were quantified by applying the same assumptions used to quantify the criteria pollutant emissions. The only exception is that the construction GHG emissions were amortized over a 30-year project life in accordance with the guidance provided in the Interim CEQA GHG

Significance Threshold for Stationary Sources, Rules and Plans[19] that was adopted by the SCAQMD Governing Board in December 2008.

Approximately 522 ~~75~~ amortized[20] MT/year of GHGs (as carbon dioxide equivalent emissions or CO2e) from the 55 ~~56~~ ~~eight~~ SCR systems and five ~~12~~ amortized MT/year from the ultra-low NOx burners would be generated from construction that may occur at the affected facilities in response to implementing the proposed project. Similarly, approximately 434~~40~~ ~~nine~~ MT/year of GHG emissions would be generated from operation-related activities (e.g., truck trips) that may occur at the facilities in response to implementing the proposed project. In total, 570~~567~~ ~~96~~ MT/year of GHG emissions would be generated by construction and operation activities from the proposed project. The total amount of GHG emissions that may be generated from operation activities at all affected non-refinery facilities is less than the GHG significance threshold of 10,000 MT/year. Table 4-13~~12~~ summarizes the GHG emissions from PARs 1146 series and PR 1100.

Table 4-13~~12~~
GHG Emissions from the Proposed Project

Activity	CO2e (MT/year[a])
Construction[b]	527 ~~87~~
Operation	434~~0 9~~
Total Project Emissions	570 ~~567~~ ~~96~~
Significance Threshold	10,000
Exceed Significance?	**No**

Note:
a. 1 metric ton =2,205 pounds
b. GHGs from short-term construction activities are amortized over 30 years
c. After the release of the Revised Draft SEA, the number of SCR systems to be installed has reduced from 56 to 55.

It is important to note that none of the affected facilities individually exceed the industrial GHG significance threshold of 10,000 MT/day. As shown in Tables 4-12~~11~~ and 4-13~~12~~, the proposed project is expected to generate construction-related CO2 emissions, and specifically~~as shown~~ in Table 4-13~~12,~~ the operational phase of the proposed project is also expected to generate additional GHG emissions. When added together, however, the GHGs do not exceed the significance threshold; thus, no adverse significant GHG cumulative impacts are expected from the implementing the proposed project.

[19] Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans, http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf?sfvrsn=2

[20] To amortize GHGs from temporary construction activities over a 30-year period (*est. life of the project/ equipment*), the amount of CO2e emissions during construction are calculated and then divided by 30.

HAZARDS AND HAZARDOUS MATERIALS IMPACTS

Significance Criteria

The impacts associated with hazards and hazardous materials will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

PROJECT-SPECIFIC IMPACTS - HAZARD ANALYSIS:

The hazards and hazardous materials analysis for the proposed project focuses on the transport, storage, and handling of aqueous ammonia used in the SCR system process. To minimize the hazards associated with using aqueous ammonia, it is the policy of the SCAQMD to require the use of 19 percent by volume aqueous ammonia in air pollution control equipment for the following reasons: 1) 19 percent aqueous ammonia does not travel as a dense gas like anhydrous ammonia; and 2) 19 percent aqueous ammonia is not on any acutely hazardous materials lists unlike anhydrous ammonia or aqueous ammonia at higher percentages. As such, SCAQMD staff does not issue permits for the use of anhydrous ammonia or aqueous ammonia in concentrations higher than 19 percent by volume for use in SCR systems. As a result, this analysis focuses on the use of 19 percent by volume aqueous ammonia. The only exception to this assumption is the scenario analyzed under the "Ammonia Gas Release" subsection.

Some~~Two~~ of the affected facilities are located within 1,000 feet or one-quarter mile of a sensitive receptor, including individuals at hospitals, nursing facilities, daycare centers, schools, and elderly intensive care facilities, as well as residential and off-site occupational areas. Therefore, the potential for adversely significant impacts from hazardous emissions onsite or the handling of acutely hazardous materials, substances and wastes on sensitive receptors is expected from the proposed project as further explained in the following discussion.

The facilities affected by the proposed project are expected to be located within urbanized industrial or commercial/mixed use areas. Some are located within two miles of an airport as noted in Appendix D. Some sites affected by the proposed project may also be identified on lists compiled by the California DTSC per Government Code Section 65962.5. They are also identified in Appendix D. The proposed project is not expected to interfere with existing hazardous waste management programs since facilities handling hazardous waste would be expected to continue to manage any and all hazardous materials and hazardous waste, in accordance with applicable federal, state, and local rules and regulations.

The analysis of hazard impacts can rely on information from past similar projects (i.e., installing new, or retrofitting existing equipment with an SCR system to comply with SCAQMD rules and regulations and installation of associated ammonia storage tanks) where the SCAQMD was the

lead agency responsible for preparing an environmental analysis pursuant to CEQA. To the extent that future projects to install SCR and associated ammonia storage equipment conform to the ammonia hazard analysis in this SEA, no further hazard analysis may be necessary. If site-specific characteristics are involved with future SCR projects that are outside the scope of this analysis, further ammonia hazards analysis may be warranted.

The onsite storage and handling of the ammonia creates the possibility of an accidental spill and release of aqueous ammonia, which could evaporate and present a potential offsite public and sensitive receptor exposure. Since ammonia is not typically considered to be a flammable compound, other types of heat-related hazard impacts such as fires, explosions, boiling liquid – expanding vapor explosion (BLEVE) are not expected to occur and, therefore, will not be evaluated as part of this hazards analysis. To further evaluate the potential for significant adverse environmental impacts due to an accidental release of aqueous ammonia, various scenarios were evaluated that could occur during the onsite storage, transportation, and transfer of ammonia. These scenarios and their consequences are discussed in detail below.

Hazard Safety Regulations

In spite of implementing modifications to comply with the proposed project, operators of each affected facility must comply or continue to comply with various regulations, including OSHA regulations (29 CFR Part 1910) that require the preparation of a fire prevention plan, and 20 CFR Part 1910 and CCR Title 8 that require prevention programs to protect workers who handle toxic, flammable, reactive, or explosive materials. In addition, Section 112 (r) of the Federal Clean Air Act Amendments of 1990 [42 USC 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop RMPs to prevent accidental releases of these substances. If any of the affected facilities has already prepared an RMP, it may need to be revised to incorporate the changes associated with the proposed project. The Hazardous Materials Transportation Act is the federal legislation that regulates transportation of hazardous materials.

Because operators of affected facilities are required to comply with all applicable design codes and regulations, conform to National Fire Protection Association standards, and conform to policies and procedures concerning leak detection containment and fire protection, no significant adverse compliance impacts are expected.

Impacts on Water Quality

A spill of any hazardous material such as aqueous ammonia that is used and stored at any of the affected facilities could occur under upset conditions such as an earthquake, tank rupture, or tank overflow. Spills could also occur from corrosion of containers, piping and process equipment; and leaks from seals or gaskets at pumps and flanges. A major earthquake would be a potential cause of a large spill. Other causes could include human or mechanical error. Construction of the vessels and foundations in accordance with the Uniform Building Code Zone 4 requirements helps structures to resist major earthquakes without collapse, but may result in some structural and non-structural damage following a major earthquake. Any facility with storage tanks on-site are currently required to have emergency spill containment equipment and would implement spill control measures in the event of an earthquake. Storage tanks typically have secondary containment such as a berm which would be capable of containing 110 percent of the contents of the storage tanks. Therefore, should a rupture occur, the contents of the tank would be collected within the containment system and pumped to an appropriate storage tank.

Spills at the affected facilities would generally be collected within containment areas. Large spills outside of containment areas at the affected facilities are expected to be captured by the process water system where they could be collected and controlled. Spilled material would be collected and pumped to an appropriate tank or sent off-site if the materials cannot be used on-site. Because of the containment system design, spills are not expected to migrate from the spill site and as such, potential adverse water quality hazard impacts are considered to be less than significant.

Transportation Release

It is expected that the affected facilities utilizing SCR systems ~~technology~~ will receive ammonia from a local ammonia supplier located in the greater Los Angeles area. Deliveries of aqueous ammonia would be made by tanker truck via public roads. The maximum capacity of an ammonia tanker truck is approximately 7,000 gallons. The projections for future ammonia use and storage as calculated relative to the quantity of NOx emission reductions needed to meet the NOx emission limits for PARs 1146 series and PR 1100 are shown in Appendix E. The "worst-case" assumption for delivery frequency from a supplier would be to deliver two ammonia tanker trucks on the same day to fill one 10,000-gallon tank of ammonia at a facility (Facility 6~~A~~). The "worst-case" for PARs 1146 series and PR 1100 involve a lower number of deliveries of ammonia on any given day (Scenario 1) or a lesser amount of ammonia (Scenario 2) than what is analyzed in the following Transportation Release Scenarios. For both scenarios, the potential impacts from transportation release are expected to be less than significant. Regulations for the transport of hazardous materials by public highway are described in 49 CFR §§ 173 and 177.

Transportation Release Scenario 1:

To evaluate the hazard impacts from an accidental release of ammonia during ammonia transport, this analysis uses as a surrogate the project at the ConocoPhillips Carson Refinery in which SCR system was installed on boiler #10 and an associated 10,000 gallon ammonia storage tank was constructed (Final Negative Declaration for: ConocoPhillips Los Angeles Refinery Carson Plant SCR Unit Project, SCH. No. 2004011066, SCAQMD 2004). This project required approximately six additional ammonia truck transport trips per month. Although truck transport of aqueous ammonia and other hazardous materials is regulated for safety by the U.S. Department of Transportation, there is a possibility that a tanker truck could be involved in an accident that would cause its contents to spill. The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, driver training, and weather. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality.

Every time hazardous materials are moved from the site of generation, opportunities are provided for an accidental (unintentional) release. A study conducted by the EPA indicates that the expected number of hazardous materials spills per mile shipped ranges from one in 100 million to one in one million, depending on the type of road and transport vehicle used. The U.S. EPA analyzed accident and traffic volume data from New Jersey, California, and Texas, using the Resource Conservation and Recovery Act Risk/Cost Analysis Model and calculated the accident involvement rates presented in Table 4-14~~13~~. This information was summarized from the Los Angeles County Hazardous Waste Management Plan (Los Angeles County, 1988).

In the study completed by the U.S. EPA, cylinders, cans, glass, plastic, fiber boxes, tanks, metal drum/parts, and open metal containers were identified as usual container types. For each container type, the expected fractional release en route was calculated. The study concluded that the release rate for tank trucks is much lower than for any other container type (Los Angeles County, 1988).

Table 4-1~~4~~3
Truck Accident Rates for Cargo on Highways

Highway Type	Accidents Per 1,000,000 miles
Interstate	0.13
U.S. and State Highways	0.45
Urban Roadways	0.73
Composite*	0.28

Source: Environmental Protection Agency, 1984.
*Note: Average number for transport on interstates, highways, and urban roadways.

The accident rates developed based on transportation in California were used to predict the accident rate associated with trucks transporting aqueous ammonia to the facility. Assuming an average truck accident rate of 0.28 accidents per million miles traveled (Los Angeles County, 1988), the estimated accident rate associated with transporting aqueous ammonia for the ConocoPhillips project is 0.00101, or about one accident every 992 years.

The actual occurrence of an accidental release of a hazardous material cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and sensitive populations into account.

The hazards associated with the transport of regulated hazardous materials (CCR Title 19, Division 2, Chapter 4.5 or the California Accidental Release Prevention Program requirements), including aqueous ammonia, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount transported, wind speed, ambient temperatures, route traveled, distance to sensitive receptors are considered when determining the consequence of a hazardous material spill.

In the unlikely event that the tanker truck would rupture and release the entire 7,000 gallons of aqueous ammonia, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a road accident, the roads are usually graded and channeled to prevent water accumulation and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent evaporative emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. In a typical release scenario, because of the characteristics of most roadways, the pooling effect on an impervious surface would not typically occur. As a result, the spilled ammonia would not be expected to evaporate into a toxic cloud at concentrations that could significantly adversely affect residences or other sensitive receptors in the area of the spill.

Based on the low probability of an ammonia tanker truck accident with a major release and the potential for exposure to low concentrations, if any, the conclusion of this analysis is that potential impacts due to accidental release of ammonia during this transportation scenario are less than significant.

Transportation Release Scenario 2:
This transportation release scenario uses as a surrogate analysis a project at the BP Carson refinery in which SCR system was retrofitted onto an existing fluid catalytic cracking unit (FCCU) and an associated 12,660 gallon ammonia storage tank was constructed (Final Negative Declaration for: BP Carson Refinery Fluid Catalytic Cracking Unit NOx Reduction Project: SCH No. 2002021068; SCAQMD, 2002). The following summarizes the ammonia transport analysis for the BP Carson Refinery FCCU project.

The temperature of the ammonia released was estimated as follows. For a delivery truck traveling from a non-desert area and taking into consideration the convective heat transfer from the tanker as it travels at highway speeds, the bulk temperature should be typical of the originating location (July average temperatures for Los Angeles, with no convective heat losses, would typically be 69 degrees Fahrenheit (°F)). To be conservative for purpose of this analysis, the tanker bulk temperature was assumed to be 77 °F.

The proposed project was estimated to require approximately 35 tanker truck deliveries of aqueous ammonia during the first year of operation (two deliveries after construction to fill the tank plus one delivery every 11 days to replenish the tank during operations). Truck accident rates are approximately one in 8.7-million miles (ENSR, 1994). Based upon the projected 35 ammonia deliveries the first year, and a distance of 30 miles from the supplier to the facility, the number of truck-miles associated with the transport of aqueous ammonia is 1,050 truck-miles per year. The expected number of truck accidents associated with the proposed BP Carson project is therefore approximately once every 8,300 years. The likelihood of any release in a transportation accident is 1 in 10, and that of a large release in a transportation accident is 1 in 40 (ENSR, 1994). The likelihood of a major transportation release after the project is constructed is therefore approximately once per 330,000 years (8,300 times 40). The probability of a transportation accident that would pose a significant risk to the public is therefore insignificant.

In the unlikely event that a major release occurred during a tanker truck accident, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. Roads are usually graded and channeled to prevent water accumulation, and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. Without this pooling effect on an impervious surface, the spilled ammonia would not evaporate into a toxic cloud and impact residences or other sensitive receptors in the area of the spill. Therefore, potential impacts due to accidental release of ammonia during this transportation scenario are less than significant.

Ammonia Tank Rupture
To analyze the effects of aqueous ammonia as a result of an accidental release due to tank rupture, a Consequence Analysis using the EPA RMP*Comp (Version 1.07) is typically performed. SCAQMD staff estimated that the largest aqueous ammonia tank that would be installed as a result

of implementing PARs 1146 series would be 10,000 gallons at one facility. The affected facilities were estimated to need anywhere from 250 to 10,0002,000-gallon tanks. TwoTwenty-eight facilities- would install a SCR system and thus need an ammonia storage tank(Facility A and E) are located within a ¼-mile of sensitive receptors. Of the 32 RECLAIM facilities that would install a SCR system, one facilityFacility A would require the installation of fourthree SCR systems, four facilities would require the installation of three SCR systems, 13 facilities would require the installation of two SCR systems per facility, and the rest would only install one SCR system per facility. and Facility E would require two SCR systems. It was assumed that these facilities would each store one large aqueous ammonia storage tank to service all of their SCR systems.

Table 4-15
Number of SCR Systems and Affected Facilities

	Number of SCR Systems to be Installed at Each Facility	Number of Affected Facilities
	4	1
	3	4
	2	13
	1	14
Total	***56****	***32***

* After the release of the Revised Draft SEA, the number of SCR systems to be installed has reduced from 56 to 55.

Although it is SCAQMD policy to reduce potential hazards associated with ammonia by requiring a permit condition that limits the aqueous ammonia concentration to 19 percent, the CalARP model only has the capability of evaluating the hazard potential of 20 percent aqueous ammonia. Therefore, the potential adverse impacts from aqueous ammonia were evaluated based on the 20 percent aqueous ammonia. Further, since it is assumed that an aqueous ammonia tank servicing one or more SCR systems would need to be relatively near to the existing equipment, the toxic endpoint for aqueous ammonia from a catastrophic failure of a storage tank would significantly adversely affect the sensitive receptors within 0.1 mile of the existing equipment.

A hazard analysis is dependent on knowing the exact location of the hazard within the site (e.g., location of the ammonia storage tank(s)), meteorological conditions, location of the receptor, et cetera, a site-specific hazard analysis is difficult to conduct without this information. Since SCAQMD staff does not currently know the exact location of the ammonia storage tanks that would be installed in the future, to estimate a worst-case analysis, the following assumptions were made for Facility A and E:

- Location of tanks: Within same building as existing boilers; building located at edge of property line, near (i.e., less than ¼-mile) existing residences or sensitive receptors
- Quantity Released of Aqueous Ammonia: 10,000 gallons at Facility A; and 2,000 gallons at Facility E
- Liquid Temperature: 77 °F
- Mitigation Measures: None

Appendix E shows t~~T~~he estimated distance to the toxic endpoint for each facility using the estimated tank size needed for enough aqueous ammonia to reduce the facility's emissions to the NOx limits. ~~: 1) Facility A is 0.6 miles or 3,168 feet; and 2) Facility E is 0.2 miles or 1,056 feet. Since the~~Thirteen RECLAIM facilities have sensitive receptors that are located directly across or adjacent to the facilities within the toxic endpoint distance;~~,~~ thus, the hazards and hazardous materials impacts due to tank rupture will be potentially significant. In addition, if mitigation measures (e.g.,~~such as~~ a secondary containment (dikes and/or berms), installation of grating-covered trench around the perimeter, and tertiary containment)~~an enclosure~~ were to occur, the toxic endpoint distance for ~~both Facilities A and E~~some facilities would be less than 0.1 miles or 528 feet and the hazards and hazardous materials impacts would continue to be potentially significant due to the vicinity of the sensitive receptors relative to the location of the affected equipment. Therefore, the proposed project has the potential to generate significant adverse hazard impacts as a result of the potential for accidental releases of aqueous ammonia.

If significant adverse environmental impacts are identified in a CEQA document, the CEQA document shall describe feasible measures that could minimize the impacts of the proposed project.

PROJECT-SPECIFIC IMPACTS – CONCLUSION: Based on the preceding description of hazards and hazardous materials impacts, the proposed project is not expected to generate significant adverse impacts related to the transport of ammonia. However, because some of the affected facilities ~~(Facilities A and E)~~ are located within ¼-mile of a sensitive receptor, implementation of the proposed project is expected to generate significant adverse impacts related to the potential for a rupture of an aqueous ammonia storage tank. The overall conclusion is that hazards and hazardous materials impacts for the proposed project are significant.

PROJECT-SPECIFIC MITIGATION MEASURES:

Facilities retrofitting units with SCR systems and the accompanying ammonia storage tank will need to submit permit applications to modify their equipment. Thus, SCAQMD staff will conduct a CEQA evaluation of the facility-specific project to determine if the project is covered by the analysis in this Final ~~Revised Draft~~ SEA. If significant adverse environmental impacts are identified in a CEQA document, the CEQA document shall describe feasible measures that could minimize the significant adverse impacts (CEQA Guidelines Section 15126.4). Therefore, feasible mitigation measures to reduce the risk of an offsite consequence to nearby sensitive receptors are necessary.

The following mitigation measures are required for any facility whose operators choose to install a new aqueous ammonia storage tank and the offsite consequence analysis indicates that sensitive receptors will be located within the toxic endpoint distance. In addition, these mitigation measures will be included in a mitigation monitoring and reporting plan as part of issuing SCAQMD permits to construct for the facility-specific project. These mitigation measures will be enforceable by SCAQMD personnel.

HZ-1 Require the use of aqueous ammonia at concentrations less than~~20~~ or equal to 19 percent by volume for all facilities regulated by Rules 1146, 1146.1, or 1146.2.

HZ-2 Install safety devices, including but not limited to: continuous tank level monitors (e.g., high and low level), temperature and pressure monitors, leak monitoring and detection system, alarms, check valves, and emergency block valves.

HZ-3 Install secondary containment such as dikes and/or berms to capture 110 percent or more of the storage tank volume in the event of a spill.

HZ-4 Install a grating-covered trench around the perimeter of the delivery bay to passively contain potential spills from the tanker truck during the transfer of aqueous ammonia from the delivery truck to the storage tank.

HZ-5 Equip the truck loading/unloading area with an underground gravity drain that flows to a large on-site retention basin to provide sufficient ammonia dilution to the extent that no hazards impact is possible in the event of an accidental release during transfer of aqueous ammonia.

HZ-6 Install tertiary containment that is capable of evacuating 110 percent or more of the storage tank volume from the secondary containment area.

Implementing Mitigation Measures HZ-1 through HZ-6 would be expected to prevent a catastrophic release of ammonia from leaving the facility property and exposing offsite sensitive receptors; however, as an abundance of caution, due to the anticipated number of affected facilities and without detailed information specific to each facility's layout and plan of action for compliance, the overall conclusion is that hazards and hazardous materials impacts for the proposed project are significant.

~~The following mitigation measures are recommended.~~
~~It is SCAQMD policy to require the use of 19 percent aqueous ammonia instead of a higher aqueous ammonia concentration or anhydrous ammonia to reduce adverse impacts from SCR units.~~
~~Install secondary containment (e.g., berms), valves that fail shut, emergency release valves and barriers around the aqueous ammonia storage tanks. These design measures can be used to prevent physical damage to storage tanks or limit the release of aqueous ammonia storage tanks. These techniques are also typically required by local fire departments.~~
~~Conduct integrity testing of aqueous ammonia storage tanks to assist in preventing failure from structural problems.~~
~~Build a containment system to be used during off-loading operations.~~

REMAINING IMPACTS: Although the aforementioned mitigation measures, if employed, would reduce the hazards and hazardous materials impacts from aqueous ammonia, they are not expected to reduce impacts to less than significant. Therefore, the remaining hazardous and hazardous materials impacts from exposure to the ERPG 2 level of 0.14 mg/l of aqueous ammonia due to tank rupture are considered to be significant after mitigation.

CUMULATIVE IMPACTS: As noted in previous discussions, the accidental release of aqueous ammonia during transport is not expected to result in exposures to ammonia exceeding the ERPG 2 level. However, because the sensitive receptors are closer than 0.1 mile ~~to Facilities A and E~~for several facilities, an accidental release of ammonia onsite, either during unloading from a truck or

an accidental release in the event of storage tank failure is considered significant. Mitigation measures were identified, but it was concluded that they could not reduce hazard impacts from project-specific releases of ammonia to less than significant.

Adverse impacts from an accidental release of aqueous ammonia are localized impacts (i.e., the impacts are isolated to the area around the affected facility). There are twoNone of the affected facilities that have been identified as potentiallyare installing SCR systems and ammonia storage tanks in accordance with the proposed project are located within one mile of each other. The worst-case aqueous ammonia toxic endpoint is less than or equal to 0.1 mile. for Facilities A and E. Since twonone of the facilities that would install SCR system(s) are within one mile of each other, someno receptors cwould be affected by accidents at multiple facilities depending on the location of the accident. However, to the extent that affected facilities are located near other facilities that have hazardous materials risks, the cumulative adverse hazard impacts from this project could contribute to existing nearby hazard risks from other projects. Therefore, cumulative hazard risks from implementing the proposed project are considered to be significant.

CUMULATIVE IMPACT MITIGATION: Because the project-specific hazards and hazardous materials impacts are considered to be cumulatively considerable for ammonia storage, cumulative mitigation measures for hazards and hazardous materials impacts for ammonia storage are required. However, since no mitigation measures have been identified over and above the extensive safety regulations that currently apply to the storage of ammonia, no feasible cumulative mitigation measures for ammonia storage have been identified that would reduce cumulative impacts from hazards and hazardous materials to less than significant. Therefore, cumulative hazards and hazardous materials impacts remain significant; however, because no additional mitigation measures were identified no cumulative mitigation measures for hazards and hazardous materials impacts for ammonia use and storage are required.

CUMULATIVE ENVIRONMENTAL IMPACTS

CEQA Guidelines Section 15130(a) requires a discussion of cumulative impacts if a project may have an effect that is potentially cumulatively considerable, as defined in CEQA Guidelines Section 15065(a)(3). The preceding analysis concluded the cumulative secondary impacts associated with the NOx emissions limits and compliance dates as contained in PARs 1146 series and PR 1100 will have the potential for creating significant adverse air quality impacts during construction for NOx, because the SCAQMD's significance threshold for NOx will be exceeded (see Tables 4-4 and 4-76). It should be noted, however, that even though the NOx emissions during construction have been shown to exceed the significance threshold, because the proposed project reduces NOx emissions at greater levels than the increases during construction, the net effect of the proposed project will result in overall emission reductions of NOx. In addition, the construction impacts will be temporary (for approximately one year and the overall NOx emissions will be reduced during the construction and operation overlap. To achieve NOx emission reductions in the proposed project, SCR systems would need to be constructed and ultra-low NOx burners would need to be installed. Further, because of the proposed project's overall NOx emission reductions, the temporary emission increases in NOx during construction will not interfere with the air quality progress and attainment demonstration projected in the 2016 AQMP. Based on regional modeling analyses performed for the 2016 AQMP, implementing control measures contained in the 2016 AQMP, in addition to the air quality benefits of the existing rules, is anticipated to bring the District into attainment with all national and most state ambient air quality standards. In particular, the federal annual PM2.5 standards are predicted to be achieved

in 2023 with implementation of the proposed ozone strategy and the California annual PM2.5 standard will be achieved in 2025. The 2016 AQMP is also expected to achieve the ozone 8-hour standard by 2023.

Per CEQA Guidelines Section 15130(e), previously approved land use documents, including, but not limited to, general plans, specific plants, regional transportation plans, plans for the reduction of greenhouse gas emissions, and local coastal plans may be used in a cumulative impact analysis. A pertinent discussion of cumulative impacts contained in one or more previously certified EIRs may be incorporated by reference pursuant to the provisions for tiering and program EIRs. No further cumulative impacts analysis is required when a project is consistent with a general, specific, master, or comparable programmatic plan where the lead agency determines that the regional or areawide cumulative impacts of the proposed project have already been adequately addressed, as defined in CEQA Guidelines Section 15152(f), in a certified EIR for that plan. Further, if a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact, as provided in CEQA Guidelines Section 15183(j).

As a result, even if the proposed project would have significant increases in NOx emissions during construction, full implementation of the proposed project would achieve NOx emission reductions capable of offsetting the construction NOx emissions. Also, implementation of other control measures in the 2016 AQMP will provide human health benefits by reducing population exposures to existing NOx emissions. Therefore, cumulative air quality impacts from the proposed project, previous amendments, and all other AQMP control measures considered together, are not expected to be significant because implementation of all 2016 AQMP control measures is expected to result in net emission reductions and overall air quality improvement. This determination is consistent with the conclusion in the 2016 AQMP Final Program EIR that cumulative air quality impacts from all AQMP control measures are not expected to be significant[21]. Therefore, there will be no significant cumulative adverse operational air quality impacts from implementing the proposed project.

In addition, there is a potential for creating significant adverse hazards and hazardous materials impacts from the catastrophic failure of an ammonia storage tank, which has been based on the toxic endpoint (using EPA RMP*Comp) and the proximity of some facilities~~ A and E~~ to nearby sensitive receptors. Because the project-specific hazards and hazardous materials impacts for ammonia deliveries would potentially create significant impacts, they are considered to be cumulatively considerable pursuant to CEQA Guidelines Section15064 (h)(1) and therefore, generate significant adverse cumulative hazards and hazardous materials impacts. However, for ammonia use and storage, the project-specific hazards and hazardous materials impacts do not exceed any applicable significance thresholds; thus, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines Section 15064 (h)(1) and therefore, do not generate significant adverse cumulative hazards and hazardous materials impacts.

[21] SCAQMD, Final Program Environmental Impact Report for the 2016 Air Quality Management Plan, March 2017; see Attachment D, Chapter 5, pp. 5-7 to 5-9. http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2017/2017-mar3-035.pdf.

POTENTIONAL ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

Because this SEA is a subsequent CEQA document to the September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP, this SEA relies on the conclusions reached in these documents as evidence for environmental areas where impacts were found not to be significant. All of these previous CEQA documents reviewed approximately 17 environmental topic areas and analyzed whether the respective projects would create potentially significant adverse impacts. While the analyses in the September 2008 Final EA for 1146.1 and May 2006 Final EA for Rule 1146.2 identified no significant adverse environmental impacts for any environmental topic area, the analysis in the September 2008 Final EA for Rule 1146 identified two environmental topic areas as having significant adverse environmental impacts: 1) air quality; and 2) hazards and hazardous materials.

Also, the analysis in the March 2017 Final Program EIR for the 2016 AQMP concluded that significant and unavoidable adverse environmental impacts from the project are expected to occur after implementing mitigation measures for the following environmental topic areas: 1) aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships; 2) construction air quality and GHGs; 3) energy (due to increased electricity demand); 4) hazards and hazardous materials due to: (a) increased flammability of solvents; (b) storage, accidental release and transportation of ammonia; (c) storage and transportation of liquefied natural gas (LNG); and (d) proximity to schools; 5) hydrology (water demand); 6) construction noise and vibration; 7) solid construction waste and operational waste from vehicle and equipment scrapping; and, 8) transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors. It is important to note, however, that for these environmental topic areas, not all of the conclusions of significance are applicable to this currently proposed project, PARs 1146 series and PR 1100. Table 4-16~~14~~ summarizes the eight significant and unavoidable adverse environmental impacts identified in the March 2017 Final Program EIR and identifies which apply to the proposed project, PARs 1146 series and PR 1100.

Table 4-16~~14~~
Applicability of Significant Impacts in March 2017 Final Program EIR to Proposed Project

Conclusion of Significant Impacts in March 2017 Final Program EIR	Applicable to/Significant for the Proposed Project?	Explanation
Aesthetics from increased glare and from the construction and operation of catenary lines and use of bonnet technology for ships	No	Neither catenary lines nor the use of bonnet technology for ships are applicable to boilers, process heaters, steam generators and water heaters and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems ~~technology~~). Therefore, this conclusion is not applicable to the proposed project.
Construction air quality and GHGs	Yes	This conclusion is applicable to the proposed project. The impacts for these environmental topics areas are analyzed in this SEA (see pp. 4-6 to 4-17 for construction air quality and pp. 4-22 to 4-25 for GHGs).
Energy due to increased electricity demand	No	While the use of SCR systems ~~technology~~ for 55 ~~eight~~ boilers will require some electricity to operate, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1 have demonstrated that the amount of electricity that would be needed to operate SCR systems ~~technology~~ would be less than significant. Similarly, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1, and the March 2006 Final EA for Rule 1146.2 have also demonstrated that the amount of electricity that would be needed to replace burners with ultra-low NOx burners would also be less than significant.
Hazards and hazardous materials due the increased flammability of solvents	No	Boilers, process heaters, steam generators and water heaters, and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems ~~technology~~) do not utilize solvents for their operation. Therefore, this conclusion is not applicable to the proposed project.
Hazards and hazardous materials due to the storage, accidental release and transportation of ammonia	Yes	This conclusion is applicable to the proposed project because SCR systems ~~technology~~ utilize ammonia. The impacts for this environmental topic area are analyzed in this SEA (see pp. 4-26 to 4-34). The conclusion of significance in this SEA was made for the storage and use of aqueous ammonia, but not for the transportation of aqueous ammonia.
Hazards and hazardous materials due to the storage and transportation of LNG	No	Boilers, process heaters, steam generators and water heaters, and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems) do not utilize LNG for their operation. Therefore, this conclusion is not applicable to the proposed project.

Table 4-1614 (concluded)
Applicability of Significant Impacts in March 2017 Final Program EIR to Proposed Project

Conclusion of Significant Impacts in March 2017 Final Program EIR	Applicable to/Significant for the Proposed Project?	Explanation
Hazards and hazardous materials due to proximity to schools	Yes	This conclusion is applicable to the proposed project because some of the affected facilities that will install SCR systems technology or ultra-low NOx burners are near schools. The impacts for this environmental topic area are analyzed in this SEA (see pp. 4-26 to 4-34)
Hydrology (water demand)	No	Boilers, process heaters, steam generators and water heaters, and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems technology) do not utilize water for their operation. Therefore, this conclusion is not applicable to the proposed project.
Construction noise and vibration	No	While the construction activities associated with installing SCR systems technology for 55 eight boilers may create some noise and vibration, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1 have demonstrated that the amount of electricity that would be needed to operate SCR systems would be less than significant. Similarly, the conclusions in the September 2008 Final EAs for Rules 1146 and 1146.1, and the March 2006 Final EA for Rule 1146.2 have also demonstrated that the construction noise and vibration that may occur while replacing burners with ultra-low NOx burners would also be less than significant.
Solid construction waste and operational waste from vehicle and equipment scrapping	No	Vehicle scrapping is not applicable to boilers, process heaters, steam generators and water heaters and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems technology). Therefore, this conclusion is not applicable to the proposed project.
Transportation and traffic during construction and during operation on roadways with catenary lines and at the harbors	No	Catenary lines and the associated transportation and traffic impacts on roadways and at the are harbors are applicable to boilers, process heaters, steam generators and water heaters and the corresponding NOx emission controls (e.g., ultra-low NOx burners and SCR systems technology). Therefore, this conclusion is not applicable to the proposed project.

PAR 1146 is expected to have: 1) significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)); and 2) significant effects that were previously examined that will be substantially more severe than what was discussed in the September 2008 Final EA for Rule 1146 and the March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(B)). Similarly, PAR 1146.1 is also expected to have significant effects that were not discussed in the previous September 2008 Final EA for Rule 1146.1 and March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(A)). However, PAR 1146.2 is not expected to create new significant effects that were not discussed in the previous May 2006 Final EA for Rule 1146.2 and the March 2017 Final Program EIR for the 2016 AQMP.

By preparing a SEA for the proposed project, since the topics of air quality and hazards and hazardous materials are the only environmental topic areas that would be affected by PARs 1146 series and PR 1100, no other environmental topic areas have been evaluated in this SEA. Thus, the conclusions reached in this Final~~Revised Draft~~ SEA are consistent with the conclusions reached in the previously certified CEQA documents (e.g., the September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP) that aside from the topic~~s air quality during construction and~~ of hazards and hazardous materials for the storage and use of aqueous ammonia, there would be no other significant adverse effects from the implementation of the proposed project. Thus, the proposed project would have no significant or less than significant direct or indirect adverse effects on the following environmental topic areas:

- aesthetics
- air quality and greenhouse gases~~ during operation~~
- agriculture and forestry resources
- biological resources
- cultural resources
- energy
- geology and soils
- hydrology and water quality
- land use and planning
- mineral resources
- noise
- population and housing
- public services
- recreation
- solid and hazardous waste
- transportation and traffic

The September 2008 Final EAs for Rules 1146 and 1146.1, the May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP can be found using the links referenced in Chapter 2.

SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

CEQA Guidelines Section 15126(b) requires an environmental analysis to consider "any significant environmental effects which cannot be avoided if the proposed project is implemented." This SEA identified the topic~~s~~ of ~~air quality during construction and~~ hazards and hazardous materials for the storage and use of aqueous ammonia as the environmental topic area~~s~~ that may have~~ing~~ potentially significant adverse environmental affects if the proposed project is implemented.

SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA Guidelines Section 15126(c) requires an environmental analysis to consider "any significant irreversible environmental changes which would be involved if the proposed action should be implemented." This SEA identified the topic of ~~air quality during construction and~~ hazards and hazardous materials for the storage and use of aqueous ammonia as the environmental area~~s~~ with potentially significant adverse impacts if the proposed project is implemented. The initial conclusion in the Revised Draft SEA of significant adverse air quality impacts during construction was concluded in this Final SEA to be fully ~~will be mostly~~ offset by the overall operational NOx emission reductions. As a result, even though the proposed project would have significant air quality impacts during construction, the proposed project overall will achieve substantial NOx emission reductions to offset the construction emissions and will provide human health benefits as a result. Implementation of other control measures in the 2016 AQMP will also provide human health benefits by reducing population exposures to existing NOx emissions. For these aforementioned reasons, the proposed project would not result in irreversible environmental changes or irretrievable commitment of resources for the topic of air quality.

Significant adverse impacts to hazards and hazardous materials from the storage and use of ammonia cannot be mitigated to less than significant levels; thus, they may be considered irreversible because facility operators that install new SCR systems for reducing NOx emissions are likely to operate these systems for the lifetime of the equipment.

POTENTIAL GROWTH-INDUCING IMPACTS

CEQA Guidelines Section 15126(d) requires an environmental analysis to consider the "growth-inducing impact of the proposed action." Implementing the proposed project will not, by itself, have any direct or indirect growth-inducing impacts on businesses in the SCAQMD's jurisdiction because it is not expected to foster economic or population growth or the construction of additional housing and primarily affects existing facilities.

RELATIONSHIP BETWEEN SHORT-TERM AND LONG-TERM ENVIRONMENTAL GOALS

CEQA documents are required to explain and make findings about the relationship between short-term uses and long-term productivity. [CEQA Guidelines Section 15065(a)(2)]. An important

consideration when analyzing the effects of a proposed project is whether it will result in short-term environmental benefits to the detriment of achieving long-term goals or maximizing productivity of these resources. Implementing the proposed project is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. PARs 1146 series and PR 1100 will begin transitioning units at RECLAIM facilities subject to Rules 1146, 1146.1, and 1146.2 to a command-and-control regulatory structure. The primary objective of this project is to ensure all Rules 1146 and 1146.1 units meet NOx emission limits and BARCT level equivalency. PR 1100 will provide the implementation schedule for PAR 1146 and 1146.1 and eventually include other future rules for equipment exiting RECLAIM. PARs 1146 series and PR 1100 implement control measure CMB-05 from the 2016 AQMP. NOx, is a precursor to the formation of ozone and PM2.5, so even if the proposed project is implemented and there will be some NOx emissions during construction and operation, there will also be ~~an~~ overall NOx emission~~s~~ reductions ~~occurring in 2022 and these~~ which will continue to help attain federal and state air quality standards which are expected to enhance short- and long-term environmental productivity in the region. Implementing the proposed project does not narrow the range of beneficial uses of the environment. Of the potential environmental impacts discussed in Chapter 4, only those related ~~to air quality during construction and~~ to hazards and hazardous materials for ammonia storage are concluded to have potentially significant adverse effects.

CHAPTER 5

ALTERNATIVES

INTRODUCTION

This Final~~Revised Draft~~ SEA provides a discussion of alternatives to the proposed project as required by CEQA. Alternatives include measures for attaining objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. A 'no project' alternative must also be evaluated. The range of alternatives must be sufficient to permit a reasoned choice, but need not include every conceivable project alternative. CEQA Guidelines Section 15126.6(c) specifically notes that the range of alternatives required in a CEQA document is governed by a 'rule of reason' and only necessitates that the CEQA document set forth those alternatives necessary to permit a reasoned choice. The key issue is whether the selection and discussion of alternatives fosters informed decision making and meaningful public participation. A CEQA document need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. SCAQMD Rule 110 (the rule which implements the SCAQMD's certified regulatory program) does not impose any greater requirements for a discussion of project alternatives in a SEA than is required for an EIR under CEQA.

METHODOLOGY FOR DEVELOPING PROJECT ALTERNATIVES

The alternatives typically included in CEQA documents for proposed SCAQMD rules, regulations, or plans are developed by breaking down the project into distinct components (e.g., emission limits, compliance dates, applicability, exemptions, pollutant control strategies, etc.) and varying the specifics of one or more of the components. Different compliance approaches that generally achieve the objectives of the project may also be considered as project alternatives.

Alternatives to the proposed project were crafted by varying how the NOx emission limits and the timing of compliance. Of the amendments proposed to Rules 1146, 1146.1, and 1146.2, only the components that pertain to complying with the NOx emission factors could entail physical modifications to the affected equipment and that these physical modifications could create potential adverse significant impacts. As such, in addition to the no project alternative, four alternatives were developed by identifying and modifying major components of the proposed project. Specifically, the primary components of the proposed alternatives that have been modified are the source categories that may be affected, and the manner and timing in which compliance with the NOx emission factors may be achieved.

Typically for projects with potentially significant adverse environmental impacts, the existing setting is established at the time the Notice of Preparation/Initial Study (NOP/IS) is circulated for public review. However, this SEA is a subsequent to multiple CEQA documents that were certified at different times and not all of the previous CEQA documents were concluded to have potentially significant adverse impacts. As previously explained, the proposed project is a revision to the previously approved projects that were analyzed in the September 2008 Final EAs for Rules 1146 and 1146.1, May 2006 Final EA for Rule 1146.2, and the March 2017 Final Program EIR for the 2016 AQMP.

The September 2008 Final EA for Rule 1146 concluded that significant adverse air quality and hazards and hazardous materials impacts would occur. However, all other environmental topic areas analyzed in the September 2008 Final EA for Rule 1146 were shown to have less than significant or no significant impacts. Both the September 2008 Final EA for Rule 1146.1 and the May 2006 Final EA for Rule 1146.2 concluded that no significant adverse environmental impacts would occur not from the respective projects. The March 2017 Final Program EIR for the 2016

AQMP determined that the overall implementation of CMB-05 has the potential to generate adverse environmental impacts to seven topic areas – air quality, energy, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste and transportation.

CEQA Guidelines Section 15125(a) recognizes that a baseline may be established at times other than when the NOP/IS circulated to the public by stating (emphasis added), "This environmental setting ***will normally*** constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." Chapter 3 summarizes the existing setting/baseline for control measure CMB-05 from the 2016 AQMP as well as the current version of Rules 1146, 1146.1, and 1146.2.

DESCRIPTION OF ALTERNATIVES

The analysis of the proposed project determined that, of the amendments proposed, only the components that pertain to the implementation of SCR systems to meet certain NOx emission limits could have potential significant adverse air quality impacts during construction. The analysis also identified potential significant adverse hazards and hazardous materials impacts for ammonia storage and use. In particular, two of the affected facilities were shown to reach the toxic endpoint distance for aqueous ammonia from a catastrophic failure of a storage tank that would significantly adversely affect the sensitive receptors within 0.1 mile of the existing equipment. As such, alternatives were developed by identifying and modifying major components of the proposed project. The rationale for selecting and modifying specific components of the proposed project to generate feasible alternatives for the analysis is based on CEQA's requirement to present "realistic" alternatives; that is, alternatives that can actually be implemented.

Five alternatives to the proposed project have been developed and summarized in Table 5-1, as follows: Alternative A - No Project, Alternative B - Compliance Deadline Extension, Alternative C - 100% of Units by January 1, 2021, Alternative D - All Ultra-Low NOx Burners, and Alternative E ~~–~~ NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits ~~Lowering Limit for ≥ 40 and < 75 MMBtu/hr~~. The primary components of the proposed alternatives that have been modified are the source categories that may be affected, and the manner and timing in which compliance with the NOx emission limits may be achieved. Unless otherwise specifically noted, all other components of the project alternatives are identical to the components of the proposed project.

The Governing Board may choose to adopt any portion or all of any alternative presented in the Final SEA with appropriate findings as required by CEQA. The Governing Board is able to adopt any portion or all of any of the alternatives presented because the impacts of each alternative will be fully disclosed to the public and the public will have the opportunity to comment on the alternatives and impacts generated by each alternative. No w~~W~~ritten suggestions on potential project alternatives were received during the comment period for the Revised Draft SEA ~~will be considered when preparing the Final SEA and will be included as an appendix of the Final SEA~~.

The following subsections provide a brief description of the alternatives.

Proposed Project (NOx Emission Limits and Compliance Deadlines):

PARs 1146 series and PR 1100 will begin transitioning units at RECLAIM facilities subject to Rules 1146, 1146.1, and 1146.2 to a command-and-control regulatory structure. The primary objective of the proposed project is to ensure all ~~RECLAIM~~ facilities with Rules

1146 and 1146.1 units meet NOx emission limits and BARCT level equivalency. PARs 1146 series would: 1) expand the applicability to include units at NOx RECLAIM facilities; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NOx concentration limits in Rules 1146 and 1146.1; 3) extend the compliance date for RECLAIM facilities replacing Rule 1146 or 1146.1 units and require a permit application submittal for unit(s) being replaced; 4) require RECLAIM facilities with Rule 1146.2 units to meet applicable NOx emission limits by December 31, 2023, unless a more stringent BARCT limit is subsequently adopted; 5) limit ammonia emissions on new or modified units with applicable air pollution control equipment and require quarterly ~~annual~~ ammonia source testing (if four consecutive quarterly source tests demonstrate compliance, an annual source test may be conducted); ~~and~~ 6) require certain units at non-RECLAIM facilities to meet new NOx emission limits according to the compliance schedules specified in Rules 1146 and 1146.1; and 7) allow units at municipal sanitation service facilities to maintain existing NOx emission limits until a Regulation XI Rule is adopted or amended. PR 1100 is an administrative rule which establishes the compliance schedule for RECLAIM facilities with Rule 1146 and/or 1146.1 units. . ~~1) expand the applicability to include units that were not previously required to comply with Rules 1146/1146.1 because they were in the NOx RECLAIM program; 2) require RECLAIM facilities to submit a permit application for each unit that does not currently meet the NOx concentration limits in Rules 1146/1146.1; 3) require the affected equipment to meet the applicable NOx concentration limit for all Rule 1146/1146.1 units for a minimum of 75 percent of the total heat input by January 1, 2021 and 100 percent of the total heat input by January 1, 2022; 4) require RECLAIM facilities replacing Rule 1146/1146.1 units to notify the Executive Officer which unit(s) will be replaced; and 5) require RECLAIM facilities with Rule 1146.2 units to meet the rule's NOx emission limits by December 31, 2023 if a more stringent BARCT limit is not applicable. PR 1100 will provide the implementation schedule for PARs 1146 series and eventually include other future rules for equipment exiting RECLAIM.~~ PARs 1146 series and PR 1100 implement control measure CMB-05 from the 2016 Final AQMP.

Alternative A: No Project (Current Rule)

Alternative A, the no project alternative, means that the current version of Rules 1146, 1146.1, and 1146.2 that were amended in November 2013, and April 2006, respectively, would remain in effect and there would be no transitioning out of the NOx RECLAIM program. Under the current version of Rules 1146 and 1146.1, units at RECLAIM facilities would not have to comply with the NOx emission limits in Tables 1146-1 and 1146.1-1, respectively. Under this alternative, no NOx emission reductions will be achieved and the units subject to Rules 1146 and 1146.1 at RECLAIM facilities would not meet BARCT level equivalency. However, the December 2015 amendments to the NOx RECLAIM program evaluated BARCT level equivalency for combustion units that would have otherwise that would have been subject to Rules 1146, 1146.1, and 1146.2 had they not been in the RECLAIM program. Furthermore, the environmental impacts for the December 2015 amendments were evaluated in the Final Program EA that was certified in December 2015[22]. Under this alternative, units subject to Rules 1146, 1146.1, and 1146.2 at RECLAIM facilities would not begin the transition to a command-and-control regulatory

[22] SCAQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX -RECLAIM, November 2015. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/regxxfinalpeaplusappendices.pdf

structure. In addition, under this alternative the implementation schedule in PR 1100 would also not take effect.

Alternative B: Compliance Deadline Extension

Under Alternative B, the requirements would be equivalent to the proposed project, but the compliance deadline for meeting the NOx emissions limits would be extended ~~shortened~~ by one year for all ~~25 percent of~~ units. At a facility, 75 percent of the units subject to Rules 1146 and 1146.1 would need to meet the applicable NOx emission limit by January 1, 2022 and 100 percent would need to achieve compliance by January 1, 2023. In addition, the facilities would have one additional year to submit permit applications. The extension of the compliance deadline for units subject to Rules 1146 and 1146.1 is less stringent than the proposed project.

Alternative C: 100% of Units by January 1, 2021

Under Alternative C, the NOx emission limits would remain the same as the proposed project, but facilities would need to meet 100 percent compliance one year earlier than the proposed project, by January 1, 2021. The earlier compliance date would apply to 25 percent of the units subject to Rules 1146 and 1146.1. The earlier compliance date under Alternative C is more stringent than the proposed project.

Alternative D: All Ultra-Low NOx Burners

Under Alternative D, the NOx emission limit would be less stringent for Group I (Rule 1146) units than the proposed project, but it would have the same compliance deadline as the proposed project. Under Alternative D, the Group I units would need to meet a NOx emission limit of nine ppm (or 0.011 pound per MMBtu) instead of five ppm (or 0.0062 pound per MMBtu). The Group II and III units (Rule 1146) and fire-tube boilers rated between two and five MMBtu (Rule 1146.1) units would need to meet nine ppm (or 0.011 pound per MMBtu) instead of the proposed five ppm or seven ppm (or 0.00085 pound per MMBtu). The NOx emission limit for thermal fluid heaters would also remain at 30 ppm (or 0.037 pound per MMBtu) instead of 12 ppm (0.015 pound per MMBtu). Thus, the thermal fluid heaters would not meet BARCT NOx emissions equivalency. All other requirements in the proposed project would remain the same for Alternative D. Overall, Alternative D would be less stringent than the proposed project.

Alternative E: NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits~~Lowering Limit for ≥ 40 and < 75 MMBtu per hour~~

Under Alternative E, only NOx RECLAIM facilities would be affected. ~~The~~the NOx emission limit would be less~~more~~ stringent than the proposed project for the following units with: a rated heat input of greater than or equal to ~~4~~20 and less than 75 MMBtu per hour (Group II); a rated heat input of greater than or equal to two but less than 20 MMBtu per hour (Rules 1146 and 1146.1) for fire-tube boilers; and thermal fluid heaters. Alternative E would require~~include a subset of~~ Group II ~~units~~and Group III units~~-~~ to meet nine ppm (or 0.011 pounds per MMBtu) instead of five ppm (or 0.0062 pound per MMBtu) for Group II units with an existing NOx limit greater than 12 ppm and seven ppm (or 0.0085

pound per MMBtu) for Group II units with an existing NOx limit less than 12 ppm and Group III fire-tube boilers~~that would be subject to the five ppm NOx emission limits as Group I units~~.

In addition, under Alternative E, any units with a rated heat input greater than two but less than five MMBtu per hour would need to meet nine ppm. In the proposed project, units with a rated heat input greater than two but less than five MMBtu per hour are required to meet seven ppm for fire-tube boilers and water-tube boilers would need to meet nine ppm. In addition, under Alternative E, thermal fluid heaters would remain at the current NOx emission limit of 30 ppm (or 0.037 pound per MMBtu). All other requirements in the proposed project would remain the same for Alternative E. Overall, Alternative E would be less ~~more~~ stringent than the proposed project.

Table 5-1
Summary of the Proposed Project and Alternatives

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project		Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 **(If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022))*	See Rule 2002 Emission Factor, Table 1 and 3** *(Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factors Tables 1 and 3 and are shown in Table 1-3)*	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2022 and 100% by January 1, 2023	100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm				
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm				
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm				
1146	I	≥ 75 MMBtu/hr	Natural Gas	5 ppm or 0.0062 lb/MMBtu				
1146	II	≥ 20 and < 75 MMBtu/hr (All others)~~with an existing NOx limit >12 ppm~~	Gaseous Fuel (excluding Landfill or Digester Gas)	5 ppm or 0.0062 lb/MMBtu				
1146	II	≥ 20 and < 75 MMBtu/hr (Fire-tube boilers with an existing NOx limit ~~≤~~<9~~12~~ ppm and >5 ppm	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu				
1146	II	≥ 20 and < 75 MMBtu/hr (All others with a previous NOx limit ≤12 ppm and >5 ppm)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu				
1146	III	≥ 5 and < 20 MMBtu/hr (Fire-tube boilers, ~~only~~ excluding units with a previous NOx limit >9 and ≤ 12 ppm)	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu				
1146	III	≥ 5 and < 20 MMBtu/hr (excluding Fire-tube boilers)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu				
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146	-	Low Fuel Usage (≤ 90,000 therms/year)	Any Fuel	12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier				
1146	-	≥ 5 MMBtu/hr Thermal Fluid Heaters	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu				

Table 5-1: Summary of the Proposed Project and Alternatives (continued~~Concluded~~)

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project		Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of units by January 1, 2021
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Fire-tube boilers, Atmospheric Units and Thermal Fluid Heaters)	Natural Gas	9 ppm or 0.011 lb/MMBtu	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 ~~*~~*(If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022))*	See Rule 2002 Emission Factor, Table 1 and 3~~**~~ *(Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factors Tables 1 and 3 and are shown in Table 1-3)*	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2022 and 100% by January 1, 2023	100% of units by January 1, 2021
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Any Fire-Tube Boilers excluding units with a previous NOx limit >9 and ≤ 12 ppm)	Natural Gas	7 ppm or 0.0085 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Thermal Fluid Heaters)	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier				
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023		-	No Change	No Change
1100	-	Rule 1146 and 1146.1 Units only	-	Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule		-	Compliance deadline would be extended by one year	Compliance deadline would be shortened by one year for 25% of units

Table 5-1: Summary of the Proposed Project and Alternatives (continued)

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project		Alternative D: All Ultra-Low NOx Burners	Alternative E: NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 *(If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022))*	No Change	No Change
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change
1146	I	≥ 75 MMBtu/hr	Natural Gas	5 ppm or 0.0062 lb/MMBtu		9 ppm or 0.011 lb/MMBtu	No Change
1146	II	≥ 20 and < 75 MMBtu/hr (All others)~~with an existing NOx limit >12 ppm~~	Gaseous Fuel (excluding Landfill or Digester Gas)	5 ppm or 0.0062 lb/MMBtu		9 ppm or 0.011 lb/MMBtu	9 ppm or 0.011 lb/MMBtu
1146	II	≥ 20 and < 75 MMBtu/hr with an existing NOx limit~~<~~≤12 ppm and >5 ppm)	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu			
1146	II	≥ 20 and < 75 MMBtu/hr (All others with a previous NOx limit <12 ppm and >5 ppm)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu			
1146	III	≥ 5 and < 20 MMBtu/hr (Fire-tube boilers only excluding units with a previous NOx limit >9 and ≤ 12 ppm))	Gaseous Fuel (excluding Landfill or Digester Gas)	7 ppm or 0.0085 lb/MMBtu			
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu		No Change	No Change
1146	-	Low Fuel Usage (≤ 90,000 therms/year)	Any Fuel	12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier		No Change	No Change
1146	-	≥ 5 MMBtu/hr Thermal Fluid Heaters	Natural Gas	12 ppm or 0.015 lb/MMBtu		30 ppm or 0.037 lb/MMBtu	30 ppm or 0.037 lb/MMBtu
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change

Table 5-1: Summary of the Proposed Project and Alternatives (concluded)

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project		Alternative D: All Ultra-Low NOx Burners	Alternative E: NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu	75% of the cumulative total heat input capacity of all Rules 1146 and 1146.1 units at the facility by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023 **If the unit is located at a non-RECLAIM facility compliance can be deferred until burner replacement or within 15 years of the date of rule adoption, whichever is earlier, unless the unit is a thermal fluid heater currently permitted at >20 ppm (these units must meet 12 ppm by January 1, 2022)*	No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Fire-tube boilers, Atmospheric Units and Thermal Fluid Heaters~~, but including at Schools/Universities~~)	Natural Gas	9 ppm or 0.011 lb/MMBtu		No Change	9 ppm or 0.011 lb/MMBtu~~No Change~~
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Any Fire-Tube Boilers, excluding units with a previous NOx limit >9 and ≤ 12 ppm)	Natural Gas	7 ppm or 0.0085 lb/MMBtu		9 ppm or 0.011 lb/MMBtu	
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Thermal Fluid Heaters)	Natural Gas	12 ppm or 0.015 lb/MMBtu		30 ppm or 0.037 lb/MMBtu	30 ppm or 0.037 lb/MMBtu
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	12 ppm, 15 years after the date of rule adoption or when 50 percent or more of the unit's burners are replaced, whichever is earlier~~30 ppm by January 1, 2022 or burner replacement, whichever occurs later~~		No Change	No Change
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023		No Change	No Change
1100	-	Rule 1146 and 1146.1 Units only	-	Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule		No Change	No Change

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project (for NOx RECLAIM facilities transitioning to command-and-control regulatory structure)		Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of units by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023	See Rule 2002 Emission Factor, Table 1 and 3*	75% of units by January 1, 2022 and 100% by January 1, 2023	100% of units by January 1, 2021
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm				
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm				
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm				
1146	I	≥ 75 MMBtu/hr (excluding Thermal Fluid Heaters)	Natural Gas	5 ppm or 0.0062 lb/MMBtu				
1146	II	≥ 20 and < 75 MMBtu/hr (excluding Thermal Fluid Heaters)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu				
1146	III	≥ 5 and < 20 MMBtu/hr (excluding Thermal Fluid Heaters, but including Units at Schools and Universities rated ≥ 5 MMBtu/hr)	Gaseous Fuel (excluding Landfill or Digester Gas)					
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146	-	Low Fuel Usage (≤ 90,000 therms/year)	Any Fuel	30 ppm by January 1, 2022 or burner replacement, whichever occurs later				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu				
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Atmospheric Units and Thermal Fluid Heaters, but including at Schools/Universities)	Natural Gas	9 ppm or 0.011 lb/MMBtu				
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	30 ppm by January 1, 2022 or burner replacement, whichever occurs later				
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023		-	No Change	No Change
1100	-	Rule 1146 and 1146.1 Units only	-	Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule		-	Compliance deadline would be extended by one year	Compliance deadline would be shortened by one year for 25% of units

*Note: Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factor Tables 1 and 3 and are shown in Table 1-3.

Rule No.	Group No.	Heat Input or Equipment Type	Fuel Type	Proposed Project (for NOx RECLAIM facilities transitioning to command-and-control regulatory structure)		Alternative D: All Ultra-Low NOx Burners	Alternative E: Lowering Limit for ≥ 40 and < 75 MMBtu/hr
1146	-	≥ 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.036 lb/MMBtu	75% of units by January 1, 2021 and 100% by January 1, 2022, unless unit replacement by January 1, 2023	No Change	No Change
1146	-	≥ 5 MMBtu/hr	Non-Gaseous Fuels	40 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Landfill Gas	25 ppm		No Change	No Change
1146	-	≥ 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change
1146	I	≥ 75 MMBtu/hr (excluding Thermal Fluid Heaters)	Natural Gas	5 ppm or 0.0062 lb/MMBtu		9 ppm or 0.011 lb/MMBtu; 75% of units by January 1, 2021 and 100% by January 1, 2022	No Change
1146	II	≥ 20 and < 75 MMBtu/hr (excluding Thermal Fluid Heaters)	Gaseous Fuel (excluding Landfill or Digester Gas)	9 ppm or 0.011 lb/MMBtu		No Change	5 ppm for units > 40 MMBtu/hr
1146	III	≥ 5 and < 20 MMBtu/hr (excluding Thermal Fluid Heaters, but including Units at Schools and Universities rated ≥ 5 MMBtu/hr)	Gaseous Fuel (excluding Landfill or Digester Gas)			No Change	No Change
1146	III	Atmospheric Unit (≤ 10 MMBtu/hr)	Natural Gas	12 ppm or 0.015 lb/MMBtu		No Change	No Change
1146	-	Low Fuel Usage (≤ 90,000 therms/year)	Any Fuel	30 ppm by January 1, 2022 or burner replacement, whichever occurs later		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Gaseous Fuel (excluding Landfill or Digester Gas)	30 ppm or 0.037 lb/MMBtu		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Landfill Gas	25 ppm		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr	Digester Gas	15 ppm		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (Atmospheric Units)	Natural Gas	12 ppm or 0.015 lb/MMBtu		No Change	No Change
1146.1	-	> 2 MMBtu/hr and < 5 MMBtu/hr (excluding Atmospheric Units and Thermal Fluid Heaters, but including at Schools/Universities)	Natural Gas	9 ppm or 0.011 lb/MMBtu		No Change	No Change
1146.1	-	Low Fuel Usage (≤ 18,000 therms/year)	Any Fuel	30 ppm by January 1, 2022 or burner replacement, whichever occurs later		No Change	No Change
1146.2	-	≤ 2 MMBtu/hr	Natural Gas	30 ppm, unless a more stringent limit is applicable, by December 31, 2023		No Change	No Change

~~1100~~	~~-~~	~~Rule 1146 and 1146.1 Units only~~	~~-~~	~~Permit application submittal by 12 months within date of rule adoption and compliance with implementation schedule~~	~~No Change~~	~~No Change~~

~~***Note: Only emission factors relevant to Rules 1146 and 1146.1 have been extracted from Rule 2002 Emission Factor Tables 1 and 3 and are shown in Table 1-3.~~

COMPARISON OF ALTERNATIVES

The following sections describe the potentially significant adverse air quality and hazards and hazardous materials impacts that may occur for each project alternative. Potentially significant adverse operational air quality impacts are quantified where sufficient data are available. A comparison of the environmental impacts for each project alternative is provided in Table 5-2. No other environmental topics other than air quality during construction and hazards and hazardous materials were determined to be significantly adversely affected by implementing any project alternative.

Pursuant to the requirements in CEQA Guidelines Section 15126.6(b) to mitigate or avoid the significant effects that a project may have on the environment, a comparison of the potential impacts to air quality and hazards and hazardous materials from each of the project alternatives for the individual rule components that comprise the proposed project is provided in Table 5-2. Secondary impacts from the proposed project were identified as having significant adverse impacts for air quality from the construction of the SCR systems and for hazards and hazardous materials from storage of ammonia (accidental rupture). The proposed project is considered to provide the best balance between emission reductions and the adverse environmental impacts due to construction activities and the storage of ammonia (accidental rupture) while meeting the objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

Pursuant to CEQA Guidelines Section 15126.6(d), a CEQA document "shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed." Accordingly, Table 5-2 provides a matrix displaying the major characteristics and significant environmental effects of the proposed project and each alternative.

Table 5-2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives

Category	**Proposed Project**	**Alternative A:** No Project	**Alternative B:** Compliance Deadline Extension	**Alternative C:** 100% of Units by January 1, 2021	**Alternative D:** All Ultra-Low NOx Burners	**Alternative E:** NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits
Air Quality	Expected to result in NOx emission reductions of 0.20 ton per day by January 1, 2021 and 0.27 ton per day by January 1, 2023. Affected RECLAIM facilities will transition to a command-and-control regulatory structure. Certain non-RECLAIM facilities will meet NOx emission limits during replacement or within 15 years of the date of rule adoption, whichever is earlier. Thermal fluid heaters currently permitted at >20 ppm must meet 12 ppm by January 1, 2022. All units will meet BARCT NOx emissions equivalency from the implementation of command-and control regulatory structure.	No new NOx emission reductions will be achieved. RECLAIM facilities would not transition to a command-and control regulatory structure and all (including some non-RECLAIM) units would not meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project except the reductions would be delayed by one year. Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all (including some non-RECLAIM) units will meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project, but emissions would be achieved sooner (by January 1, 2021). Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units (including some non-RECLAIM) will meet BARCT level equivalency.	Expected to result in lesser NOx emission reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and-control regulatory structure. Some facilities would not meet BARCT level equivalency.	Expected to result in less NOx emissions reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and control regulatory structure, but units would not reach BARCT level equivalency.
Signifi-cance of Air Quality Impacts	Less than Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx during construction due to overlapping construction of SCR systems and ultra-low NOx burners, but these significant impacts will be reduced to less than significant levels because a concurrent operational air quality benefit would result due to the project's overall NOx emission reductions.	Not Significant: This would not result in an exceedance of SCAQMD's regional air quality CEQA significance threshold for NOx. The SCAQMD will not achieve any emissions reductions; thus, attainment for the SCAQMD for ozone is unlikely to occur.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx during construction due to overlapping construction of SCR systems and ultra-low NOx burners. While a concurrent operational air quality benefit would result due to the project's overall NOx emission reductions, ~~and these significantce is equivalent to the amount in the proposed project but with a~~ the delay in the operational benefit is may not fully reduce the overlapping construction emissions to less than significant levels.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx during construction due to the overlapping construction of SCR systems and ultra-low NOx burners, but these significant~~ce~~ impacts will be reduced to less than significant levels because a concurrent operational air quality benefit would result due to the project's overall NOx emission reductions This alternative is equivalent in benefit to the amount in the proposed project but achieves the operational benefits sooner which may cause peak daily construction emissions to be greater than the proposed project.	Less than ~~Not~~ Significant: This would result in an amount that is less significant than the proposed project and would not exceed SCAQMD's regional air quality CEQA significance threshold for NOx.	Less than Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx during construction~~. D~~ due to the overlapping construction of ~~additional~~ SCR systems and ultra-low NOx burners, but these significant impacts will be reduced to less than significant levels because a concurrent operational air quality benefit would result. However, to meet the current NOx emission limits, the impacts are at an amount that is less ~~more~~ significant than the proposed project and NOx emissions reductions would be less than the proposed project.~~but with more operational benefits.~~

Table 5-2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (Concluded)

Category	**Proposed Project**	**Alternative A:** No Project	**Alternative B:** Compliance Deadline Extension	**Alternative C:** 100% of Units by January 1, 2021	**Alternative D:** All Ultra-Low NOx Burners	**Alternative E:** NOx RECLAIM Facilities Transitioning to Command-and-Control Regulatory Structure at Current Limits
Significance of Hazards and Hazardous Materials Impacts	Significant: To operate, SCR systems require ammonia. Ammonia is considered a hazardous material. At 32 facilities, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors would result in significant impacts.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. No hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance. The number of affected facilities would be the same as the proposed project. The level of significance in this alternative is equivalent to the amount in the proposed project.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance. The number of affected facilities would be the same as the proposed project. The level of significance in this alternative is equivalent to the amount in the proposed project.	Less than ~~Not~~ Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. All facilities with affected units would need to retrofit with ultra-low NOx burners; thus, no hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Less stringent NOx emission limits would result in fewer affected facilities constructing SCR systems; thus, a fewer number of ammonia storage tanks would be needed. However, depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint distance and thus still result in significant impacts, but at an equivalent amount of the proposed project. It is estimated four facilities would be affected from this alternative.

Category	Proposed Project	Alternative A: No Project	Alternative B: Compliance Deadline Extension	Alternative C: 100% of Units by January 1, 2021	Alternative D: All Ultra-Low-NOx Burners	Alternative E: Lowering Limit for ≥ 40 and < 75 MMBtu/hr
Air Quality	Expected to result in NOx emission reductions of 0.23 ton per day by January 1, 2023. Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units will meet BARCT level equivalency.	No new NOx emission reductions will be achieved. RECLAIM facilities would not transition to a command-and-control regulatory structure and all units would not meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project except the reductions would be delayed by one year. Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units will meet BARCT level equivalency.	Expected to result in equivalent NOx emissions reductions as the proposed project, but emissions would be achieved sooner (by January 1, 2021). Affected RECLAIM facilities will transition to a command-and-control regulatory structure and all units will meet BARCT level equivalency.	Expected to result in lesser NOx emission reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and-control regulatory structure. Some facilities would not meet BARCT level equivalency.	Expected to result in more NOx emissions reductions than the proposed project. Affected RECLAIM facilities would transition to a command-and-control regulatory structure and units will be equal to or more stringent than BARCT.
Significance of Air Quality Impacts	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems.	Not Significant: This would not result in an exceedance of SCAQMD's regional air quality CEQA significance threshold for NOx. The SCAQMD will not achieve any emissions reductions; thus, attainment for the SCAQMD for ozone is unlikely to occur.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems and the significance is equivalent to the amount in the proposed project but with a delay in the operational benefit.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx due to the construction of SCR systems and the significance is equivalent to the amount in the proposed project but achieves the operational benefits sooner.	Not Significant: This would result in an amount that is less significant than the proposed project and would not exceed SCAQMD's regional air quality CEQA significance threshold for NOx.	Significant: Exceeds the SCAQMD's regional air quality significance threshold for NOx. Due to the construction of additional SCR systems to meet the NOx emission limits, the impacts are at an amount that is more significant than the proposed project but with more operational benefits.
Significance of Hazards and Hazardous Materials Impacts	Significant: To operate, SCR systems require ammonia. Ammonia is considered a hazardous material. At two facilities, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors would result in significant impacts.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. No hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint. The significance in this alternative is equivalent to the amount in the proposed project.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint. The significance in this alternative is equivalent to the amount in the proposed project.	Not Significant: The construction of SCR systems would not be necessary; thus, the storage of aqueous ammonia would be eliminated. No hazards or hazardous materials impacts would occur.	Significant: The operation of an SCR system requires the use of ammonia; thus, facilities would need to store ammonia on-site. Depending on the vicinity of the ammonia storage tank(s) to sensitive receptors, during catastrophic failure sensitive receptors could be within the toxic endpoint. Additional facilities would be subject to the lower NOx emission limit. As a result, the construction of more SCR systems and ammonia storage tanks would occur. The significance is greater than the amount in the proposed project.

ALTERNATIVES REJECTED AS INFEASIBLE

In accordance with CEQA Guidelines Section 15126.6 (c), a CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. CEQA Guidelines Section 15126.6 (c) also states that among the factors that may be used to eliminate alternatives from detailed consideration in a CEQA document are: 1) failure to meet most of the basic project objectives; 2) infeasibility; or, 3) inability to avoid significant environmental impacts.

As noted in the Introduction, the range of feasible alternatives to the proposed project is limited by the nature of the proposed project and associated legal requirements. Similarly, the range of alternatives considered, but rejected as infeasible is also relatively limited.

The following discussion identifies Alternative A, the No Project Alternative, as being rejected due its failure to meet most of the basic project objectives.

CEQA documents typically assume that the adoption of a No Project alternative would result in no further action on the part of the project proponent or lead agency. For example, in the case of a proposed land use project such as a housing development, adopting the No Project alternative terminates further consideration of that housing development or any housing development alternative identified in the associated CEQA document. In that case, the existing setting would typically remain unchanged.

The concept of taking no further action (and thereby leaving the existing setting intact) by adopting a No Project alternative does not readily apply to implementation of a control measure that has been adopted and legally mandated in the 2016 AQMP. The federal and state Clean Air Acts require the SCAQMD to implement the AQMP in order to attain all state and national ambient air quality standards. More importantly, a No Project alternative in the case of the proposed project is not a legally viable alternative because it violates a state law requirement in Health and Safety Code Section 40440 that regulations mandate the use of BARCT for existing sources and for the subset of RECLAIM facilities subject to the requirements of ABs 617 and 398.

"The 'no project' analysis shall discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, *as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services*…" It should be noted that, except for air quality, there would be no further incremental impacts on the existing environment if no further action is taken. Although there are other existing rules that may have future compliance dates for NOx emission reductions, potential adverse impacts from these rules have already been evaluated in the Final Program EIR for the 2016 AQMP and their subsequent rule-specific CEQA documents. While air quality would continue to improve to a certain extent, it is unlikely that all state or federal ozone standards would be achieved as required by the federal and California CAAs. It is possible that the federal 24-hour PM2.5 standard may be achieved; however, it is unlikely that further progress would be made towards achieving the state PM2.5 standard as required by the California CAA.

LOWEST TOXIC ALTERNATIVE

In accordance with SCAQMD's policy document Environmental Justice Program Enhancements for FY 2002-03, Enhancement II-1 recommends for all SCAQMD CEQA documents which are required to include an alternatives analysis, the alternative analysis shall also include and identify a feasible project alternative with the lowest air toxics emissions. In other words, for any major equipment or process type under the scope of the proposed project that creates a significant environmental impact, at least one alternative, where feasible, shall be considered from a "least harmful" perspective with regard to hazardous or toxic air pollutants.

As explained in the hazards and hazardous materials discussion in Chapter 4, implementation of the proposed project may alter the hazards and hazardous materials associated with the existing facilities affected by the proposed project. Air pollution control equipment (e.g., SCR systems) are expected to be installed at affected facilities such that their operations may increase the quantity of ammonia (a hazardous material) used in the control equipment. The main NOx reduction technologies considered for the proposed project are based on employing SCR systems and ultra-low NOx burners. The analysis shows that of the possible NOx controls, only the use of SCR systems may increase the use of toxic materials (e.g., aqueous ammonia).

To identify a lowest toxic alternative with respect to the proposed project, a lowest toxic alternative would be if NOx control technologies are employed that use the least amount of hazardous or toxic materials. For the proposed project, ultra-low NOx burners are the least toxic technology when compared to SCR systems. Of the five alternatives, only Alternative A – the No Project alternative and Alternative D – All Ultra-Low NOx Burners, do not assume that SCR systems and ammonia will be utilized. Thus, hazardous materials would not be needed if either of these alternatives are implemented.

Under Alternative A, the No Project alternative, no NOx emission limits would be imposed on Rules 1146/1146.1/1146.2 units and no NOx control equipment (e.g., SCR systems or ultra-low NOx burners) would be installed. Further, no significant adverse impacts from construction and operating NOx control equipment would be expected to occur. Since no construction or operation activities associated with new or modified control equipment would occur under Alternative A, no new impacts to the environment, including the topic of hazards and hazardous materials would be expected. Thus, no increased use in the amount of hazardous or toxic materials would occur if Alternative A is implemented. While Alternative A results in no toxic emissions when compared to the proposed project, it is not the environmentally superior alternative because it results in no NOx benefits and does not meet the project objectives.

Under Alternative D, no SCR systems would be installed and only ultra-low NOx burners would be installed. Further, no significant adverse impacts from construction and operating NOx control equipment would be expected to occur. Since no SCR systems would be installed under Alternative D, no hazards and hazardous materials impacts would be expected. Thus, from a hazard and air toxics perspective, when compared to the proposed project and the other alternatives under consideration, if implemented, Alternative D is considered to be the lowest toxic alternative.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Pursuant to CEQA Guidelines Section 15126.6(e)(2), if the environmentally superior alternative is the "no project" alternative, the CEQA document shall also identify an alternate environmentally superior alternative from among the other alternatives.

If Alternative A is implemented, PARs 1146 series and PR 1100 would not be adopted; thus, the proposed project's objectives would not be achieved and no NOx emissions reductions would occur such that the corresponding health benefits that result from NOx emission reductions would also not occur. If Alternative A is implemented, the baseline of NOx emissions currently generated by the affected units will remain unchanged. Currently, the Basin is in non-attainment for ozone and cannot achieve attainment unless NOx emissions reductions occur. In addition, implementing Alternative A means that RECLAIM facilities with units subject to Rules 1146, 1146.1, and 1146.2 would not transition to a command-and-control regulatory structure or some units would not achieve BARCT level equivalency. Units at non-RECLAIM facilities would also not meet BARCT level equivalency. Alternative A would result in no significant air quality or hazards and hazardous materials impacts; however, this alternative would not achieve the project objectives.

If Alternative B is implemented, the compliance deadline would be extended by one year. The same NOx emissions reductions would be achieved as the proposed project; however, the NOx emission reductions would be achieved one year later (e.g., a delay in the operational benefits). If Alternative B is implemented the air quality impacts during construction would occur up to one year later depending when facility operators decide to install SCR systems on their affected equipment. Once the SCR systems are installed and operational, the hazards and hazardous materials impacts would be the same. Like the proposed project, Alternative B is implemented, the project objectives would be achieved and equivalent significant adverse environmental impacts for the topics of air quality during construction and hazards and hazardous materials due to ammonia storage and use during operation would occur.

If Alternative C is implemented, the desired NOx emissions reductions would be achieved sooner (100 percent by January 1, 2021) than the proposed project. The earlier compliance date would apply to 25 percent of the units subject to Rules 1146 and 1146.1. For this reason, Alternative C provides equivalent NOx emission reductions on an expedited schedule when compared to the proposed project which will in turn allow for the corresponding benefits to air quality and public health to occur earlier. Of the significant adverse impacts from air quality during construction and hazards and hazardous materials that would be generated under Alternative C, the impacts would be greater than the proposed project, because of the compressed schedule; however, the project objectives would be achieved.

If Alternative D is implemented, all units subject to Rules 1146 and 1146.1 would be required to install ultra-low NOx burners to meet NOx emission limits of nine ppm (or 0.011 pound per MMBtu) by the same compliance date as the proposed project (75 percent of units by January 1, 2021 and 100 percent of units by January 1, 2022). Alternative D would result in fewer NOx emissions reductions than the proposed project without achieving BARCT NOx emissions equivalency. Thus, Alternative D would result in reduced benefits to public health and air quality and would not achieve all of the project objectives. If Alternative D is implemented, no SCR systems would be installed and no ammonia would be needed such that there would be less than significant air quality impacts during construction and the significant adverse hazards and hazardous materials impacts due to ammonia use would also be eliminated. For these reasons,

Alternative D is considered to be the environmentally superior alternative. However, the project's objectives would not be achieved.

If Alternative E is implemented, units with a rated heat input of greater than or equal to 75~~40~~ MMBtu per hour would be required to meet a five ppm NOx emission limit. Alternative E would require Group II and Group III units to meet nine ppm (or 0.011 pounds per MMBtu) instead of five ppm (or 0.0062 pound per MMBtu) for Group II units with an existing NOx limit greater than 12 ppm and seven ppm (or 0.0085 pound per MMBtu) for Group II units with an existing NOx limit less than 12 ppm and Group III fire-tube boilers. Under Alternative E, any units with a rated heat input greater than two but less than five MMBtu per hour would need to meet nine ppm. In the proposed project, units with a rated heat input greater than two but less than five MMBtu per hour are required to meet seven ppm for fire-tube boilers and water-tube boilers would need to meet nine ppm. In addition, under Alternative E, thermal fluid heaters would remain at the current NOx emission limit of 30 ppm (or 0.037 pound per MMBtu). Under Alternative E, the affected units will have the same compliance deadline as the proposed project (e.g., 75 percent of units by January 1, 2021 and 100 percent compliance by January 1, 2022). ~~To achieve a five ppm NOx emission limit, the subset of Group II units (with a rated heat input of greater than or equal to 40 MMBtu, but less than 75 MMBtu) would need to have SCR systems.~~ Because less SCR systems would be need to be installed to meet NOx emissions limits, Alternative E is less stringent than the proposed project. However, t~~T~~he installation of additional SCR systems would result in less than significant impacts to air quality during construction and significant adverse impacts t~~o air quality during construction and~~ hazards and hazardous materials for ammonia. If Alternative E is implemented, the air quality impacts are expected to be less~~greater~~ on a peak day than the proposed project, because ~~of the installation of~~ fewer additional SCR systems will be installed. The impacts from the hazards and hazardous materials for ammonia may be equivalent or less~~greater~~ than the proposed project depending on the location and size of the ammonia storage tanks required by the construction of the additional SCR system and the proximity to sensitive receptors. Because less~~more~~ units would have SCR systems installed and in turn would result in fewer ~~less allow for greater~~ NOx emission reductions than ~~would otherwise occur if the same units only had the burners replaced with ultra-low NOx burners~~ under the proposed project, Alternative E would be less ~~more~~ stringent than the proposed project. Alternative E would not~~also~~ achieve all of the project objectives and still~~while~~ -create~~ing~~ significant adverse impacts to air quality during construction ~~than the proposed project~~ and possibly for hazards and hazardous materials for ammonia storage and use.

In summary, of the five alternatives, Alternative D would be considered the environmentally superior alternative.

CONCLUSION

Of the five alternatives analyzed, Alternative A would generate the least severe and fewest number of environmental impacts compared to the proposed project. However, of the project alternatives, Alternative A would achieve the fewest of the project objectives and would have the fewest NOx emission reduction benefits.

Thus, from a hazard and air toxics perspective, when compared to the other alternatives under consideration, if implemented, Alternative D is considered to be the lowest toxic alternative and the environmentally superior alternative. However, Alternative D does not achieve the same amount of NOx emission reductions that would result if the proposed project is implemented.

Thus, when comparing the environmental effects of the project alternatives with the proposed project and evaluating the effectiveness of achieving the project objectives of the proposed project versus the project alternatives, the proposed project provides the best balance in achieving the project objectives while minimizing the significant adverse environmental impacts to air quality during construction and hazards and hazardous materials.

APPENDICES

APPENDIX A

PARs 1146 SERIES AND PR 1100

In order to save space and avoid repetition, please refer to the latest versions of PARs 1146 series and PR 1100 located elsewhere in the Governing Board Package (meeting date December 7, 2018). The versions of PARs 1146 series and PR 1100 that were circulated with the Revised Draft SEA which was released on September 27, 2018 for a 45-day public review and comment period ending on November 13, 2018 was identified in Appendix A as follows:

PAR 1146 was identified as version "PAR September 18, 2018"
PAR 1146.1 was identified as version "PAR September 18, 2018"
PAR 1146.2 was identified as version "PAR September 18, 2018"
PR 1100 was identified as version "PR September 18, 2018"

Original hard copies of the Revised Draft EA, which include the draft version of the proposed amended rule listed above, can be obtained through the SCAQMD Public Information Center at the Diamond Bar headquarters or by contacting Fabian Wesson, Public Advisor at the SCAQMD's Public Information Center by phone at (909) 396-2039 or by email at PICrequests@aqmd.gov.

APPENDIX B

ASSUMPTIONS AND CALCULATIONS

APPENDIX B-1

CalEEMod Files and Assumptions – Construction Emissions (SCR system)

CalEEMod Files and Assumptions – Construction Emissions

Construction of a SCR System (Annual)

PAR 1146 series SCR - South Coast AQMD Air District, Annual

PAR 1146 series SCR

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	9			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series SCR - South Coast AQMD Air District, Annual

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 10 days; Site Preparation: 2 days; Building Construction: 250 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Demolition - 1 acre = 43,560 square feet

Trips and VMT - Demolition: 15 Worker Trips, 0 Vendor Trips, 5 Hauling Trips
Site Preparation: 8 Work Trips, 0 Vendor Trips, 0 Hauling Trips
Building Construction: 18 Worker Trips, 7 Vendor Trips, 0 Hauling Trips
Paving: 13 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	250.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	2.00
tblConstructionPhase	PhaseEndDate	2/21/2018	1/3/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/14/2019
tblConstructionPhase	PhaseEndDate	2/21/2018	1/10/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/16/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/20/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/1/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/4/2020

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tblConstructionPhase	PhaseStartDate	2/22/2018	1/15/2019
tblGrading	AcresOfGrading	1.00	0.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	LoadFactor	0.29	0.29
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Rollers	Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	1.00	8.00

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tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	198.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripNumber	0.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	13.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00

2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2650	2.0945	1.7949	3.2300e-003	0.0575	0.1102	0.1677	0.0145	0.1057	0.1202	0.0000	278.3107	278.3107	0.0508	0.0000	279.5795
2020	5.1400e-003	0.0445	0.0448	8.0000e-005	7.2000e-004	2.3300e-003	3.0500e-003	1.9000e-004	2.1900e-003	2.3800e-003	0.0000	6.6282	6.6282	1.5500e-003	0.0000	6.6669
Maximum	**0.2650**	**2.0945**	**1.7949**	**3.2300e-003**	**0.0575**	**0.1102**	**0.1677**	**0.0145**	**0.1057**	**0.1202**	**0.0000**	**278.3107**	**278.3107**	**0.0508**	**0.0000**	**279.5795**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2650	2.0945	1.7949	3.2300e-003	0.0575	0.1102	0.1677	0.0145	0.1057	0.1202	0.0000	278.3104	278.3104	0.0508	0.0000	279.5792
2020	5.1400e-003	0.0445	0.0448	8.0000e-005	7.2000e-004	2.3300e-003	3.0500e-003	1.9000e-004	2.1900e-003	2.3800e-003	0.0000	6.6282	6.6282	1.5500e-003	0.0000	6.6669
Maximum	**0.2650**	**2.0945**	**1.7949**	**3.2300e-003**	**0.0575**	**0.1102**	**0.1677**	**0.0145**	**0.1057**	**0.1202**	**0.0000**	**278.3104**	**278.3104**	**0.0508**	**0.0000**	**279.5792**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	11-22-2018	2-21-2019	0.3551	0.3551
5	2-22-2019	5-21-2019	0.5678	0.5678
6	5-22-2019	8-21-2019	0.5867	0.5867
7	8-22-2019	11-21-2019	0.5870	0.5870
8	11-22-2019	2-21-2020	0.2979	0.2979
		Highest	0.5870	0.5870

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/14/2019	5	10	
2	Site Preparation	Site Preparation	1/15/2019	1/16/2019	5	2	
3	Building Construction	Building Construction	1/20/2019	1/3/2020	5	250	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series SCR - South Coast AQMD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Paving Equipment	1	8.00	131	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Plate Compactors	1	6.00	8	0.43
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Welders	2	8.00	46	0.45
Building Construction	Aerial Lifts	1	8.00	63	0.31
Demolition	Cranes	1	8.00	226	0.29
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Site Preparation	Graders	1	8.00	187	0.41
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	7	18.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	15.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0214	0.0000	0.0214	3.2500e-003	0.0000	3.2500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0111	0.1142	0.0840	1.2000e-004		5.7200e-003	5.7200e-003		5.3500e-003	5.3500e-003	0.0000	10.6175	10.6175	2.7000e-003	0.0000	10.6849
Total	**0.0111**	**0.1142**	**0.0840**	**1.2000e-004**	**0.0214**	**5.7200e-003**	**0.0272**	**3.2500e-003**	**5.3500e-003**	**8.6000e-003**	**0.0000**	**10.6175**	**10.6175**	**2.7000e-003**	**0.0000**	**10.6849**

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3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.5000e-004	1.4000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1906	0.1906	1.0000e-005	0.0000	0.1909
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.9000e-004	3.1300e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7645	0.7645	2.0000e-005	0.0000	0.7651
Total	**3.8000e-004**	**1.0400e-003**	**3.2700e-003**	**1.0000e-005**	**8.6000e-004**	**1.0000e-005**	**8.8000e-004**	**2.3000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.9551**	**0.9551**	**3.0000e-005**	**0.0000**	**0.9560**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0214	0.0000	0.0214	3.2500e-003	0.0000	3.2500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0111	0.1142	0.0840	1.2000e-004		5.7200e-003	5.7200e-003		5.3500e-003	5.3500e-003	0.0000	10.6174	10.6174	2.7000e-003	0.0000	10.6849
Total	**0.0111**	**0.1142**	**0.0840**	**1.2000e-004**	**0.0214**	**5.7200e-003**	**0.0272**	**3.2500e-003**	**5.3500e-003**	**8.6000e-003**	**0.0000**	**10.6174**	**10.6174**	**2.7000e-003**	**0.0000**	**10.6849**

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3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.5000e-004	1.4000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1906	0.1906	1.0000e-005	0.0000	0.1909
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.9000e-004	3.1300e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7645	0.7645	2.0000e-005	0.0000	0.7651
Total	**3.8000e-004**	**1.0400e-003**	**3.2700e-003**	**1.0000e-005**	**8.6000e-004**	**1.0000e-005**	**8.8000e-004**	**2.3000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.9551**	**0.9551**	**3.0000e-005**	**0.0000**	**0.9560**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.2700e-003	0.0000	5.2700e-003	2.9000e-003	0.0000	2.9000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0227	0.0144	2.0000e-005		1.1200e-003	1.1200e-003		1.0300e-003	1.0300e-003	0.0000	1.8948	1.8948	6.0000e-004	0.0000	1.9098
Total	**2.0800e-003**	**0.0227**	**0.0144**	**2.0000e-005**	**5.2700e-003**	**1.1200e-003**	**6.3900e-003**	**2.9000e-003**	**1.0300e-003**	**3.9300e-003**	**0.0000**	**1.8948**	**1.8948**	**6.0000e-004**	**0.0000**	**1.9098**

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3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.3000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0815	0.0815	0.0000	0.0000	0.0816
Total	**4.0000e-005**	**3.0000e-005**	**3.3000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0815**	**0.0815**	**0.0000**	**0.0000**	**0.0816**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.2700e-003	0.0000	5.2700e-003	2.9000e-003	0.0000	2.9000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0227	0.0144	2.0000e-005		1.1200e-003	1.1200e-003		1.0300e-003	1.0300e-003	0.0000	1.8948	1.8948	6.0000e-004	0.0000	1.9098
Total	**2.0800e-003**	**0.0227**	**0.0144**	**2.0000e-005**	**5.2700e-003**	**1.1200e-003**	**6.3900e-003**	**2.9000e-003**	**1.0300e-003**	**3.9300e-003**	**0.0000**	**1.8948**	**1.8948**	**6.0000e-004**	**0.0000**	**1.9098**

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3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.3000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0815	0.0815	0.0000	0.0000	0.0816
Total	**4.0000e-005**	**3.0000e-005**	**3.3000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0815**	**0.0815**	**0.0000**	**0.0000**	**0.0816**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2373	1.8472	1.5750	2.6100e-003		0.1025	0.1025		0.0985	0.0985	0.0000	220.7004	220.7004	0.0452	0.0000	221.8311
Total	**0.2373**	**1.8472**	**1.5750**	**2.6100e-003**		**0.1025**	**0.1025**		**0.0985**	**0.0985**	**0.0000**	**220.7004**	**220.7004**	**0.0452**	**0.0000**	**221.8311**

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3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4000e-003	0.1008	0.0253	2.2000e-004	5.4500e-003	6.6000e-004	6.1100e-003	1.5700e-003	6.3000e-004	2.2000e-003	0.0000	21.4025	21.4025	1.4800e-003	0.0000	21.4395
Worker	0.0107	8.5300e-003	0.0927	2.5000e-004	0.0244	1.9000e-004	0.0246	6.4800e-003	1.8000e-004	6.6600e-003	0.0000	22.6589	22.6589	7.1000e-004	0.0000	22.6766
Total	**0.0141**	**0.1093**	**0.1180**	**4.7000e-004**	**0.0298**	**8.5000e-004**	**0.0307**	**8.0500e-003**	**8.1000e-004**	**8.8600e-003**	**0.0000**	**44.0614**	**44.0614**	**2.1900e-003**	**0.0000**	**44.1161**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2373	1.8472	1.5750	2.6100e-003		0.1025	0.1025		0.0985	0.0985	0.0000	220.7002	220.7002	0.0452	0.0000	221.8308
Total	**0.2373**	**1.8472**	**1.5750**	**2.6100e-003**		**0.1025**	**0.1025**		**0.0985**	**0.0985**	**0.0000**	**220.7002**	**220.7002**	**0.0452**	**0.0000**	**221.8308**

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3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.4000e-003	0.1008	0.0253	2.2000e-004	5.4500e-003	6.6000e-004	6.1100e-003	1.5700e-003	6.3000e-004	2.2000e-003	0.0000	21.4025	21.4025	1.4800e-003	0.0000	21.4395
Worker	0.0107	8.5300e-003	0.0927	2.5000e-004	0.0244	1.9000e-004	0.0246	6.4800e-003	1.8000e-004	6.6600e-003	0.0000	22.6589	22.6589	7.1000e-004	0.0000	22.6766
Total	**0.0141**	**0.1093**	**0.1180**	**4.7000e-004**	**0.0298**	**8.5000e-004**	**0.0307**	**8.0500e-003**	**8.1000e-004**	**8.8600e-003**	**0.0000**	**44.0614**	**44.0614**	**2.1900e-003**	**0.0000**	**44.1161**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5800e-003	0.0207	0.0188	3.0000e-005		1.0800e-003	1.0800e-003		1.0400e-003	1.0400e-003	0.0000	2.6529	2.6529	5.3000e-004	0.0000	2.6662
Total	**2.5800e-003**	**0.0207**	**0.0188**	**3.0000e-005**		**1.0800e-003**	**1.0800e-003**		**1.0400e-003**	**1.0400e-003**	**0.0000**	**2.6529**	**2.6529**	**5.3000e-004**	**0.0000**	**2.6662**

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3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	1.1200e-003	2.8000e-004	0.0000	7.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2583	0.2583	2.0000e-005	0.0000	0.2587
Worker	1.2000e-004	9.0000e-005	1.0200e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2667	0.2667	1.0000e-005	0.0000	0.2669
Total	**1.6000e-004**	**1.2100e-003**	**1.3000e-003**	**0.0000**	**3.7000e-004**	**1.0000e-005**	**3.7000e-004**	**1.0000e-004**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**0.5249**	**0.5249**	**3.0000e-005**	**0.0000**	**0.5255**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5800e-003	0.0207	0.0188	3.0000e-005		1.0800e-003	1.0800e-003		1.0400e-003	1.0400e-003	0.0000	2.6529	2.6529	5.3000e-004	0.0000	2.6662
Total	**2.5800e-003**	**0.0207**	**0.0188**	**3.0000e-005**		**1.0800e-003**	**1.0800e-003**		**1.0400e-003**	**1.0400e-003**	**0.0000**	**2.6529**	**2.6529**	**5.3000e-004**	**0.0000**	**2.6662**

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3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	1.1200e-003	2.8000e-004	0.0000	7.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2583	0.2583	2.0000e-005	0.0000	0.2587
Worker	1.2000e-004	9.0000e-005	1.0200e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2667	0.2667	1.0000e-005	0.0000	0.2669
Total	**1.6000e-004**	**1.2100e-003**	**1.3000e-003**	**0.0000**	**3.7000e-004**	**1.0000e-005**	**3.7000e-004**	**1.0000e-004**	**1.0000e-005**	**1.0000e-004**	**0.0000**	**0.5249**	**0.5249**	**3.0000e-005**	**0.0000**	**0.5255**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.2600e-003**	**0.0225**	**0.0235**	**4.0000e-005**		**1.2400e-003**	**1.2400e-003**		**1.1400e-003**	**1.1400e-003**	**0.0000**	**3.1294**	**3.1294**	**9.8000e-004**	**0.0000**	**3.1539**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.1000e-004	1.2300e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3210	0.3210	1.0000e-005	0.0000	0.3212
Total	**1.5000e-004**	**1.1000e-004**	**1.2300e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3210**	**0.3210**	**1.0000e-005**	**0.0000**	**0.3212**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.2600e-003**	**0.0225**	**0.0235**	**4.0000e-005**		**1.2400e-003**	**1.2400e-003**		**1.1400e-003**	**1.1400e-003**	**0.0000**	**3.1294**	**3.1294**	**9.8000e-004**	**0.0000**	**3.1539**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.1000e-004	1.2300e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3210	0.3210	1.0000e-005	0.0000	0.3212
Total	**1.5000e-004**	**1.1000e-004**	**1.2300e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3210**	**0.3210**	**1.0000e-005**	**0.0000**	**0.3212**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

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5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Files and Assumptions – Construction Emissions

Construction of a SCR System (Summer)

PAR 1146 series SCR - South Coast AQMD Air District, Summer

PAR 1146 series SCR

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	9			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series SCR - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 10 days; Site Preparation: 2 days; Building Construction: 250 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Demolition - 1 acre = 43,560 square feet

Trips and VMT - Demolition: 15 Worker Trips, 0 Vendor Trips, 5 Hauling Trips
Site Preparation: 8 Work Trips, 0 Vendor Trips, 0 Hauling Trips
Building Construction: 18 Worker Trips, 7 Vendor Trips, 0 Hauling Trips
Paving: 13 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	250.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	2.00
tblConstructionPhase	PhaseEndDate	2/21/2018	1/3/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/14/2019
tblConstructionPhase	PhaseEndDate	2/21/2018	1/10/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/16/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/20/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/1/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/4/2020

PAR 1146 series SCR - South Coast AQMD Air District, Summer

tblConstructionPhase	PhaseStartDate	2/22/2018	1/15/2019
tblGrading	AcresOfGrading	1.00	0.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	LoadFactor	0.29	0.29
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Rollers	Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	1.00	8.00

PAR 1146 series SCR - South Coast AQMD Air District, Summer

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	198.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripNumber	0.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	13.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00

2.0 Emissions Summary

PAR 1146 series SCR - South Coast AQMD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.2939	23.0369	17.4919	0.0261	5.3588	1.1452	6.4825	2.9202	1.0719	3.9540	0.0000	2,560.2379	2,560.2379	0.6638	0.0000	2,575.3184
2020	1.8267	14.5786	13.4094	0.0250	0.2460	0.7260	0.9720	0.0663	0.6976	0.7639	0.0000	2,347.6649	2,347.6649	0.4365	0.0000	2,357.8954
Maximum	**2.2939**	**23.0369**	**17.4919**	**0.0261**	**5.3588**	**1.1452**	**6.4825**	**2.9202**	**1.0719**	**3.9540**	**0.0000**	**2,560.2379**	**2,560.2379**	**0.6638**	**0.0000**	**2,575.3184**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.2939	23.0369	17.4919	0.0261	5.3588	1.1452	6.4825	2.9202	1.0719	3.9540	0.0000	2,560.2379	2,560.2379	0.6638	0.0000	2,575.3184
2020	1.8267	14.5786	13.4094	0.0250	0.2460	0.7260	0.9720	0.0663	0.6976	0.7639	0.0000	2,347.6649	2,347.6649	0.4365	0.0000	2,357.8954
Maximum	**2.2939**	**23.0369**	**17.4919**	**0.0261**	**5.3588**	**1.1452**	**6.4825**	**2.9202**	**1.0719**	**3.9540**	**0.0000**	**2,560.2379**	**2,560.2379**	**0.6638**	**0.0000**	**2,575.3184**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

PAR 1146 series SCR - South Coast AQMD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

PAR 1146 series SCR - South Coast AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/14/2019	5	10	
2	Site Preparation	Site Preparation	1/15/2019	1/16/2019	5	2	
3	Building Construction	Building Construction	1/20/2019	1/3/2020	5	250	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series SCR - South Coast AQMD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Paving Equipment	1	8.00	131	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Plate Compactors	1	6.00	8	0.43
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Welders	2	8.00	46	0.45
Building Construction	Aerial Lifts	1	8.00	63	0.31
Demolition	Cranes	1	8.00	226	0.29
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Site Preparation	Graders	1	8.00	187	0.41
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series SCR - South Coast AQMD Air District, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	7	18.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	15.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.2879	0.0000	4.2879	0.6492	0.0000	0.6492			0.0000			0.0000
Off-Road	2.2163	22.8402	16.7900	0.0239		1.1433	1.1433		1.0702	1.0702		2,340.7487	2,340.7487	0.5948		2,355.6184
Total	**2.2163**	**22.8402**	**16.7900**	**0.0239**	**4.2879**	**1.1433**	**5.4312**	**0.6492**	**1.0702**	**1.7194**		**2,340.7487**	**2,340.7487**	**0.5948**		**2,355.6184**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.1100e-003	0.1456	0.0279	3.9000e-004	8.7400e-003	5.4000e-004	9.2800e-003	2.3900e-003	5.2000e-004	2.9100e-003		42.3409	42.3409	2.8900e-003		42.4131
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.0511	0.6740	1.7800e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		177.1484	177.1484	5.5400e-003		177.2869
Total	**0.0776**	**0.1967**	**0.7019**	**2.1700e-003**	**0.1764**	**1.8400e-003**	**0.1783**	**0.0469**	**1.7200e-003**	**0.0486**		**219.4892**	**219.4892**	**8.4300e-003**		**219.6999**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.2879	0.0000	4.2879	0.6492	0.0000	0.6492			0.0000			0.0000
Off-Road	2.2163	22.8402	16.7900	0.0239		1.1433	1.1433		1.0702	1.0702	0.0000	2,340.7487	2,340.7487	0.5948		2,355.6184
Total	**2.2163**	**22.8402**	**16.7900**	**0.0239**	**4.2879**	**1.1433**	**5.4312**	**0.6492**	**1.0702**	**1.7194**	**0.0000**	**2,340.7487**	**2,340.7487**	**0.5948**		**2,355.6184**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.1100e-003	0.1456	0.0279	3.9000e-004	8.7400e-003	5.4000e-004	9.2800e-003	2.3900e-003	5.2000e-004	2.9100e-003		42.3409	42.3409	2.8900e-003		42.4131
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.0511	0.6740	1.7800e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		177.1484	177.1484	5.5400e-003		177.2869
Total	**0.0776**	**0.1967**	**0.7019**	**2.1700e-003**	**0.1764**	**1.8400e-003**	**0.1783**	**0.0469**	**1.7200e-003**	**0.0486**		**219.4892**	**219.4892**	**8.4300e-003**		**219.6999**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0758	22.6996	14.3849	0.0211		1.1231	1.1231		1.0332	1.0332		2,088.6792	2,088.6792	0.6608		2,105.2001
Total	**2.0758**	**22.6996**	**14.3849**	**0.0211**	**5.2693**	**1.1231**	**6.3924**	**2.8965**	**1.0332**	**3.9297**		**2,088.6792**	**2,088.6792**	**0.6608**		**2,105.2001**

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530
Total	**0.0392**	**0.0273**	**0.3595**	**9.5000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**94.4791**	**94.4791**	**2.9500e-003**		**94.5530**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0758	22.6996	14.3849	0.0211		1.1231	1.1231		1.0332	1.0332	0.0000	2,088.6792	2,088.6792	0.6608		2,105.2001
Total	**2.0758**	**22.6996**	**14.3849**	**0.0211**	**5.2693**	**1.1231**	**6.3924**	**2.8965**	**1.0332**	**3.9297**	**0.0000**	**2,088.6792**	**2,088.6792**	**0.6608**		**2,105.2001**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0392	0.0273	0.3595	9.5000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		94.4791	94.4791	2.9500e-003		94.5530
Total	**0.0392**	**0.0273**	**0.3595**	**9.5000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**94.4791**	**94.4791**	**2.9500e-003**		**94.5530**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752
Total	**1.9213**	**14.9573**	**12.7532**	**0.0211**		**0.8300**	**0.8300**		**0.7976**	**0.7976**		**1,969.8833**	**1,969.8833**	**0.4037**		**1,979.9752**

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0270	0.8010	0.1936	1.8100e-003	0.0448	5.3100e-003	0.0501	0.0129	5.0800e-003	0.0180		193.3538	193.3538	0.0128		193.6736
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	**0.1151**	**0.8623**	**1.0024**	**3.9500e-003**	**0.2460**	**6.8800e-003**	**0.2529**	**0.0663**	**6.5200e-003**	**0.0728**		**405.9318**	**405.9318**	**0.0194**		**406.4179**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752
Total	**1.9213**	**14.9573**	**12.7532**	**0.0211**		**0.8300**	**0.8300**		**0.7976**	**0.7976**	**0.0000**	**1,969.8833**	**1,969.8833**	**0.4037**		**1,979.9752**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0270	0.8010	0.1936	1.8100e-003	0.0448	5.3100e-003	0.0501	0.0129	5.0800e-003	0.0180		193.3538	193.3538	0.0128		193.6736
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	**0.1151**	**0.8623**	**1.0024**	**3.9500e-003**	**0.2460**	**6.8800e-003**	**0.2529**	**0.0663**	**6.5200e-003**	**0.0728**		**405.9318**	**405.9318**	**0.0194**		**406.4179**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927		1,949.5559	1,949.5559	0.3912		1,959.3368
Total	**1.7223**	**13.7893**	**12.4986**	**0.0211**		**0.7208**	**0.7208**		**0.6927**	**0.6927**		**1,949.5559**	**1,949.5559**	**0.3912**		**1,959.3368**

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0230	0.7346	0.1749	1.8000e-003	0.0448	3.6400e-003	0.0484	0.0129	3.4800e-003	0.0164		192.1139	192.1139	0.0121		192.4155
Worker	0.0814	0.0547	0.7359	2.0700e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		205.9951	205.9951	5.9200e-003		206.1432
Total	**0.1044**	**0.7893**	**0.9108**	**3.8700e-003**	**0.2460**	**5.1700e-003**	**0.2512**	**0.0663**	**4.8900e-003**	**0.0711**		**398.1091**	**398.1091**	**0.0180**		**398.5587**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927	0.0000	1,949.5559	1,949.5559	0.3912		1,959.3368
Total	**1.7223**	**13.7893**	**12.4986**	**0.0211**		**0.7208**	**0.7208**		**0.6927**	**0.6927**	**0.0000**	**1,949.5559**	**1,949.5559**	**0.3912**		**1,959.3368**

PAR 1146 series SCR - South Coast AQMD Air District, Summer

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0230	0.7346	0.1749	1.8000e-003	0.0448	3.6400e-003	0.0484	0.0129	3.4800e-003	0.0164		192.1139	192.1139	0.0121		192.4155
Worker	0.0814	0.0547	0.7359	2.0700e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		205.9951	205.9951	5.9200e-003		206.1432
Total	**0.1044**	**0.7893**	**0.9108**	**3.8700e-003**	**0.2460**	**5.1700e-003**	**0.2512**	**0.0663**	**4.8900e-003**	**0.0711**		**398.1091**	**398.1091**	**0.0180**		**398.5587**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9037**	**8.9966**	**9.4003**	**0.0145**		**0.4945**	**0.4945**		**0.4564**	**0.4564**		**1,379.8266**	**1,379.8266**	**0.4323**		**1,390.6332**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0588	0.0395	0.5315	1.4900e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		148.7743	148.7743	4.2800e-003		148.8812
Total	**0.0588**	**0.0395**	**0.5315**	**1.4900e-003**	**0.1453**	**1.1000e-003**	**0.1464**	**0.0385**	**1.0200e-003**	**0.0396**		**148.7743**	**148.7743**	**4.2800e-003**		**148.8812**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9037**	**8.9966**	**9.4003**	**0.0145**		**0.4945**	**0.4945**		**0.4564**	**0.4564**	**0.0000**	**1,379.8266**	**1,379.8266**	**0.4323**		**1,390.6332**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0588	0.0395	0.5315	1.4900e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		148.7743	148.7743	4.2800e-003		148.8812
Total	**0.0588**	**0.0395**	**0.5315**	**1.4900e-003**	**0.1453**	**1.1000e-003**	**0.1464**	**0.0385**	**1.0200e-003**	**0.0396**		**148.7743**	**148.7743**	**4.2800e-003**		**148.8812**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Files and Assumptions – Construction Emissions

Construction of a SCR System (Winter)

PAR 1146 series SCR

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	9			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series SCR - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 10 days; Site Preparation: 2 days; Building Construction: 250 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Demolition - 1 acre = 43,560 square feet

Trips and VMT - Demolition: 15 Worker Trips, 0 Vendor Trips, 5 Hauling Trips
Site Preparation: 8 Work Trips, 0 Vendor Trips, 0 Hauling Trips
Building Construction: 18 Worker Trips, 7 Vendor Trips, 0 Hauling Trips
Paving: 13 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	250.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	2.00
tblConstructionPhase	PhaseEndDate	2/21/2018	1/3/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/14/2019
tblConstructionPhase	PhaseEndDate	2/21/2018	1/10/2020
tblConstructionPhase	PhaseEndDate	2/21/2018	1/16/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/20/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/1/2019
tblConstructionPhase	PhaseStartDate	2/22/2018	1/4/2020

PAR 1146 series SCR - South Coast AQMD Air District, Winter

tblConstructionPhase	PhaseStartDate	2/22/2018	1/15/2019
tblGrading	AcresOfGrading	1.00	0.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	LoadFactor	0.29	0.29
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Rollers	Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	1.00	8.00

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	198.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripNumber	0.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	13.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.3005	23.0437	17.4282	0.0260	5.3588	1.1452	6.4825	2.9202	1.0720	3.9540	0.0000	2,548.0195	2,548.0195	0.6636	0.0000	2,563.0942
2020	1.8352	14.5830	13.3562	0.0248	0.2460	0.7260	0.9720	0.0663	0.6977	0.7639	0.0000	2,328.7805	2,328.7805	0.4363	0.0000	2,339.0234
Maximum	**2.3005**	**23.0437**	**17.4282**	**0.0260**	**5.3588**	**1.1452**	**6.4825**	**2.9202**	**1.0720**	**3.9540**	**0.0000**	**2,548.0195**	**2,548.0195**	**0.6636**	**0.0000**	**2,563.0942**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.3005	23.0437	17.4282	0.0260	5.3588	1.1452	6.4825	2.9202	1.0720	3.9540	0.0000	2,548.0195	2,548.0195	0.6636	0.0000	2,563.0942
2020	1.8352	14.5830	13.3562	0.0248	0.2460	0.7260	0.9720	0.0663	0.6977	0.7639	0.0000	2,328.7805	2,328.7805	0.4363	0.0000	2,339.0234
Maximum	**2.3005**	**23.0437**	**17.4282**	**0.0260**	**5.3588**	**1.1452**	**6.4825**	**2.9202**	**1.0720**	**3.9540**	**0.0000**	**2,548.0195**	**2,548.0195**	**0.6636**	**0.0000**	**2,563.0942**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

PAR 1146 series SCR - South Coast AQMD Air District, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

PAR 1146 series SCR - South Coast AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/14/2019	5	10	
2	Site Preparation	Site Preparation	1/15/2019	1/16/2019	5	2	
3	Building Construction	Building Construction	1/20/2019	1/3/2020	5	250	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series SCR - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Paving Equipment	1	8.00	131	0.36
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Paving	Plate Compactors	1	6.00	8	0.43
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Welders	2	8.00	46	0.45
Building Construction	Aerial Lifts	1	8.00	63	0.31
Demolition	Cranes	1	8.00	226	0.29
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Site Preparation	Graders	1	8.00	187	0.41
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series SCR - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	7	18.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	15.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.2879	0.0000	4.2879	0.6492	0.0000	0.6492			0.0000			0.0000
Off-Road	2.2163	22.8402	16.7900	0.0239		1.1433	1.1433		1.0702	1.0702		2,340.7487	2,340.7487	0.5948		2,355.6184
Total	**2.2163**	**22.8402**	**16.7900**	**0.0239**	**4.2879**	**1.1433**	**5.4312**	**0.6492**	**1.0702**	**1.7194**		**2,340.7487**	**2,340.7487**	**0.5948**		**2,355.6184**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.2300e-003	0.1475	0.0301	3.9000e-004	8.7400e-003	5.5000e-004	9.2900e-003	2.3900e-003	5.3000e-004	2.9200e-003		41.5725	41.5725	3.0200e-003		41.6480
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6081	1.6600e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		165.6984	165.6984	5.1800e-003		165.8278
Total	**0.0842**	**0.2035**	**0.6382**	**2.0500e-003**	**0.1764**	**1.8500e-003**	**0.1783**	**0.0469**	**1.7300e-003**	**0.0486**		**207.2709**	**207.2709**	**8.2000e-003**		**207.4758**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.2879	0.0000	4.2879	0.6492	0.0000	0.6492			0.0000			0.0000
Off-Road	2.2163	22.8402	16.7900	0.0239		1.1433	1.1433		1.0702	1.0702	0.0000	2,340.7487	2,340.7487	0.5948		2,355.6184
Total	**2.2163**	**22.8402**	**16.7900**	**0.0239**	**4.2879**	**1.1433**	**5.4312**	**0.6492**	**1.0702**	**1.7194**	**0.0000**	**2,340.7487**	**2,340.7487**	**0.5948**		**2,355.6184**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.2300e-003	0.1475	0.0301	3.9000e-004	8.7400e-003	5.5000e-004	9.2900e-003	2.3900e-003	5.3000e-004	2.9200e-003		41.5725	41.5725	3.0200e-003		41.6480
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6081	1.6600e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		165.6984	165.6984	5.1800e-003		165.8278
Total	**0.0842**	**0.2035**	**0.6382**	**2.0500e-003**	**0.1764**	**1.8500e-003**	**0.1783**	**0.0469**	**1.7300e-003**	**0.0486**		**207.2709**	**207.2709**	**8.2000e-003**		**207.4758**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0758	22.6996	14.3849	0.0211		1.1231	1.1231		1.0332	1.0332		2,088.6792	2,088.6792	0.6608		2,105.2001
Total	**2.0758**	**22.6996**	**14.3849**	**0.0211**	**5.2693**	**1.1231**	**6.3924**	**2.8965**	**1.0332**	**3.9297**		**2,088.6792**	**2,088.6792**	**0.6608**		**2,105.2001**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415
Total	**0.0427**	**0.0299**	**0.3243**	**8.9000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**88.3725**	**88.3725**	**2.7600e-003**		**88.4415**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0758	22.6996	14.3849	0.0211		1.1231	1.1231		1.0332	1.0332	0.0000	2,088.6792	2,088.6792	0.6608		2,105.2001
Total	**2.0758**	**22.6996**	**14.3849**	**0.0211**	**5.2693**	**1.1231**	**6.3924**	**2.8965**	**1.0332**	**3.9297**	**0.0000**	**2,088.6792**	**2,088.6792**	**0.6608**		**2,105.2001**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0427	0.0299	0.3243	8.9000e-004	0.0894	7.0000e-004	0.0901	0.0237	6.4000e-004	0.0244		88.3725	88.3725	2.7600e-003		88.4415
Total	**0.0427**	**0.0299**	**0.3243**	**8.9000e-004**	**0.0894**	**7.0000e-004**	**0.0901**	**0.0237**	**6.4000e-004**	**0.0244**		**88.3725**	**88.3725**	**2.7600e-003**		**88.4415**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752
Total	**1.9213**	**14.9573**	**12.7532**	**0.0211**		**0.8300**	**0.8300**		**0.7976**	**0.7976**		**1,969.8833**	**1,969.8833**	**0.4037**		**1,979.9752**

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0282	0.8015	0.2156	1.7600e-003	0.0448	5.3900e-003	0.0502	0.0129	5.1600e-003	0.0181		187.8214	187.8214	0.0138		188.1651
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	**0.1242**	**0.8687**	**0.9453**	**3.7600e-003**	**0.2460**	**6.9600e-003**	**0.2530**	**0.0663**	**6.6000e-003**	**0.0729**		**386.6594**	**386.6594**	**0.0200**		**387.1584**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752
Total	**1.9213**	**14.9573**	**12.7532**	**0.0211**		**0.8300**	**0.8300**		**0.7976**	**0.7976**	**0.0000**	**1,969.8833**	**1,969.8833**	**0.4037**		**1,979.9752**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0282	0.8015	0.2156	1.7600e-003	0.0448	5.3900e-003	0.0502	0.0129	5.1600e-003	0.0181		187.8214	187.8214	0.0138		188.1651
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	**0.1242**	**0.8687**	**0.9453**	**3.7600e-003**	**0.2460**	**6.9600e-003**	**0.2530**	**0.0663**	**6.6000e-003**	**0.0729**		**386.6594**	**386.6594**	**0.0200**		**387.1584**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927		1,949.5559	1,949.5559	0.3912		1,959.3368
Total	**1.7223**	**13.7893**	**12.4986**	**0.0211**		**0.7208**	**0.7208**		**0.6927**	**0.6927**		**1,949.5559**	**1,949.5559**	**0.3912**		**1,959.3368**

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0241	0.7338	0.1950	1.7500e-003	0.0448	3.6900e-003	0.0485	0.0129	3.5300e-003	0.0164		186.5590	186.5590	0.0130		186.8828
Worker	0.0888	0.0599	0.6626	1.9300e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		192.6657	192.6657	5.5300e-003		192.8038
Total	**0.1129**	**0.7937**	**0.8576**	**3.6800e-003**	**0.2460**	**5.2200e-003**	**0.2512**	**0.0663**	**4.9400e-003**	**0.0712**		**379.2247**	**379.2247**	**0.0185**		**379.6867**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7223	13.7893	12.4986	0.0211		0.7208	0.7208		0.6927	0.6927	0.0000	1,949.5559	1,949.5559	0.3912		1,959.3368
Total	**1.7223**	**13.7893**	**12.4986**	**0.0211**		**0.7208**	**0.7208**		**0.6927**	**0.6927**	**0.0000**	**1,949.5559**	**1,949.5559**	**0.3912**		**1,959.3368**

PAR 1146 series SCR - South Coast AQMD Air District, Winter

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0241	0.7338	0.1950	1.7500e-003	0.0448	3.6900e-003	0.0485	0.0129	3.5300e-003	0.0164		186.5590	186.5590	0.0130		186.8828
Worker	0.0888	0.0599	0.6626	1.9300e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		192.6657	192.6657	5.5300e-003		192.8038
Total	**0.1129**	**0.7937**	**0.8576**	**3.6800e-003**	**0.2460**	**5.2200e-003**	**0.2512**	**0.0663**	**4.9400e-003**	**0.0712**		**379.2247**	**379.2247**	**0.0185**		**379.6867**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9037**	**8.9966**	**9.4003**	**0.0145**		**0.4945**	**0.4945**		**0.4564**	**0.4564**		**1,379.8266**	**1,379.8266**	**0.4323**		**1,390.6332**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0433	0.4785	1.4000e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		139.1474	139.1474	3.9900e-003		139.2472
Total	**0.0642**	**0.0433**	**0.4785**	**1.4000e-003**	**0.1453**	**1.1000e-003**	**0.1464**	**0.0385**	**1.0200e-003**	**0.0396**		**139.1474**	**139.1474**	**3.9900e-003**		**139.2472**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9037**	**8.9966**	**9.4003**	**0.0145**		**0.4945**	**0.4945**		**0.4564**	**0.4564**	**0.0000**	**1,379.8266**	**1,379.8266**	**0.4323**		**1,390.6332**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0433	0.4785	1.4000e-003	0.1453	1.1000e-003	0.1464	0.0385	1.0200e-003	0.0396		139.1474	139.1474	3.9900e-003		139.2472
Total	**0.0642**	**0.0433**	**0.4785**	**1.4000e-003**	**0.1453**	**1.1000e-003**	**0.1464**	**0.0385**	**1.0200e-003**	**0.0396**		**139.1474**	**139.1474**	**3.9900e-003**		**139.2472**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

PAR 1146 series SCR - South Coast AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B-2

Construction Emissions of Ultra-Low NOx Burners

Retrofit with Ultra-Low Nox Burners in 2019

PAR 1146 Series Affected Equipment	No. of Units	Construction Activity
Rule 1146 and 1146.1 units in RECLAIM	1	Install Ultra-Low NOx burners on 35 units during 2019

Construction Schedule - 1 day per unit

Activity	Equipment Type	No. of Equipment	Hrs/day	Crew Size
Off-Road Mobile Source Operations	Welding Machin	1	2	1

Construction Equipment Emission Factors	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type*	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Welding Machine (composite)	0.0344	0.1843	0.1832	0.0003	0.0117	25.6

Source: Off-road Mobile Source Emission Factors - Scenario Year 2019

http://www.aqmd.gov/docs/default-source/cega/handbook/emission-factors/off-road-mobile-source-emission-factors-(scenario-years-2007-2025).xls

**Equipment is assumed to be diesel fueled.*

Construction Vehicle (Mobile Source) Emission Factors for Year 2019	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Construction Related Activity	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Offsite (Construction Worker Vehicle)	0.00034	0.00291	0.00030	0.00001	0.00010	0.00004	0.92780
Offsite (Delivery Truck - pickup truck)	0.00034	0.00291	0.00030	0.00001	0.00010	0.00004	0.92780

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2019

https://www.arb.ca.gov/emfac/2014/

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Offsite (Construction Worker)	2	25
Offsite (Delivery Truck - Medium Duty)	2	50

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lbs/day)

	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Welding Machine	0.07	0.37	0.37	0.00	0.02	51.20
TOTAL	**0.07**	**0.37**	**0.37**	**0.00**	**0.02**	**51.20**

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Offsite Construction Emissions (lbs/day)

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Offsite (Construction Worker Vehicle)	0.03	0.29	0.03	0.00	0.01	0.00	92.78
Offsite (Delivery Truck - pickup truck)	0.07	0.58	0.06	0.00	0.02	0.01	185.56
TOTAL	**0.10**	**0.87**	**0.09**	**0.00**	**0.03**	**0.01**	**278.34**

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2019
https://www.arb.ca.gov/emfac/2014/

Total Incremental Combustion Emissions from Construction Activities

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Ultra-low Nox burner (1 unit)	**0.2**	**1**	**0.5**	**0.003**	**0.1**	**0.01**	**330**
Significant Threshold	75	550	100	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Incremental Increase in Fuel Usage From Construction Equipment and Workers' Vehicles

Construction Activity	**Total Project Hours of Operation***	**Equipment Type**	**Diesel Fuel Usage (gal/hr)****	**Diesel Fuel Usage (gal/project) ****	**Gasoline Fuel Usage (gal/yr)*****
Operation of Portable Equipment	2	Welding Machines	1.177	2.35	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Trucks	N/A	N/A	2.50
Workers' Vehicles - Offsite Delivery/Haul	N/A	Delivery Truck****	N/A	N/A	5.00
		TOTAL	**2.35**	**7.50**	

Notes:

**Assume construction will take approximately 1 day (8 hrs/day max), but welder will only be needed for ~2 hours per day.*

***Based on CARB's Off-Road Model (Version 2.0) for Equipment Year 2014.*

****Assume that construction workers' commute vehicle and pick-up truck use gasoline and get 20 mi/gal and round trip length is 50 miles.*

Retrofit with Ultra-Low Nox Burners in 2020

PAR 1146 Series Affected Equipment	No. of Units	Construction Activity
Rule 1146 and 1146.1 units in RECLAIM	1	Install Ultra-Low NOx burners on 80 units during 2020

Construction Schedule - 1 day per unit

Activity	Equipment Type	No. of Equipment	Hrs/day	Crew Size
Off-Road Mobile Source Operations	Welding Machin	1	2	1

Construction Equipment Emission Factors	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type*	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Welding Machine (composite)	0.0310	0.1816	0.1735	0.0003	0.0102	25.6

Source: Off-road Mobile Source Emission Factors - Scenario Year 2019
http://www.aqmd.gov/docs/default-source/ceqa/handbook/emission-factors/off-road-mobile-source-emission-factors-(scenario-years-2007-2025).xls
**Equipment is assumed to be diesel fueled.*

Construction Vehicle (Mobile Source) Emission Factors for Year 2011	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Construction Related Activity	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Offsite (Construction Worker Vehicle)	0.00031	0.00263	0.00026	0.00001	0.00010	0.00004	0.90138
Offsite (Delivery Truck - pickup truck)	0.00031	0.00263	0.00026	0.00001	0.00010	0.00004	0.90138

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2020
https://www.arb.ca.gov/emfac/2014/

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Offsite (Construction Worker)	2	25
Offsite (Delivery Truck - Medium Duty)	2	50

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lbs/day)

	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Welding Machine	0.06	0.36	0.35	0.00	0.02	51.20
TOTAL	**0.06**	**0.36**	**0.35**	**0.00**	**0.02**	**51.20**

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Offsite Construction Emissions (lbs/day)

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Offsite (Construction Worker Vehicle)	0.03	0.26	0.03	0.00	0.01	0.00	90.14
Offsite (Delivery Truck - pickup truck)	0.06	0.53	0.05	0.00	0.02	0.01	180.28
TOTAL	**0.09**	**0.79**	**0.08**	**0.00**	**0.03**	**0.01**	**270.41**

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2020 https://www.arb.ca.gov/emfac/2014/

Total Incremental Combustion Emissions from Construction Activities

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Ultra-low Nox burner (1 unit)	**0.2**	**1**	**0.4**	**0.003**	**0.1**	**0.01**	**322**
Significant Threshold	75	550	100	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Incremental Increase in Fuel Usage From Construction Equipment and Workers' Vehicles

Construction Activity	**Total Project Hours of Operation***	**Equipment Type**	**Diesel Fuel Usage (gal/hr)****	**Diesel Fuel Usage (gal/project) ****	**Gasoline Fuel Usage (gal/yr)*****
Operation of Portable Equipment	2	Welding Machines	1.177	2.35	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Trucks	N/A	N/A	2.50
Workers' Vehicles - Offsite Delivery/Haul	N/A	Delivery Truck****	N/A	N/A	5.00
		TOTAL	**2.35**	**7.50**	

Notes:

**Assume construction will take approximately 1 day (8 hrs/day max), but welder will only be needed for ~2 hours per day.*

***Based on CARB's Off-Road Model (Version 2.0) for Equipment Year 2014.*

****Assume that construction workers' commute vehicle and pick-up truck use gasoline and get 20 mi/gal and round trip length is 50 miles.*

Retrofit with Ultra-Low Nox Burners in 2021

PAR 1146 Series Affected Equipment	No. of Units	Construction Activity
Rule 1146 and 1146.1 units in RECLAIM	1	Install Ultra-Low NOx burners on 51 units during 2021

Construction Schedule - 1 day per unit

Activity	Equipment Type	No. of Equipment	Hrs/day	Crew Size
Off-Road Mobile Source Operations	Welding Machin	1	2	1

Construction Equipment Emission Factors	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type*	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Welding Machine (composite)	0.0280	0.1788	0.1635	0.0003	0.0088	25.6

Source: Off-road Mobile Source Emission Factors - Scenario Year 2019
http://www.aqmd.gov/docs/default-source/ceqa/handbook/emission-factors/off-road-mobile-source-emission-factors-(scenario-years-2007-2025).xls
**Equipment is assumed to be diesel fueled.*

Construction Vehicle (Mobile Source) Emission Factors for Year 2021	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Construction Related Activity	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Offsite (Construction Worker Vehicle)	0.00029	0.00243	0.00023	0.00001	0.00010	0.00004	0.87361
Offsite (Delivery Truck - pickup truck)	0.00029	0.00243	0.00023	0.00001	0.00010	0.00004	0.87361

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2021
https://www.arb.ca.gov/emfac/2014/

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Offsite (Construction Worker)	2	25
Offsite (Delivery Truck - Medium Duty)	2	50

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lbs/day)

	VOC	CO	NOx	SOx	PM10	CO2
Equipment Type	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Welding Machine	0.06	0.36	0.33	0.00	0.02	51.20
TOTAL	**0.06**	**0.36**	**0.33**	**0.00**	**0.02**	**51.20**

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Offsite Construction Emissions (lbs/day)

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Vehicle	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Offsite (Construction Worker Vehicle)	0.03	0.24	0.02	0.00	0.01	0.00	87.36
Offsite (Delivery Truck - pickup truck)	0.06	0.49	0.05	0.00	0.02	0.01	174.72
TOTAL	**0.09**	**0.73**	**0.07**	**0.00**	**0.03**	**0.01**	**262.08**

Source: Highest (Most Conservative) EMFAC2014 (Version 1.07) Emission Factors for On-Passenger Vehicles & Delivery Trucks - Scenario Year 2021 https://www.arb.ca.gov/emfac/2014/

Total Incremental Combustion Emissions from Construction Activities

	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Ultra-low Nox burner (1 unit)	**0.1**	**1**	**0.4**	**0.003**	**0.05**	**0.01**	**313**
Significant Threshold	75	550	100	150	150	55	n/a
Exceed Significance?	NO	NO	NO	NO	NO	NO	n/a

Incremental Increase in Fuel Usage From Construction Equipment and Workers' Vehicles

Construction Activity	**Total Project Hours of Operation***	**Equipment Type**	**Diesel Fuel Usage (gal/hr)****	**Diesel Fuel Usage (gal/project) ****	**Gasoline Fuel Usage (gal/yr)*****
Operation of Portable Equipment	2	Welding Machines	1.177	2.35	N/A
Workers' Vehicles - Commuting	N/A	Light-Duty Trucks	N/A	N/A	2.50
Workers' Vehicles - Offsite Delivery/Haul	N/A	Delivery Truck****	N/A	N/A	5.00
			TOTAL	**2.35**	**7.50**

Notes:

**Assume construction will take approximately 1 day (8 hrs/day max), but welder will only be needed for ~2 hours per day.*

***Based on CARB's Off-Road Model (Version 2.0) for Equipment Year 2014.*

****Assume that construction workers' commute vehicle and pick-up truck use gasoline and get 20 mi/gal and round trip length is 50 miles.*

Emissions Summary Due to Retrofits of Ultra-Low NOx Burners in 2019, 2020, and 2021

Peak Construction by Year	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	CO2 (lbs/day)	CO2 (lbs/day)	CO2 (lbs/day)
2019									
TOTAL for 1 unit in one day	0.17	1.24	0.46	0.003	0.05	0.01	329.54	329.54	0.15
Peak Daily TOTAL for 10 units installed in one day	1.70	12.42	4.56	0.03	0.55	0.13	3295.39	n/a	n/a
Peak TOTAL for 35 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11533.85	5.23
Significance Threshold	75	550	100	150	150	55	n/a	n/a	n/a
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**n/a**	**n/a**	**n/a**
2020									
TOTAL for 1 unit in one day	0.16	1.15	0.43	0.003	0.05	0.01	321.61	321.61	0.15
Peak Daily TOTAL for 10 units installed in one day	1.56	11.52	4.25	0.03	0.52	0.13	3216.14	n/a	n/a
Peak TOTAL for 35 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11256.48	5.10
Significance Threshold	75	550	100	150	150	55	n/a	n/a	n/a
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**n/a**	**n/a**	**n/a**
2021									
TOTAL for 1 unit in one day	0.14	1.09	0.40	0.003	0.05	0.01	313.28	313.28	0.14
Peak Daily TOTAL for 10 units installed in one day	1.44	10.85	3.96	0.03	0.49	0.13	3132.84	n/a	n/a
Peak TOTAL for 23 units installed in one year	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7205.52	3.27
Significance Threshold	75	550	100	150	150	55	n/a	n/a	n/a
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**n/a**	**n/a**	**n/a**

APPENDIX B-3

CalEEMod Files and Assumptions – Construction Emissions (Boiler Replacement)

CalEEMod Files and Assumptions – Construction Emissions

Construction for a Boiler Replacement (Annual)

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

PAR 1146 series Large Boiler Replacement

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	9			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 20 days; Site Preparation: 5 days; Building Construction: 60 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 2 hours per day; Welders (1): 8 hours per day; Cement and Mortar Mixers (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Trips and VMT - Demolition: 2 Worker Trips, 0 Vendor Trips, 5 Hauling Trips
Site Preparation: 2 Work Trips, 0 Vendor Trips, 0 Hauling Trips
Building Construction: 2 Worker Trips, 1 Vendor Trips, 0 Hauling Trips
Paving: 2 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Demolition - Assume 1,000 square feet would be demo from existing pad

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	65.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblGrading	AcresOfGrading	2.50	0.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00
tblTripsAndVMT	WorkerTripNumber	10.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00

2.0 Emissions Summary

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0911	0.7523	0.6276	9.9000e-004	0.0149	0.0405	0.0554	7.6500e-003	0.0387	0.0463	0.0000	84.5310	84.5310	0.0181	0.0000	84.9826
2020	2.2800e-003	0.0225	0.0237	4.0000e-005	5.0000e-005	1.2400e-003	1.2900e-003	1.0000e-005	1.1400e-003	1.1600e-003	0.0000	3.1788	3.1788	9.8000e-004	0.0000	3.2033
Maximum	**0.0911**	**0.7523**	**0.6276**	**9.9000e-004**	**0.0149**	**0.0405**	**0.0554**	**7.6500e-003**	**0.0387**	**0.0463**	**0.0000**	**84.5310**	**84.5310**	**0.0181**	**0.0000**	**84.9826**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0911	0.7523	0.6276	9.9000e-004	0.0149	0.0405	0.0554	7.6500e-003	0.0387	0.0463	0.0000	84.5309	84.5309	0.0181	0.0000	84.9825
2020	2.2800e-003	0.0225	0.0237	4.0000e-005	5.0000e-005	1.2400e-003	1.2900e-003	1.0000e-005	1.1400e-003	1.1600e-003	0.0000	3.1788	3.1788	9.8000e-004	0.0000	3.2033
Maximum	**0.0911**	**0.7523**	**0.6276**	**9.9000e-004**	**0.0149**	**0.0405**	**0.0554**	**7.6500e-003**	**0.0387**	**0.0463**	**0.0000**	**84.5309**	**84.5309**	**0.0181**	**0.0000**	**84.9825**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	11-22-2018	2-21-2019	0.4910	0.4910
5	2-22-2019	5-21-2019	0.3464	0.3464
8	11-22-2019	2-21-2020	0.0248	0.0248
		Highest	0.4910	0.4910

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/15/2019	1/21/2019	5	5	
3	Building Construction	Building Construction	1/20/2019	4/19/2019	5	65	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Cement and Mortar Mixers	1	8.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	2.00	226	0.29
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Demolition	Welders	1	8.00	46	0.45
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Aerial Lifts	1	8.00	63	0.31
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Building Construction	Welders	2	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Paving Equipment	1	8.00	131	0.36
Paving	Plate Compactors	1	6.00	8	0.43
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	2.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	2.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.9000e-004	0.0000	4.9000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0229	0.2046	0.1724	2.3000e-004		0.0107	0.0107		0.0101	0.0101	0.0000	19.8063	19.8063	4.5700e-003	0.0000	19.9204
Total	**0.0229**	**0.2046**	**0.1724**	**2.3000e-004**	**4.9000e-004**	**0.0107**	**0.0112**	**7.0000e-005**	**0.0101**	**0.0102**	**0.0000**	**19.8063**	**19.8063**	**4.5700e-003**	**0.0000**	**19.9204**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.5000e-004	1.4000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1906	0.1906	1.0000e-005	0.0000	0.1909
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	8.0000e-005	8.3000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2039	0.2039	1.0000e-005	0.0000	0.2040
Total	**1.2000e-004**	**8.3000e-004**	**9.7000e-004**	**0.0000**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.3945**	**0.3945**	**2.0000e-005**	**0.0000**	**0.3950**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.9000e-004	0.0000	4.9000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0229	0.2046	0.1724	2.3000e-004		0.0107	0.0107		0.0101	0.0101	0.0000	19.8063	19.8063	4.5700e-003	0.0000	19.9204
Total	**0.0229**	**0.2046**	**0.1724**	**2.3000e-004**	**4.9000e-004**	**0.0107**	**0.0112**	**7.0000e-005**	**0.0101**	**0.0102**	**0.0000**	**19.8063**	**19.8063**	**4.5700e-003**	**0.0000**	**19.9204**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.5000e-004	1.4000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1906	0.1906	1.0000e-005	0.0000	0.1909
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-004	8.0000e-005	8.3000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2039	0.2039	1.0000e-005	0.0000	0.2040
Total	**1.2000e-004**	**8.3000e-004**	**9.7000e-004**	**0.0000**	**2.6000e-004**	**0.0000**	**2.7000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.3945**	**0.3945**	**2.0000e-005**	**0.0000**	**0.3950**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0132	0.0000	0.0132	7.2400e-003	0.0000	7.2400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.1800e-003	0.0567	0.0359	5.0000e-005		2.8000e-003	2.8000e-003		2.5800e-003	2.5800e-003	0.0000	4.7331	4.7331	1.5000e-003	0.0000	4.7706
Total	**5.1800e-003**	**0.0567**	**0.0359**	**5.0000e-005**	**0.0132**	**2.8000e-003**	**0.0160**	**7.2400e-003**	**2.5800e-003**	**9.8200e-003**	**0.0000**	**4.7331**	**4.7331**	**1.5000e-003**	**0.0000**	**4.7706**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0510	0.0510	0.0000	0.0000	0.0510
Total	**2.0000e-005**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0510**	**0.0510**	**0.0000**	**0.0000**	**0.0510**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0132	0.0000	0.0132	7.2400e-003	0.0000	7.2400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.1800e-003	0.0567	0.0359	5.0000e-005		2.8000e-003	2.8000e-003		2.5800e-003	2.5800e-003	0.0000	4.7331	4.7331	1.5000e-003	0.0000	4.7706
Total	**5.1800e-003**	**0.0567**	**0.0359**	**5.0000e-005**	**0.0132**	**2.8000e-003**	**0.0160**	**7.2400e-003**	**2.5800e-003**	**9.8200e-003**	**0.0000**	**4.7331**	**4.7331**	**1.5000e-003**	**0.0000**	**4.7706**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0510	0.0510	0.0000	0.0000	0.0510
Total	**2.0000e-005**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0510**	**0.0510**	**0.0000**	**0.0000**	**0.0510**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0624	0.4861	0.4145	6.9000e-004		0.0270	0.0270		0.0259	0.0259	0.0000	58.0791	58.0791	0.0119	0.0000	58.3766
Total	**0.0624**	**0.4861**	**0.4145**	**6.9000e-004**		**0.0270**	**0.0270**		**0.0259**	**0.0259**	**0.0000**	**58.0791**	**58.0791**	**0.0119**	**0.0000**	**58.3766**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3000e-004	3.7900e-003	9.5000e-004	1.0000e-005	2.0000e-004	2.0000e-005	2.3000e-004	6.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.8046	0.8046	6.0000e-005	0.0000	0.8060
Worker	3.1000e-004	2.5000e-004	2.7100e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	1.9000e-004	0.0000	0.6625	0.6625	2.0000e-005	0.0000	0.6631
Total	**4.4000e-004**	**4.0400e-003**	**3.6600e-003**	**2.0000e-005**	**9.1000e-004**	**3.0000e-005**	**9.5000e-004**	**2.5000e-004**	**3.0000e-005**	**2.7000e-004**	**0.0000**	**1.4672**	**1.4672**	**8.0000e-005**	**0.0000**	**1.4691**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0624	0.4861	0.4145	6.9000e-004		0.0270	0.0270		0.0259	0.0259	0.0000	58.0790	58.0790	0.0119	0.0000	58.3765
Total	**0.0624**	**0.4861**	**0.4145**	**6.9000e-004**		**0.0270**	**0.0270**		**0.0259**	**0.0259**	**0.0000**	**58.0790**	**58.0790**	**0.0119**	**0.0000**	**58.3765**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3000e-004	3.7900e-003	9.5000e-004	1.0000e-005	2.0000e-004	2.0000e-005	2.3000e-004	6.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.8046	0.8046	6.0000e-005	0.0000	0.8060
Worker	3.1000e-004	2.5000e-004	2.7100e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	1.9000e-004	0.0000	0.6625	0.6625	2.0000e-005	0.0000	0.6631
Total	**4.4000e-004**	**4.0400e-003**	**3.6600e-003**	**2.0000e-005**	**9.1000e-004**	**3.0000e-005**	**9.5000e-004**	**2.5000e-004**	**3.0000e-005**	**2.7000e-004**	**0.0000**	**1.4672**	**1.4672**	**8.0000e-005**	**0.0000**	**1.4691**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.2600e-003**	**0.0225**	**0.0235**	**4.0000e-005**		**1.2400e-003**	**1.2400e-003**		**1.1400e-003**	**1.1400e-003**	**0.0000**	**3.1294**	**3.1294**	**9.8000e-004**	**0.0000**	**3.1539**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0494	0.0494	0.0000	0.0000	0.0494
Total	**2.0000e-005**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0494**	**0.0494**	**0.0000**	**0.0000**	**0.0494**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2600e-003	0.0225	0.0235	4.0000e-005		1.2400e-003	1.2400e-003		1.1400e-003	1.1400e-003	0.0000	3.1294	3.1294	9.8000e-004	0.0000	3.1539
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.2600e-003**	**0.0225**	**0.0235**	**4.0000e-005**		**1.2400e-003**	**1.2400e-003**		**1.1400e-003**	**1.1400e-003**	**0.0000**	**3.1294**	**3.1294**	**9.8000e-004**	**0.0000**	**3.1539**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0494	0.0494	0.0000	0.0000	0.0494
Total	**2.0000e-005**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0494**	**0.0494**	**0.0000**	**0.0000**	**0.0494**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Annual

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Files and Assumptions – Construction Emissions

Construction for a Boiler Replacement (Summer)

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

PAR 1146 series Large Boiler Replacement

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	9			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 20 days; Site Preparation: 5 days; Building Construction: 60 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 2 hours per day; Welders (1): 8 hours per day; Cement and Mortar Mixers (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Trips and VMT - Demolition: 2 Worker Trips, 0 Vendor Trips, 5 Hauling Trips
Site Preparation: 2 Work Trips, 0 Vendor Trips, 0 Hauling Trips
Building Construction: 2 Worker Trips, 1 Vendor Trips, 0 Hauling Trips
Paving: 2 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Demolition - Assume 1,000 square feet would be demo from existing pad

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	65.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblGrading	AcresOfGrading	2.50	0.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00
tblTripsAndVMT	WorkerTripNumber	10.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00

2.0 Emissions Summary

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.3237	58.3077	44.6733	0.0663	5.3964	3.0252	8.4216	2.9247	2.8448	5.7695	0.0000	6,359.7499	6,359.7499	1.5727	0.0000	6,399.0678
2020	0.9127	9.0027	9.4820	0.0147	0.0224	0.4946	0.5170	5.9300e-003	0.4565	0.4624	0.0000	1,402.7149	1,402.7149	0.4329	0.0000	1,413.5380
Maximum	**6.3237**	**58.3077**	**44.6733**	**0.0663**	**5.3964**	**3.0252**	**8.4216**	**2.9247**	**2.8448**	**5.7695**	**0.0000**	**6,359.7499**	**6,359.7499**	**1.5727**	**0.0000**	**6,399.0678**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.3237	58.3077	44.6733	0.0663	5.3964	3.0252	8.4216	2.9247	2.8448	5.7695	0.0000	6,359.7499	6,359.7499	1.5727	0.0000	6,399.0678
2020	0.9127	9.0027	9.4820	0.0147	0.0224	0.4946	0.5170	5.9300e-003	0.4565	0.4624	0.0000	1,402.7149	1,402.7149	0.4329	0.0000	1,413.5380
Maximum	**6.3237**	**58.3077**	**44.6733**	**0.0663**	**5.3964**	**3.0252**	**8.4216**	**2.9247**	**2.8448**	**5.7695**	**0.0000**	**6,359.7499**	**6,359.7499**	**1.5727**	**0.0000**	**6,399.0678**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/15/2019	1/21/2019	5	5	
3	Building Construction	Building Construction	1/20/2019	4/19/2019	5	65	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Cement and Mortar Mixers	1	8.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	2.00	226	0.29
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Demolition	Welders	1	8.00	46	0.45
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Aerial Lifts	1	8.00	63	0.31
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Building Construction	Welders	2	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Paving Equipment	1	8.00	131	0.36
Paving	Plate Compactors	1	6.00	8	0.43
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	2.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	2.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0492	0.0000	0.0492	7.4500e-003	0.0000	7.4500e-003			0.0000			0.0000
Off-Road	2.2936	20.4634	17.2377	0.0230		1.0722	1.0722		1.0139	1.0139		2,183.2691	2,183.2691	0.5033		2,195.8508
Total	**2.2936**	**20.4634**	**17.2377**	**0.0230**	**0.0492**	**1.0722**	**1.1214**	**7.4500e-003**	**1.0139**	**1.0214**		**2,183.2691**	**2,183.2691**	**0.5033**		**2,195.8508**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0500e-003	0.0728	0.0139	2.0000e-004	4.3700e-003	2.7000e-004	4.6400e-003	1.2000e-003	2.6000e-004	1.4600e-003		21.1704	21.1704	1.4400e-003		21.2065
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	**0.0118**	**0.0796**	**0.1038**	**4.4000e-004**	**0.0267**	**4.4000e-004**	**0.0272**	**7.1300e-003**	**4.2000e-004**	**7.5500e-003**		**44.7902**	**44.7902**	**2.1800e-003**		**44.8448**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0492	0.0000	0.0492	7.4500e-003	0.0000	7.4500e-003			0.0000			0.0000
Off-Road	2.2936	20.4634	17.2377	0.0230		1.0722	1.0722		1.0139	1.0139	0.0000	2,183.2691	2,183.2691	0.5033		2,195.8508
Total	**2.2936**	**20.4634**	**17.2377**	**0.0230**	**0.0492**	**1.0722**	**1.1214**	**7.4500e-003**	**1.0139**	**1.0214**	**0.0000**	**2,183.2691**	**2,183.2691**	**0.5033**		**2,195.8508**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.0500e-003	0.0728	0.0139	2.0000e-004	4.3700e-003	2.7000e-004	4.6400e-003	1.2000e-003	2.6000e-004	1.4600e-003		21.1704	21.1704	1.4400e-003		21.2065
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	**0.0118**	**0.0796**	**0.1038**	**4.4000e-004**	**0.0267**	**4.4000e-004**	**0.0272**	**7.1300e-003**	**4.2000e-004**	**7.5500e-003**		**44.7902**	**44.7902**	**2.1800e-003**		**44.8448**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0735	22.6793	14.3712	0.0211		1.1215	1.1215		1.0318	1.0318		2,086.9458	2,086.9458	0.6603		2,103.4529
Total	**2.0735**	**22.6793**	**14.3712**	**0.0211**	**5.2693**	**1.1215**	**6.3909**	**2.8965**	**1.0318**	**3.9283**		**2,086.9458**	**2,086.9458**	**0.6603**		**2,103.4529**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	**9.7900e-003**	**6.8200e-003**	**0.0899**	**2.4000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0900e-003**		**23.6198**	**23.6198**	**7.4000e-004**		**23.6383**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0735	22.6793	14.3712	0.0211		1.1215	1.1215		1.0318	1.0318	0.0000	2,086.9457	2,086.9457	0.6603		2,103.4529
Total	**2.0735**	**22.6793**	**14.3712**	**0.0211**	**5.2693**	**1.1215**	**6.3909**	**2.8965**	**1.0318**	**3.9283**	**0.0000**	**2,086.9457**	**2,086.9457**	**0.6603**		**2,103.4529**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	**9.7900e-003**	**6.8200e-003**	**0.0899**	**2.4000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0900e-003**		**23.6198**	**23.6198**	**7.4000e-004**		**23.6383**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752
Total	**1.9213**	**14.9573**	**12.7532**	**0.0211**		**0.8300**	**0.8300**		**0.7976**	**0.7976**		**1,969.8833**	**1,969.8833**	**0.4037**		**1,979.9752**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.8600e-003	0.1144	0.0277	2.6000e-004	6.4000e-003	7.6000e-004	7.1600e-003	1.8400e-003	7.3000e-004	2.5700e-003		27.6220	27.6220	1.8300e-003		27.6677
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	**0.0137**	**0.1212**	**0.1175**	**5.0000e-004**	**0.0288**	**9.3000e-004**	**0.0297**	**7.7700e-003**	**8.9000e-004**	**8.6600e-003**		**51.2418**	**51.2418**	**2.5700e-003**		**51.3059**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752
Total	**1.9213**	**14.9573**	**12.7532**	**0.0211**		**0.8300**	**0.8300**		**0.7976**	**0.7976**	**0.0000**	**1,969.8833**	**1,969.8833**	**0.4037**		**1,979.9752**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.8600e-003	0.1144	0.0277	2.6000e-004	6.4000e-003	7.6000e-004	7.1600e-003	1.8400e-003	7.3000e-004	2.5700e-003		27.6220	27.6220	1.8300e-003		27.6677
Worker	9.7900e-003	6.8200e-003	0.0899	2.4000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		23.6198	23.6198	7.4000e-004		23.6383
Total	**0.0137**	**0.1212**	**0.1175**	**5.0000e-004**	**0.0288**	**9.3000e-004**	**0.0297**	**7.7700e-003**	**8.9000e-004**	**8.6600e-003**		**51.2418**	**51.2418**	**2.5700e-003**		**51.3059**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9037**	**8.9966**	**9.4003**	**0.0145**		**0.4945**	**0.4945**		**0.4564**	**0.4564**		**1,379.8266**	**1,379.8266**	**0.4323**		**1,390.6332**

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Summer

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.0500e-003	6.0800e-003	0.0818	2.3000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		22.8884	22.8884	6.6000e-004		22.9048
Total	**9.0500e-003**	**6.0800e-003**	**0.0818**	**2.3000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0800e-003**		**22.8884**	**22.8884**	**6.6000e-004**		**22.9048**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9037**	**8.9966**	**9.4003**	**0.0145**		**0.4945**	**0.4945**		**0.4564**	**0.4564**	**0.0000**	**1,379.8266**	**1,379.8266**	**0.4323**		**1,390.6332**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.0500e-003	6.0800e-003	0.0818	2.3000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		22.8884	22.8884	6.6000e-004		22.9048
Total	**9.0500e-003**	**6.0800e-003**	**0.0818**	**2.3000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0800e-003**		**22.8884**	**22.8884**	**6.6000e-004**		**22.9048**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEMod Files and Assumptions – Construction Emissions

Construction for a Boiler Replacement (Winter)

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

PAR 1146 series Large Boiler Replacement

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	9			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use - User Defined Industrial

Construction Phase - SCR: Demolition: 20 days; Site Preparation: 5 days; Building Construction: 60 days; Paving: 5 days

Off-road Equipment - No Arch. Coating

Off-road Equipment - Cranes (1): 6 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 6 hours per day; Welders (2): 8 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 8 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Cranes (1): 2 hours per day; Welders (1): 8 hours per day; Cement and Mortar Mixers (1): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Plate Compactors (1): 6 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 8 hours per day; Trenchers (1): 8 hours per day

Trips and VMT - Demolition: 2 Worker Trips, 0 Vendor Trips, 5 Hauling Trips
Site Preparation: 2 Work Trips, 0 Vendor Trips, 0 Hauling Trips
Building Construction: 2 Worker Trips, 1 Vendor Trips, 0 Hauling Trips
Paving: 2 Worker Trips, 0 Vendor Trips, 0 Hauling Trips

Demolition - Assume 1,000 square feet would be demo from existing pad

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	65.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblGrading	AcresOfGrading	2.50	0.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00
tblOffRoadEquipment	HorsePower	97.00	98.00

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	132.00	131.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	78.00	81.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00
tblTripsAndVMT	WorkerTripNumber	10.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	15.00	2.00

2.0 Emissions Summary

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.3265	58.3107	44.6512	0.0662	5.3964	3.0253	8.4217	2.9247	2.8448	5.7695	0.0000	6,353.9953	6,353.9953	1.5728	0.0000	6,393.3147
2020	0.9135	9.0033	9.4739	0.0147	0.0224	0.4946	0.5170	5.9300e-003	0.4565	0.4624	0.0000	1,401.2339	1,401.2339	0.4329	0.0000	1,412.0558
Maximum	**6.3265**	**58.3107**	**44.6512**	**0.0662**	**5.3964**	**3.0253**	**8.4217**	**2.9247**	**2.8448**	**5.7695**	**0.0000**	**6,353.9953**	**6,353.9953**	**1.5728**	**0.0000**	**6,393.3147**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.3265	58.3107	44.6512	0.0662	5.3964	3.0253	8.4217	2.9247	2.8448	5.7695	0.0000	6,353.9953	6,353.9953	1.5728	0.0000	6,393.3147
2020	0.9135	9.0033	9.4739	0.0147	0.0224	0.4946	0.5170	5.9300e-003	0.4565	0.4624	0.0000	1,401.2339	1,401.2339	0.4329	0.0000	1,412.0558
Maximum	**6.3265**	**58.3107**	**44.6512**	**0.0662**	**5.3964**	**3.0253**	**8.4217**	**2.9247**	**2.8448**	**5.7695**	**0.0000**	**6,353.9953**	**6,353.9953**	**1.5728**	**0.0000**	**6,393.3147**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/15/2019	1/21/2019	5	5	
3	Building Construction	Building Construction	1/20/2019	4/19/2019	5	65	
4	Paving	Paving	1/4/2020	1/10/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Cement and Mortar Mixers	1	8.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	2.00	226	0.29
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Demolition	Welders	1	8.00	46	0.45
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	98	0.37
Site Preparation	Trenchers	1	8.00	81	0.50
Building Construction	Aerial Lifts	1	8.00	63	0.31
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	98	0.37
Building Construction	Welders	2	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Paving Equipment	1	8.00	131	0.36
Paving	Plate Compactors	1	6.00	8	0.43
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	98	0.37

Trips and VMT

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	2.00	0.00	5.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	2.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	2.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0492	0.0000	0.0492	7.4500e-003	0.0000	7.4500e-003			0.0000			0.0000
Off-Road	2.2936	20.4634	17.2377	0.0230		1.0722	1.0722		1.0139	1.0139		2,183.2691	2,183.2691	0.5033		2,195.8508
Total	**2.2936**	**20.4634**	**17.2377**	**0.0230**	**0.0492**	**1.0722**	**1.1214**	**7.4500e-003**	**1.0139**	**1.0214**		**2,183.2691**	**2,183.2691**	**0.5033**		**2,195.8508**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1100e-003	0.0738	0.0151	1.9000e-004	4.3700e-003	2.8000e-004	4.6400e-003	1.2000e-003	2.6000e-004	1.4600e-003		20.7863	20.7863	1.5100e-003		20.8240
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	**0.0128**	**0.0812**	**0.0962**	**4.1000e-004**	**0.0267**	**4.5000e-004**	**0.0272**	**7.1300e-003**	**4.2000e-004**	**7.5500e-003**		**42.8794**	**42.8794**	**2.2000e-003**		**42.9344**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0492	0.0000	0.0492	7.4500e-003	0.0000	7.4500e-003			0.0000			0.0000
Off-Road	2.2936	20.4634	17.2377	0.0230		1.0722	1.0722		1.0139	1.0139	0.0000	2,183.2691	2,183.2691	0.5033		2,195.8508
Total	**2.2936**	**20.4634**	**17.2377**	**0.0230**	**0.0492**	**1.0722**	**1.1214**	**7.4500e-003**	**1.0139**	**1.0214**	**0.0000**	**2,183.2691**	**2,183.2691**	**0.5033**		**2,195.8508**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1100e-003	0.0738	0.0151	1.9000e-004	4.3700e-003	2.8000e-004	4.6400e-003	1.2000e-003	2.6000e-004	1.4600e-003		20.7863	20.7863	1.5100e-003		20.8240
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	**0.0128**	**0.0812**	**0.0962**	**4.1000e-004**	**0.0267**	**4.5000e-004**	**0.0272**	**7.1300e-003**	**4.2000e-004**	**7.5500e-003**		**42.8794**	**42.8794**	**2.2000e-003**		**42.9344**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0735	22.6793	14.3712	0.0211		1.1215	1.1215		1.0318	1.0318		2,086.9458	2,086.9458	0.6603		2,103.4529
Total	**2.0735**	**22.6793**	**14.3712**	**0.0211**	**5.2693**	**1.1215**	**6.3909**	**2.8965**	**1.0318**	**3.9283**		**2,086.9458**	**2,086.9458**	**0.6603**		**2,103.4529**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	**0.0107**	**7.4700e-003**	**0.0811**	**2.2000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0900e-003**		**22.0931**	**22.0931**	**6.9000e-004**		**22.1104**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	2.0735	22.6793	14.3712	0.0211		1.1215	1.1215		1.0318	1.0318	0.0000	2,086.9457	2,086.9457	0.6603		2,103.4529
Total	**2.0735**	**22.6793**	**14.3712**	**0.0211**	**5.2693**	**1.1215**	**6.3909**	**2.8965**	**1.0318**	**3.9283**	**0.0000**	**2,086.9457**	**2,086.9457**	**0.6603**		**2,103.4529**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	**0.0107**	**7.4700e-003**	**0.0811**	**2.2000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0900e-003**		**22.0931**	**22.0931**	**6.9000e-004**		**22.1104**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976		1,969.8833	1,969.8833	0.4037		1,979.9752
Total	**1.9213**	**14.9573**	**12.7532**	**0.0211**		**0.8300**	**0.8300**		**0.7976**	**0.7976**		**1,969.8833**	**1,969.8833**	**0.4037**		**1,979.9752**

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.0300e-003	0.1145	0.0308	2.5000e-004	6.4000e-003	7.7000e-004	7.1700e-003	1.8400e-003	7.4000e-004	2.5800e-003		26.8316	26.8316	1.9600e-003		26.8807
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	**0.0147**	**0.1220**	**0.1119**	**4.7000e-004**	**0.0288**	**9.4000e-004**	**0.0297**	**7.7700e-003**	**9.0000e-004**	**8.6700e-003**		**48.9247**	**48.9247**	**2.6500e-003**		**48.9911**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9213	14.9573	12.7532	0.0211		0.8300	0.8300		0.7976	0.7976	0.0000	1,969.8833	1,969.8833	0.4037		1,979.9752
Total	**1.9213**	**14.9573**	**12.7532**	**0.0211**		**0.8300**	**0.8300**		**0.7976**	**0.7976**	**0.0000**	**1,969.8833**	**1,969.8833**	**0.4037**		**1,979.9752**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.0300e-003	0.1145	0.0308	2.5000e-004	6.4000e-003	7.7000e-004	7.1700e-003	1.8400e-003	7.4000e-004	2.5800e-003		26.8316	26.8316	1.9600e-003		26.8807
Worker	0.0107	7.4700e-003	0.0811	2.2000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0900e-003		22.0931	22.0931	6.9000e-004		22.1104
Total	**0.0147**	**0.1220**	**0.1119**	**4.7000e-004**	**0.0288**	**9.4000e-004**	**0.0297**	**7.7700e-003**	**9.0000e-004**	**8.6700e-003**		**48.9247**	**48.9247**	**2.6500e-003**		**48.9911**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564		1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9037**	**8.9966**	**9.4003**	**0.0145**		**0.4945**	**0.4945**		**0.4564**	**0.4564**		**1,379.8266**	**1,379.8266**	**0.4323**		**1,390.6332**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.8700e-003	6.6600e-003	0.0736	2.1000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		21.4073	21.4073	6.1000e-004		21.4227
Total	**9.8700e-003**	**6.6600e-003**	**0.0736**	**2.1000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0800e-003**		**21.4073**	**21.4073**	**6.1000e-004**		**21.4227**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9037	8.9966	9.4003	0.0145		0.4945	0.4945		0.4564	0.4564	0.0000	1,379.8266	1,379.8266	0.4323		1,390.6332
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9037**	**8.9966**	**9.4003**	**0.0145**		**0.4945**	**0.4945**		**0.4564**	**0.4564**	**0.0000**	**1,379.8266**	**1,379.8266**	**0.4323**		**1,390.6332**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	9.8700e-003	6.6600e-003	0.0736	2.1000e-004	0.0224	1.7000e-004	0.0225	5.9300e-003	1.6000e-004	6.0800e-003		21.4073	21.4073	6.1000e-004		21.4227
Total	**9.8700e-003**	**6.6600e-003**	**0.0736**	**2.1000e-004**	**0.0224**	**1.7000e-004**	**0.0225**	**5.9300e-003**	**1.6000e-004**	**6.0800e-003**		**21.4073**	**21.4073**	**6.1000e-004**		**21.4227**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

PAR 1146 series Large Boiler Replacement - South Coast AQMD Air District, Winter

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B-4

Operational Emissions

Appendix B-4
CEQA Impact Evaluations - Assumptions and Calculations
(2018/08/28 rev)

Emissions Summary

PARs 1146 series and PR 1100	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOX, lb/day
Increased Delivery Trucks	19.25	30.43	2.18	1.22	4.54	0.12
Total	**19.25**	**30.43**	**2.18**	**1.22**	**4.54**	**0.12**

By Vehicle Class	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOX, lb/day	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr	All sites: Max. # used/day	All sites: Max. # day used/yr
Diesel Delivery Trucks (T6 Construction Truck)	19.25	30.43	2.18	1.22	4.54	0.12	39.53	0.001	-	39.55	65	452
Total	**19.25**	**30.43**	**2.18**	**1.22**	**4.54**	**0.12**	**39.53**	**0.001**	**-**	**39.55**		

Note:

1. It is conservatively assumed that there will be 56 units at 32 facilities affected by PARs 1146 series and PR 1100.

2. Peak daily trips assume one ammonia/urea delivery occurs at each facility, except for Facility 6 in which there will be two ammonia truck deliveries. Truck trip distances to deliver ammonia are assumed to be 100 miles round-trip.

3. No additional employees are anticipated to be needed to operate the new SCR systems; the existing work force per affected facility is expected to be sufficient. As such, no workers' travel emissions are anticipated from the operation of the new SCR systems.

4. It is assumed heavy duty trucks would be used to deliever ammonia/urea and catalyst.

5. Values in table may difffer due to rounding.

Delivery Trucks (Ammonia and Catalyst) - T6 instate construction heavy (T6) - each

	CO	NOx	PM10	PM2.5	VOC	SOX	CO2	CH4	N2O	CO2e	VMT, mile/day
lb/mile	0.0030	0.0047	0.0003	0.0002	0.0007	0.00002	1.93	0.000042	-	1.93	100.0
lb/day, MT/day for GHG	0.30	0.47	0.03	0.02	0.07	0.002	0.09	0.000002	-	0.09	

EF: from EMFAC2017 - Year 2019

PARs 1146 series and PR 1100 Operation Emissions
(11/08/18 rev.)

Summary

Key Requirements: Operation Phase	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOX, lb/day
Source Testing	5.12	0.43	0.13	0.06	0.54	0.002
Total	**5.12**	**0.43**	**0.13**	**0.06**	**0.54**	**0.002**

By Vehicle Class	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOX, lb/day	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr
Source Testing (LDT)	5.12	0.43	0.13	0.06	0.54	0.002	3.30	0.00	-	3.30
Total	**5.12**	**0.43**	**0.13**	**0.06**	**0.54**	**0.002**	**3.30**	**0.00**	**-**	**3.30**

All facilities	
Max. # used/day	**Max. # used/yr**
32	224

Notes and Assumptions:
1. 32 facilities would be subject to source testing for ammonia emissions limits. Each facility would only conduct one source test at a time even with multiple units at a facility.
2. 56 SCR systems would be required to conduct the necessary ammonia emissions testing four times a year; thus, in one year the maximum number of source testing truck trips would be 224.
3. It was assumed (1) source testing truck (LDT) would be used to complete source testing at each facility.
4. It was assumed every on-road vehicle used during operation would travel a distance of 40 miles round trip.
5. Values in table may differ due to rounding.

Light-Duty Truck (LDT) - each

	CO	NOx	PM10	PM2.5	VOC	SOX	CO2	CH4	N2O	CO2e
lb/mile	0.0040	0.0003	0.0001	0.00004	0.0004	0.000002	0.8	0.00004	-	0.81246
lb/day, MT/day for GHG	0.16	0.01	0.00	0.00	0.02	0.00	0.01	0.000001	-	0.01

VMT, mile/day
40.0

EF: from EMFAC2017, EPA AP-42

APPENDIX C

Tier III Risk Assessment Calculations of Diesel PM

TIER 3 SCREENING RISK ASSESSMENT DATA INPUT

(Version 8.0 & Attachment M, Revision Mar 2016) - RiskTool (V1.03)

Application Deemed Complete Date	02/28/18
A/N	PAR 1146 series/PR 1100
Facility Name	PAR 1146 series/PR 1100

Stack Data	**Input**	**Units**
Hours/Day	24	hrs/day
Days/Week	7	days/wk
Weeks/Year	52	wks/yr
Emission Units	lb/hr	
Control Efficiency	0.00000	fraction range 0-1
Does source have T-BACT?	NO	
Point or Volume Source?	P	P or V
Stack Height or Building Height	10	feet
Area (For Volume Source Only)	5000	ft^2
Distance-Residential	25	meters
Distance-Commercial	25	meters
Meteorological Station	Redlands	
Project Duration (Short Term Options: 2, 5, or 9 Years; Else 30 years)	30	years

Source Type:	O - Other
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	YES

FOR SOURCES TYPE OTHER THAN CREMATORY, BOILER, ICES, OR PRESSURE WASHER, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Compound Code	Compound	Emission Rate (lbs/hr)	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
P1	Particulate Emissions from Diesel-Fueled Engines	2.83E-06	350	0.000002834		0.000002834

TIER 3 SCREEN INPUT & CANCER BURDEN CALCULATION

(Version 8.0 & Attachment M, Revision Mar 2016) - RiskTool (V1.03)

A/N: PAR 1146 series/PR 1100 **Fac:** R 1146 series/PR 1100

Screening program used	AERSCREEN
Convert 1-hr to Annual Conc. Factor	0.1

Instructions: Run a screening program at 1 lb/hr rate to get the max 1-hr concentrations at residential & commercial receptors. Enter values into the yellow highlighted cells in the table below.

Modeling emissions rate	0.1260	g/sec
Modeling emissions rate	1.00	lbs/hr
Modeling emissions rate	4.38	tons/yr
Max Hours per day	24	hr/day
Days per week	7	dy/wk
Weeks per year	52	wk/yr

MODELING RESULTS - MAX ONE HOUR

Distance residential	**25**	meters
Max. 1-hr Conc. at Residential receptor	247.9	µg/m³
Annualized Conc. Residential	24.79	µg/m³
Distance Commerical	**25**	meters
Max. 1-hr Conc. at Comm. receptor	247.9	µg/m³
Annualized Conc. Commercial	24.79	µg/m³

Annualized X/Q

X/Q Residential	**5.665**	(µg/m³)/(tons/yr)
X/Q Commercial	**5.665**	(µg/m³)/(tons/yr)

Hourly X/Q (X/Q Max)

X/Q Residential	**248.119**	(µg/m³)/(lbs/hr)
X/Q Commercial	**248.119**	(µg/m³)/(lbs/hr)

SCREEN INPUT DATA - BRITISH UNITS

Actual exhaust rate	10000.00	acfm
Temperature	68.00	°F
Stack diameter	24.00	in
Stack height	13.50	ft
Modeling emissions rate	1.00	lb/hr

SCREEN INPUT DATA - METRIC UNITS

Temperature	293.000	K
Stack diameter	0.610	meters
Stack area	0.292	m^2
Stack height	4.115	meters
Stack velocity	16.179	m/s
Modeling emissions rate	0.12611	g/s

TIER 3 SCREENING RISK ASSESSMENT REPORT
(Version 8.0 & Attachment M, Revision Mar 2016) - RiskTool (V1.03)

A/N: ? 1146 series/PR 1100 **Application deemed complete date:** 2/28/2018
Fac: ? 1146 series/PR 1100

2. Tier 3 Data

Equipment Type	Other		No T-BACT			
Operation Schedule	24	hours/day;	7	days/week;	52	weeks/year
Stack Height	10	ft				
Distance - Residential	25	m				
Distance - Commercial	25	m				
Meteorological Station	Redlands					

Dispersion Factors tables	Point Source
For Chronic X/Q	Table 3
For Acute X/Q max	Table 6

Dilution Factors

Receptor	X/Q (µg/m³)/(tons/yr)	X/Qmax (µg/m³)/(lbs/hr)
Residential	5.665	248.119
Commercial - Worker	5.665	248.119

Adjustment and Intake Factors

	Residential	Worker
Year of Exposure	30	
Combined Exposure Factor (CEF) - Table 9.1 & 9.2	676.63	56.26
Worker Adjustment Factor (WAF) - Table 10	1	1.00

3. Rule 1401 Compound Data

Compound	R1 - Uncontrolled (lbs/hr)	R2 - Controlled (lbs/hr)	CP (mg/kg-day)$^{-1}$	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic (µg/m^3)	REL 8-hr Chronic (µg/m^3)	REL Acute (µg/m^3)	MWAF
Particulate Emissions from Diesel-Fueled Engines	2.83E-06	2.83E-06	1.10E+00	1.00	1.00	1.00	1.00	5.00E+00			1

4. Emission Calculations

Compound	R1 (lbs/hr)	R2 (lbs/hr)	R2 (lbs/yr)	R2 (tons/yr)
Particulate Emissions from Diesel-Fueled Engines	2.83E-06	2.83E-06	2.48E-02	1.24E-05
Total	**2.83E-06**	**2.83E-06**	**2.48E-02**	**1.24E-05**

TIER 3 RESULTS **A/N:** 1146 series/PR 1100 **Application deemed complete date:** 02/28/18

5a. MICR

MICR Resident = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) Resident * CEF Resident * MP Resident * 1e-6 * MWAF

MICR Worker = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) Worker * CEF Worker* MP Worker* WAF Worker* 1e-6 * MWAF

Compound	Residential	Commercial
Particulate Emissions from Diesel-Fueled Engines	5.22E-08	4.34E-09
Total	**5.22E-08**	**4.34E-09**
	PASS	**PASS**

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden Calculation?	**NO**

6. Hazard Index **A/N:** ≀ 1146 series/PR 1 **Application deemed complete date:** 02/28/18

HIA = [Q(lb/hr) * (X/Q)max * MWAF]/ Acute REL
HIC = [Q(ton/yr) * (X/Q) * MP * MWAF] / Chronic REL
HIC 8-hr= [Q(ton/yr) * (X/Q) * WAF * MWAF] / 8-hr Chronic REL

Target Organs	Acute	Chronic	8-hr Chronic	Acute Pass/Fail	Chronic Pass/Fail	8-hr Chronic Pass/Fail
Alimentary system (liver) - AL				Pass	Pass	Pass
Bones and teeth - BN				Pass	Pass	Pass
Cardiovascular system - CV				Pass	Pass	Pass
Developmental - DEV				Pass	Pass	Pass
Endocrine system - END				Pass	Pass	Pass
Eye				Pass	Pass	Pass
Hematopoietic system - HEM				Pass	Pass	Pass
Immune system - IMM				Pass	Pass	Pass
Kidney - KID				Pass	Pass	Pass
Nervous system - NS				Pass	Pass	Pass
Reproductive system - REP				Pass	Pass	Pass
Respiratory system - RES		1.40E-05		Pass	Pass	Pass
Skin				Pass	Pass	Pass

6a. Hazard Index Acute - Resident

HIA = [Q(lb/hr) * (X/Q)max resident * MWAF] / Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Particulate Emissions from Diesel-Fueled Engines										
Total										

6a. Hazard Index Acute - Worker **A/N:** ≀ 1146 series/PR 1 **Application deemed complete date:** 02/28/18

HIA = [Q(lb/hr) * (X/Q)max Worker * MWAF] / Acute REL

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Particulate Emissions from Diesel-Fueled Engines										
Total										

6b. Hazard Index Chronic - Resident

HIC = [Q(ton/yr) * (X/Q) Resident * MP Chronic Resident * MWAF] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Particulate Emissions from Diesel-Fueled Engines												1.40E-05	
Total												1.40E-05	

6b. Hazard Index Chronic - Worker

HIC = [Q(ton/yr) * (X/Q) * MP Chronic Worker * MWAF] / Chronic REL

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Particulate Emissions from Diesel-Fueled Engines												1.40E-05	
Total												1.40E-05	

6c. 8-hour Hazard Index Chronic - Resident **A/N:** ≀ 1146 series/PR 1 **Application deemed complete date:** 02/28/18

HIC 8-hr = [Q(ton/yr) * (X/Q) Resident * WAF Resident * MWAF] / 8-hr Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Particulate Emissions from Diesel-Fueled Engines													
Total													

6c. 8-hour Hazard Index Chronic - Worker

HIC 8-hr = [Q(ton/yr) * (X/Q) Worker * WAF Worker * MWAF] / 8-hr Chronic REL

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Particulate Emissions from Diesel-Fueled Engines													
Total													

APPENDIX D

List of Affected Facilities

Appendix D - List of Affected Facilities

Facility ID	NAICS	Facility Name	Address	On List per Government Code 65962.5 (Envirostor)?	Distance from School (meters)	Distance from Sensitive Receptor (meters)	Airport within 2 miles (code)
1744	339991	KIRKHILL - TA COMPANY	300 E CYPRESS ST BREA 92821	No	227	227	No
2946	332111	PACIFIC FORGE INC	10641 S ETIWANDA AVE FONTANA 92337	No	2613	979	No
3029	313310	MATCHMASTER DYEING & FINISHING INC	3700 S BROADWAY LOS ANGELES 90007	No	185	185	No
3721	326140	DART CONTAINER CORP OF CALIFORNIA	150 S MAPLE ST CORONA 92880	No	1080	553	AJO
7416	325120	PRAXAIR INC	2300 E Pacific Coast Hwy Wilmington 90744	No	663	487	No
9053	221330	VEOLIA ENERGY LA INC	715 W 3RD ST LOS ANGELES 90071	No	91	91	No
11435	325180	PQ CORPORATION	8401 QUARTZ AVE SOUTH GATE 90280	No	702	268	No
11716	324122	FONTANA PAPER MILLS INC	13733 VALLEY BLVD FONTANA 92335	No	2268	171	No
12155	327120	ARMSTRONG FLOORING INC	5037 PATATA ST SOUTH GATE 90280	Yes	507	131	No
14871	322130	SONOCO PRODUCTS CO	166 N BALDWIN PARK BLVD CITY OF INDUSTRY 91746	No	994	211	No
16642	312120	ANHEUSER-BUSCH LLC., (LA BREWERY)	15800 ROSCOE BLVD VAN NUYS 91406	Yes	835	68	VNY
16978	311611	CLOUGHERTY PACKING LLC/HORMEL FOODS CORI	3049 E VERNON AVE VERNON 90058	No	1088	953	No
18294	336411	NORTHROP GRUMMAN SYSTEMS CORP	1 HORNET WAY EL SEGUNDO 90245	No	159	220	LAX
20604	445110	RALPHS GROCERY CO	1100 W ARTESIA BLVD COMPTON 90220	No	840	582	CPM
21887	322121	KIMBERLY-CLARK WORLDWIDE INC.-FULT. MILL	2001 E ORANGETHORPE AVE FULLERTON 92831	No	789	789	No
22607	311511	CALIFORNIA DAIRIES, INC	11709 ARTESIA BLVD ARTESIA 90701	No	391	29	No
35302	324122	OWENS CORNING ROOFING AND ASPHALT, LLC	1501 N TAMARIND AVE COMPTON 90222	No	463	125	CPM
40034	314110	BENTLEY PRINCE STREET INC	14641 DON JULIAN RD CITY OF INDUSTRY 91746	No	1123	548	No
42775	211120	WEST NEWPORT OIL CO	1080 W 17TH ST COSTA MESA 92627	No	428	428	No
45746	322130	PABCO BLDG PRODUCTS LLC,PABCO PAPER, DBA	4460 PACIFIC BLVD VERNON 90058	Yes	150	266	No
46268	332996	CALIFORNIA STEEL INDUSTRIES INC	14000 SAN BERNARDINO AVE FONTANA 92335	No	1241	302	No
47781	221112	OLS ENERGY-CHINO	5601 EUCALYPTUS AVE CHINO 91710	No	1548	546	No
51620	221112	WHEELABRATOR NORWALK ENERGY CO INC	11500 BALSAM ST NORWALK 90650	No	801	278	No
59618	313310	PACIFIC CONTINENTAL TEXTILES, INC.	2880 E ANA ST COMPTON 90221	No	899	778	No
74424	812331	ANGELICA TEXTILE SERVICES	451 SAN FERNANDO RD LOS ANGELES 90031	No	738	185	No
85943	331315	SIERRA ALUMINUM COMPANY	11806 PACIFIC AVE FONTANA 92337	Yes	1776	721	No
94872	332431	METAL CONTAINER CORP	10980 INLAND AVE MIRA LOMA 91752	No	2353	611	No
94930	325411	CARGILL INC	566 N GILBERT ST FULLERTON 92833	No	861	834	FUL
95212	314110	FABRICA	3201 S SUSAN ST SANTA ANA 92704	No	431	568	No
96587	313310	TEXOLLINI INC	2575 EL PRESIDIO ST CARSON 90810	No	848	370	No
126498	332812	STEELSCAPE, INC	11200 ARROW ROUTE RANCHO CUCAMONGA 91730	Yes	955	600	No
129816	221112	INLAND EMPIRE ENERGY CENTER, LLC	26226 Antelope Rd Menifee 92585	No	561	380	No
131732	334413	NEWPORT FAB, LLC	4321 JAMBOREE RD NEWPORT BEACH 92660	No	1960	175	SNA
131850	314110	SHAW DIVERSIFIED SERVICES INC	15305 VALLEY VIEW AVE SANTA FE SPRINGS 90670	No	715	532	No
132068	311812	BIMBO BAKERIES USA INC	480 S VAIL AVE MONTEBELLO 90640	No	203	98	No
143741	211120	DCOR LLC	OFFSHORE PLATFORM EDITH OCS P-0296 HUNTINGTON BEACH 92649	No	3337	3337	No
153199	445110	THE KROGER CO/RALPHS GROCERY CO	850 S CYPRESS ST LA HABRA 90631	No	585	585	No
155877	312120	MILLERCOORS, LLC	15801 E 1ST ST IRWINDALE 91706	No	1705	1537	No
157363	322211	INTERNATIONAL PAPER CO	601 E BALL RD ANAHEIM 92805	No	407	160	No
165192	336411	TRIUMPH AEROSTRUCTURES, LLC	3901 JACK NORTHROP AVE HAWTHORNE 90250	No	566	256	HHR
168088	561110	POLYNT COMPOSITES USA INC	2801 LYNWOOD RD LYNWOOD 90262	Yes	457	234	No
172005	322121	NEW- INDY ONTARIO, LLC	5100 E. JURUPA ST ONTARIO 91761	No	3465	2589	No
173290	812332	MEDICLEAN	4500 DUNHAM ST COMMERCE 90040	No	521	60	No

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175154	211120	FREEPORT-MCMORAN OIL & GAS	1400 N MONTEBELLO BLVD MONTEBELLO 90640	No	1059	425	No
175191	211120	FREEPORT-MCMORAN OIL & GAS	5640 S FAIRFAX AVE LOS ANGELES 90056	No	803	25	No
180367	211111	LINN OPERATING, INC.	25121 N SIERRA HWY SANTA CLARITA 91321	No	1112	1040	No
180410	325211	REICHHOLD LLC 2	237 S MOTOR AVE AZUSA 91702	No	1721	1327	No
182049	486910	TORRANCE VALLEY PIPELINE CO LLC	8044 WOODLEY AVE VAN NUYS 91406	No	1019	498	VNY
182050	221210	TORRANCE VALLEY PIPELINE CO LLC	25500 MAGIC MOUNTAIN PKY VALENCIA 91355	No	1878	724	No
182051	486210	TORRANCE VALLEY PIPELINE CO LLC	5800 SEPULVEDA BLVD CULVER CITY 90230	No	306	364	No
183832	313210	AST Textile	12537 CERISE AVE HAWTHORNE 90250	No	303	204	HHR
800003	336413	HONEYWELL INTERNATIONAL INC	2525 W 190TH ST TORRANCE 90504	No	266	218	No
800066	336419	HITCO CARBON COMPOSITES INC	1551 W 139TH ST GARDENA 90249	No	1256	219	No
800113	336412	ROHR, INC.	8200 ARLINGTON AVE RIVERSIDE 92503	Yes	712	157	RAL
800128	486210	SO CAL GAS CO	12801 TAMPA AVE NORTHRIDGE 91326	No	385	99	No
800129	486910	SFPP, L.P.	2359 RIVERSIDE AVE BLOOMINGTON 92316	Yes	1586	576	No
800149	325180	US BORAX INC	300 FALCON ST WILMINGTON 90744	No	1813	1653	No
800189	713110	DISNEYLAND RESORT	1313 S HARBOR BLVD ANAHEIM 92802	Yes	1142	568	No
800205	522120	BANK OF AMERICA NT & SA, BREA CENTER	275 VALENCIA AVE BREA 92823	No	376	1258	No
800371	541511	RAYTHEON SYSTEMS COMPANY - FULLERTON OPS	1801 HUGHES DR FULLERTON 92833	No	112	112	FUL
800408	336411	NORTHROP GRUMMAN SYSTEMS	3301 AVIATION Blvd Lawndale 90260	No	611	247	No
800409	336411	NORTHROP GRUMMAN SYSTEMS CORPORATION	1 SPACE PARK BLVD REDONDO BEACH 90278	Yes	594	247	No
800416	486110	PLAINS WEST COAST TERMINALS LLC	692 STUDEBAKER RD LONG BEACH 90803	Yes	193	81	No
800417	486110	PLAINS WEST COAST TERMINALS LLC	2500 E VICTORIA ST COMPTON 90220	No	1620	412	No
800419	486110	PLAINS WEST COAST TERMINALS LLC	21652 NEWLAND ST HUNTINGTON BEACH 92646	Yes	1046	668	No
800420	486110	PLAINS WEST COAST TERMINALS LLC	2685 PIER S LN LONG BEACH 90802	Yes	2631	1378	No
56	611310	UNIVERSITY SO CALIFORNIA,HEALTH SCIENCES	2011 ZONAL AVENUE LOS ANGELES 90033	No	134	134	No
918	622110	QUEEN OF THE VALLEY HOSPITAL	1115 S SUNSET AV WEST COVINA 91790	No	652	29	No
958	611110	LA UNI SCH DIST, WOODROW WILSON HIGH	4500 MULTNOMAH ST LOS ANGELES 90032	No	277	11	No
1179	221320	INLAND EMPIRE UTL AGEN, A MUN WATER DIS	16400 EL PRADO CHINO 91710	No	1790	898	No
1209	325314	DECCO US POST HARVEST, INC.	1713 S CALIFORNIA AV MONROVIA 91016	No	615	164	No
1440	622110	ST. VINCENT MEDICAL GROUP	2131 W 3RD ST LOS ANGELES 90057	No	761	79	No
1483	311999	ACCESS BUSINESS GROUP LLC, NUTRILITE	5600 BEACH BLVD BUENA PARK 90622	No	658	132	FUL
1912	611210	SADDLEBACK COMMUNITY COLLEGE DISTRICT	28000 MARGUERITE PKY MISSION VIEJO 92692	No	776	2	No
2119	611110	LA UNI SCH DIST, STEVENSON MIDDLE SCHOOL	725 S INDIANA ST LOS ANGELES 90023	No	470	135	No
2124	622110	ADVENTIST HEALTH GLENDALE	1505-1509 WILSON TERRACE GLENDALE 91206	No	655	47	No
2212	221320	LA CITY, LA-GLENDALE WATER RECLAMATION	4600-4610 COLORADO BL LOS ANGELES 90039	No	917	404	No
2261	622110	METROPOLITAN STATE HOSPITAL	11401 S BLOOMFIELD AVE NORWALK 90650	No	1219	307	No
2344	512110	20TH CENTURY FOX FILM CORP	10201 W PICO BL LOS ANGELES 90035	No	718	180	No
2504	444190	ANGELUS BLOCK CO INC	11740 SHELDON ST SUN VALLEY 91352	No	1262	700	No
2537	562213	CORONA CITY, DEPT OF WATER & POWER	1904 W CLEARWATER DR CORONA 92880	No	2155	998	No
2605	325412	3M DRUG DELIVERY SYSTEMS	19901 NORDHOFF ST NORTHRIDGE 91324	No	1146	201	No
2638	611310	OCCIDENTAL COLLEGE	1600 CAMPUS RD LOS ANGELES 90041	No	779	0	No
2680	924110	LA CO., SANITATION DISTRICT	1965 WORKMAN MILL RD WHITTIER 90601	No	1312	148	No
2961	611310	CAL ST UNIV, DOMINGUEZ HILLS	1000 E VICTORIA ST. CARSON 90747	No	87	19	No
3002	811490	ARAMARK CLEANROOM SERVICES, INC.	1405 E 58TH PLACE LOS ANGELES 90001	No	687	47	No
3153	311412	GOLDEN STATE FOODS CORP	640 S 6TH AV CITY OF INDUSTRY 91746	No	565	426	No
3254	312111	AMERIPEC INC	6965 ARAGON CIR BUENA PARK 90620	No	595	126	No

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3424	424430	THRIFTY ICE CREAM	9200 TELSTAR EL MONTE 91731	No	341	227	No
3496	624120	FAIRVIEW DEVELOPMENTAL CENTER	2501 HARBOR BLVD COSTA MESA 92626	No	830	19	No
3550	524113	PACIFIC LIFE INSURANCE	700 NEWPORT CENTER DR NEWPORT BEACH 92660	No	1320	97	No
3578	448190	PRUDENTIAL OVERALL SUPPLY	951 E SANDHILL CARSON 90746	No	526	108	No
3665	622110	METHODIST HOSPITAL OF SO CAL	300 W HUNTINGTON DR ARCADIA 91007	No	455	338	No
3671	622110	EISENHOWER MEDICAL CENTER	39000 BOB HOPE DR RANCHO MIRAGE 92270	No	2359	129	No
3781	327390	OLDCASTLE PRECAST	10650 HEMLOCK AV FONTANA 92335	No	2097	689	No
3885	622110	JERRY L PETTIS MEMORIAL VETERANS HOSP	11201 BENTON ST LOMA LINDA 92357	No	1434	16	No
4297	712110	J. PAUL GETTY TRUST	17985 PACIFIC COAST HWY MALIBU 90265	No	1458	19	No
4311	325412	INTERNATIONAL MEDICATION SYSTEMS LTD	1878-86 SANTA ANITA AVE SOUTH EL MONTE 91733	No	399	69	No
4351	611310	CAL ST, POLYTECHNIC UNIV, POMONA	3801 TEMPLE AV POMONA 91768	Yes	790	10	No
4430	444190	ANGELUS BLOCK CO INC	11374 TUXFORD ST SUN VALLEY 91352	No	1543	476	No
4565	611310	CAL ST UNIV NORTHRIDGE	18111 NORDHOFF ST NORTHRIDGE 91330	No	1172	21	No
4591	221310	ORANGE COUNTY WATER DISTRICT	10500 ELLIS AV FOUNTAIN VALLEY 92708	No	497	35	No
4783	622110	LOS ALAMITOS MEDICAL CENTER	3751 KATELLA AV LOS ALAMITOS 90720	No	710	158	No
5023	611310	CAL ST UNIV LONG BEACH EH&S	1250 BELLFLOWER BL.; SSA-341 LONG BEACH 90840	No	584	29	LGB
5176	611110	LA UNI SCH DIST, VERDUGO HILLS HIGH	10625 PLAINVIEW AV TUJUNGA 91042	No	209	34	No
5254	813410	JONATHAN CLUB	545 S FIGUEROA ST. LOS ANGELES 90071	No	441	360	No
5259	325620	JOHNSON & JOHNSON CONSUMER, INC.	5755-60 W 96TH STREET LOS ANGELES 90045	No	480	480	LAX
5346	611110	ALHAMBRA SCHOOL DIST,ALHAMBRA HIGH SCH	101 S 2ND ST ALHAMBRA 91801	No	521	14	No
5366	921110	PASADENA CITY, CITY HALL	100 N GARFIELD AVE. PASADENA 91109	No	855	557	No
5484	621491	SADDLEBACK MEMORIAL MEDICAL CENTER	24451 HEALTH CENTER DR LAGUNA HILLS 92653	No	943	0	No
5583	611110	ALHAMBRA SCH DIST, SAN GABRIEL HI SCHOOL	801 RAMONA ST SAN GABRIEL 91776	No	163	163	No
5679	621111	US GOVT, VETERANS ADMINISTRATION MED CTR	16111 PLUMMER ST NORTH HILLS 91343	No	394	19	No
5756	921190	REDLANDS CITY, WASTEWATER TREATMENT PLT	1950 NEVADA ST REDLANDS 92373	No	1500	1500	SBD
5903	311511	ALTA DENA CERTIFIED DAIRY INC,UNIT N0.01	17637 E VALLEY BLVD CITY OF INDUSTRY 91744	No	950	130	No
6046	711212	LOS ANGELES TURF CLUB INC	285 W HUNTINGTON DR ARCADIA 91007	No	644	587	No
6069	812331	STEINER CORP	1755 HASTER ST ANAHEIM 92802	No	874	121	No
6321	721110	WESTIN BONAVENTURE HOTEL	404 S FIGUEROA ST LOS ANGELES 90071	No	455	200	No
6324	622110	ST. BERNARDINE MEDICAL CENTER	2101 N WATERMAN AV SAN BERNARDINO 92404	No	797	69	No
6331	622210	PATTON STATE HOSPITAL	3102 E HIGHLAND AV HIGHLAND 92346	No	993	214	No
6358	424490	MARUKAN VINEGAR (USA) INC	7755 MONROE ST. PARAMOUNT 90723	No	744	0	No
6384	622310	LA CO., RANCHO LOS AMIGOS NAT. REHAB CTR	7601 E IMPERIAL HWY DOWNEY 90242	No	816	192	No
6432	221310	METROPOLITAN WATER DISTRICT OF SO CAL	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
6552	519120	LA CITY, CENTRAL PUB LIBRARY	630 W 5TH ST LOS ANGELES 90071	No	235	93	No
6586	488320	VOPAK TERMINAL LOS ANGELES, INC.	401 CANAL ST WILMINGTON 90744	No	1100	970	No
6739	622110	KAISER FOUNDATION HOSPITAL	13652 CANTARA ST PANORAMA CITY 91402	No	792	116	BUR
6897	115310	LONG BEACH CITY, WATER DEPT	2920 REDONDO AVE. LONG BEACH 90806	No	362	6	No
6974	484121	BULK TRANSPORTATION INC	415 LEMON AVE. WALNUT 91789	No	592	172	No
7010	812332	PRUDENTIAL OVERALL SUPPLY	16901 ASTON ST IRVINE 92606	No	1548	209	No
7018	448190	L & N COSTUME SERVICES	1602 E EDINGER SANTA ANA 92705	No	785	674	No
7417	221320	EASTERN MUNICIPAL WATER DIST	26560 WATSON RD & 1301 CASE RD PERRIS 92570	No	1571	82	No
7462	611110	LONG BEACH UNI SCH DIST/JORDAN HIGH	6500 ATLANTIC AV LONG BEACH 90805	No	452	19	No
7730	326150	CARPENTER CO	7809 LINCOLN AVENUE RIVERSIDE 92504	Yes	1427	206	No
7814	311111	STAR MILLING CO	20767 HWY I-215 PERRIS 92570	No	546	546	L65

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8015	332813	ANADITE INC	10647 GARFIELD AV SOUTH GATE 90280	Yes	1054	47	No
8066	325180	US BORAX & CHEM CORP UNIT NO. 9	300 FALCON ST WILMINGTON 90744	No	2000	1700	No
8220	622110	PROVIDENCE ST JOSEPH MED CTR	501 S BUENA VISTA ST BURBANK 91505	No	175	175	No
8254	423990	YAMAHA CORPORATION OF AMERICA	6600 ORANGETHORPE AV BUENA PARK 90620	No	402	171	No
8369	922150	LA CO., PROBATION DEPT/ISD	7285 QUILL DR DOWNEY 90242	No	507	143	No
8488	322211	INTERNATIONAL PAPER CO	1350 E 223RD ST CARSON 90745	No	1263	301	No
8560	812332	PRUDENTIAL OVERALL SUPPLY CO	6920 & 6948 BANDINI BL COMMERCE 90040	No	1183	1024	No
8608	812331	CINTAS CORP	7735 PARAMOUNT BLVD. PICO RIVERA 90660	No	1579	235	No
9163	221320	INLAND EMPIRE UTL AGEN, A MUN WATER DIS	2450 PHILADELPHIA AVE ONTARIO 91761	No	744	716	ONT
9243	622110	TORRANCE MEMORIAL MEDICAL CENTER	3330 LOMITA BL TORRANCE 90505	Yes	695	245	No
9519	311919	SANYO FOODS CORP OF AMERICA	11955 MONARCH ST GARDEN GROVE 92841	No	679	414	No
9784	622310	REDLANDS COMMUNITY HOSPITAL	350 TERRACINA BLVD/LAUREL AV REDLANDS 92373	No	629	142	No
9961	221320	RIVERSIDE CITY, WATER QUALITY CONTROL	5950 ACORN ST RIVERSIDE 92504	No	1468	1064	RAL
10167	922120	SAN BERN. CO, FACILITIES MGMT DEPT	351 N ARROWHEAD SAN BERNARDINO 92410	No	678	398	No
10198	221320	VALLEY SANITARY DIST	45-500 VAN BUREN ST INDIO 92201	No	208	3	No
10245	924110	LA CITY, TERMINAL ISLAND TREATMENT PLANT	445 FERRY ST SAN PEDRO 90731	No	2300	1773	No
10267	621493	SAINT MARY'S MEDICAL CENTER	1050 LINDEN AVE. LONG BEACH 90813	No	343	119	No
10609	611110	PASADENA USD, CHARLES W ELIOT MIDDLE SCH	2184 N LAKE AVE ALTADENA 91001	No	150	43	No
10740	325991	TEKNOR APEX COMPANY, MACLIN DIVISION	420 S 6TH AV CITY OF INDUSTRY 91746	No	925	428	No
11082	441110	DESERT COTTONSEED PRODUCTS INC	86-600 AVENUE 54 COACHELLA 92236	No	2153	597	No
11218	921190	ORANGE CO, CENTRAL UTILITY FACILITY	525 N FLOWER ST SANTA ANA 92703	Yes	628	262	No
11245	622110	HOAG HOSPITAL	301 NEWPORT BLVD NEWPORT BEACH 92658	No	1109	122	No
11301	221320	SAN BERNARDINO CITY MUN WATER DEPT (WRP)	399 CHANDLER PL SAN BERNARDINO 92408	No	660	391	No
11328	611210	RIO HONDO COMMUNITY COLLEGE	3600 WORKMAN MILL RD WHITTIER 90601	No	954	132	No
11428	622110	KAISER FOUNDATION HOSP	6041 CADILLAC AVE LOS ANGELES 90034	Yes	790	89	No
11508	622110	PRESBYTERIAN INTERCOMMUNITY HOSP	12401 E WASHINGTON BL WHITTIER 90602	No	719	156	No
11604	311511	STREMICKS HERITAGE FOODS LLC	4002 W WESTMINSTER AV SANTA ANA 92703	No	723	82	No
11732	622110	KAISER FOUNDATION HOSPITALS	9961 SIERRA AV FONTANA 92335	Yes	776	124	No
11998	336413	GOODRICH CORPORATION	11120 S NORWALK BLVD SANTA FE SPRINGS 90670	Yes	1027	71	No
12129	623311	BEVERLY HOSPITAL	309 W BEVERLY BLVD MONTEBELLO 90640	No	618	113	No
12170	332999	VACCO INDUSTRIES	10350 VACCO ST SOUTH EL MONTE 91733	Yes	444	156	No
12182	531110	PARK LA BREA	530 S BURNSIDE AV LOS ANGELES 90036	No	800	0	No
12319	921110	LA CITY, DEPT OF GEN SERVICES	111 E 1ST ST LOS ANGELES 90012	No	723	251	No
12332	532411	GATX CORPORATION	20878 SLOVER COLTON 92324	No	950	695	No
12505	622110	VALLEY PRESBYTERIAN HOSPITAL	15107 VANOWEN ST VAN NUYS 91405	No	275	0	No
12528	321211	GENERAL VENEER MFG CO	8651-52 OTIS ST SOUTH GATE 90280	No	237	175	No
12732	622110	JOHN F. KENNEDY MEM HOSP	47111 MONROE ST INDIO 92201	No	438	61	No
12820	622110	KAISER FOUNDATION HOSP	9400 E ROSECRANS AV BELLFLOWER 90706	No	863	79	No
12876	326140	FOAM FABRICATORS	1810 S SANTA FE AVE COMPTON 90221	No	829	0	No
12900	424950	ELLIS PAINTS CO/PACIFIC COAST LACQUER	3150 E PICO BL LOS ANGELES 90023	Yes	489	288	No
12923	922160	RIALTO CITY	501 E SANTA ANA AV BLOOMINGTON 92316	No	2297	23	No
13011	326199	THE GILL CORPORATION	4040-76 EASY ST EL MONTE 91731	No	821	32	EMT
13031	621111	ORTHOPAEDIC HOSP	2400 S FLOWER ST LOS ANGELES 90007	No	409	222	No
13041	331492	GEMINI INDUSTRIES INC	2311 S PULLMAN ST SANTA ANA 92705	Yes	713	713	No
13126	311225	COAST PACKING CO	3275 E VERNON AVE VERNON 90058	No	1487	1418	No

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13433	562219	SO ORANGE CO WASTEWATER AUTHORITY-RTP	29200-01 LA PAZ RD LAGUNA NIGUEL 92677	No	668	11	No
13510	621111	HOSPITAL OF THE GOOD SAMARITAN	616 S WITMER ST LOS ANGELES 90017	No	642	151	No
13613	622110	WHITE MEMORIAL MEDICAL CENTER	1720 CESAR CHAVEZ AVE LOS ANGELES 90033	No	201	0	No
13854	611210	EAST LOS ANGELES COLLEGE	1301 AVENIDA CESAR CHAVEZ MONTEREY PARK 91754	No	573	47	No
13920	622110	SAINT JOSEPH HOSPITAL	1100 W STEWART DR ORANGE 92868	No	792	116	No
13990	621491	US GOVT, VETERANS AFFAIRS MEDICAL CENTER	5901 E 7TH ST LONG BEACH 90822	No	1326	24	No
14150	922140	CAL ST, INST FOR WOMEN	16756 CHINO-CORONA RD. CORONA 92880	No	2255	349	CNO
14213	622110	LONG BEACH MEMORIAL MEDICAL CENTER	2801 ATLANTIC AVE. LONG BEACH 90806	No	745	166	No
14277	611110	LA UNI SCH DIST, NIGHTINGALE MIDDLE SCH	3311 N FIGUEROA ST LOS ANGELES 90065	No	319	85	No
14336	611110	LA UNI SCH DIST, PEARY MIDDLE SCHOOL	1415 W GARDENA BLVD GARDENA 90247	No	180	109	64CL
14437	622110	SAN ANTONIO REGIONAL HOSPITAL	999 SAN BERNARDINO RD UPLAND 91786	Yes	723	171	No
14625	322211	INTERNATIONAL PAPER	11211 GREENSTONE AVE SANTA FE SPRINGS 90670	No	1283	422	No
14924	622110	ST. FRANCIS MEDICAL CENTER	3630 E IMPERIAL HWY. LYNWOOD 90262	No	150	150	No
14966	621491	VA GREATER LOS ANGELES HEALTHCARE SYS	WILSHIRE/SAWTELLE LOS ANGELES 90073	No	678	219	No
15031	922140	SAN BERN. CO, EPWA COUNTY JAIL	630 E RIALTO AV SAN BERNARDINO 92415	No	649	101	No
15523	611110	PASADENA UNI SCH DIST, PASADENA HIGH SCH	2925 E SIERRA MADRE BL PASADENA 91107	No	278	47	No
15648	336419	HITCO CARBON COMPOSITES INC	1600 W 135TH STREET GARDENA 90249	No	1000	500	No
15713	813410	THE CALIFORNIA CLUB	538 S FLOWER ST LOS ANGELES 90071	No	216	185	No
15794	311999	NISSIN FOODS (USA) CO., INC.	2001 W ROSECRANS AV GARDENA 90249	No	772	240	No
16070	812331	BRAUN LINEN SERVICE INC	16514 S GARFIELD AV PARAMOUNT 90723	No	306	74	No
16110	611310	LA CITY, HARBOR COLLEGE	1111 FIGUEROA PL WILMINGTON 90744	Yes	679	360	No
16389	622110	CEDARS-SINAI MEDICAL CTR	8700 BEVERLY BLVD & ARDEN DR LOS ANGELES 90048	No	410	0	No
16424	611210	NORTH OR. CO. COMM COL DIST	321 E CHAPMAN AVE & 315 E WLSH FULLERTON 92832	No	311	113	No
16654	812320	BRAUN/A-1 LINEN SERVICE INC	396 S LA MESA ST POMONA 91766	No	613	0	No
16865	325320	AMVAC CHEMICAL CORP	4100 E WASHINGTON BLVD LOS ANGELES 90023	No	780	730	No
16947	311612	SERV-RITE MEAT CO INC	2515 SAN FERNANDO RD LOS ANGELES 90065	No	507	23	No
17069	924110	LA CITY, DEPT OF GEN SERVICES, PIPER TEC	555 RAMIREZ ST, (1/18)SP #200 LOS ANGELES 90012	No	761	383	No
17288	611210	EL CAMINO COLLEGE	16007 S CRENSHAW BL TORRANCE 90506	No	510	325	64CL
17301	221320	ORANGE COUNTY SANITATION DISTRICT	10844 ELLIS AVE. FOUNTAIN VALLEY 92708	No	1098	315	No
17328	541990	US GOVT, FED BLDG GSA	300 N LOS ANGELES ST LOS ANGELES 90012	No	779	472	No
17474	444190	ANGELUS BLOCK CO INC	14515 WHITTRAM AVE. FONTANA 92335	No	341	193	No
17722	622110	COMMUNITY HOSPITAL OF SAN BERNARDINO	1500 W 17TH ST SAN BERNARDINO 92411	No	621	27	No
17749	922140	ST CALIF DEPT CORRECTIONS,CAL REHAB CNTR	5TH ST/WESTERN NORCO 92860	No	649	330	No
17829	611310	L.A. PIERCE COMMUNITY COLLEGE	6201 WINNETKA AV WOODLAND HILLS 91371	Yes	475	37	No
17838	922140	OR CO, SHERIFF DEPT, FAC OPERATIONS	501 CITY DR ORANGE 92868	No	1191	66	No
18451	622110	SAN GORGONIO PASS MEM HOSP DIST	600 N HIGHLAND SPRINGS AV BANNING 92220	Yes	858	146	No
18452	611210	UNIVERSITY OF CALIFORNIA, LOS ANGELES	301 HILGARD AVENUE LOS ANGELES 90095	No	615	16	No
18542	561990	COLLEGE OF THE DESERT	43-500 MONTEREY AV PALM DESERT 92260	No	887	50	No
18606	812331	STEINER CORP, AMERICAN LINEN	900 N HIGHLAND AV LOS ANGELES 90038	No	167	74	No
18636	325180	US BORAX & CHEM CORP UNIT NO. 2	300 FALCON ST WILMINGTON 90744	No	2000	1000	No
18791	324191	LUBRICATING SPECIALTIES CO	8015 PARAMOUNT BLVD PICO RIVERA 90660	No	1326	80	No
18885	622310	CHILDREN'S HOSPITAL OF LOS ANGELES	4650 SUNSET BLVD LOS ANGELES 90027	Yes	423	256	No
18960	611210	PASADENA CITY COLLEGE	1570 E COLORADO BLVD PASADENA 91106	No	116	116	No
19159	221320	EASTERN MUNICIPAL WATER DIST	22251 SANDERSON AVE SAN JACINTO 92582	No	3504	13	No
19185	611210	NO ORANGE CO,.COMM COLLEGE DIST, CYPRESS	9200 VALLEY VIEW CYPRESS 90630	No	678	43	No

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19353	611210	GOLDEN WEST COLLEGE, COMMUNITY COLLEGE	15744 GOLDEN WEST ST HUNTINGTON BEACH 92647	No	203	34	No
19629	311225	LIBERTY VEGETABLE OIL CO	15306 S CARMENITA RD SANTA FE SPRINGS 90670	No	1424	423	No
19848	611310	CAL BAPTIST UNIVERSITY	8432 MAGNOLIA AV RIVERSIDE 92504	No	570	66	No
20197	622110	LAC/USC MEDICAL CENTER	1200 N STATE ST LOS ANGELES 90033	No	460	261	No
20237	221310	SAN CLEMENTE CITY, WASTEWATER DIV	380 AVENIDA PICO SAN CLEMENTE 92672	No	909	26	No
20252	221118	BANNING CITY, WASTEWATER TREATMENT PLAN	2242 E CHARLES ST BANNING 92220	No	2689	134	BNG
20375	812332	PRUDENTIAL OVERALL SUPPLY	6997 JURUPA AV RIVERSIDE 92504	No	1579	502	RAL
20451	622310	INTER-COMMUNITY MEDICAL CENTER	303 N 3RD AV COVINA 91723	No	443	5	No
20782	327331	ANGELUS BLOCK CO INC	1705 N MAIN ST ORANGE 92865	No	1025	803	No
21147	623220	HOLLENBECK PALMS	573 S BOYLE LOS ANGELES 90033	No	449	0	No
21505	611310	LA CITY COLLEGE	855 N VERMONT AV LOS ANGELES 90029	No	333	60	No
21717	712110	LA CO., MUSEUM OF ART	5905 WILSHIRE BLVD LOS ANGELES 90036	No	713	143	No
21858	311511	YOPLAIT USA INC	1055 E SANDHILL AV CARSON 90746	No	480	98	No
22092	331210	WESTERN TUBE & CONDUIT CORP	2001 E DOMINGUEZ ST LONG BEACH 90801	No	843	623	No
22312	721110	LA AIRPORT MARRIOTT HOTEL	5855 W CENTURY BLVD LOS ANGELES 90045	No	925	346	No
22390	923130	LA CO CIVIC CENTER	313 N FIGUEROA ST LOS ANGELES 90012	No	737	414	No
22674	221320	L.A. COUNTY SANITATION DIST VALENCIA PLT	28185 THE OLD ROAD VALENCIA 91355	No	2033	42	No
22962	311511	DRIFTWOOD DAIRY	10724 LOWER AZUSA RD. EL MONTE 91731	No	752	101	EMT
23043	541618	CSU, SAN BERNARDINO	5500 UNIVERSITY PKWY SAN BERNARDINO 92407	No	863	148	No
23106	325211	CARGILL INC	2800 LYNWOOD RD LYNWOOD 90262	No	748	101	No
23194	622310	CITY OF HOPE MEDICAL CENTER	1500 E DUARTE RD DUARTE 91010	No	995	227	No
23303	721110	ANAHEIM MAJESTIC GARDEN HOTEL	1015 W BALL RD ANAHEIM 92802	No	682	220	No
23324	325611	NORMAN, FOX & CO, UNIT NO. 1	5511 S BOYLE AVE VERNON 90058	No	782	549	No
23399	622110	WEST HILLS HOSPITAL AND MEDICAL CENTER	7300 MEDICAL CENTER DR WEST HILLS 91307	No	475	64	No
23411	325612	SANITEK PROD. INC	3959 GOODWIN AV LOS ANGELES 90039	No	853	74	No
23506	611210	WEST LOS ANGELES COLLEGE	4800 FRESHMAN DRIVE CULVER CITY 90230	no	644	34	No
23909	623110	CONGREGATIONAL HOMES, MT SAN ANTONIO GAI	900 E HARRISON AV CLAREMONT 91711	No	235	3	POC
23988	484110	VERNON WAREHOUSE CO	2322 E 37TH/38TH ST VERNON 90058	No	690	642	No
24006	611310	CAL ST UNIV LA	5151 STATE UNIVERSITY DR LOS ANGELES 90032	No	126	126	No
24046	327390	ORCO BLOCK CO INC	4510 RUTILE ST RIVERSIDE 92509	No	1178	280	No
24207	522110	WELLS FARGO BANK	3440 FLAIR DR EL MONTE 91731	No	605	163	No
24209	332813	VALMONT GEORGE INDUSTRIES	4116 WHITESIDE ST LOS ANGELES 90063	Yes	752	148	No
24505	622110	BEAR VALLEY COMMUNITY HEALTHCARE DIST.	41870 GARSTIN DR BIG BEAR LAKE 92315	No	1650	100	No
24532	721110	MIRAMAR HOTEL	1132 2ND ST SANTA MONICA 90403	No	386	35	No
24546	622110	ST JUDE MEDICAL CENTER	101 E VALENCIA MESA DR FULLERTON 92835	No	504	169	No
24570	332813	PRECISION ANODIZING & PLATING INC	1601 MILLER ST ANAHEIM 92806	No	835	190	No
24638	332811	NEWTON HEAT TREATING CO, INC	19235 E WALNUT DRIVE CITY OF INDUSTRY 91748	No	187	185	No
24711	531120	ANAHEIM CITY, CONVENTION CTR	800 W KATELLA AV ANAHEIM 92803	No	1036	330	No
25070	562212	LA CNTY SANITATION DISTRICT-PUENTE HILLS	2800 WORKMAN MILL RD CITY OF INDUSTRY 91745	No	1442	452	No
25248	561210	US GOVT, FED CORRECTIONAL INST (FCI)	TERMINAL ISLAND SAN PEDRO 90731	Yes	2116	1580	No
25591	922140	COUNTY OF RIVERSIDE (BA176)	1626 HARGRAVE ST BANNING 92220	No	1341	0	BNG
25786	312111	SEVEN-UP/ROYAL CROWN BOTTLING CO OF SOCA	3220 E 26TH ST LOS ANGELES 90023	No	1333	1165	No
25965	811310	RAINBOW TRANSPORT TANK CLEANERS,C.ALBIN	21119 S. WILMINGTON AVE LONG BEACH 90810	Yes	259	56	No
27497	722511	LA CITY, DEPT OF GEN SERVICES	1201 S FIGUEROA ST LOS ANGELES 90015	No	610	23	No
29110	221320	ORANGE COUNTY SANITATION DISTRICT	22212 BROOKHURST ST HUNTINGTON BEACH 92646	No	1255	55	No

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29411	922140	LA CO., SHERIFF'S DEPT	441 BAUCHET ST LOS ANGELES 90012	No	319	274	No
29582	112111	SCOTT BROS DAIRY	12000 S EAST END AVE CHINO 91710	No	417	19	No
30626	322299	F-D-S MANUFACTURING CO INC	2200 S RESERVOIR ST POMONA 91766	No	1173	130	No
32924	611210	CRAFTON HILLS COLLEGE	11711 SAND CANYON RD YUCAIPA 92399	No	1939	10	No
35103	621111	UCI MEDICAL CENTER	101 CITY DR S (ROUTE 104) ORANGE 92868	No	1390	27	No
35161	921190	MONROVIA CITY, DEPT OF PUBLIC WORKS	600 S MOUNTAIN AV MONROVIA 91016	No	251	66	No
35483	512110	WARNER BROTHERS STUDIO FACILITIES	4000 WARNER BLVD BURBANK 91505	No	731	335	No
35485	531120	5757 WILSHIRE LLC	5757 WILSHIRE BLVD, SUITE 380 LOS ANGELES 90036	No	636	124	No
36706	325620	COSMETIC LABORATORIES OF AMERICA	20245 SUNBURST ST CHATSWORTH 91311	No	1345	380	No
37028	532412	TOTAL EQUIP RENTAL INC	2828 S SPRING ST LONG BEACH 90806	No	467	467	No
37768	423110	TOYOTA MOTOR SALES,U.S.A. INC	19001 S WESTERN AV TORRANCE 90501	No	871	438	64CL
37934	524114	BLUE CROSS OF CAL	21555 OXNARD ST WOODLAND HILLS 91367	No	1431	251	No
39855	311941	MIZKAN AMERICA, INC	10037 E 8TH ST RANCHO CUCAMONGA 91730	No	711	151	No
39979	485113	OMNITRANS	1700 W 5TH ST SAN BERNARDINO 92411	No	612	0	No
41223	311812	PURITAN BAKERY INC	1624 E CARSON ST CARSON 90745	No	552	64	No
41229	332813	LUBECO INC	6859 DOWNEY AV LONG BEACH 90805	Yes	383	77	No
42278	Unknown	THE AEROSPACE CORP, UNIT NO.04	300 S DOUGLAS ST EL SEGUNDO 90245	No	329	244	LAX
42357	424490	ROCKVIEW DAIRIES, INC	7011 & 7044 STEWART & GRAY RD DOWNEY 90241	No	705	10	No
42783	922160	PALM SPRINGS CITY, FIRE DEPT 442	300 N EL CIELO #400 PALM SPRINGS 92262	No	1221	214	PSP
42948	921110	LONG BEACH CITY, FLEET SERV	400 W BROADWAY LONG BEACH 90802	No	550	8	No
43023	311999	WALKER FOODS, INC	225-258 N MISSION RD LOS ANGELES 90033	No	208	47	No
43522	621111	KAISER FOUNDATION HOSPITAL	25825 S VERMONT AV HARBOR CITY 90710	Yes	694	206	No
44012	311412	GOODMAN FOOD PROD INC	200 E BEACH AV INGLEWOOD 90302	No	455	106	No
44158	721110	ANAHEIM MARRIOTT HOTEL	700 W CONVENTION WY ANAHEIM 92802	No	613	80	No
44173	721110	LOS ANGELES AIRPORT HILTON	5711 W CENTURY BLVD LOS ANGELES 90045	No	721	417	No
44287	325180	PHIBRO-TECH INC	8851 DICE RD SANTA FE SPRINGS 90670	Yes	642	233	No
44655	336413	REINHOLD INDUSTRIES INC	12827 E IMPERIAL HWY SANTA FE SPRINGS 90670	No	1020	216	No
44790	611210	GLENDALE COMMUNITY COLLEGE	1500 N VERDUGO RD GLENDALE 91208	No	544	119	No
45317	621999	MED CTR GARDEN GROVE	12601 GARDEN GROVE BLVD GARDEN GROVE 92843	No	941	64	No
45489	334510	ABBOTT CARDIOVASCULAR SYSTEMS, INC.	26531 YNEZ RD TEMECULA 92591	No	459	195	No
45973	611310	UNIVERSITY OF REDLANDS	1200 E COLTON AV REDLANDS 92373	No	525	309	REI
47651	928110	US GOVT NAVAL AIR STATION NORTH ISLAND	BLDG 60121-93-96 SAN CLEMENTE 92672	No	#N/A	#N/A	#N/A
47661	922110	SAN BERN. CO, TWIN PEAKS BLDG	26010 HWY 189 TWIN PEAKS 92391	No	1579	14	No
48012	424130	CORRU-KRAFT ALHAMBRA	3201 W MISSION RD ALHAMBRA 91803	No	1083	40	No
49380	721110	MARRIOTT'S DESERT SPRINGS RESORT & SPA	74855 COUNTRY CLUB DR PALM DESERT 92260	No	938	451	No
49381	713910	THE VINTAGE CLUB	75-001 VINTAGE DR W INDIAN WELLS 92210	No	1025	5	No
49387	611310	UNIV CAL, RIVERSIDE	PHYSICAL PLANT DEPT RIVERSIDE 92521	No	647	319	No
49572	622110	KAISER FOUNDATION HOSPITAL	5601 DE SOTO WOODLAND HILLS 91367	No	288	204	No
50134	311513	CACIQUE CHEESE CO	14940 PROCTOR AV CITY OF INDUSTRY 91744	No	1085	367	No
50300	325193	PARALLEL PRODUCTS	12281 ARROW ROUTE RANCHO CUCAMONGA 91739	No	1349	927	No
50865	322211	LIBERTY CONTAINER CO, KEY CONTAINER	4224 SANTA ANA ST SOUTH GATE 90280	No	935	64	No
51304	221310	SANTA MARGARITA WATER DISTRICT	28793 ORTEGA HWY SAN JUAN CAPISTRANO 92675	No	1851	3	No
52742	326140	STOROPACK INC	12007 S WOODRUFF AV DOWNEY 90241	No	690	243	No
53015	325620	COSWAY CO INC	14805 SO MAPLE ST GARDENA 90248	No	993	510	No
54586	622110	KAISER FOUNDATION HOSPITAL	10800 MAGNOLIA AV RIVERSIDE 92505	Yes	758	5	No

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54941	444190	ANGELUS BLOCK CO INC	252 E REDONDO BEACH BL GARDENA 90247	No	872	98	No
55700	562212	WASTE MANAGEMENT OF SAN GABRIEL/POMONA	13940 E LIVE OAK AV BALDWIN PARK 91706	No	892	113	No
58876	336412	INDUSTRIAL MFG CO LLC DBA ARROWHEAD PROD	4411 KATELLA AV LOS ALAMITOS 90720	Yes	834	130	No
59001	313310	TEXLON CORP	555 VAN NESS AV TORRANCE 90501	No	360	134	64CL
59765	812332	ARAMARK UNIFORM SERVICES	4422 & 4440 E DUNHAM ST LOS ANGELES 90023	No	995	113	No
60043	812331	AMERICAN TEXTILE MAINTENANCE, REPUBLIC	1705 S HOOPER AV LOS ANGELES 90021	No	594	280	No
60442	327390	RIALTO CONCRETE PRODUCTS INC	2250 W LOWELL ST RIALTO 92377	No	1220	497	L67
60541	622110	FOUNTAIN VALLEY REGIONAL HOSP,B HANNA ET	17100 EUCLID ST FOUNTAIN VALLEY 92708	No	912	146	No
60812	311412	OVERHILL FARMS INC	3055 E 44TH ST VERNON 90058	No	1606	1524	No
61201	327390	JAMES HARDIE BUILDING PRODUCTS INC	10901 ELM AV FONTANA 92337	No	1297	309	No
61840	324191	LUBRICATING SPECIALTIES CO	3365 E SLAUSON AV VERNON 90058	No	882	349	No
62589	322211	SUNCLIPSE INC,ST HART/CORRU-KRAFT IV DIV	1911 E ROSSLYNN AV FULLERTON 92831	No	753	525	No
62596	611110	REDLANDS UNIFIED SCHOOL DISTRICT	840 E CITRUS AVE REDLANDS 92374	No	51	51	No
62901	812331	DOMESTIC LINEN SUPPLY CO INC	1600-1620 COMPTON AVE LOS ANGELES 90021	No	761	436	No
62903	313310	EXPO DYEING & FINISHING, INC.	1365 & 1385 KNOLLWOOD CIRCLE ANAHEIM 92801	No	1049	47	FUL
63249	445110	THE VONS CO INC SAFEWAY INC	3361 S BOXFORD ST LOS ANGELES 90040	No	1384	1007	No
63462	812331	MORGAN SERVICES INC	905 YALE ST LOS ANGELES 90012	No	526	48	No
63850	311421	SUNNY DELIGHT BEVERAGES CO.	1230 N TUSTIN AV ANAHEIM 92807	No	863	657	No
65108	921120	WEST COVINA CITY, CITY HALL	1444 W GARVEY AV SOUTH WEST COVINA 91790	No	903	235	No
65742	111339	SUN DATE	85-215 AVENUE 50 COACHELLA 92236	No	779	156	No
66463	611310	HARVEY MUD COLLEGE	340 E FOOTHILL BLVD CLAREMONT 91711	No	539	322	POC
66665	531110	GAYLORD APARTMENTS LTD	3355 WILSHIRE BLVD. LOS ANGELES 90010	No	319	230	No
66850	237210	VDA PROPERTY CO	4605 LANKERSHIM BLVD #707 NORTH HOLLYWOOD 91602	No	439	63	No
66906	813990	SANTA MONICA BAY TOWERS	101 CALIFORNIA AVE. SANTA MONICA 90403	No	521	0	No
67630	524210	WESCO FINANCIAL CORPORATION	301 E COLORADO BLVD PASADENA 91101	No	732	642	No
67873	484110	VERNON WAREHOUSE CO	2050 E 38TH ST VERNON 90058	No	734	558	No
68284	721110	LAKE ARROWHEAD RESORT	27984 HWY 189 LAKE ARROWHEAD 92352	No	1567	11	No
68458	721110	IRVINE OFFICE CO, TOWER 4	660 NEWPORT CENTER DR NEWPORT BEACH 92660	No	1231	0	No
69022	531120	THE 3250 WILSHIRE BLVD BUILDING	3250 WILSHIRE BLVD LOS ANGELES 90010	No	369	161	No
69367	531210	PARAMOUNT CONTRACTORS & DEVELOPERS INC	6464 SUNSET BLVD., #700 HOLLYWOOD 90028	No	484	42	No
69586	481111	DISTRIBUTORS UNLIMITED	1205 DATE STREET MONTEBELLO 90640	No	568	31	No
70049	711310	MUSIC CENTER OF LOS ANGELES COUNTY	135 N GRAND AV LOS ANGELES 90012	No	660	558	No
70496	311421	TROPICAL PRESERVING CO INC	1712 NEWTON STREET LOS ANGELES 90021	No	819	740	No
70630	313310	ALMORE DYE HOUSE INC	6850 TUJUNGA AV NORTH HOLLYWOOD 91605	No	858	193	No
70913	311411	LANGER JUICE COMPANY, INC.	16195 STEPHENS ST CITY OF INDUSTRY 91745	No	805	272	No
71051	484121	SYSTEM TRANSPORT	1710 E 29TH ST SIGNAL HILL 90755	No	922	599	No
71074	611110	LONG BEACH UNI SCH DIST; WOODROW WILSON	4400 E 10TH ST LONG BEACH 90804	No	259	16	No
71087	611110	LONG BEACH UNI SCH DIST/STEPHENS JR HIGH	1830 W COLUMBIA ST LONG BEACH 90810	No	502	16	No
71108	921110	LA CO., DEPT OF PUBLIC WORKS	900 S FREMONT AV ALHAMBRA 91803	No	813	299	No
71448	813990	SIERRA TOWERS	9255 DOHENY RD WEST HOLLYWOOD 90069	No	690	0	No
71510	611519	ORANGE, COUNTY OF - JOHN WAYNE AIRPORT	18601 AIRPORT WAY NORTH SANTA ANA 92707	No	1519	700	SNA
71570	611110	LA UNI SCH DIST, HOLLENBECK JUNIOR HIGH	2510 E SIXTH ST LOS ANGELES 90023	No	431	51	No
71573	611110	LA UNI SCH DIST, LINCOLN SENIOR HIGH	3501 N BROADWAY LOS ANGELES 90031	No	327	89	No
71654	812331	KLEEN KRAFT SERVICES INC	632 TOWNE AV LOS ANGELES 90021	No	510	238	No
71791	445110	SAFEWAY INC	12844 EXCELSIOR DRIVE NORWALK 90650	No	586	92	No

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71797	423840	TED LEVINE DRUM CO	1729 CHICO AV SOUTH EL MONTE 91733	No	1572	674	No
71854	443142	INTER-CONTINENTAL HOTEL L A CENTURY CITY	2151 AVENUE OF THE STARS LOS ANGELES 90067	No	950	0	No
71937	812331	DY-DEE SERV OF PASADENA INC,DY-DEE SERV	40 E CALIFORNIA BLVD PASADENA 91105	No	779	232	No
72494	525920	301 N LAKE, LLC	301 N LAKE ST PASADENA 91101	No	1036	211	No
72519	921110	ORANGE CO - COUNTY OPERATIONS CENTER	1300 S GRAND AVE. SANTA ANA 92705	No	195	195	No
72520	624110	ORANGE COUNTY YOUTH GUIDANCE CTR	3030 N HESPERIAN ST SANTA ANA 92706	No	1366	216	No
72664	325411	PHARMAVITE LLC	1150 AVIATION PL SAN FERNANDO 91340	No	291	140	No
72666	722330	LA UNI SCH DIST,NEWMAN NUTRITION CENTER	2310 CHARLOTTE ST LOS ANGELES 90021	No	425	89	No
72672	611110	LA UNI SCH DIST, BRET HARTE JUNIOR HIGH	9301 S HOOVER ST LOS ANGELES 90044	No	542	98	No
72693	611110	LA UNI SCH DIST, CANOGA PARK SENIOR HIGH	6850 TOPANGA CANYON BLVD CANOGA PARK 91303	No	132	51	No
72767	611110	LA UNI SCH DIST, DEARBORN ST ELEMENTARY	9240 WISH AV NORTHRIDGE 91325	No	208	80	No
72768	611110	LA UNI SCH DIST, HOLMES MIDDLE SCHOOL	9351 PASO ROBLES AV NORTHRIDGE 91325	No	116	116	No
72772	611519	LA UNIFIED DIST, FRIEDMAN OCCUPATION CTR	1646 S OLIVE ST LOS ANGELES 90015	No	631	180	No
72776	611110	LA UNI SCH DIST, TWENTY-EIGHTH ST ES	2807 STANFORD AV LOS ANGELES 90011	Yes	90	27	No
72786	238990	LA UNI SCH DIST, HUGHES MIDDLE SCHOOL	5607 CAPISTRANO AV WOODLAND HILLS 91367	Yes	362	16	No
72811	611110	LA UNI SCH DIST, BRAINARD AVE ELEMENTARY	11407 BRAINARD AV LAKE VIEW TERRACE 91342	No	47	47	No
72815	611110	LA UNI SCH DIST, CARSON SENIOR HIGH	22328 S MAIN ST CARSON 90745	No	225	0	No
72827	Unknown	LA UNI SCH DIST,SHERMAN OAKS CTR	18555 ERWIN ST RESEDA 91335	No	163	13	No
72849	611110	LA UNI SCH DIST, SEVENTH ST SCHOOL	1570 W 7TH ST SAN PEDRO 90732	No	71	0	No
72851	611110	LA UNI SCH DIST, NORMANDIE ELEMENTARY	4505 S RAYMOND AV LOS ANGELES 90037	No	16	16	No
72861	611110	LA UNI SCH DIST, EVERGREEN ELEMENTARY	2730 GANAHL ST LOS ANGELES 90033	No	481	71	No
72862	611110	LA UNI SCH DIST, GATES ST ELEMENTARY	3333 MANITOU AV LOS ANGELES 90031	No	140	8	No
72991	238990	VENTURA PETIT EAST BUILDING, ETAL	16633 VENTURA BLVD ENCINO 91436	No	708	92	No
73292	622110	CHILDREN'S HOSPITAL OF ORANGE COUNTY	455 S MAIN ST ORANGE 92868	No	932	61	No
73327	922110	LA CO., LYNWOOD REGIONAL JUSTICE CTR	11711 ALAMEDA ST LYNWOOD 90262	No	578	335	No
74060	325211	ENGINEERED POLYMER SOLUTIONS INC	5501 E SLAUSON AV LOS ANGELES 90040	Yes	1024	301	No
74398	921110	CERRITOS CITY, MAINTENANCE DIV	13150 E 166TH ST CERRITOS 90701	No	538	64	No
74408	332999	ARMTEC DEFENSE PROD. CO	85901 AVENUE 53 COACHELLA 92236	No	1233	327	No
74461	453220	PASADENA GATEWAY PLAZA, CB RICHARD ELLIS	300 N LAKE AVENUE PASADENA 91101	No	246	72	No
74723	622110	CALIFORNIA HOSPITAL MEDICAL CENTER	1401 S GRAND AVE. LOS ANGELES 90015	No	444	154	No
74840	311612	POCINO FOODS CO	14250 LOMITAS AVE CITY OF INDUSTRY 91746	No	129	90	No
75306	921190	LONG BEACH CITY, CONVENTION CENTER	300 E OCEAN BLVD LONG BEACH 90802	No	1210	209	No
76635	611110	SAN BERN CITY UNI SCH DIST,KIMBARK ELM S	18021 KENWOOD DR SAN BERNARDINO 92407	No	77	8	No
77266	311999	JSL FOODS INC.	3550 PASADENA AV LOS ANGELES 90031	No	351	98	No
77635	311421	TROPICANA MANUFACTURING COMPANY	14380 NELSON AV CITY OF INDUSTRY 91744	No	589	174	No
78137	311422	JUANITA'S FOODS	645 NO EUBANKS WILMINGTON 90744	No	742	13	No
78504	531120	GLENDALE CITY CIVIC AUDITORIUM	1401 NO VERDUGO RD GLENDALE 91208	No	410	124	No
79065	813990	WILSHIRE HOLMBY TOWER	10433 WILSHIRE BLVD LOS ANGELES 90024	No	183	0	No
79253	531210	8730 SUNSET TOWERS	8730 SUNSET BLVD LOS ANGELES 90069	No	212	0	No
79460	922110	COUNTY OF RIVERSIDE (IN701)	46-209 OASIS ST INDIO 92201	No	436	8	No
79589	812320	SUN HILL PROP.,INC, UNIV HILTON HOTEL	555 UNIVERSAL TERRACE PKWY UNIVERSAL CITY 91608	No	1445	373	No
79621	532490	NATIONWIDE BOILER INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
79639	611110	PALM SPRINGS UNIFIED SCHOOL DIST	69-250 DINAH SHORE DR CATHEDRAL CITY 92234	No	335	21	No
80246	711310	SEGERSTROM CENTER FOR THE ARTS	600 TOWN CENTER COSTA MESA 92626	No	755	172	SNA
80719	221310	WESTERN MUNICIPAL WATER DIST	16450 LAKEPOINT DR RIVERSIDE 92503	No	1122	8	No

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80826	811192	L A WASH RACK,	4317 DOWNEY RD VERNON 90058	No	1881	1547	No
81233	623110	LA JEWISH HOME FOR THE AGING	7150 TAMPA AV RESEDA 91335	Yes	435	0	No
81234	623110	JEWISH HOME FOR THE AGING	18855 VICTORY BLVD RESEDA 91335	Yes	594	0	No
81270	237310	KIEWIT INFRASTRUCTURE WEST CO	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
82537	Unknown	US GOVT, JUSTICE DEPARTMENT	535 N ALAMEDA LOS ANGELES 90012	No	655	406	No
82542	611110	WALNUT HIGH SCHOOL	400 N PIERRE AV WALNUT 91789	No	134	134	No
82613	484110	ANCON MARINE INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
82674	322211	SOUTHLAND BOX CO	4955 MAYWOOD AV VERNON 90058	No	1035	958	No
82741	611110	GLENDALE UNI SCH DIST/GLENDALE HIGH SCH	1440 E BROADWAY GLENDALE 91205	No	367	137	No
82742	611110	GLENDALE UNI SCH DIST/HOOVER HIGH SCH	651 GLENWOOD RD GLENDALE 91202	No	196	150	No
83101	611699	THE J PAUL GETTY TRUST	1200 GETTY CENTER DR LOS ANGELES 90049	No	1170	211	No
83485	922120	COUNTY OF RIVERSIDE (MU1307, MU 1313)	30755 AULD RD MURRIETA 92563	No	2263	750	RBK
84108	812320	YEE YUEN LAUNDRY & CLEANERS INC	2575 S NORMANDIE AV LOS ANGELES 90007	No	698	31	No
84273	325412	TEVA PARENTERAL MEDICINES, INC	17-25 HUGHES IRVINE 92618	No	2689	921	No
84456	488490	LA CANADA UNIFIED SCHOOL DISTRICT	1100 FOOTHILL BLVD LA CANADA FLINTRIDGE 91011	No	111	10	No
84516	623110	LITTLE SISTERS OF THE POOR	2100 SOUTH WESTERN AVENUE SAN PEDRO 90732	No	940	0	No
84687	424490	FARMDALE CREAMERY INC	1049 W BASELINE ST SAN BERNARDINO 92411	No	747	98	No
84742	924110	SOUTH COAST AIR QUALITY MANAGEMENT DIST	21865 COPLEY DR DIAMOND BAR 91765	No	1004	185	No
86710	623110	CLAREMONT MANOR	650 W HARRISON CLAREMONT 91711	No	148	137	POC
87651	622110	SAINT JOSEPH HOSPITAL	1140 W LA VETA DR ORANGE 92868	No	1109	172	No
88321	922130	LA CO.,INTERNAL SER DIV, S F VLY JUV HAL	16350 FILBERT ST SYLMAR 91342	No	68	68	No
89186	311930	THE COCA COLA COMPANY	1650 S VINTAGE AV ONTARIO 91761	No	3624	1455	No
89467	622110	MOUNTAINS COMMUNITY HOSPITAL	29101 HOSPITAL RD LAKE ARROWHEAD 92352	No	476	93	No
89974	813990	SHOREHAM TOWERS HOMEOWNERS ASSOCIATION	8787 SHOREHAM DR WEST HOLLYWOOD 90069	No	414	0	No
90447	488210	D & S INGREDIENT TRANSFER CO INC	5112 ALHAMBRA AVE LOS ANGELES 90032	No	1157	56	No
90933	311421	TRIPLE H FOOD PROCESSORS, LLC	5821 WILDERNESS AVE. RIVERSIDE 92504	No	1090	801	RAL
91737	611110	LONG BEACH USD JOHN G WHITTIER SCHOOL	1761 WALNUT AV LONG BEACH 90813	No	483	18	No
92065	561110	TOYOTA MOTOR SALES, USA INC.	19300 GRAMERCY PLACE TORRANCE 90501	Yes	1112	414	64CL
92771	721110	WILSHIRE PLAZA HOTEL	3515 WILSHIRE BOULEVARD LOS ANGELES 90010	No	523	34	No
93246	531120	WILSHIRE TERRACE CORPORATION	10375 WILSHIRE BLVD LOS ANGELES 90024	No	98	0	No
94009	221310	LAS VIRGENES MUNICIPAL WATER DISTRICT	3700 LAS VIRGENES ROAD CALABASAS 91302	No	1302	172	No
94529	811310	DITTY CONTAINER INC	2226 NORTH ROSEMEAD BLVD SOUTH EL MONTE 91733	No	1118	426	No
94961	311941	Q & B FOODS INC	15547 FIRST ST IRWINDALE 91706	No	2208	768	No
95135	812331	AMER TEX MAINT, REPUBLIC MSTR CHEFS RNTL	1664 W WASHINGTON BLVD LOS ANGELES 90007	No	156	95	No
95252	622210	MISSION COMMUNITY HOSPITAL	14850 ROSCOE BLVD PANORAMA CITY 91402	No	356	0	No
95345	622110	KAISER FOUNDATION HOSPITAL	1011 BALDWIN PARK BLVD BALDWIN PARK 91706	No	671	21	No
95371	622110	WEST ANAHEIM MEDICAL CENTER	3033 W ORANGE ANAHEIM 92804	No	813	74	No
95507	324121	EDGINGTON OIL CO	2400 E ARTESIA BLVD LONG BEACH 90805	No	590	227	LGB
95638	623990	CASA DE LOS AMIGOS	123 S CATALINA AVE REDONDO BEACH 90277	No	315	0	No
95952	611110	FONTANA USD A.B. MILLER HIGH SCH	6821 OLEANDER AVE FONTANA 92336	Yes	401	14	No
96326	622110	COUNTY OF RIVERSIDE REGIONAL MEDICAL CTR	26520 CACTUS AVE & NASON ST MORENO VALLEY 92555	No	612	19	No
96369	484110	UNITED PUMPING SERVICE INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
96470	813990	DESERT ISLAND HOMEOWNERS ASSN BLDG 910	71777 FRANK SINATRA DR RANCHO MIRAGE 92270	No	3121	137	No
96674	813110	SOKA GAKKAI INTERNATIONAL USA	606 WILSHIRE BLVD SANTA MONICA 90401	No	208	53	No
96974	813110	WILSHIRE BLVD TEMPLE	3663 WILSHIRE BLVD LOS ANGELES 90010	No	232	232	No

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97020	811111	HONDA R & D NORTH AMERICAS INC	1900 HARPERS WAY TORRANCE 90501	No	732	497	64CL
97046	812331	MISSION LINEN SUPPLY	5400 ALTON ST CHINO 91710	No	1080	264	No
98134	812332	UNIFIRST CORP, INTERSTATE NUCLEAR SRVCS	700 S ETIWANDA AVE ONTARIO 91761	No	2979	1992	No
98326	325620	LEVLAD, LLC	9200 MASON AVE CHATSWORTH 91311	No	1146	547	No
98409	622110	LAKEWOOD REGIONAL MEDICAL CENTER, INC	3700 E SOUTH ST LAKEWOOD 90712	No	113	113	No
98545	488190	TAC-WEST INC	1156 NORTH FEE ANA ST ANAHEIM 92807	No	1476	641	No
98625	531210	NK BEVERLY HILLS CORP	8500 WILSHIRE BLVD, SUITE 820 BEVERLY HILLS 90211	No	409	13	No
99119	325211	INTERPLASTIC CORP	12335 S VAN NESS HAWTHORNE 90250	No	805	311	No
99265	921190	LONG BEACH UNI SCH DIST	3333 AIRPORT WAY LONG BEACH 90806	No	328	193	No
99616	722511	RENAISSANCE HOTELS & RESORTS	44-400 INDIAN WELLS LN INDIAN WELLS 92210	No	1928	161	No
100542	712110	AUTRY NATIONAL CENTER	4700 WESTERN HERITAGE WAY LOS ANGELES 90027	No	1539	795	No
100808	311824	MARUCHAN INC	15800 LAGUNA CANYON RD IRVINE 92618	No	1951	647	No
101311	423840	BOGGS TOOL PROCESSING & FILE SHARPENING	14100 ORANGE AVE PARAMOUNT 90723	No	438	18	No
102099	611110	MARGARITA MIDDLE SCH, TEMECULA VLY USD	30600 NARGARITA ROAD TEMECULA 92591	Yes	66	66	No
102334	332813	MOOG, INC	20263 S WESTERN AVE TORRANCE 90501	Yes	1337	299	64CL
103083	453998	CALIFORNIA BOILER INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
103424	611110	WALNUT VALLEY UNIFIED SCHOOL DISTRICT	21400 PATHFINDER ROAD DIAMOND BAR 91765	No	402	21	No
104325	722410	THE CHEESECAKE FACTORY	26950 WEST AGOURA ROAD CALABASAS 91301	No	867	174	No
104641	424130	CORRU-KRAFT BUENA PARK	6600 VALLEY VIEW ST BUENA PARK 90620	No	692	692	No
105064	531120	LUCKMAN MANAGEMENT CO	9200 SUNSET BLVD LOS ANGELES 90069	No	538	0	No
105663	531120	BEVERLY WILSHIRE PROPERTIES, INC	9465 WILSHIRE BL BEVERLY HILLS 90212	No	528	34	No
106355	621999	LA CITY, 77TH ST AREA POLICE FACILITY	7600 BROADWAY LOS ANGELES 90003	No	148	23	No
107149	332813	MARKLAND MANUFACTURING INC	1111 E MCFADDEN AVE SANTA ANA 92705	No	428	74	No
107652	445110	RALPHS GROCERY CO	1500 EASTRIDGE AVENUE RIVERSIDE 92507	No	2356	777	No
107696	813990	EMPIRE WEST HOMEOWNERS ASSOCIATION	1100 N ALTA LOMA ROAD WEST HOLLYWOOD 90069	No	166	0	No
107821	562910	MESA ENVIRONMENTAL INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
107891	622110	ORANGE COAST MEMORIAL MEDICAL CENTER	9920 TALBERT AV FOUNTAIN VALLEY 92708	No	666	27	No
108169	611110	ONTARIO MONTCLAIR SCHOOL DISTRICT	1525 BONVIEW AVE ONTARIO 91761	No	95	95	No
108214	238990	SANCON ENGINEERING INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
108278	611310	LOYOLA MARYMOUNT UNIVERSITY	7900 LOYOLA BLVD LOS ANGELES 90045	No	1168	0	LAX
109019	311224	HOUSE FOODS AMERICA CORPORATION	7351 ORANGEWOOD AVE GARDEN GROVE 92841	No	768	307	No
109393	531312	SMG	300 E OCEAN BLVD LONG BEACH 90802	No	1210	209	No
109562	332813	VALLEY PLATING WORKS INC	5900 E SHEILA ST COMMERCE 90040	Yes	937	217	No
109608	562212	CR & R INC	1706 GOETZ RD. PERRIS 92570	No	724	509	L65
109654	531190	TRIYAR COMPANIES LLC	10850 WILSHIRE BLVD LOS ANGELES 90024	No	687	43	No
110096	313310	SWISSTEX CALIFORNIA INC.	13660 S FIGUEROA ST LOS ANGELES 90061	No	755	459	No
110930	561110	CYGNUS WILSHIRE CENTER	2975 WILSHIRE BL LOS ANGELES 90010	No	134	134	No
111176	541611	WESTERN RIVERSIDE CO REG WASTEWATER AUTH	14634 RIVER RD CORONA 92880	No	3215	315	CNO
111289	561990	KOOS MANUFACTURING INC	2741 SEMINOLE AVE SOUTH GATE 90280	No	797	6	No
111301	311511	WWF OPERATING COMPANY	18275 ARENTH AV CITY OF INDUSTRY 91748	No	502	143	No
111485	221310	INLAND EMPIRE UTL AGEN, A MUN WATER DIST	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
111958	313310	WASHINGTON GARMENT DYEING & FINISHING	1334 E 18TH ST LOS ANGELES 90021	No	356	146	No
112329	812331	CINTAS CORPORATION	2150 S PROFORMA AVE ONTARIO 91761	No	1046	898	ONT
112509	221310	METROPOLITAN WATER DIST OF SO CAL	700 N ALAMEDA ST LOS ANGELES 90012	No	835	161	No
112547	336411	GULFSTREAM AEROSPACE CORPORATION	3495 LAKEWOOD BLVD LONG BEACH 90808	No	1791	10	No

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112909	622110	DESERT HOSPITAL	1150 N INDIAN CANYON DR PALM SPRINGS 92262	No	797	19	No
112956	339992	FENDER MUSICAL INSTRUMENTS CORP.	311 CESSNA CIR CORONA 92880	No	1764	898	No
112968	332813	COAST PLATING INC	417 W 164 TH ST GARDENA 90248	Yes	513	187	No
113170	621493	SANTA MONICA - UCLA MEDICAL CENTER	1250 16TH ST SANTA MONICA 90404	No	365	63	No
113303	812332	CAITAC GARMENT PROCESSING INC	14725 S BROADWAY GARDENA 90248	No	671	330	No
113329	812930	ONE HUNDRED TOWERS LLC, CENTURY PLAZA	2049 CENTURY PARK EAST LOS ANGELES 90067	No	657	85	No
113436	622110	PACIFICA HOSPITAL OF THE VALLEY	9449 SAN FERNANDO RD SUN VALLEY 91352	No	689	0	BUR
113563	622110	RIVERSIDE COMMUNITY HOSPITAL	4445 MAGNOLIA AV RIVERSIDE 92501	No	473	164	No
113873	221112	MM WEST COVINA LLC	2210 S AZUSA AVE WEST COVINA 91792	Yes	1390	29	No
113936	812320	RADIANT SRVS CORP, EL SEGUNDO CLNRS/LDRY	651 W KNOX ST GARDENA 90248	No	1777	703	64CL
114012	313310	UNIVERSAL DYEING & PRINTING	2303 E 11TH ST LOS ANGELES 90021	No	1260	1197	No
114296	531210	KILROY AIRPORT IMPERIAL COMPANY	909 N SEPULVEDA BLVD EL SEGUNDO 90245	No	1080	217	No
114346	531120	CB RICHARD INVESTORS ITF CAL STRS	9595 WILSHIRE BLVD BEVERLY HILLS 90212	No	340	134	No
114484	922120	CITY OF SANTA ANA POLICE DEPARTMENT	60/62 CIVIC CENTER PLZ SANTA ANA 92702	No	750	71	No
114561	322212	SMURFIT KAPPA NORTH AMERICA LLC	13400 E NELSON AVE CITY OF INDUSTRY 91746	No	1184	179	No
114910	813110	PROVIDENCE HOLY CROSS MEDICAL CTR.	15031 RINALDI STREET MISSION HILLS 91345	No	674	61	No
115117	311612	S & S FOODS, L.L.C.	1120 W FOOTHILL BLVD AZUSA 91702	No	1024	341	No
115987	531110	PACIFIC PLAZA PARTNERS, LLC	1431 OCEAN AV SANTA MONICA 90401	No	483	137	No
116001	812331	AMERIPRIDE UNIFORM SERVICES	5950 ALCOA AVE VERNON 90058	No	761	484	No
116020	311612	GAYTAN FOODS	15430 E PROCTOR AVE CITY OF INDUSTRY 91744	No	1072	354	No
116773	111339	C C GRABER COMPANY	315 E 4TH ST ONTARIO 91764	No	575	0	No
116924	325412	AMPHASTAR PHARMACEUTICAL, INC	11570 SIXTH ST RANCHO CUCAMONGA 91730	No	3051	591	No
117536	313310	SUPER DYEING & FINISHING	8825 MILLERGROVE AVE SANTA FE SPRINGS 90670	No	718	124	No
117851	424710	SHORE TERMINALS LLC	841-901 LA PALOMA AVE WILMINGTON 90744	No	1820	1400	No
117980	325620	THIBIANT INTERNATIONAL INC	20320 PRAIRIE ST CHATSWORTH 91311	No	1040	494	No
118124	713110	CEDAR FAIR LP, KNOTT'S BERRY FARM DBA	8039 BEACH BLVD BUENA PARK 90620	Yes	698	0	No
118217	531110	DOUGLAS EMMETT REALTY FUND DBA WESTSIDE	11845 OLYMPIC BLVD #1260 LOS ANGELES 90064	No	510	124	No
118379	622110	ARROWHEAD REGIONAL MEDICAL CTR	4 COLTON 92324	No	449	11	No
118420	621310	GENERAL SERVICES ADMINISTRATION	411 W 4TH ST SANTA ANA 92701	No	472	55	No
118458	531110	BARRINGTON PLAZA, D EMMETT REALTY FUND	11740 WILSHIRE BLVD STE 240 LOS ANGELES 90025	No	406	5	No
118526	541611	WESTERN MUNICIPAL WATER DISTRICT	22751 NANDINA AVE RIVERSIDE 92518	No	1426	8	No
118628	621111	ALHAMBRA HOSPITAL MEDICAL CENTER	100 S RAYMOND AV ALHAMBRA 91801	No	336	58	No
118648	541611	STAPLES CENTER, L A ARENA COMPANY LLC.	1111 S FIGUEROA ST LOS ANGELES 90015	Yes	702	159	No
118681	561720	LA STATE BLDG AUTHORITY, JUNIPERO SIERRA	320 W 4TH ST LOS ANGELES 90013	No	544	462	No
118984	622110	NORTHRIDGE HOSPITAL MEDICAL CENTER	18300 ROSCOE BLVD. NORTHRIDGE 91325	No	771	89	No
119366	424690	UNIVAR USA INC.	2600 S GARFIELD AVE COMMERCE 90040	No	407	407	No
119386	311511	STREMICKS HERITAGE FOODS LLC	11503 PIERCE ST RIVERSIDE 92505	No	389	63	No
119433	531120	WILSHIRE PARK PLACE LLC	3700 WILSHIRE BLVD LOS ANGELES 90010	No	235	140	No
119664	311919	MARQUEZ MARQUEZ FOOD PRODUCTS	11803 INDUSTRIAL AVE SOUTH GATE 90280	Yes	575	39	No
119681	541618	WILMONT INC	3200 WILSHIRE BLVD LOS ANGELES 90010	No	457	127	No
119710	311411	NOR-CAL BEVERAGE COMPANY, INC.	1226 N OLIVE ST ANAHEIM 92801	No	869	161	No
120651	622110	HUNTINGTON BEACH HOSPITAL	17772 BEACH BLVD. HUNTINGTON BEACH 92647	No	999	0	No
120676	541380	HEMET UNIFIED SCHOOL DIST/NUTRITION CNTR	2075 W ACACIA HEMET 92545	No	224	117	HMT
120748	424480	PACIFIC FRUIT PROCESSORS, INC.	12128 CENTER ST SOUTH GATE 90280	No	739	10	No
121017	311612	SQUARE H BRANDS INC	2731 S SOTO ST LOS ANGELES 90023	Yes	1403	1228	No

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121045	531210	3600 WILSHIRE LLC	3600 WILSHIRE BLVD LOS ANGELES 90010	No	417	124	No
121289	334510	MEDTRONIC MINIMED, INC.	18000 DEVONSHIRE ST NORTHRIDGE 91325	No	690	196	No
121294	623311	BARTLETT CARE CENTER LLC	600 E WASHINGTON AVE SANTA ANA 92701	No	323	0	No
121371	237210	DOUGLAS, EMMETT & CO	15303 VENTURA BLVD SHERMAN OAKS 91403	No	661	117	No
121459	322211	PACKAGING CORPORATION OF AMERICA	4240 BANDINI BLVD LOS ANGELES 90023	No	1067	1067	No
121507	531110	THE SALVATION ARMY (CALIF CORP)	180 E OCEAN BLVD LONG BEACH 90802	No	1138	0	No
121570	322130	C B SHEETS	13901 S CARMENITA RD SANTA FE SPRINGS 90670	No	745	272	No
121671	721110	CROWNE PLAZA LOS ANGELES AIRPORT	5985 W CENTURY BLVD. LOS ANGELES 90045	No	1297	451	No
121872	313210	DAE SHIN USA INC /JAE WEON LEE	610 N GILBERT ST FULLERTON 92833	No	663	122	FUL
121897	531120	EQUITABLE PLAZA, LLC	3435 WILSHIRE BLVD LOS ANGELES 90010	No	394	182	No
121908	311941	VAN LAW FOODS	2325 MOORE AVE FULLERTON 92833	No	980	217	FUL
122083	562219	STERICYCLE, INC.	2775 E 26TH ST LOS ANGELES 90023	No	1215	1003	No
122166	811310	MANLEYS BOILER REPAIR CO., INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
122325	424990	RRR REAL ESTATE	5151 ALCOA AVE VERNON 90058	No	1329	946	No
122337	561499	CENTRAL PLAZA LLC	3450 WILSHIRE BLVD, STE #400 LOS ANGELES 90010	No	380	138	No
122412	531210	PARAMOUNT PLAZA, LLC	3550 WISLHIRE BLVD LOS ANGELES 90010	No	496	154	No
122599	325620	GAR LABS	1844 MASSACHUSETTS AVE RIVERSIDE 92507	No	623	293	No
122740	722511	611 W 6TH ST ASSOC LLC/METCOM MGMT LLC	611 W 6TH ST STE 2600 LOS ANGELES 90017	No	80	80	No
123664	311710	AQUAMAR INC	10888 7TH ST RANCHO CUCAMONGA 91730	No	2208	158	No
123788	531210	LOWE ENTERPRISES COMMERCIAL GROUP	16133 VENTURA BLVD ENCINO 91436	No	1141	43	No
123846	531210	JAMISON PROPERTIES	4201 WILSHIRE BLVD LOS ANGELES 90010	No	441	37	No
123880	531120	CENTURY PARK PLAZA, DOUGLAS EMMETT REALT	1801 CENTURY PARK EAST LOS ANGELES 90067	No	323	251	No
124116	311513	SAPUTO CHEESE USA, INC.	5611 E IMPERIAL HWY SOUTH GATE 90280	No	1371	23	No
124275	326299	KMC ACQUISITION CORP	12023 WOODRUFF AVE DOWNEY 90241	No	700	249	No
124868	812332	CINTAS CORPORATION NO 3	1851 S WINEVILLE ONTARIO 91761	No	3397	737	No
125244	813110	WEST ANGELES CHURCH OF GOD IN CHRIST	3600 CRENSHAW BLVD LOS ANGELES 90018	No	175	60	No
125282	325414	GILEAD SCIENCES INC, 502 BLDG	502 COVINA BLVD SAN DIMAS 91773	No	855	356	No
125299	325412	GILEAD SCIENCES INC	650 CLIFFSIDE DRIVE SAN DIMAS 91773	No	573	372	No
125840	313210	WIMATEX, INC.	5801 S SECOND ST VERNON 90058	No	599	409	No
125900	624410	DEPT OF CHILDREN & FAMILY, MACLAREN HALL	4024 N DURFEE AVE EL MONTE 91732	No	343	113	EMT
126214	311520	DONG PHUONG TOFU INC	15022 MORAN ST WESTMINSTER 92683	No	467	0	No
126728	541611	DOUGLAS EMMETT & CO/ONE WESTWOOD	10990 WILSHIRE BLVD, STE #1280 LOS ANGELES 90024	No	1099	87	No
126835	519120	DPSS - EXPOSITION PARK WEST ASSET LEASIN	3833 S VERMONT AVE LOS ANGELES 90037	No	987	23	No
126847	524210	GLENDALE PLAZA	655 N CENTRAL AVE GLENDALE 91203	No	452	0	No
126939	561110	THE ATRIUM IRVINE LLC	19100 VON KARMAN # 260 IRVINE 92612	No	1973	192	SNA
127411	713940	BILTMORE HOTEL	506 S GRAND AVE LOS ANGELES 90071	No	212	146	No
127416	926110	LA CO, VALENCIA CIVIC CENTER	23740 MAGIC MOUNTAIN PKY VALENCIA 91355	No	922	132	No
127861	561450	EXPERIAN INFORMATION SOLUTIONS INC	475 ANTON BLVD COSTA MESA 92626	No	769	146	SNA
128159	238320	KOREAN EDUCATION FOUNDATION IN LA	680 WILSHIRE PL LOS ANGELES 90005	No	290	140	No
128951	313310	HARRY'S DYE & WASH, INC	1015 E ORANGETHORPE ANAHEIM 92801	No	1262	391	No
129376	812320	FINAL TOUCH DYEING & FINISHING	13416 ESTRELLA AVE GARDENA 90248	No	426	166	No
129416	721110	WESTIN SOUTH COAST PLAZA	686 ANTON BOULEVARD COSTA MESA 92626	No	985	306	SNA
129562	561210	3055 WILSHIRE LLC	3055 WILSHIRE BLVD. LOS ANGELES 90010	No	69	69	No
129827	721110	PACIFIC PALMS CONFERENCE RESORT	1 INDUSTRY HILLS PKWY CITY OF INDUSTRY 91744	No	700	517	No
130248	311412	O'TASTY FOODS, INC.	160 S HACIENDA BLVD CITY OF INDUSTRY 91745	No	557	63	No

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130254	551112	10100 SANTA MONICA, INC	10100 SANTA MONICA BLVD LOS ANGELES 90067	No	428	349	No
130388	313310	WESTERN YARN DYEING INC.	2011 EAST RAYMER AVENUE FULLERTON 92833	No	716	470	FUL
130646	326299	WEST AMERICAN RUBBER COMPANY, LLC	750 N MAIN ST ORANGE 92868	No	830	259	No
130668	311999	GOLDEN SPECIALTY FOODS. LLC	14605 BEST AV NORWALK 90650	No	1291	206	No
131431	522110	OLYMPIC PLAZA	11500 OLYMPIC BLVD LOS ANGELES 90064	No	348	116	No
131507	551112	WIRETECH, INC.	6440 E CANNING ST COMMERCE 90040	No	1006	1004	No
131864	621999	BRISTOL GROUP LLC/SAMARITAN MED TOWER	1127 WILSHIRE BLVD LOS ANGELES 90017	No	737	156	No
132152	315190	COMPLETE GARMENT, INC.	2101 E 38TH ST VERNON 90058	No	698	694	No
132401	311612	RICE FIELD CORP. / DEREK LEE	14500 E VALLEY BLVD CITY OF INDUSTRY 91746	No	690	459	No
132942	327390	QUIKRETE CORP OF SOUTHERN CALIF	20625 TEMESCAL CYN RD CORONA 92883	No	2926	29	No
132999	531210	BEVERLY HILLS PROPERTY	691 S IROLO ST LOS ANGELES 90005	No	467	51	No
133596	812332	STONE BLUE INC	2501 E 28TH ST VERNON 90058	No	1035	998	No
133975	611210	NORTH ORANGE COUNTY COMM.COLLEGE DIST.	1830 REMNEYA ANAHEIM 92801	No	512	80	No
134102	621511	QUEST DIAGNOSTICS,NICHOLS INST. VALENCIA	27027 TOURNEY RD SANTA CLARITA 91355	No	1175	275	No
134211	721110	MONTAGE RESORTS & SPA	30801 SOUTH COAST HWY LAGUNA BEACH 92651	No	249	103	No
134334	923120	US FOOD AND DRUG ADMINISTRATION	19701 FAIRCHILD AVE IRVINE 92612	No	1600	489	SNA
134426	237210	AMISCOPE PROPERTIES	20525 NORDOFF CHATSWORTH 91311	No	1061	336	No
134847	237210	DOUGLAS EMMETT 2000 LLC	21700 OXNARD STREET WOODLAND HILLS 91367	No	1349	198	No
134985	311412	OVERHILL FARMS, INC	2727 E VERNON AVE VERNON 90058	No	721	652	No
135023	722310	KINGS HAWAIIAN BAKERY	19161 HARBORGATE WAY TORRANCE 90501	No	694	436	64CL
135185	813212	BEACH CITIES HEALTH DISTRICT	514 N PROSPECT AVE REDONDO BEACH 90277	No	447	109	No
135273	424490	ARCHER DANIELS MIDLAND COMPANY	455 N 6TH ST COLTON 92324	No	718	63	No
135425	721110	SHERATON GATEWAY HOTEL- LAX	6101 W CENTURY BLVD LOS ANGELES 90045	No	1464	583	No
135545	334220	NORTHROP GRUMMAN SPACE & MISSION SYSTEM	ONE SPACE PARK REDONDO BEACH CA 90278	Yes	791	357	No
136655	311942	USA FOODS, INC/LEE KUM KEE	14415 & 14455 DON JULIAN RD CITY OF INDUSTRY 91746	No	813	377	No
136953	311710	BUMBLE BEE FOODS, LLC	13100 ARTIC CIRCLE DR SANTA FE SPRINGS 90670	No	1128	370	No
137244	454390	CLEMENT- PAPPAS CA INC	1755 E ACACIA ST ONTARIO 91761	No	2124	1527	ONT
137433	424420	JESSIE LORD BAKERY, LLC	21100 S WESTERN AV TORRANCE 90501	No	1458	66	64CL
137722	493190	VOPAK TERMINAL LONG BEACH INC,A DELAWARE	305 HENRY FORD AV SAN PEDRO 90731	No	2639	2277	No
137966	452111	LA CURACAO BUSINESS CENTER	1605 W OLYMPIC BLVD LOS ANGELES 90015	No	280	98	No
138325	424590	IMPERIAL WESTERN PRODUCTS CO INC	86-600 AVE 54 COACHELLA 92236	No	2153	597	No
138402	444190	ORCO BLOCK CO INC	35100 DILLON RD INDIO 92202	No	8021	1421	No
138514	531210	SHATTO CORPORATION	425 SHATTO PL LOS ANGELES 90020	No	146	146	No
138689	926120	CALTRANS DISTRICT 7 HEADQUARTERS	100 S MAIN ST LOS ANGELES 90012	No	774	288	No
138705	531120	BROADWAY CIVIC CENTER	316 W 2ND ST LOS ANGELES 90012	No	916	591	No
139172	812990	DOWNTOWN CENTER STUDIOS	1201 W 5TH ST LOS ANGELES 90017	No	623	257	No
139193	622110	UHS-CORONA INC/CORONA REGIONAL MED CTR	800 S MAIN ST CORONA 92882	No	340	127	No
139280	621111	KAISER PERMANENTE ONTARIO VINEYARD MED C	2295 S VINEYARD AVE ONTARIO 91761	No	1242	431	ONT
139318	531312	811 WILSHIRE, LLC	811 WILSHIRE LOS ANGELES 90017	No	291	291	No
139668	325998	NALCO COMPANY	2111 E DOMINGUEZ ST CARSON 90810	Yes	1030	792	No
139759	611110	LAKESIDE HIGH SCHOOL	32693 RIVERSIDE DR LAKE ELSINORE 92530	No	179	111	No
139800	713940	KAISER PERMANENTE/INDEPENDENCE PARK FAC	12254 BELLFLOWER BLVD DOWNEY 90242	No	573	121	No
140022	325211	HUNTSMAN ADVANCED MATERIALS AMERICAS, L	5121 SAN FERNANDO RD WEST LOS ANGELES 90039	No	565	100	No
140043	611210	WILSHIRE CENTER, INC.	3255 WILSHIRE BLVD LOS ANGELES 90010	No	452	164	No
140423	531120	KAJIMA DEVELOPMENT CORPORATION	250 E FIRST STREET #610 LOS ANGELES 90012	No	488	26	No

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140961	326199	GKN AEROSPACE TRANSPARENCY SYS INC	12122 & 12241 WESTERN AVE GARDEN GROVE 92841	No	599	19	No
141072	424690	BRENNTAG PACIFIC INC	10747 PATTERSON PL SANTA FE SPRINGS 90670	No	1284	388	No
141119	721110	DOUBLETREE ANAHEIM/ORANGE CO, DT MGMT	100 THE CITY DR ORANGE 92868	No	1307	0	No
141175	928110	CALIFORNIA NATIONAL GUARD ARMORY	1351 W SIERRA MADRE AVE AZUSA 91702	No	1053	208	No
141473	424410	NONG SHIM AMERICA, INC	12155 6TH ST RANCHO CUCAMONGA 91730	No	2675	1117	No
142065	711310	SEGERSTROM CENTER FOR THE ARTS	615 TOWN CENTER DR COSTA MESA 92626	No	771	183	SNA
142435	921110	CLAREMONT CITY	1616 MONTE VISTA AVE CLAREMONT 91711	No	808	195	No
143929	813110	HARVEST ROCK CHURCH	131 S ST JOHN PASADENA 91105	No	393	335	No
144132	312111	ASEPTIC SOLUTIONS USA, LLC	484 ALCOA CIR CORONA 92880	No	1696	613	No
144422	454390	NESTLE WATERS NORTH AMERICA INC	1925 COMPTON AVENUE LOS ANGELES 90011	No	554	172	No
144539	333241	PURATOS CORPORATION	18831 LAUREL PARK RD RANCHO DOMINGUEZ 90220	No	1745	1403	No
144695	713940	WESTLAKE WELLBEING PROPERTIES, LLC	2 DOLE DR WESTLAKE VILLAGE 91362	No	375	375	No
145071	561499	PASEO COLORADO HOLDINGS LLC	280 E COLORADO BLVD PASADENA 91101	No	756	624	No
145389	311999	SWEET OVATIONS	16911 S NORMANDIE AVE GARDENA 90247	No	813	19	64CL
145747	721110	CROWNE PLAZA HOTEL	300 N HARBOR DR REDONDO BEACH 90277	No	594	37	No
145869	621511	QUEST DIAGNOSTICS INC.	8401 FALLBROOK AVE WEST HILLS 91304	No	1221	212	No
146016	238110	COFFMAN SPECIALTIES, INC.	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
146346	621111	KAISER FOUNDATION HOSPITAL	9353 IMPERIAL HWY DOWNEY 90242	No	338	11	No
146468	237210	DOUGLAS EMMETT REALTY FUND 2002	6320 CANOGA AVE WOODLAND HILLS 91367	No	1323	132	No
146706	424690	TITAN TERMINAL AND TRANSPORT INC	4570 ARDINE ST SOUTH GATE 90280	Yes	562	80	No
146897	922120	LOS ANGELES CO SHERIFF DEPT/LA REGIONAL	1800 PASEO RANCHO CASTILLA LOS ANGELES 90032	No	341	43	No
146903	454390	NESTLE WATERS NORTH AMERICA	5772 JURUPA ST ONTARIO 91761	No	2866	1894	No
146908	621399	PROV HLTH SYS/LITTLE CO MARY MED CTR S.P	1300 W 7TH ST SAN PEDRO 90732	No	650	29	No
147356	622110	CHA HOLLYWOOD MED CTR LP	1300 N VERMONT AVE LOS ANGELES 90027	No	521	51	No
147371	221320	INLAND EMPIRE UTILITIES AGENCY	6063 KIMBALL AVE CHINO 91710	No	1455	761	No
147620	325412	SUNRIDER MANUFACTURING, LP	1461 FRANCISCO ST TORRANCE 90501	No	1215	666	64CL
147669	531210	7080 HOLLYWOOD, LLC	7080 HOLLYWOOD BLVD HOLLYWOOD 90028	No	314	101	No
147943	531210	LBA REALTY	1150 S OLIVE ST LOS ANGELES 90015	No	84	72	No
147971	812331	REPUBLIC MASTER CHEFS	1340 ORIZABA AVE. LONG BEACH 90804	No	401	6	No
148034	721110	THE ISLAND HOTEL	690 NEWPORT CENTER DR NEWPORT BEACH 92660	No	1333	0	No
148094	311111	BREEDERS CHOICE PET FOODS INC	16321 E ARROW HIGHWAY IRWINDALE 91706	No	1036	37	No
148140	445299	THE COCA-COLA COMPANY-ANAHEIM	2121 E WINSTON RD ANAHEIM 92806	No	1363	100	No
148411	621610	KAISER PERMANENTE DOWNEY MED CENTER	9333 IMPERIAL HWY DOWNEY 90242	No	338	11	No
148720	611110	HAWTHORNE SCHOOL DIST, PRARIE VISTA MID	13600 PRAIRIE AVE HAWTHORNE 90250	Yes	398	43	No
148928	313210	TRI-STAR DYEING AND FINISHING, INC..	15125 MARQUARDT SANTA FE SPRINGS 90670	No	1812	978	No
148962	562211	VEOLIA ENVIRONMENTAL SERVICES	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
148983	334510	BOSTON SCIENTIFIC NEUROMODULATION	25155 RYE CANYON LOOP SANTA CLARITA 91355	No	933	488	No
149051	322211	SMURFIT KAPPA NORTH AMERICA LLC	440 N BALDWIN PARK BL CITY OF INDUSTRY 91746	No	930	467	No
149102	811111	2000 AVE OF THE STARS/TRAMMELL CROW CO.	2000 AVENUE OF THE STARS LOS ANGELES 90067	No	684	253	No
149387	311511	REX CREAMERY	5743 SMITHWAY ST COMMERCE 90040	No	779	145	No
149431	424490	BDS NATURAL PRODUCTS	1904 E DOMINGUEZ ST LONG BEACH 90810	No	573	354	No
149455	531210	3780 WILTERN CENTER LLC	3780 WILSHIRE BLVD LOS ANGELES 90010	No	251	138	No
149526	445110	HEALTHVERVE FOOD MFG. USA, INC	9083 SANTA ANITA AVE RANCHO CUCAMONGA 91730	No	2351	1439	No
150072	721110	CELEBRITY CASINOS INC	123 E ARTESIA BLVD COMPTON 90220	No	1587	348	No
150397	811219	RF MAC DONALD CO	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A

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150519	928110	CALIFORNIA ARMY NATIONAL GUARD	4255 SARATOGA AVE LOS ALAMITOS 90720	No	1352	309	No
150667	311225	VENTURA FOODS LLC	2900 E JURUPA AVE ONTARIO 91761	No	2694	1527	ONT
151474	311999	MARUKOME USA, INC.	17132 PULLMAN ST IRVINE 92614	No	1350	145	SNA
151843	326140	INSULFOAM	5635 SCHAEFER AVE CHINO 91710	No	1482	378	No
152332	512131	LA LIVE, LLC	777 CHICK HEARN CT LOS ANGELES 90015	No	750	219	No
152494	424490	GOURMET FRESH PASTA	950 N FAIR OAKS AVE PASADENA 91103	No	1099	35	No
152576	448120	ARAMARK UNIFORM & CAREER APPAREL LLC	1135 HALL AVE RIVERSIDE 92509	No	2993	283	No
152641	561990	WATT MINERAL HOLDINGS LLC	E/SIERRA HWY & N/DOCKWEILER NEWHALL 91321	No	1328	16	No
152886	312112	NIAGARA BOTTLING, LLC.	2560 PHILADELPHIA AVE ONTARIO 91761	No	573	552	ONT
153663	424690	1990 WESTWOOD,LLC	2140 W OLYMPIC BLVD LOS ANGELES 90006	No	576	37	No
153702	811490	CM LAUNDRY, LLC	14919 S FIGUEROA ST GARDENA 90248	No	412	39	No
154028	531210	350 FIGUEROA, LLC	350 S FIGUEROA ST LOS ANGELES 90071	No	628	327	No
154030	531312	JAMISON CALIFORNIA MARKET CENTER, LP	110 E 9TH ST LOS ANGELES 90079	No	586	237	No
154034	621999	CENTINELA HOSPITAL MEDICAL CENTER	555 E HARDY ST INGLEWOOD 90301	No	394	164	No
154509	453220	SAN GABRIEL VALLEY MEDICAL CENTER	438 W. LAS TUNAS DR., SAN GABRIEL SAN GABRIEL 91776	No	209	47	No
155134	424310	ROYAL PRINTEX , INC.	1946 E 46TH ST VERNON 90058	No	544	544	No
155368	312111	REFRESCO BEVERAGES US INC.	570 E MILL ST SAN BERNARDINO 92408	Yes	987	463	No
155422	611310	POMONA COLLEGE	609 N COLLEGE WAY CLAREMONT 91711	No	488	232	POC
155452	921190	CITY OF LA, DEPT OF GEN SVCS, LAPD ADM B	100 W 1ST ST LOS ANGELES 90012	No	840	354	No
155521	531312	WILSHIRE CATALINA PLAZA, LLC	3325 WILSHIRE BLVD LOS ANGELES 90010	No	377	175	No
156167	622110	MONTCLAIR HOSPITAL MEDICAL CENTER	5000 SAN BERNARDINO ST MONTCLAIR 91763	No	798	100	No
156294	812331	MEDICO PROFESSIONAL LINEN SERVICE	2201 E CARSON ST LONG BEACH 90807	No	1159	100	No
156298	561110	WASTE MGMT. HEALTHCARE SOLUTIONS OF CA	4280 E BANDINI BLVD VERNON 90058	No	877	877	No
156722	313310	AMERICAN APPAREL KNIT AND DYE	12641 INDUSTRY ST GARDEN GROVE 92841	No	875	298	No
156851	322211	INTERNATIONAL PAPER CO	19615 S SUSANA RD COMPTON 90221	No	1217	631	No
156875	313210	HITEX DYEING & FINISHING, INC	355 N VINELAND AVE CITY OF INDUSTRY 91746	No	885	92	No
156902	622110	PROVIDENCE TARZANA MEDICAL CENTER	18321 CLARK ST TARZANA 91356	No	838	132	No
157418	561499	OVERLAND VENTURE, L.P.	955 OVERLAND CT SAN DIMAS 91773	No	529	187	No
157845	531210	WILSHIRE TOWER APARTMENTS, LLC	701 S PARKER ST ORANGE 92868	No	888	8	No
158151	611110	ROBERT F KENNEDY COMMUNITY OF SCHOOLS	3161 W 8TH ST LOS ANGELES 90005	No	174	42	No
158404	622110	HOAG MEM HOSP PRESBYTERIAN	16200 SAND CANYON AVE IRVINE 92618	No	1175	190	No
158573	721110	TERRANEA RESORT	100 TERRANEA WAY RANCHO PALOS VERDES 90275	No	1181	531	No
158809	622110	GARFIELD MEDICAL CENTER/AHMC	525 N GARFIELD AV MONTEREY PARK 91754	No	584	71	No
159107	622110	LOMA LINDA UNIVERSITY HEALTH BEAUMONT-BA	81 HIGHLAND SPRINGS AVE BEAUMONT 92223	No	1464	117	No
159449	622110	KECK HOSPITAL OF USC	1500 SAN PABLO ST LOS ANGELES 90033	No	356	132	No
159634	531210	WILSHIRE SHATTO CENTER	3130 WILSHIRE BLVD LOS ANGELES 90010	No	266	241	No
160367	531120	JAMISON CALIFORNIA MARKET CENTER LP	124 E OLYMPIC BLVD LOS ANGELES 90079	No	480	235	No
160576	311999	FOSTER FARMS, COMPTON PLANT	1805 N SANTA FE AV COMPTON 90221	No	853	0	No
160826	622110	MISSION HOSPITAL LAGUNA BEACH	31872 S COAST HWY LAGUNA BEACH 92651	No	2277	77	No
160853	622110	AHMC ANAHEIM REGIONAL MEDICAL CENTER	1111 W LA PALMA AV ANAHEIM 92801	No	832	71	No
161439	313240	FANTASY DYEING AND FINISHING, INC.	5389 ALCOA AVE VERNON 90058	No	1196	761	No
161754	311511	ALTA DENA CERTIFIED DAIRY, LLC	17851 E RAILROAD ST CITY OF INDUSTRY 91748	No	1572	645	No
161834	424430	LOS ALTOS FOOD PRODUCTS, INC.	450 BALDWIN PARK BLVD CITY OF INDUSTRY 91746	No	821	467	No
161945	811192	QUALAWASH HOLDINGS, LLC	8332 WILCOX AVE SOUTH GATE 90280	No	884	84	No
162430	622110	PHYSICIANS HOSPITAL OF MURRIETA	28070 BAXTER RD MURRIETA 92563	No	1885	272	No

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163088	325180	ARKEMA INC.	19206 HAWTHORNE BL TORRANCE 90503	No	893	34	No
163123	311119	GEORGE VERHOEVEN GRAIN, INC.	5355 E AIRPORT DR ONTARIO 91761	No	3906	1408	No
164081	424430	IMURAYA USA INC.	2502 BARRANCA PKY IRVINE 92606	No	1221	295	No
164459	523991	KAISER PERMANENTE	3424 E LA PALMA AVE ANAHEIM 92806	No	1651	143	No
164522	423220	USA CANNING	201 N SULLIVAN ST SANTA ANA 92703	No	295	92	No
164820	541990	MEDICAL WASTE SERVICES, LLC	7321 QUIMBY ST PARAMOUNT 90723	No	554	208	No
165233	448150	POMONA COURTHOUSE SOUTH, JCC/AOC	400 CIVIC CENTER PLAZA POMONA 91766	No	753	98	No
165524	311421	CLIFFSTAR CALIFORNIA LLC	11751 PACIFIC AVE FONTANA 92337	No	2057	1012	No
165535	453910	LOTUS NATURAL PET FOOD	2727 MARICOPA ST TORRANCE 90503	No	610	63	No
165892	236115	FLATIRON CONSTRUCTION CORP	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
166187	322219	INTERNATIONAL COMPOSITES TECHNOLOGIES IN	1435 S SANTA FE AVE COMPTON 90221	No	671	68	No
166475	622110	HEMET VALLEY MEDICAL CENTER	1117 E DEVONSHIRE AVE HEMET 92543	No	671	126	No
166488	611210	LOS ANGELES MISSION COLLEGE	12890 W HARDING ST SYLMAR 91342	No	641	6	No
166710	531210	REALTY ASSOCIATES FUND IX	1960 E GRAND AVE EL SEGUNDO 90245	No	1154	436	No
167167	311513	SCHREIBER FOODS, INC.	1901 VIA BURTON ST FULLERTON 92831	No	610	338	No
167524	811219	PALM SPRINGS USD RANCHO MIRAGE HS	31001 RATTLER RD RANCHO MIRAGE 92270	No	1963	5	No
167938	424130	ROCKTENN CP, LLC	18021 S VALLEY VIEW AVE CERRITOS 90703	No	760	293	No
167947	322211	ROCKTENN CP, LLC	185 N SMITH AV CORONA 92880	No	814	369	No
167951	334418	CITY OF BUENA PARK	6955 ARAGON CIR BUENA PARK 90620	No	697	200	No
168083	622110	COMMUNITY HOSPITAL LONG BEACH	1720 TERMINO AV LONG BEACH 90804	No	694	0	No
168160	424490	YAKULT U.S.A., INC.	17235 NEWHOPE ST FOUNTAIN VALLEY 92708	No	1062	335	No
168424	424950	BNA COLOR INDUSTRY, INC	5000 DISTRICT BLVD VERNON 90058	No	377	377	No
168523	311999	JSL FOODS INTERNATIONAL	1478 N INDIANA ST LOS ANGELES 90063	No	435	13	No
169893	562219	CARBONLITE INDUSTRIES LLC	875 MICHIGAN AVE RIVERSIDE 92507	No	1223	150	No
169910	335312	ACCESS ENERGY, LLC	16323 SHOEMAKER AVE CERRITOS 90703	No	599	328	No
170075	523999	PACIFIC FINANCIAL EQUITIES, LLC	800 W 6TH ST LOS ANGELES 90017	No	290	290	No
170140	336413	HELICOPTER TECHNOLOGY COMPANY	14610 S BROADWAY GARDENA 90248	No	879	504	No
170253	327120	SAK CONSTRUCTION, LLC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
170890	812990	HOLLYWOOD PRODUCTION CTR	401 N BRAND BLVD GLENDALE 91203	No	591	0	No
171250	333241	JOHN BEAN TECHNOLOGIES CORPORATION	1660 IOWA AVE RIVERSIDE 92507	No	639	377	No
171575	447190	PHILLIPS 66 COMPANY LOS ANGELES LUBRICAN	13707 S BROADWAY LOS ANGELES 90061	No	977	573	No
171914	561720	ENVTECH TANK SERVICES LLC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
172211	311423	INLAND EMPIRE FOODS	5425 WILSON ST RIVERSIDE 92509	No	2121	922	No
172234	321920	IFCO SYSTEMS US., INC	8950 ROCHESTER AVE RANCHO CUCAMONGA 91730	No	2628	1044	No
172272	922120	VAN NUYS COURTHOUSE EAST, JCC/AOC	6230 SYLMAR AV VAN NUYS 91401	No	583	156	No
172387	339112	HAEMONETICS MANUFACTURING INC	1630-1665 INDUSTRIAL PARK ST COVINA 91722		491	56	No
172630	311999	PROPORTION FOODS, LLC	3501 E VERNON VERNON 90058	No	1854	1463	No
172641	561720	SHANNON DIVERSIFIED INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
172781	622110	TEMECULA VALLEY HOSPITAL	31700 TEMECULA PKY TEMECULA 92592	No	655	108	No
173258	322211	INTERNATIONAL PAPER	9211 NORWALK BLVD SANTA FE SPRINGS 90670	No	877	369	No
173418	424480	EVOLUTION FRESH	11655 JERSEY BLVD RANCHO CUCAMONGA 91730	No	2391	734	No
173420	621999	EQUINOX	1835 S SEPULVEDA BLVD LOS ANGELES 90025	No	473	87	No
173647	721110	MIX RESTAURANT, HILTON ANAHEIM, HHC HA T	777 CONVENTION WAY ANAHEIM 92802	No	731	216	No
173739	327390	OLDCASTLE PRECAST INC	2020 GOETZ RD PERRIS 92570	No	785	729	L65
174183	424480	IMT CAPITAL II SHERMAN OAKS LLC	14130 RIVERSIDE DR SHERMAN OAKS 91423	No	1022	39	No

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175030	921110	CITY OF CHINO HILLS	15091 LA PALMA DR CHINO 91710	No	880	406	No
175080	531210	BERINGIA CENTRAL, LLC	633 W 5TH ST LOS ANGELES 90071	No	328	26	No
175126	325110	AEROJET ROCKETDYNE OF DE, INC.	8900 DE SOTO AV CANOGA PARK 91304	No	766	85	No
175261	339999	OSI RIVERSIDE	1155 MOUNT VERNON AVE RIVERSIDE 92507	No	2002	332	No
175552	237210	DOUGLAS EMMETT MANAGEMENT, LLC	8484 WILSHIRE BLVD BEVERLY HILLS 90211	No	315	63	No
176198	811111	RINCON TRUCK CENTER, INC	114 RINCON CT SAN CLEMENTE 92672	No	713	130	No
176295	237210	HINES GLOBAL REIT 2300 MAIN ST LP	2300 MAIN ST IRVINE 92614	No	396	396	SNA
176369	541990	TESORO LOGISTICS MARINE TERMINAL 3	MARINE TERMINAL 3 PORT OF LB LONG BEACH 90813	Yes	216	0	No
176480	488210	TMG TRANSPORTATION INC	1435 N HARBOR FULLERTON 92835	No	1131	40	No
176489	238220	MANLEYS BOILER, INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
176566	622110	PIH HEALTH DOWNEY	11500 BROOKSHIRE AV DOWNEY 90241	No	558	129	No
176762	622210	COLLEGE MEDICAL CENTER	2776 PACIFIC AV LONG BEACH 90806	No	282	19	No
176788	311811	BIMBO BAKERIES USA, INC.	500 S PLACENTIA AV PLACENTIA 92870	No	1061	415	No
176803	325180	CLEAN HARBORS	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
177039	541380	NATIONAL TECHNICAL SYSTEMS	3505 E THIRD ST SAN BERNARDINO 92408	No	1032	116	SBD
177042	236220	SOLVAY USA, INC	20851 S SANTA FE AVE LONG BEACH 90810	Yes	929	433	No
177422	311111	AMERICAN JERKY COMPANY	2400 E FRANCIS ST ONTARIO 91761	No	1577	1452	ONT
177551	721110	NREA-TRC 700 LLC	700 S FLOWER ST. LOS ANGELES 90017	No	375	298	No
177942	327390	RIALTO CONCRETE PRODUCTS	23200 TEMESCAL CYN RD CORONA 92883	No	1186	45	No
178029	Unknown	350 SOUTH GRAND AVENUE (LA) OWNER, LLC	350 S GRAND AV LOS ANGELES 90071	No	489	251	No
178181	424910	MARTIN FEED LLC	8755 CHINO-CORONA RD CORONA 92880	No	2358	264	CNO
178261	Unknown	RICH PRODUCTS CORPORATION	3401 W SEGERSTROM AVE SANTA ANA 92704	No	1349	655	No
178416	Unknown	CALIFORNIA DEPT OF VETERANS AFFAIRS	11500 NIMITZ AVE LOS ANGELES 90049	No	1143	179	No
178423	531210	BROOKFIELD OFFICE PROPERTIES	333 & 355 SO GRAND AVE LOS ANGELES 90071	No	488	238	No
178726	423920	LOS ANGELES DISTILLERY	8650 HAYDEN PL CULVER CITY 90232	No	473	145	No
179052	423720	BOILER DYNAMICS INC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
179104	813990	GREAT WOLF LODGE	12681 HARBOR BLVD GARDEN GROVE 92840	No	999	5	No
179129	322211	INTERNATIONAL PAPER	5991 BANDINI BLVD LOS ANGELES 90040	No	1511	150	No
179134	336411	NORTHROP GRUMMAN SYSTEMS CORPORATION	5500 CANOGA AV WOODLAND HILLS 91367	No	1019	18	No
179265	531110	PROLOGIS, L.P.	20704 S FORDYCE AVE LONG BEACH 90810	No	1297	491	No
179310	531210	ONYX TOWER, LLC	6100 WILSHIRE BLVD LOS ANGELES 90048	No	373	74	No
179514	327331	SIERRA BUILDING PRODUCTS, OLDCASTLE APG	10774 POPLAR AVE FONTANA 92337	No	1318	430	No
179547	722511	US CORRUGATED OF LOS ANGELES	13820 MICA ST SANTA FE SPRINGS 90670	No	1788	948	No
179811	327213	ASEPTIC TECHNOLOGY LLC	24855 CORBIT PL YORBA LINDA 92887	No	729	92	No
180116	326130	REPET INC.	14207 MONTE VISTA AVE CHINO 91710	No	1674	430	No
180258	622110	INLAND EMPIRE SATELLITE REGIONAL REFEREN	13000 PEYTON DR CHINO HILLS 91709	No	969	148	No
180375	622110	UNIVERSITY OF SOUTHERN CALIFORNIA ON BEH	1812 VERDUGO BL GLENDALE 91208	No	679	51	No
180392	722513	CURCI IRVINE LLC C/O NEWPORT REAL ESTATE	1 GLEN BELL WAY IRVINE 92618	No	3595	58	No
180426	561990	HERITAGE DISTRIBUTING	425 9TH AVE CITY OF INDUSTRY 91746	No	1141	509	No
180538	312112	NIAGARA BOTTLING, LLC	1401 N ALDER AVE RIALTO 92376	No	858	415	L67
180672	334413	INFINEON TECHNOLOGIES AMERICAS CORP.	41915 BUSINESS PARK DR TEMECULA 92590	Yes	185	185	No
180889	541330	523 WEST 6TH STREET PROPERTY OWNER, LLC	523 W 6TH ST LOS ANGELES 90014	No	76	76	No
180908	325998	ECO SERVICES OPERATIONS CORP.	20720 S WILMINGTON AVE CARSON 90810	Yes	1019	381	No
180945	238210	ALLTECH, INC.	1702 S CUCAMONGA AVE ONTARIO 91761	No	406	406	No
181040	221310	SANTA MARGARITA WATER DISTRICT	26801 CAMINO CAPISTRANO LAGUNA NIGUEL 92677	No	782	346	No

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181041	812331	CINTAS - WHITTIER, CINTAS CORP.	2829 WORKMAN MILL RD WHITTIER 90601	No	1569	415	No
181084	531120	W/GL OCEAN AVENUE LB HOLDINGS VII, LLC	1 WORLD TRADE CENTER, #1820 LONG BEACH 90831	No	570	8	No
181182	424470	KING MEAT SERVICE, INC.	4215 EXCHANGE AV VERNON 90058	No	1490	1468	No
181225	322211	MONTEBELLO CONTAINER COMPANY, LLC	5150 INDUSTRY AV PICO RIVERA 90660	No	938	327	No
181257	322211	MONTEBELLO CONTAINER COMPANY, LLC	14333 MACAW ST LA MIRADA 90638	No	1643	480	No
181291	812331	HONG KONG DENIM DESIGN ONC	9725 FACTORIAL WAY SOUTH EL MONTE 91733	No	948	254	No
181347	722310	PREFERRED MEALS	5469 FERGUSON DR COMMERCE 90022	No	729	249	No
181526	531210	STATE OF CALIFORNIA	3737 MAIN ST RIVERSIDE 92501	No	554	554	No
181542	812331	LEMON TREE WASHHOUSE SERVICES, INC.	717 JUNIPERO SERRA DRIVE SAN GABRIEL 91776	No	246	14	No
181609	541711	GILEAD SCIENCES, INC	1800 WHEELER AVE LA VERNE 91750	No	980	240	No
181660	454390	NEW AVON LLC	2940 E FOOTHILL BLVD. PASADENA 91121	No	385	79	No
181946	531210	COLLIERS INTERNATIONAL	6053 W CENTURY BLVD LOS ANGELES 90045	No	1469	623	No
181947	531210	COLLIERS INTERNATIONAL	6033 W CENTURY BLVD LOS ANGELES 90045	No	1403	576	No
181966	236220	SYNEAR FOODS USA, LLC	9601 CANOGA AVE CHATSWORTH 91311	Yes	695	618	No
182093	561110	ONNI 800 WILSHIRE LIMITED PARTNERSHIP	800 WILSHIRE BLVD LOS ANGELES 90017	No	304	304	No
182102	334412	EMD SPECIALTY MATERIALS, LLC ARLON EMD	9433 HYSSOP DR RANCHO CUCAMONGA 91730	No	3259	549	No
182157	325412	BAXALTA US INC	4501 COLORADO BLVD LOS ANGELES 90039	No	600	68	No
182187	561499	DEDEAUX PROPERTIES	4000 NOAKES ST COMMERCE 90023	No	697	378	No
182210	611110	MCKINLEY K-8 SCHOOL	325 S OAK KNOLL AVE PASADENA 91101	No	327	293	No
182214	311422	COMAN	3305 E VERNON AVE VERNON 90058	No	1703	1595	No
182599	237110	INSITUFORM TECHNOLOGIES, LLC	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
182601	531210	THE KOLL COMPANY	18000 STUDEBAKER RD CERRITOS 90703	No	605	219	No
182603	311930	AMERICAN FRUITS AND FLAVORS LLC.	10725 SUTTER ST PACOIMA 91331	No	581	13	No
182752	488999	TORRANCE LOGISTICS COMPANY LLC	2619 E 37TH ST VERNON 90058	No	921	859	No
182774	812310	MELIK DYE WORKS	710 W 58TH STREET LOS ANGELES 90037	No	444	14	No
182957	811198	VALVOLINE, LLC	9520 JOHN ST SANTA FE SPRINGS 90670	No	959	922	No
183134	333414	CANSECO BOILER SERVICES, INC.	VARIOUS LOCATIONS	No	#N/A	#N/A	#N/A
183368	522310	FORTERRA BUILDING PRODUCTS	26380 PALOMAR RD. ROMOLAND 92585	No	1078	58	No
183465	311411	ASEPTIC INNOVATIONS, INC	4940 E LANDON DR ANAHEIM 92807	No	821	385	No
183581	311412	DEL REAL LLC	11041 INLAND AVE MIRA LOMA 91752	No	2710	801	No
183736	322211	GEORGIA-PACIFIC CORRUGATED LLC	15500 VALLEY VIEW AVE LA MIRADA 90638	No	1923	710	No
183737	621111	ORANGE COUNTY GLOBAL MEDICAL CENTER	1001 N TUSTIN AV SANTA ANA 92705	No	89	66	No
183926	325998	EVONIK CORPORATION	3305 E 26TH ST LOS ANGELES 90058	No	1088	863	No
184003	722511	FRANZ BAKERY LOS ANGELES	457 E MARTIN LUTHER KING BLVD LOS ANGELES 90011	No	229	39	No
184249	326199	RPLANET EARTH LOS ANGELES, LLC	5300 S BOYLE AVE VERNON 90058	No	1112	744	No
184321	531120	CVFI-444 S FLOWER, LP	444 SOUTH FLOWER ST, STE #1750 LOS ANGELES 90071	No	399	135	No
185034	322211	JELLCO CONTAINER	1265 N VAN BUREN ST ANAHEIM 92807	No	1048	435	No
185143	812331	9W HALO WESTERN OPCP L.P. D/B/A ANGELICA	300 E COMMERCIAL ST POMONA 91766	No	745	5	No
185144	812331	9W HALO WESTER OPCP L.P. D/B/A ANGELICA	925 S 8TH ST COLTON 92324	No	249	113	No
185145	812331	9W HALO WESTERN OPCP LP DBA ANGELICA	1575 N CASE ST ORANGE 92867	No	735	299	No
185146	812331	9W HALO WESTERN OPCP L.P. D/B/A ANGELICA	451 SAN FERNANDO RD LOS ANGELES 90031	No	826	560	No
185282	238990	BKEP MATERIALS LLC - FONTANA	14929 SLOVER AV FONTANA 92337	No	2039	845	No
185504	333318	UNIFIRST CORP	13123 ROSECRANS AVE SANTA FE SPRINGS 90670	No	451	24	No
185509	622110	GLENDALE MEMORIAL HOSPITAL & HEALTH CTR	1420 S CENTRAL AV GLENDALE 91204	No	462	21	No
185630	424480	AVALON PACKING,AMERICAN FOOD PROCESSING	2501 W ROSECRANS AVE LOS ANGELES 90059	No	246	13	No
185801	211111	BERRY PETROLEUM COMPANY, LLC	25121 N SIERRA HWY SANTA CLARITA 91321	No	1384	6	No
186226	312111	REYES COCA-COLA BOTTLING, LLC	1338 E 14TH ST LOS ANGELES 90021	No	235	235	No

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186255	312111	REYES COCA-COLA BOTTLING, LLC	1321 E 14TH ST LOS ANGELES 90021	No	232	232	No
186291	312111	REYES COCA-COLA BOTTLING, LLC	11536 PATTON RD. DOWNEY 90241	No	568	137	No
186424	333318	SUEZ WTS SERVICES USA, INC	11689 PACIFIC AV FONTANA 92335	No	2110	1098	No
186621	722513	MODU FOOD SERVICE INC	5050 EVERETT CT VERNON 90058	No	761	761	No
186836	Unknown	GAMBOL PET USA	20343 HARVILL AVE PERRIS 92570	No	1167	319	No
187119	Unknown	MERIDIAN PARKWAY CAMPUS	14950 INNOVATION DR RIVERSIDE 92518	No	1455	903	RIV
187165	Unknown	ALTAIR PARAMOUNT, LLC	14700-14708 DOWNEY AV PARAMOUNT 90723	No	298	3	No
187180	Unknown	KIRKHILL MANUFACTURING COMPANY	2500,2525 THOMPSON ST LONG BEACH 90805	No	425	106	No
187258	Unknown	LEE KUM KEE	14515 DON JULIAN RD CITY OF INDUSTRY 91746	No	869	570	No
187272	Unknown	MCGUFF PHARMACEUTICALS INC	4040 W CARRIAGE DR SANTA ANA 92704	No	1521	164	No
187354	Unknown	CAPTEK PHARMA	14535 INDUSTRY CIR LA MIRADA 90638	No	1864	497	No
187823	Unknown	KIRKHILL INC	300 E CYPRESS ST BREA 92821	No	689	140	No
187872	Unknown	T.I. COMMERCE LLC	19001 S WESTERN AVE TORRANCE 90501	No	681	393	64CL
187885	Unknown	SMITHFIELD PACKAGED MEATS CORP	3049 E VERNON AVE VERNON 90058	No	1157	1088	No
187888	Unknown	SMITHFIELD PACKAGED MEATS CORP	3883 S SOTO ST VERNON 90058	No	1144	1075	No
187890	Unknown	SMITHFIELD PACKAGED MEATS CORP	2750 E 37TH ST VERNON 90058	No	1130	1064	No
188010	Unknown	MEDICO PROFESSIONAL LINEN SERVICE	2654 SEQUOIA DR SOUTH GATE 90280	No	439	5	No
188064	Unknown	HOLLYWOOD PARK LAND COMPANY LLC	1050 S PRAIRIE AVE INGLEWOOD CA 90301	No	972	185	LAX
188199	Unknown	SMG	4000 E ONTARIO CENTER PKY ONTARIO CA 91764	No	669	325	ONT
188265	Unknown	CJ FOODS MANUFACTURING BEAUMONT CORP	415 NICHOLAS ROAD BEAUMONT CA 92223	No	1170	821	No
188437	Unknown	CHAI FIVE LAUNDRY SERVICES LLC	640 E WARDLOW RD LONG BEACH CA 90807	No	204	64	LGB
188487	Unknown	505 NORTH BRAND OWNER LLC.	505 N BRAND BLVD GLENDALE CA 91203	No	594	164	GCJ
800202	512110	UNIVERSAL CITY STUDIOS, LLC.	3900 LANKERSHIM/100 UNI CTY PL UNIVERSAL CITY 91608	Yes	1440	375	No
800212	622110	POMONA VALLEY COMM HOSP (EIS USE)	1798 N GAREY AV POMONA 91767	Yes	684	0	POC
800214	221320	LA CITY, SANITATION BUREAU (HTP)	12000 VISTA DEL MAR PLAYA DEL REY 90293	No	2047	700	No
800234	611310	LOMA LINDA UNIV	10935 PARKLAND AV LOMA LINDA 92350	No	546	126	No
800236	221320	LA CO. SANITATION DIST	24501 S FIGUEROA ST CARSON 90745	Yes	1109	407	No
800265	611310	UNIV OF SO CAL (EIS & NSR USE ONLY)	MCCLINTOCK ST,W 34TH,CHILD'S LOS ANGELES 90089	No	161	0	No
800288	611310	UNIV CAL IRVINE (NSR USE ONLY)	JAMBOREE, CAMPUS, BRIDGE ETC. IRVINE 92697	No	922	312	No
800289	325412	ALLERGAN INC	18600 VON KARMAN & 2525 DUPONT IRVINE 92612	No	1709	146	SNA
800312	622110	LA CO HARBOR-UCLA MEDICAL CENTER	1000 W CARSON & 1124 W CARSON TORRANCE 90502	No	438	21	No
800353	622110	HUNTINGTON MEMORIAL HOSPITAL	160 CONGRESS,100 W CALIF,720 F PASADENA 91105	No	694	84	No
800386	922140	LA CO., SHERIFF DEPT	29300 THE OLD RD SAUGUS 91384	No	850	418	No
800387	611310	CAL INST OF TECH	650 S WILSON PASADENA 91106	No	127	127	No
800429	622110	KAISER FOUNDATION HOSPITAL	1550 N EDGEMONT ST LOS ANGELES 90027	No	238	35	No
550	921190	LA CO., INTERNAL SERVICE DEPT	301 N BROADWAY LOS ANGELES 90012	No	541	388	No
2418	322211	FRUIT GROWERS SUPPLY CO	225 S WINEVILLE ROAD ONTARIO 91761	No	4067	1088	No
2825	311421	MCP FOODS INC	424,425 S ATCHISON ST ANAHEIM 92805	No	777	0	No
3704	324121	ALL AMERICAN ASPHALT, UNIT NO.01	1776 ALL AMERICAN WAY CORONA 92879	No	998	404	No
5973	486210	SO CAL GAS CO	25205 W RYE CANYON ROAD VALENCIA 91355	No	882	724	No
7411	331222	DAVIS WIRE CORP	5555 IRWINDALE AV IRWINDALE 91706	No	1910	682	No
8582	221210	SO CAL GAS CO/PLAYA DEL REY STORAGE FAC	8141 GULANA AV PLAYA DEL REY 90293	No	726	0	LAX
14049	311824	MARUCHAN INC	1902 DEERE AV IRVINE 92606	No	1456	496	No
16660	336414	THE BOEING COMPANY	5301 BOLSA AVE HUNTINGTON BEACH 92647	Yes	1371	502	No
21598	812331	ANGELICA TEXTILE SERVICES	1575 N CASE ST ORANGE 92867	No	687	332	No
38872	311111	MARS PETCARE U.S., INC.	2765 LEXINGTON WY SAN BERNARDINO 92407	No	1371	182	No
40483	326130	NELCO PROD. INC	1411 E ORANGETHORPE AV FULLERTON 92831	No	1382	629	No
42630	325120	PRAXAIR INC	5705 AIRPORT DR ONTARIO 91761	No	3568	1746	No
50098	311613	D&D DISPOSAL INC,WEST COAST RENDERING CO	4105 BANDINI BL VERNON 90023	No	1419	1365	No

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62548	322130	THE NEWARK GROUP, INC.	6001 S EASTERN AV COMMERCE 90040	No	1053	369	No
63180	311613	DARLING INGREDIENTS INC.	2626,2643 E 25TH ST LOS ANGELES 90058	No	1432	1144	No
107654	212321	CALMAT CO	16005 FOOTHILL BLVD IRWINDALE 91706	No	1812	945	No
107656	324121	CALMAT CO	11447 TUXFORD ST SUN VALLEY 91352	No	1437	637	No
115241	334220	THE BOEING COMPANY	2260,2060,2030,2010,2012,2030,2060 IMP H EL SEGUNDO 90245	No	1072	188	No
115563	332812	NCI GROUP INC., DBA, METAL COATERS OF CA	9133 CENTER AVE RANCHO CUCAMONGA 91730	Yes	1382	484	No
117227	722511	SHCI SM BCH HOTEL LLC, LOEWS SM BCH HOTE	1700 OCEAN AV SANTA MONICA 90401	No	747	60	No
117290	325412	B BRAUN MEDICAL, INC	2525 MCGAW AVE. IRVINE 92614	No	715	267	No
122666	313310	A'S MATCH DYEING & FINISHING	2522 E 37TH ST VERNON 90058	No	658	600	No
123774	331492	HERAEUS PRECIOUS METALS NO. AMERICA, LLC	13429 ALONDRA BL. SANTA FE SPRINGS 90670	No	1118	425	No
130211	322121	PAPER-PAK INDUSTRIES	1941 WHITE AV LA VERNE 91750	No	1165	0	POC
137471	325414	GRIFOLS BIOLOGICALS INC	5555 VALLEY BLVD LOS ANGELES 90032	No	1120	97	No
138568	332111	CALIFORNIA DROP FORGE, INC	1033 ALHAMBRA AV LOS ANGELES 90012	No	307	140	No
141295	313310	LEKOS DYE AND FINISHING, INC	3131 HARCOURT ST COMPTON 90221	No	591	121	No
142267	331512	FS PRECISION TECH LLC	3025 E VICTORIA ST COMPTON 90221	No	478	224	No
144455	326113	LIFOAM INDUSTRIES, LLC	2340 E 52ND ST VERNON 90058	No	739	669	No
169754	211111	SO CAL HOLDING, LLC	20101 GOLDENWEST ST HUNTINGTON BEACH 92648	No	771	6	No
171960	322211	TIN, INC. DBA INTERNATIONAL PAPER	5110 JURUPA ONTARIO 91761	No	4004	1508	No
183564	531210	ONNI TIMES SQUARE LP	202 W 1ST ST, LOS ANGELES 90012	No	938	460	No
800037	324191	DEMENNO/KERDOON	2000 N ALAMEDA ST COMPTON 90222	Yes	480	108	No
800067	334220	THE BOEING COMPANY	IMPERIAL, MAPLE,NASH,& SELBY EL SEGUNDO 90245	No	631	444	No
800335	488111	LA CITY, DEPT OF AIRPORTS	275 CENTER WAY LOS ANGELES 90045	No	1559	1453	No
800338	322211	SPECIALTY PAPER MILLS INC	8834 & 8844 S MILLERGORVE DR SANTA FE SPRINGS 90670	No	660	103	No

APPENDIX E

Ammonia Storage Calculations

Hazards Assessment for PARs 1146 series and PR 1100 - SCRs

Summary						
Facility	Monthly Aq. NH3 Needed (gal/month)	Sized for Tank	Typical Tank Sizes to Hold NH3 (gallons)	RMP Value (in miles)	Distance (feet)	Significant?
1	401.98	603	1,000	0.2	1056	No
2	214.19	321	500	0.1	528	Yes
3	981.89	1,473	2,000	0.2	1056	No
4	955.22	1,433	2,000	0.2	1056	No
5	1370.37	2,056	3,900	0.3	1584	Yes
6	6455.27	9,683	10,000	0.6	3168	Yes
7	339.99	510	1,000	0.2	1056	No
8	1860.51	2,791	3,900	0.3	1584	No
9	565.23	848	1,000	0.2	1056	Yes
10	1217.88	1,827	2,000	0.2	1056	No
11	1042.07	1,563	2,000	0.2	1056	Yes
12	934.97	1,402	2,000	0.2	1056	Yes
13	566.42	850	1,000	0.2	1056	No
14	1011.43	1,517	2,000	0.2	1056	Yes
15	119.00	178	250	0.1	528	No
16	296.07	444	500	0.1	528	No
17	297.49	446	500	0.1	528	No
18	486.47	730	1,000	0.2	1056	No
19	177.93	267	500	0.1	528	No
20	355.71	534	1,000	0.2	1056	Yes
21	1130.47	1,696	2,000	0.2	1056	No
22	3138.28	4,707	6,565	0.4	2112	No
23	340.33	510	1,000	0.2	1056	Yes
24	420.40	631	1,000	0.2	1056	No
25	690.67	1,036	2,000	0.2	1056	Yes
26	2487.31	3,731	3,900	0.3	1584	No
27	942.90	1,414	2,000	0.2	1056	Yes
28	652.78	979	1,000	0.2	1056	No
29	935.65	1,403	2,000	0.2	1056	Yes
30	1334.57	2,002	3,900	0.3	1584	Yes
31	451.51	677	1,000	0.2	1056	No
32	1211.27	1,817	2,000	0.2	1056	No

Notes:

1. Storage tanks should be sized to hold at least 1.5 times (https://www.tannerind.com/sto-aqua-ammonia.html)
2. Tank Size Dimensions (Typical): https://ammoniatanks.com/; https://www.epa.gov/sites/production/files/2013-11/documents/appendix-f1.pdf
3. RMP*Comp run at 77 degrees F
4. Assume square footage of building enclosure is twice the size of the O.D. and length of the tank

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
1	20.9816	0.0105

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	20.9816	2	0.4561	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.9122	15.5082	1.05	16.2836

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.11	770.17	64.18
Water	H20	18	81%	4.5	0.80	8.345	11.11	4053.53	337.79
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**13.22**	**4823.70**	**401.98**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
2	11.1801	0.0056

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	11.1801	2	0.2430	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.4861	8.2636	1.05	8.6767

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.12	410.39	34.20
Water	H20	18	81%	4.5	0.80	8.345	5.92	2159.93	179.99
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**7.04**	**2570.32**	**214.19**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
3	51.2510	0.0256

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	51.2510	2	1.1142	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.2283	37.8812	1.05	39.7753

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.15	1881.27	156.77
Water	H20	18	81%	4.5	0.80	8.345	27.13	9901.41	825.12
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**32.28**	**11782.68**	**981.89**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
4	49.8591	0.0249

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	49.8591	2	1.0839	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.1678	36.8524	1.05	38.6950

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.01	1830.17	152.51
Water	H20	18	81%	4.5	0.80	8.345	26.39	9632.50	802.71
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**31.40**	**11462.67**	**955.22**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
5	71.5283	0.0358

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	71.5283	2	1.5550	-	-	-
Aqueous Ammonia	NH3	17	-	4	3.1099	52.8687	1.05	55.5122

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	7.19	2625.58	218.80
Water	H20	18	81%	4.5	0.80	8.345	37.86	13818.86	1151.57
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**45.05**	**16444.44**	**1370.37**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
6	336.9413	0.1685

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	336.9413	2	7.3248	-	-	-
Aqueous Ammonia	NH3	17	-	4	14.6496	249.0436	1.05	261.4958

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	33.89	12368.08	1030.67
Water	H20	18	81%	4.5	0.80	8.345	178.34	65095.13	5424.59
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**212.23**	**77463.21**	**6455.27**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
7	17.7462	0.0089

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	17.7462	2	0.3858	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.7716	13.1168	1.05	13.7726

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.78	651.41	54.28
Water	H20	18	81%	4.5	0.80	8.345	9.39	3428.47	285.71
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**11.18**	**4079.87**	**339.99**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
8	97.1120	0.0486

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	97.1120	2	2.1111	-	-	-
Aqueous Ammonia	NH3	17	-	4	4.2223	71.7784	1.05	75.3673

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	9.77	3564.68	297.06
Water	H20	18	81%	4.5	0.80	8.345	51.40	18761.48	1563.46
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**61.17**	**22326.16**	**1860.51**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
9	29.5031	0.0148

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	29.5031	2	0.6414	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.2827	21.8066	1.05	22.8969

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.97	1082.97	90.25
Water	H20	18	81%	4.5	0.80	8.345	15.62	5699.82	474.99
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**18.58**	**6782.79**	**565.23**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
10	63.5686	0.0318

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	63.5686	2	1.3819	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.7639	46.9855	1.05	49.3348

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	6.39	2333.41	194.45
Water	H20	18	81%	4.5	0.80	8.345	33.65	12281.10	1023.42
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**40.04**	**14614.51**	**1217.88**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
11	54.3921	0.0272

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	54.3921	2	1.1824	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.3649	40.2029	1.05	42.2130

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.47	1996.57	166.38
Water	H20	18	81%	4.5	0.80	8.345	28.79	10508.25	875.69
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**34.26**	**12504.81**	**1042.07**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
12	48.8021	0.0244

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	48.8021	2	1.0609	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.1218	36.0711	1.05	37.8746

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	4.91	1791.37	149.28
Water	H20	18	81%	4.5	0.80	8.345	25.83	9428.28	785.69
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**30.74**	**11219.65**	**934.97**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
13	29.5650	0.0148

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	29.5650	2	0.6427	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.2854	21.8524	1.05	22.9450

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.97	1085.24	90.44
Water	H20	18	81%	4.5	0.80	8.345	15.65	5711.80	475.98
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**18.62**	**6797.04**	**566.42**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
14	52.7930	0.0264

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	52.7930	2	1.1477	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.2953	39.0209	1.05	40.9719

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.31	1937.87	161.49
Water	H20	18	81%	4.5	0.80	8.345	27.94	10199.30	849.94
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**33.25**	**12137.16**	**1011.43**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
15	6.2112	0.0031

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	6.2112	2	0.1350	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.2701	4.5909	1.05	4.8204

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	0.62	227.99	19.00
Water	H20	18	81%	4.5	0.80	8.345	3.29	1199.96	100.00
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**3.91**	**1427.96**	**119.00**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
16	15.4540	0.0077

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	15.4540	2	0.3360	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.6719	11.4225	1.05	11.9936

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.55	567.27	47.27
Water	H20	18	81%	4.5	0.80	8.345	8.18	2985.62	248.80
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**9.73**	**3552.89**	**296.07**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
17	15.5279	0.0078

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	15.5279	2	0.3376	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.6751	11.4772	1.05	12.0510

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.56	569.98	47.50
Water	H20	18	81%	4.5	0.80	8.345	8.22	2999.91	249.99
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**9.78**	**3569.89**	**297.49**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
18	25.3919	0.0127

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	25.3919	2	0.5520	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.1040	18.7679	1.05	19.7063

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.55	932.06	77.67
Water	H20	18	81%	4.5	0.80	8.345	13.44	4905.56	408.80
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**15.99**	**5837.62**	**486.47**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
19	9.2872	0.0046

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	9.2872	2	0.2019	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.4038	6.8644	1.05	7.2077

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	0.93	340.90	28.41
Water	H20	18	81%	4.5	0.80	8.345	4.92	1794.23	149.52
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**5.85**	**2135.13**	**177.93**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
20	18.5670	0.0093

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	18.5670	2	0.4036	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.8073	13.7234	1.05	14.4096

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.87	681.54	56.79
Water	H20	18	81%	4.5	0.80	8.345	9.83	3587.03	298.92
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**11.69**	**4268.57**	**355.71**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
21	59.0061	0.0295

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	59.0061	2	1.2827	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.5655	43.6132	1.05	45.7939

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	5.93	2165.93	180.49
Water	H20	18	81%	4.5	0.80	8.345	31.23	11399.65	949.97
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**37.17**	**13565.58**	**1130.47**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
22	163.8066	0.0819

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	163.8066	2	3.5610	-	-	-
Aqueous Ammonia	NH3	17	-	4	7.1220	121.0745	1.05	127.1282

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	16.47	6012.84	501.07
Water	H20	18	81%	4.5	0.80	8.345	86.70	31646.50	2637.21
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**103.18**	**37659.34**	**3138.28**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
23	17.7640	0.0089

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	17.7640	2	0.3862	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.7723	13.1299	1.05	13.7864

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	1.79	652.06	54.34
Water	H20	18	81%	4.5	0.80	8.345	9.40	3431.89	285.99
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**11.19**	**4083.95**	**340.33**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
24	21.9432	0.0110

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	21.9432	2	0.4770	-	-	-
Aqueous Ammonia	NH3	17	-	4	0.9541	16.2189	1.05	17.0298

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.21	805.47	67.12
Water	H20	18	81%	4.5	0.80	8.345	11.61	4239.30	353.27
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**13.82**	**5044.76**	**420.40**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
25	36.0503	0.0180

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	36.0503	2	0.7837	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.5674	26.6458	1.05	27.9781

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	3.63	1323.29	110.27
Water	H20	18	81%	4.5	0.80	8.345	19.08	6964.71	580.39
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**22.71**	**8288.00**	**690.67**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
26	129.8283	0.0649

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	129.8283	2	2.8224	-	-	-
Aqueous Ammonia	NH3	17	-	4	5.6447	95.9600	1.05	100.7580

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	13.06	4765.60	397.13
Water	H20	18	81%	4.5	0.80	8.345	68.72	25082.08	2090.17
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**81.77**	**29847.68**	**2487.31**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
27	49.2161	0.0246

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	49.2161	2	1.0699	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.1398	36.3772	1.05	38.1960

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	4.95	1806.57	150.55
Water	H20	18	81%	4.5	0.80	8.345	26.05	9508.28	792.36
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**31.00**	**11314.85**	**942.90**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
28	34.0727	0.0170

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	34.0727	2	0.7407	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.4814	25.1842	1.05	26.4434

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	3.43	1250.70	104.23
Water	H20	18	81%	4.5	0.80	8.345	18.03	6582.65	548.55
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**21.46**	**7833.36**	**652.78**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
29	48.8376	0.0244

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	48.8376	2	1.0617	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.1234	36.0973	1.05	37.9022

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	4.91	1792.68	149.39
Water	H20	18	81%	4.5	0.80	8.345	25.85	9435.14	786.26
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**30.76**	**11227.81**	**935.65**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
30	69.6598	0.0348

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	69.6598	2	1.5143	-	-	-
Aqueous Ammonia	NH3	17	-	4	3.0287	51.4877	1.05	54.0620

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	7.01	2557.00	213.08
Water	H20	18	81%	4.5	0.80	8.345	36.87	13457.87	1121.49
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**43.88**	**16014.87**	**1334.57**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
31	23.5670	0.0118

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	23.5670	2	0.5123	-	-	-
Aqueous Ammonia	NH3	17	-	4	1.0247	17.4191	1.05	18.2900

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	2.37	865.07	72.09
Water	H20	18	81%	4.5	0.80	8.345	12.47	4553.00	379.42
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**14.84**	**5418.07**	**451.51**

Estimated Ammonia Use & Ammonia Tank Sizing

Amount of NOx Reductions Needed

Facility	NOx Reductions (lb/day)	NOx Reductions (ton/day)
32	63.2238	0.0316

Stochiometric Equation

2NO2 + 4NH3 + O2 --> 3N2 + 6H2O

Amount of NH3 Needed (lb/day)

Compound	Formula	Molecular Weight (MW)	NOx Reductions (lb/day)	Mole Ratio	Moles	NH3 Needed (lb/day)	Ammonia Slip Factor	Total NH3 Needed for Ammonia Slip (lb/day)
NOx	NO2	46	63.2238	2	1.3744	-	-	-
Aqueous Ammonia	NH3	17	-	4	2.7489	46.7306	1.05	49.0672

Gallons Needed of NH3 (19% solution)

Compound	Formula	Molecular Weight (MW)	Molecular Weight (MW)	Moles (%/MW)	Mole Fraction	Density (lb/gal)	Daily Solution Needed (gal/day)	Annual Solution Needed (gal/yr)	Monthly Solution Needed (gal/month)
Aqueous Ammonia	NH3	17	19%	1.12	0.20	7.72	6.36	2320.75	193.40
Water	H20	18	81%	4.5	0.80	8.345	33.46	12214.48	1017.87
Total	**-**	**-**	**100%**	**5.62**	**1.00**	**-**	**39.82**	**14535.23**	**1211.27**

APPENDIX F

CEQA Scoping Comments and Responses to Comments

Introduction

A CEQA scoping meeting was required for the proposed project pursuant to Public Resources Code Section 21083.9(a)(2) and was held at the SCAQMD's Headquarters in conjunction with the Public Workshop on February 14, 2018. One oral, CEQA-related comment was made during the scoping meeting.

Comment #1

Mr. Shawn Tieu from Andeavor inquired about whether the CEQA document will analyze particulate emissions from the ammonia slip that may result from using ammonia in SCR systems to control NOx emissions.

Response to Comment #1

The analysis of ammonia slip can be found in Chapter 4, page 4-19~~16~~ of this Revised Draft SEA.

APPENDIX G

Comment Letters Received on the Original Draft SEA (comment period from April 3, 2018 to May 18, 2018) and Responses to Comments

Comment Letter #1: Shasta Gaughen, Ph.D./Pala Environmental Department

Comment Letter #2: Ray Teran/Viejas Band of Kumeyaay Indians

Comment Letter #3: Richard Vuong/OC Public Works

Comment Letter #4: Oyango A. Snell/Western States Petroleum Association

Comment Letter #1

PALA ENVIRONMENTAL DEPARTMENT
PALA BAND OF MISSION INDIANS
PMB 50, 35008 Pala Temecula Road | Pala, CA 92059
Phone 760-891-3510 | Fax 760-742-3189

April 9, 2018

South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178
Attention: Ms. Diana Thai (c/o CEQA)

Re: Recipient of CEQA Notices/Documents

Dear Ms. Thai,

The Pala Band of Mission Indians would like to thank you for the opportunity to review and comment on the SDAPCD's notices related to the California Environmental Quality Act (CEQA). According to your letter the SDAPCD participating as a lead agency on projects is very valuable information for us and we wish to continue receiving more communication from SCAQMD pertaining to CEQA. This letter therefore is to inform you that Pala currently has no objections to receiving more information from SCAQMD. Please keep us on your contacts list.

If you have any questions or comments, please contact Darold Wallick, Air Technician for the Pala Environmental Department, at dwallick@palatribe.com or 760-891-3540.

Sincerely,

Shasta C. Gaughen, PhD
Environmental Director

Response to Comment Letter #1 – Pala Environmental Department

Thank you for your comment. No further response is required under CEQA.

Comment Letter #2

VIEJAS
TRIBAL GOVERNMENT

P.O Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

April 9, 2018

Barbara Radlein
Program Supervisor
South Coast AQMD
21865 Copley Drive
Diamond Bar, CA 91765

Re: Emissions of Oxides of Nitrogen

Dear Ms. Radlein,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has little cultural significance or ties to Viejas. We further recommend that you contact the tribe(s) closest to the cultural resources. We, however, request to be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains in order for us to reevaluate our participation in the government-to-government consultation process.

Please do not hesitate to contact me if you have further questions. Please call Ernest Pingleton at 619-659-2314 or me at 619-659-2312, or email, epingleton@viejas-nsn.gov or rteran@viejas-nsn.gov. Thank you.

Sincerely,

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

Response to Comment Letter #2 – Viejas Band of Kumeyaay Indians

The comment recieved from Mr. Ray Teran indicates the proposed project would have little culturual significance or ties to the Viejas Band of Kumeyaay Indians. Mr. Teran has suggested staff contact the Tribe(s) closest to cultural resources about the proposed project and asked to be informed of any new developments. Staff notified all of the tribes on the Tribal Consultation List as provided by the Native American Heritage Commission of the availability of the original Draft SEA. Afte rthe comment period for the original Draft SEA ended, SCAQMD staff revised the project description and environmental analysis and prepared this Revised Draft SEA to reflect these changes. The Revised Draft SEA has been released for a 45-day public comment and review period. As part of the recirculation process, the staff has also notified all of the tribes on the list of the availability of the Revised Draft SEA.

Comment Letter #3

OC Public Works
Integrity, Accountability, Service, Trust
Shane L. Silsby, Director

April 26, 2018 NCL-18-021

Diana Thai
c/o CEQA
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Subject: Proposed Amended Rules 1146 Series and Adoption of Rule 1100

Dear Ms. Thai:

The County of Orange has reviewed the Draft Subsequent Environmental Assessment (SEA) for the Proposed Amended Rules 1146 Series and Adoption of Rule 1100 and has no comments at this time. We would like to be advised of any further developments on the project. Please continue to keep us on the distribution list for future notifications related to the project.

If you have any questions, please contact John Fyne-Nsofor in Development Services at (714) 667-8870.

Sincerely,

Richard Vuong, Manager, Planning Division
OC Public Works Service Area/OC Development Services
300 North Flower Street
Santa Ana, California 92702-4048
Richard.Vuong@ocpw.ocgov.com

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www.ocpublicworks.com
714.667.8800 | Info@OCPW.ocgov.com

Response to Comment Letter #3 – OC Public Works

Thank you for your comment. Staff has also sent a notification regarding the availability of the Revised Draft SEA. Staff will continue to keep OC Public Works on the distribution list for future notifications related to the project. No further response is required under CEQA.

Comment Letter #4

Western States Petroleum Association
Credible Solutions • Responsive Service • Since 1907

Oyango A. Snell, Esq.
General Counsel

May 1, 2018

Dr. Philip Fine
Deputy Executive Officer, Planning and Rules
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Via e-mail at: pfine@aqmd.gov

Re: WSPA concerns with Proposed Amended Rules 1146, 1146.1 and 1146.2 and RECLAIM Landing Rules

Dear Dr. Fine:

Western States Petroleum Association (WSPA) appreciates the ability to participate in working groups related to the transition of the Regional Clean Air Incentives Market (RECLAIM) program and Proposed Amended Rules (PAR) 1146, 1146.1 and 1146.2 and the opportunity to make comments. WSPA is a non-profit trade association representing companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas and other energy supplies in five western states including California. WSPA has been an active participant in air quality planning issues for over 30 years. WSPA-member companies operate petroleum refineries and other facilities in the South Coast Air Basin that are within the purview of the RECLAIM Program administered by the South Coast Air Quality Management District (AQMD or District).

PAR 1146, 1146.1 and 1146.2 represent essential "landing rules" which, if adopted, would apply to many WSPA member and non-member facilities which stand to be transitioned from RECLAIM's market-based structure into new command-and-control Best Available Retrofit Control Technology (BARCT) requirements. We have several comments and concerns with the District's current proposals for these PARs.

1. **Staff has not conducted a BARCT assessment for the boilers, steam generators, or process heaters at facilities that would be transitioning from RECLAIM under PAR 1146, 1146.1 and 1146.2.**

State law 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 or category of source." (Health & Saf. Code § 40406). Under the current proposal, District Staff has not conducted a BARCT assessment for boilers, steam generators, or process heaters located at facilities transitioning from RECLAIM to command and control. Rather, the current Staff proposal would simply extend the requirements of existing Rules 1146, 1146.1 and 1146.2 to this large number of facilities. These RECLAIM facilities were not part of the universe of facilities or equipment considered when the District adopted the BARCT requirements currently found in Rules 1146, 1146.1, or 1146.2. Therefore, the District has not analyzed the environmental, energy, and economic impacts for the entire class or category of source. The District cannot simply extend existing requirements to a new universe of facilities and equipment without first conducting new (or supplementary)

4-1

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Comment Letter #4 (continued)

BARCT determinations to demonstrate that proposed emission limitations and/or other requirements are both technically feasible and cost effective. Such a demonstration is required under California Health & Safety Code Section 40406.

RECLAIM facilities have been subject to market-based emissions control requirements since 1994. For this reason, the boilers, steam generators, and process heaters at these facilities will widely vary in terms of their physical configurations (e.g., basic equipment, emissions controls) and their emissions performance. Furthermore, many of the compliance requirements (e.g., averaging periods) in these rules differ from RECLAIM and cannot readily be applied to RECLAIM equipment and facilities. It is inappropriate to assume that the BARCT requirements, and supporting technical feasibility and cost effectiveness analyses, can apply equally and equitably to facility equipment that was not part of the original BARCT analysis. The District needs to demonstrate that those requirements or alternative BARCT requirements are both technically feasible and cost effective for this new group of facilities being transitioned from RECLAIM where they have operated for two plus decades. 4-1 cont.

2. The environmental and socioeconomic impacts for PAR 1146, 1146.1 and 1146.2 should be considered in CEQA and Socioeconomic Assessments for the entire RECLAIM Transition Project.

Under the California Environmental Quality Act (CEQA), CEQA Guidelines and SCAQMD Rule 110, the SCAQMD Governing Board (as the lead agency under its certified regulatory program) is required to identify and evaluate environmental impacts of its rulemaking activities, as well as feasible means and alternatives to reduce, avoid or eliminate significant impacts. More specifically, "an accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR." (*County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.) The entire project being proposed must be described in the EIR, and the project description must not minimize project impacts. (*City of Santee v. County of San Diego* (1989) 214 Cal.App.3d 1438, 1450.) Furthermore, CEQA forbids piecemealing[1] and the Court has explicitly found that it is inappropriate to divide a project into small segments in order to avoid preparing an EIR. (*Bozung v. Local Agency Formation Com.* (1975) 13 Cal.3d 263, 283-284.) 4-2

The California Supreme Court has also held that EIRs may need to address future environmental effects of a proposed project. In Laurel Heights I, the court set forth the standards for determining whether reasonably foreseeable future activities must be included in an EIR project description and for determining whether the impacts of those activities must be analyzed in the EIR:

> "We hold that an EIR must include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects." (*Laurel Heights Improvement Assn. v. Regents of the University of California ("Laurel Heights I")* (1988) 47 Cal.3d 376, 396.)

[1] "Piecemealing" or "segmenting" means dividing a project into two or more pieces and evaluating each piece in a separate environmental document. The rule of forbidding piecemealing arises from the definition of "project" under CEQA, where "project" is defined as "the whole of an action." (14 Cal. Code Regs. § 15378(a).)

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Comment Letter #4 (continued)

As previously noted, PAR 1146, 1146.1 and 1146.2 are part of the District's larger effort to transition RECLAIM program facilities from RECLAIM's market-based design to a command-and-control design. This has been described to the Working Group, and documented in the District's staff report:

> "The proposed amendments in Rules 1146, 1146.1 and 1146.2 initiate the transition of the NOx RECLAIM program to a command-and-control regulatory structure." [2]

This transition is also noted in the District's preliminary environmental assessment, which was drafted for compliance with the California Environmental Quality Act (CEQA):

> "As a result of control measure CMB-05 from the 2016 AQMP and ABs 617 and 398, SCAQMD staff has been directed by the Governing Board to begin the process of transitioning equipment at NOx RECLAIM facilities from a facility permit structure to an equipment-based command-and-control regulatory structure per SCAQMD Regulation XI – Source Specific Standards. SCAQMD has begun this transition process by proposing amendments to Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; Rule 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; and Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters. Proposed Amended Rules (PAR) 1146, 1146.1, and 1146.2 (collectively referred to herein as the PAR 1146 series) will be the first set of rules to be amended to initiate the transition of equipment from the NOx RECLAIM program to a command-and-control regulatory structure while achieving BARCT." [3]

4-2 cont.

We believe the District needs to prepare an environmental assessment that considers the entire RECLAIM Transition Project, its rulemakings and its other associated components, across impacted facilities and equipment. While the District prepared a Final Program Environmental Impact Report (Final Program EIR) regarding the 2016 AQMP (certified in March 2017), the analysis focused solely on the implementation of CMB-05. CMB-05 was a general directive from the 2016 AQMP, requiring an assessment of further NOx reductions from the RECLAIM program. (Final Program EIR for the 2016 Air Quality Management Plan (January 2017) p. 2-17.) More specifically, the Final Program EIR describes CMB-05 as "identif[ying] a series of approaches, assessments, and analyses *that can be explored* to make the program more effective…" (Emphasis added. Final Program EIR at p. 2-17.) The Final Program EIR lists the control methodology of CMB-05 as "re-examination of the RECLAIM program, including voluntary opt-out and the additional control equipment and SCR/SNCR equipment." (Final Program EIR at p. 4.1-2.) Additionally, the Final Program EIR also sets forth the air quality impact, as it relates to CMB-05, as "potential emissions as a result of construction to install new equipment, generation of ammonia emissions from the operations of SCR/SNCR equipment, and potential air quality and GHG emissions from electricity to operate equipment." (Final Program EIR at p. 4.1-2.) The Final Program EIR never addresses the concept of, much less the impacts related to, sunsetting the RECLAIM program.

As shown above, CMB-05 lacks the specifications set forth in the RECLAIM Transition Project and its rulemakings. More importantly, the RECLAIM Transition Project had not yet even been created when CMB-05 was conceived or evaluated under the Final Program EIR. In fact, the RECLAIM Transition Project is still

[2] SCAQMD Preliminary Draft Staff Report for Proposed Amended Rule (PAR) 1146, PAR 1146.1, PAR 1146.2 and Proposed Rule 1100, January 2018, see page 3.

[3] SCAQMD Draft Subsequent Environmental Assessment for PAR 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.1 – Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1146.2 - Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters; and PR 1100 – Implementation Schedule for NOx Facilities, March 2018, page 1-2.

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Comment Letter #4 (continued)

currently under development on an ongoing basis, as District Staff continues to determine how to approach the applicability of several landing rules and whether some rules will even be included in the Project. Given the Final Program EIR's reliance on general directives like CMB-05 and the RECLAIM Transition Project not yet existing at the time of assessment, the Final Program EIR fails to properly evaluate the potential environmental impacts specifically related to the RECLAIM Transition Project and its rulemakings.

4-2 cont.

As prior amendments to the Regulation XX program were considered under CEQA, we believe the overall group of RECLAIM Transition rulemakings[4] needs to be collectively considered under CEQA, as well. Rules to advance the RECLAIM Transition Project, including these proposed amendments to the 1146 series rules, should not be adopted and facilities should not be removed from RECLAIM until the District has completed and certified a CEQA assessment that evaluates the entire Project. Undertaking these RECLAIM Transition Project rulemakings in a fragmented manner constitutes a piecemealing of the project, which is explicitly forbidden by CEQA as described above. Given that the 1146 series rules are clearly part of the larger RECLAIM Transition Project, we believe the District's current draft CEQA document is improperly scoped.

Additionally, Health & Safety Code Section 40440.8 requires that "[w]henever the south coast district intends to propose the adoption, amendment, or repeal of a rule or regulation that will significantly affect air quality or emissions limitations, the district . . . shall perform an assessment of the socioeconomic impacts of the adoption, amendment, or repeal of the rule or regulation." (Health & Saf. Code § 40440.8(a)). One of the specific factors that the Board is to take into consideration is the "availability and cost-effectiveness of alternatives to the rule or regulation . . ." (Health & Saf. Code § 40440.8(b)(4)). Health & Safety Code Section 40728.5 sets forth substantively identical requirements for all air districts. Similarly, Health & Safety Code Section 40440.5(c)(3) requires that if an environmental assessment is prepared in connection with a proposal to adopt, amend or repeal any rule or regulation, "the staff report shall also include social, economic, and public health analyses." Stakeholders have not yet seen the District's draft socioeconomic assessment for these proposed rules, but we similarly recommend that the District conduct a program-level socioeconomic assessment that considers the socioeconomic effects of the overall RECLAIM Transition Project, including all associated Regulation XI rulemakings, and the 1146 series rules. This should be completed to support related Governing Board rule adoptions prior to the District transitioning individual RECLAIM facilities out of the program.

4-3

WSPA continues to be concerned that the RECLAIM transition could cause significant negative impacts to Southern California businesses, air quality and the regional economy. Similar to the Final Program EIR described above, the Final Socioeconomic Report for the 2016 AQMP analyzed the socioeconomic impacts for the 2016 AQMP, which focused solely on CMB-05. As discussed above, CMB-05 did not include a transition of the RECLAIM program to a command-and-control scheme like that described in the RECLAIM Transition Project or in the Project's associated rulemakings. Given that fact, the RECLAIM Transition rulemaking proposals cannot rely on the 2016 AQMP's Socioeconomic Assessment to cover the RECLAIM Transition Project.

3. The District needs to resolve critical questions about New Source Review (NSR) requirements and Federal NSR equivalency before transitioning individual RECLAIM facilities out of the program.

Under PAR 1146, 1146.1 and 1146.2, Staff has proposed that RECLAIM facilities covered by these rules would begin to be transitioned out of the RECLAIM program after the rules' adoption. This raises a number of serious concerns due to the lack of transition framework, particularly on the topic of NSR. There remain a number of complex questions (legal and otherwise) over how the District will satisfy EPA requirements to demonstrate equivalency with the Federal NSR program. Since a transition model has not been agreed upon between EPA and

4-4

[4] At this time, RECLAIM Transition project includes proposed amendments to Regulation XX rules, as well as PAR 301, PAR 1109 and/or PR 1109.1, PAR 1110.2, PAR 1118.1, PAR 1134, PAR 1135, PAR 1146, 1146.1, and 1146.2, and PAR 1147, 1147.1, and 1147.2.

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Comment Letter #4 (concluded)

the District, facilities are left with uncertainty regarding their permit transition requirements and how future permit changes will impact their operations. RECLAIM facilities should not be transitioned from the program until SCAQMD has resolved these key NSR issues with EPA.

In light of these important issues, PAR 1146, 1146.1 and 1146.2 are not ready for the Governing Board's consideration. Any scheduled or proposed hearing should be delayed until these issues have been adequately addressed. 4-4 cont.

Thank you for considering these comments. We look forward to continuing to work with you and your Staff on this rulemaking which is critically important to stakeholders, as well as the regional air quality and economy.

If you have any questions, please contact me at (916) 325-3115, or by email at osnell@wspa.org.

Sincerely,

cc: Cathy Reheis-Boyd, WSPA
Patty Senecal, WSPA
Bridget McCann, WSPA
Wayne Nastri, SCAQMD
Clerk of the Board, SCAQMD

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Response to Comment Letter #4 – Western States Petroleum Association

Response to Comment 4-1:
Based on the feedback received on the prior analysis, staff conducted a new BARCT assessment for the boilers, steam generators, and process heaters that took into account equipment at both RECLAIM and non-RECLAIM facilities that will be subject to PAR 1146 and 1146.1. Based on those findings, staff has determined new BARCT recommendations for both RECLAIM and non-RECLAIM equipment. Results of the BARCT assessment, which includes a technology assessment, along with supporting cost-effectiveness analysis and incremental cost-effectiveness played a key role in the BARCT NOx emission level recommendations that were presented Working Group Meeting #5 on August 2, 2018 and updated rule language was presented at Working Group #6 on August 29, 2018 meeting on updated rule language on August 29th. The recommendations were also presented at a Public Workshop on September 20, 2018. Staff has encouraged facility operators to meet with staff regarding unique facility operations and, to the extent possible, were included in the staff recommendations.

Response to Comment 4-2:
The commentator's suggestion that only one programmatic CEQA document should be prepared because future rule amendments to landing rules, or NSR (Regulation XIII) are related to PARs 1146 series and PR 1100 is incorrect and inconsistent with SCAQMD past practice. SCAQMD past practice in conducting CEQA analyses for rule projects such as PARs 1146 series and PR 1100 is that the project being contemplated undergoes its own CEQA analysis. All SCAQMD rules and regulations are related to each other in that they are adopted and/or amended to meet the clean air goals outlined in the 2016 AQMP. The CEQA document for the 2016 AQMP, the March 2017 Final Program EIR, contains the programmatic analyses of the overall effects of SCAQMD's clean air goals. However, CEQA neither requires the SCAQMD to simultaneously amend every rule that may be affected by a control measure in the 2016 AQMP nor requires one programmatic CEQA document to be prepared that encompasses every rule.

The decision to transition from NOx RECLAIM into a source-specific command-and-control regulatory structure was approved by the SCAQMD Governing Board as control measure CMB-05 in the 2016 AQMP. CMB-05 is required by the California Health and Safety Code to implement BARCT in the RECLAIM program as well as other stationary sources, which will be completed upon rule amendment or adoption of various landing rules. CMB-05 identifies a series of approaches that can be explored to make the RECLAIM program more effective in ensuring equivalency with command-and-control regulations implementing BARCT and to generate further NOx emissions reductions at RECLAIM facilities.

CMB-05 specifically contemplates the unwinding of the RECLAIM program (see Appendix IV-A, pp. IV-A-67 to IV-A-71 - http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/appendix-iv-a.pdf).

Furthermore, the potential environmental impacts associated with the 2016 AQMP, including CMB-05, were specifically analyzed in the March 2017 Final Program EIR. In particular, the March 2017 Final Program EIR addressed the environmental effects of future expansion and other actions of reasonably foreseeable consequences for the RECLAIM Transition project and determined that the overall implementation has the potential to generate adverse environmental

impacts to seven topic areas: air quality; energy; hazards and hazardous materials; hydrology and water quality; noise; solid and hazardous waste; and transportation. More specifically the March 2017 Final Program EIR evaluated and identified the impacts from the installation and operation of additional control equipment, such as selective catalytic reduction (SCR) equipment, potentially resulting in construction emissions, increased electricity demand, hazards from the additional ammonia transport and use, increase in water use and wastewater discharge, changes in noise volume, generation of solid waste from construction and disposal of old equipment and catalyst replacements, as well as changes in traffic patterns and volume. The commentator has not identified any additional impact areas, mitigation, or project alternatives from the RECLAIM Transition project that were excluded from the analysis in the March 2017 Final Program EIR for the 2016 AQMP. In any event, the time to challenge the assessments for the analyses of March 2017 Final Program EIR for the 2016 AQMP relied upon has passed (see Public Resources Code Sections 21167 and 21167.2).

The environmental impacts of the entire RECLAIM Transition project were analyzed in the 2016 AQMP and the associated March 2017 Final Program EIR was a program level analysis. The SCAQMD has and will continue to evaluate each individual RECLAIM Transition rule that is developed pursuant to the 2016 AQMP, to determine if any additional CEQA review is required. This has been consistent with SCAQMD's past practice and is not considered piecemealing.

While PARs 1146 series and PR 1100 are part of SCAQMD's Regulation XX - Regional Clean Air Incentives Market (RECLAIM) and that other landing rules are scheduled to be amended in the future, separate CEQA analyses will be conducted for these future rule amendments. Table G-1 identifies several source-specific landing rules as identified by the SCAQMD in its monthly rule forecast report as scheduled to be undergoing separate, future rule amendments[23] from PARs 1146 series and PR 1100.

[23] SCAQMD, Final Subsequent Environmental Assessment for PARs 2001 and 2002, September 2018, p. 1-6.

Table G-1
Rule Development Forecast for Source-Specific Rules
Affected by NOx RECLAIM Transition

Rule Number	Rule Title	Rule Development Forecast (subject to change)
1109.1	Emissions of Oxides of Nitrogen from Boilers and Process Heaters in Refineries	December 2019
1110.2	Emissions from Gaseous- and Liquid-Fueled Engines	1st Quarter2019
1118.1	Control of Emissions from Non-Refinery Flares	December 2018
1134	Emissions of Oxides of Nitrogen from Stationary Gas Turbines	1st Quarter 2019
1135	Emissions of Oxides of Nitrogen from Electric Power Generating Systems	November 2018
1146	Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters	December 2018
1146.1	Emissions of Oxides of Nitrogen from Small Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters	
1146.2	Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	
1147	NOx Reductions from Miscellaneous Sources	TBD 2019
1147.1	NOx Reductions from Metal Operations Facilities	TBD 2019
1147.2	NOx Reductions from Aggregate Facilities	TBD 2019
1153.1	Emissions of Oxides of Nitrogen from Commercial Food Ovens	TBD 2019

Key: TBD = to be determined

Pursuant to the SCAQMD's Certified Regulatory Program (CEQA Guidelines Section 15251(l); codified in SCAQMD Rule 110 - the rule which implements the SCAQMD's certified regulatory program), the SCAQMD typically prepares an Environmental Assessment (EA) to evaluate the environmental impacts for rule projects proposed for adoption or amendment. PARs 1146 series and PR 1100, are considered a "rule" project that is subject to CEQA under the SCAQMD's Certified Regulatory Program.

The original and Revised Draft SEA for PARs 1146 series and PR 1100 rely on the previous CEQA analyses in: 1) the Final EAs that were certified for the September 2008 amendments to Rules 1146 and 1146.1 (referred to herein as the September 2008 Final EAs for Rules 1146 and 1146.1); 2) the Final EA that was certified for the May 2006 amendments to Rule 1146.2 (referred to herein as the May 2006 Final EA); and 3) the Final Program EIR that was certified for the March 2017 adoption of the 2016 AQMP (referred to herein as the March 2017 Final Program EIR), which is specifically allowed per CEQA Guidelines Section 15162. The preparation of the original and Revised Draft SEA for PARs 1146 series and PR 1100 in this manner in no way chops up the project into "bite-sized pieces" to avoid CEQA or obscure the effects of the project. To the contrary, both the original and Revised Draft SEA for PARs 1146 series and PR 1100 identify the previous CEQA analyses conducted, which already identified and analyzed significant adverse impacts, so as to not repeat or duplicate the information previously provided. The original and

Revised Draft SEA instead focus on the changes proposed in PARs 1146 series and PR 1100, which transition NOx RECLAIM facilities with applicable equipment units to a command-and-control regulatory structure because BARCT analyses have been conducted for these landing rules.

Also, the March 2017 Final Program EIR for the 2016 AQMP evaluated and identified the impacts from the installation and operation of additional control equipment, which would be the same type of equipment and impacts that would occur under the RECLAIM Transition. Furthermore, the December 2015 Final Program EA for NOx RECLAIM also evaluated and identified the impacts from the installation and operation of additional control equipment to comply with BARCT, which is equivalent to command-and-control requirements. Thus, the environmental impacts analysis of complying with BARCT would be the same whether NOx RECLAIM continued in its present form or if NOx RECLAIM facilities transition to a command-and-control regulatory structure. Thus, even though the RECLAIM transition language was added to the 2016 AQMP, no changes were required to the March 2017 Final Program EIR since the impacts associated with implementing BARCT were already evaluated.

Response to Comment 4-3:

Based on past practice, SCAQMD staff evaluates socioeconomic impacts for all command-and-control rules identified as landing rules, including impacts for the installation and operation of controls, as well as impacts for monitoring, reporting, and recordkeeping requirements. To be published in the forthcoming 30-day package (available October 2018) for the November 2, 2018 Governing Board Set Hearing will be the most recent PAR 1146 Series staff report and draft socioeconomic impact analysis. The Final Socioeconomic Report in the 2016 AQMP includes program-level benefit-cost and macroeconomic impact assessment of proposed and amended rules involving RECLAIM transition, and the socioeconomic impact assessment for all such rules undergo a project-level cost assessment that the Governing Board considers before the proposed rule or amendment is adopted.

Response to Comment 4-4:

Staff has given priority to resolve the NSR issues and are committed to working with the U.S. EPA to ensure a whole and functional NSR program. However, staff disagrees that the BARCT rulemakings that are currently underway in several categories should cease until amendments to the NSR program are adopted. Staff believes that the development and implementation of BARCT NOx emission requirement development and implementation can proceed on a parallel path, because it is possible for facilities to go through NSR permitting under current RECLAIM rules. Furthermore, many emission reduction projects as a result of implementing BARCT would not necessarily trigger NSR. RECLAIM transition framework has been outlined in PARs 2001 and 2002. PAR 2002 will provide an option for facilities to remain in RECLAIM for a limited time until future provisions in Regulation XIII pertaining to NSR are adopted. A facility that elects to remain in RECLAIM can offset NOx emission increases with RTCs, while obtaining offset exemptions for other pollutants, if eligible under Rule 1304 requirements. A facility that elects to exit RECLAIM would temporarily not be allowed access to the internal bank for NOx offsets. There are some RECLAIM facilities that have expressed interest in exiting RECLAIM and these facilities are primarily those that have shut down all of their equipment, but are still considered active facilities. Staff has initiated efforts to resolve NSR (Regulation XIII) and related permitting issue, any future amendments that are proposed to Regulation XIII will be accompanied by a CEQA and socioeconomic analysis.

ATTACHMENT N

Proposed Amended Rules 1146, 1146.1, 1146.2 & Proposed Rule 1100

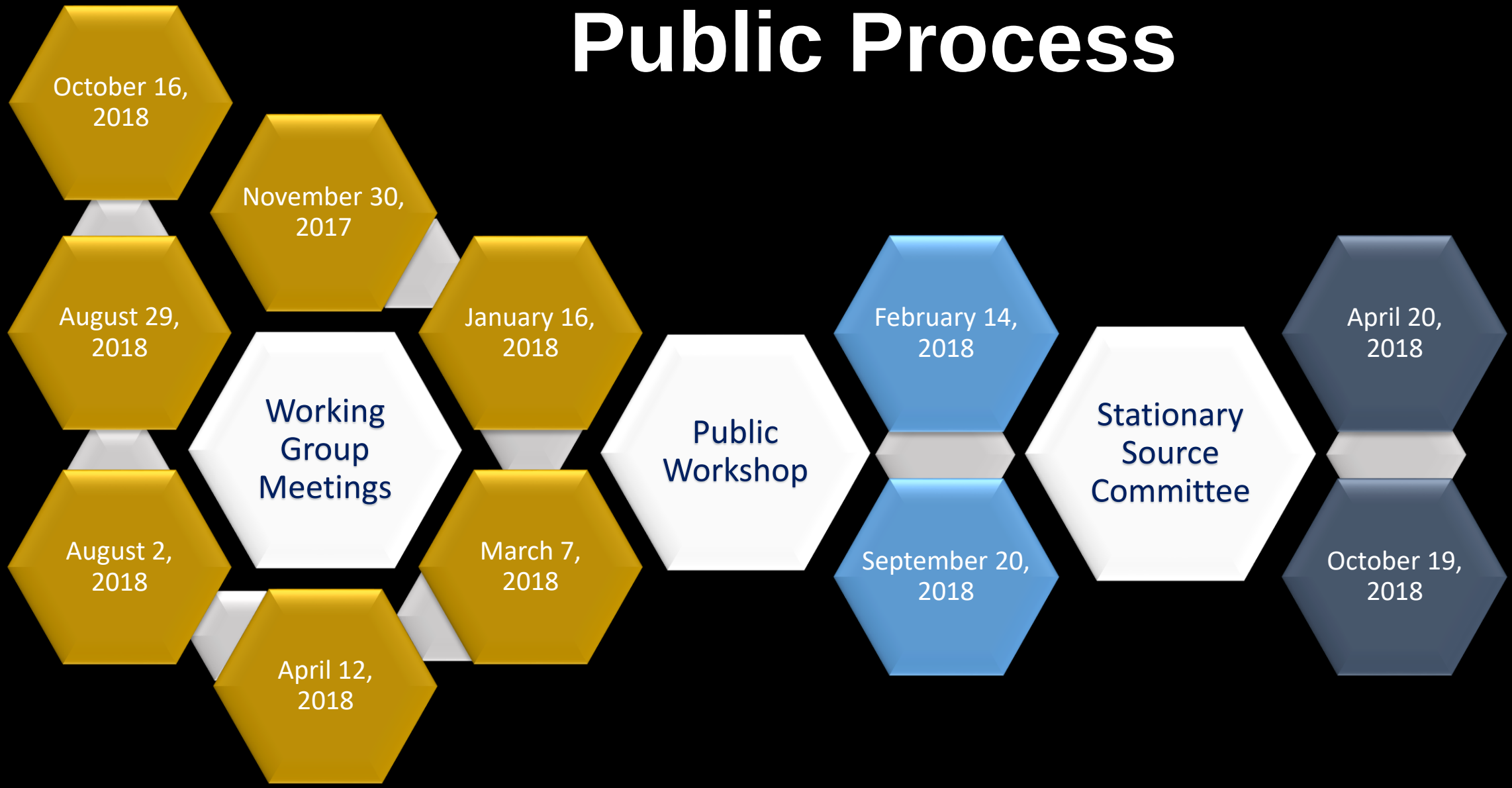
Governing Board Meeting

December 7, 2018

Background

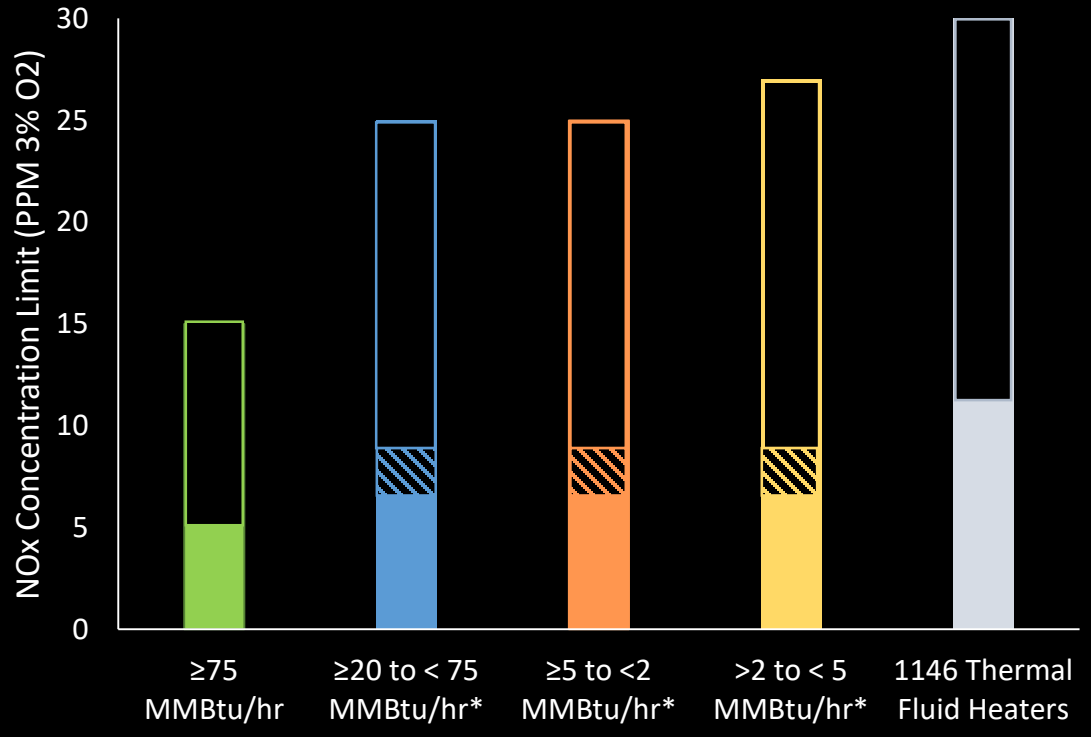
- Proposed Amended Rules 1146, 1146.1, and 1146.2 apply to boilers, process heaters, and steam generators
- Implements 2016 AQMP CMB-05 and AB 617 Best Available Retrofit Control Requirements (BARCT) requirements
- Excludes units located at refineries and electricity generating facilities

Public Process



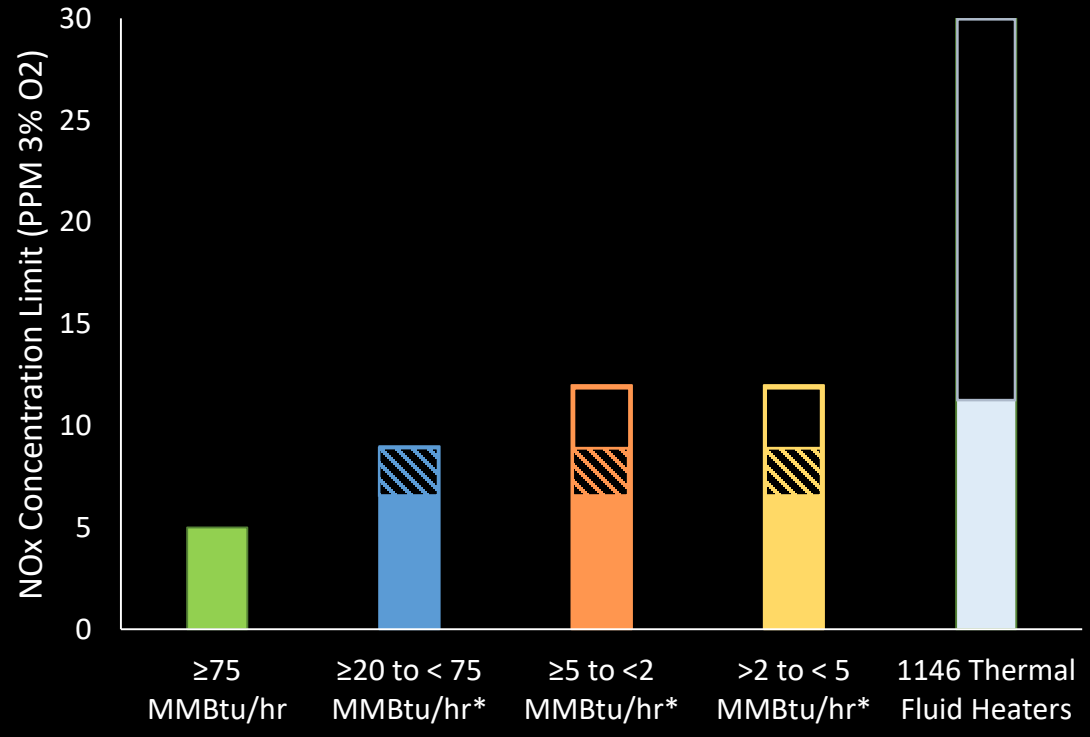
PAR 1146 and 1146.1 Proposed NOx Emission Limits[+] and Emission Reductions

RECLAIM**



Emission Reductions: 0.27 Tons per Day

Non-RECLAIM



Emission Reductions: 0.04 Tons per Day

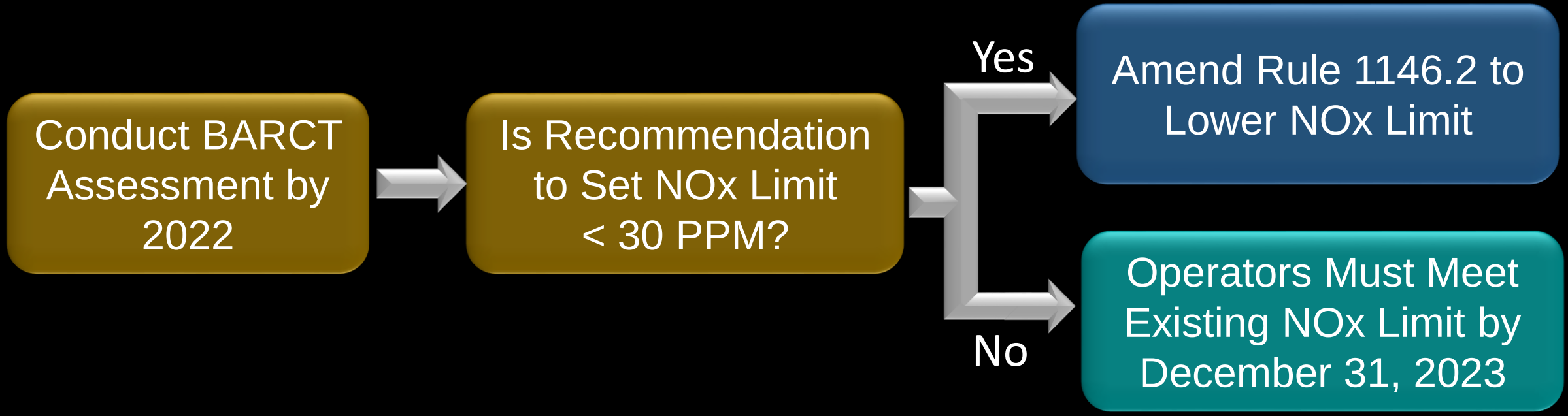
[+] Add Ammonia Slip limit of 5 ppm for units with pollution control devices with ammonia emissions (such as SCR)

* NOx limits depending if units baseline emissions and lower limits are for fire-tube boilers

** Average baseline NOx concentration levels

Proposed Amended Rule 1146.2

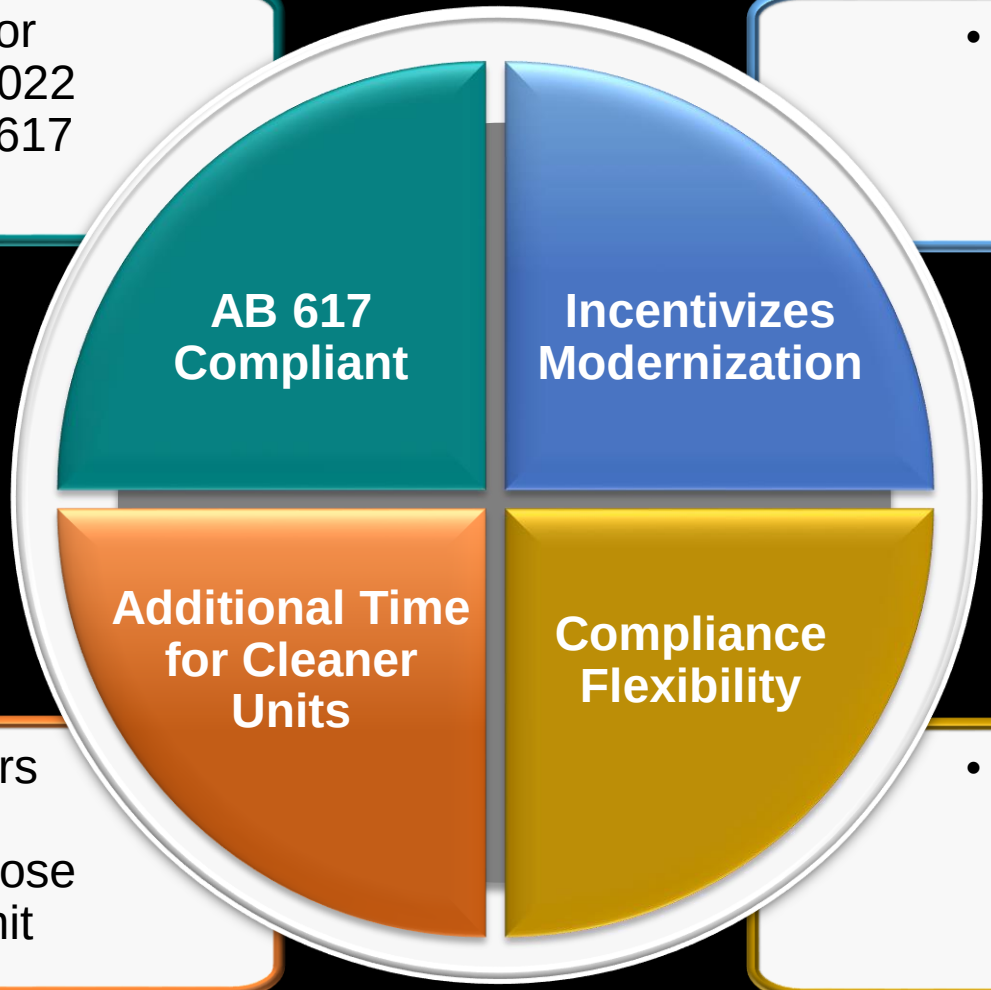
- No changes to NOx concentration limit of 30 ppm at this time
- Commitment to conduct a technology assessment by January 1, 2022



Key Elements of Proposed Rule 1100

- Compliance dates for most units by Jan 2022 (2 years before AB 617 deadline)

- Provides additional year for equipment replacement – Jan 2023



- Allows up to 15 years or when burner replaced for units close to NOx emission limit

- Combines PAR 1146 and 1146.1 units to provide more compliance flexibility*

* Conducted analysis for facilities with multiple devices with other landing rules

Monitoring, Reporting and Recordkeeping (MRR) Requirements

Interim MRR Requirements in Proposed Rule 1100

- Title V Facilities → Follow MRR requirements in Rule 2012
- Non-Title V Facilities* → Follow MRR requirements in PAR 1146/1146.1

Proposed Rule 113

Will address MRRs for all RECLAIM facilities

Scheduled for late 2019

*Once becoming a former RECLAIM facility

Key Remaining Issues – New Source Review

- **Comment:** Transition rules should not proceed without resolution of new source review (NSR) issues
- **Response:**
  - State law (AB 617) requires implementation of BARCT for facilities in the state greenhouse gas cap and trade program by December 31, 2023
  - RECLAIM facilities can begin implementing BARCT requirements while in RECLAIM
  - Rule 2002 provides an option for facilities to remain in RECLAIM for a limited time until future provisions in Regulation XIII pertaining to NSR are adopted
  - Staff is making progress on NSR issues with EPA

Key Remaining Issues – 7 ppm Burner Retrofits

- **Comment:** Stakeholders expressed doubt that 7 ppm burner retrofits are commercially available in the market
- **Response:**
  - Three vendors stated that 7 ppm burner retrofits are available
  - 708 units (between 5 to 300 MMBtu/hr) in SJVAPCD are able to comply with 7 ppm limit using ultra low-NOx burners
  - More than 740 source test results from both SCAQMD and SJVAPCD support a 7 ppm NOx emission limit

Key Remaining Issues – Cost Analysis

- **Comment:** One stakeholder expressed that their cost estimate is higher than staff's estimates
- **Response:**
  - Staff cost estimates are averages provided by five equipment vendors based on conventional equipment and standard installations
  - Facilities that might experience higher than average costs:
    - Operators that decide to stay with one specific vendor
    - Units that are highly specialized requiring specific engineering

Recommended Actions

- Adopt Resolution:
  - Certifying Final Subsequent Environmental Assessment;
  - Amending Rules 1146, 1146.1 and 1146.2; and
  - Adopting Rule 1100