BOARD MEETING DATE: November 1, 2019 AGENDA NO. 28

PROPOSAL: Certify Final Subsequent Environmental Assessment and Amend Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines and Rule 1100 – Implementation Schedule for NOx Facilities

SYNOPSIS: The adoption Resolution of the Final 2016 AQMP directed staff to achieve additional NOx reductions and to transition the NOx RECLAIM program to a command-and-control regulatory structure as soon as practicable. Proposed Amended Rule 1110.2 removes exemptions for internal combustion engines greater than 50 brake horsepower located at RECLAIM facilities. Engines at existing RECLAIM facilities would be required to comply with current Rule 1110.2 NOx emission limits, which represents current BARCT. Proposed Amended Rule 1110.2 incorporates optional averaging times, modifies monitoring, reporting, and recordkeeping requirements, and provides additional clarification to various provisions. Proposed Amended Rule 1100 establishes the compliance schedule for equipment at RECLAIM facilities that will be subject to Proposed Amended Rule 1110.2.

COMMITTEE: Stationary Source, September 20, 2019, Reviewed

RECOMMENDED ACTIONS:
Adopt the attached Resolution:
1. Certifying the Final Subsequent Environmental Assessment for Proposed Amended Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, and Rule 1100 – Implementation Schedule for NOx Facilities; and
2. Amending Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, and Rule 1100 – Implementation Schedule for NOx Facilities.

Wayne Nastri
Executive Officer

PMF:SN:MM:KO:RC

Background

Rule 1110.2 - Emissions from Gaseous- and Liquid-Fueled Engines was adopted on August 3, 1990 and has been amended ten times. Rule 1110.2 establishes NOx, VOC, and CO emission limits for stationary engines greater than 50 brake horsepower (bhp). Facilities with engines in the NOx RECLAIM program are currently exempt from the NOx emission limits in Rule 1110.2. Although engines in the RECLAIM program were not required to meet the Rule 1110.2 NOx emission limits, engines were still required to meet the VOC and CO concentration limits. Proposed Amended Rule (PAR) 1110.2 will remove the exemption for NOx RECLAIM facilities to help facilitate the transition of NOx RECLAIM, a market-based regulatory program, to a command-and-control regulatory structure.

During the adoption of the 2016 AQMP, the Resolution directed staff to modify Control Measure CMB-05 to achieve an additional five tons per day of NOx emission reductions and to transition the NOx RECLAIM program to a command-and-control regulatory structure requiring BARCT as soon as practicable, but no later than 2025. In addition, 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.

Consistent with AB 617, staff conducted a BARCT analysis on engines and concluded that the NOx, VOC, and CO concentration limits established on February 1, 2008 and September 7, 2012 are still representative of BARCT. PAR 1110.2 will establish NOx emission concentration limits for engines at NOx RECLAIM facilities and monitoring, reporting, and recordkeeping requirements. Additional revisions are also proposed that would affect engines at non-RECLAIM facilities. Proposed Amended Rule 1100 - Implementation Schedule for NOx Facilities, establishes the implementation schedule for NOx RECLAIM facilities affected by PAR 1110.2

Public Process

The development of Proposed Amended Rules 1110.2 and 1100 was conducted through a public process. Six working group meetings were held on: June 28, 2018, September 27, 2018, February 6, 2019, April 24, 2019, May 30, 2019, and August 20, 2019. The working group meetings included representatives from affected businesses, environmental and community groups, public agencies, and other interested parties. A public workshop was held on July 31, 2019, along with a California Environmental Quality Act (CEQA) scoping meeting, as required pursuant to Public Resources Code Section 21083.9(a)(2). Other meetings were also held with stakeholders and numerous site visits were conducted.

Proposed Amendments
PAR 1110.2 will remove the exemption for NOx RECLAIM facilities and will apply to stationary engines rated greater than 50 bhp located at RECLAIM, former RECLAIM, and non-RECLAIM facilities. Staff conducted a BARCT analysis and concluded that the existing NOx concentration limits are still representative of BARCT, so the existing Rule 1110.2 NOx, VOC, and CO concentration limits will be maintained.

PAR 1110.2 provides options for averaging times to demonstrate compliance with the NOx concentration limits, revisions for CEMS requirements for engines at essential public services, and includes interim VOC concentration limits for linear generators. PAR 1110.2 also exempts diesel crane engines operated offshore from NOx, VOC, and CO emission limits and periodic source testing provisions provided the engines meet specific criteria and an Inspection and Monitoring Plan is prepared and implemented for those engines. In addition, an exemption for remote radio transmission towers was added to be consistent with provisions under Rules 219 and 222. Other proposed amendments remove obsolete provisions, update monitoring, reporting, and recordkeeping requirements, and provide clarifications for a variety of provisions.

PAR 1100 provides the implementation schedule for RECLAIM facilities to meet the NOx emission limits under PAR 1110.2. The schedule establishes a compliance date of December 31, 2023, consistent with the requirements of AB 617. Alternative implementation schedules are proposed for unique classes and categories of engines, some of which will undergo replacement and facility modernization that result in additional emission reductions.

Emission Reductions
Implementation of PAR 1110.2 is expected to reduce NOx emissions by 0.29 tons per day. Out of the 254 facilities currently in the NOx RECLAIM program, 21 RECLAIM facilities representing 76 engines are affected by PAR 1110.2. Of the 76 engines, 47 engines currently do not meet the PAR 1110.2 NOx emission limit. The engines were distributed among four categories: lean-burn two-stroke, lean-burn four-stroke, rich-burn, and engines subject to the statewide portable Air Toxics Control Measure (ATCM).

Key Issues
Throughout the rulemaking process, staff has worked closely with stakeholders to address their comments and issues regarding the implementation schedule, averaging times, provisions for linear generator engines, exemptions, monitoring, reporting, and recordkeeping requirements, and emissions testing requirements. Staff is not aware of any remaining key issues.

California Environmental Quality Act

PARs 1110.2 and 1100 are considered a "project" as defined by the California Environmental Quality Act (CEQA) and the South Coast AQMD is the designated lead agency. Pursuant to CEQA and South Coast AQMD's Certified Regulatory Program (Public Resources Code Section 21080.5 and CEQA Guidelines Section 15251(l); codified in South Coast AQMD Rule 110), the South Coast AQMD has prepared a Final Subsequent Environmental Assessment (SEA) for PARs 1110.2 and 1100, which is a substitute CEQA document pursuant to CEQA Guidelines Section 15252, prepared in lieu of a Subsequent Environmental Impact Report. The Final SEA relies on the March 2017 Final Program Environmental Impact Report (EIR) for the 2016 AQMP. The environmental analysis in the Final SEA concluded that PARs 1110.2 and 1100 would generate significant adverse hazards and hazardous materials impacts. Since significant adverse impacts were identified, the Final SEA includes an alternatives analysis and mitigation measures. The Final SEA is included as an attachment to this Board package (see Attachment K). Staff has also prepared Findings pursuant to CEQA Guidelines 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.

Socioeconomic Analysis

There are 21 facilities that are potentially impacted by complying with the NOx emission limits in PAR 1110.2. There are 76 engines at these 21 facilities: eight engines will be subject to the State ATCM, 21 engines are already permitted to achieve the emission limit, and 47 will incur compliance costs through tuning, repowering, retrofitting with exhaust emission controls, or replacement. The engines are divided into four general categories: lean-burn two-stroke, lean-burn four-stroke, rich-burn, and engines subject to the ATCM.

The majority of the one-time costs come from the required purchase and installation of new selective catalytic reduction (SCR) controls or for the retrofit of existing SCR equipment. The total cost of SCRs including installation is approximately $33.8 million or approximately $2.1 million average annual cost across the 10 affected facilities. The largest recurring cost is the replacement of catalyst, which totals almost $30.6 million or $1.88 million average annual cost across the 10 affected facilities. The overall cost effectiveness was determined to be $32,000 per ton of NOx reduction across all the engine categories.

The majority of compliance costs (61%) for PAR 1110.2 impact Pipeline Transportation, where engines are used by utility gas suppliers to maintain pipeline systems for distribution of natural gas consumers. Smaller portions of the total costs impact Oil & Gas Extraction, Natural Gas Distribution, Beverage Manufacturing, and Amusement, Gambling and Recreation Industries with 20%, 11%, 5%, and 3%, respectively.

Compliance costs for PAR 1110.2 are expected to result in 76 to 175 jobs foregone annually, on average, between 2021 and 2046. The projected jobs forgone represents about 0.001% of total employment in the four-county region. The Pipeline Transportation industry, which bears more than half of the total expected compliance cost, would have an average of 8 to 13 jobs foregone annually. The industry with the largest job impacts is construction, where an estimated 12 to 31 jobs would be foregone annually on average.

AQMP and Legal Mandates

Pursuant to Health & Safety Code Section 40460 (a), the South Coast AQMD is required to adopt an AQMP demonstrating compliance with all federal regulations and standards. The South Coast AQMD is required to adopt rules and regulations that carry out the objectives of the AQMP. PAR 1110.2 will partially implement control measure CMB-05 – Further NOx Reductions from RECLAIM Assessment in the 2016 AQMP and will reduce 0.29 tons per day of NOx emissions and is needed to help facilitate the transition of the NOx RECLAIM program to a command-and-control regulatory structure.

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 1110.2
H. Proposed Amended Rule 1100
I. Final Staff Report
J. Final Socioeconomic Impact Assessment
K. Final Subsequent Environmental Assessment
L. Board Meeting Presentation

ATTACHMENT A

SUMMARY OF PROPOSAL

Proposed Amended Rules 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines and Rule 1100 – Implementation Schedule for NOx Facilities

Applicability
• Applies to stationary engines rated greater than 50 brake horsepower
• Applies to RECLAIM, former RECLAIM, and non-RECLAIM facilities
 	
Emissions Limits
• BARCT analysis concluded that existing NOx, VOC, and CO emission limit are still representative of BARCT – No changes to existing emissions limits for most engines
• Provides options for alternate emission limits for compressor gas lean-burn engines for an interim time period
• Allows for concentration-based limits for linear generator technology for electricity generation
• Includes an interim and VOC concentration based emission limit for such engines for electricity generation that meets specific criteria
 	
Monitoring, Recordkeeping, and Reporting
• Provides options for longer emissions averaging periods
  o Engines equipped with CEMS – 1 hour
  o Compressor gas lean-burn engines – 3 hours
  o Biogas engines – 48 hours, provided engines meet lower NOx emission limits
• Clarifies source testing deadlines
  o Testing must be completed by the end of the month of when the test is due
  o If the engine is not in operation prior to when testing is due, testing must be conducted by the end of 7 consecutive days or 15 cumulative days of resumed operation
• Requires former RECLAIM units to install CEMS if a facility aggregate threshold is exceeded
• Requires former RECLAIM process units to use a monthly operating log
• Allows for the approval of equivalent alternatives for Inspection and Monitoring Plan parameters

Proposed Amended Rules 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines and Rule 1100 – Implementation Schedule for NOx Facilities

Exemptions
• Harmonizes exemptions with Rules 219 and 222 for diesel engines operated at remote radio transmission sites
• Revises exemptions to allow for tuning of an engine and/or associated emission control equipment
• Includes the replacement of catalytic equipment as a major repair
• Provides a placeholder for possible future exemptions for engines located at landfills and publicly owned treatment works if these engines are subject to separate, new rules
• Includes exemption for diesel engines powering cranes located on offshore platforms, provided specific criteria are met
 	
PAR 1100 (Compliance Schedule)
• Engines at RECLAIM and former RECLAIM facilities must comply with emission limits by December 31, 2023 except:
    o Compressor gas lean-burn engines, which may apply for time extensions for:
        ➢ Retrofits
        ➢ Alternative emission limits
        ➢ Facility modernization
    o Engines located at ski resorts may opt for a low use classification and retain current permitted emission limits

ATTACHMENT B

KEY ISSUES AND RESPONSES

Proposed Amended Rules 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines and Rule 1100 – Implementation Schedule for NOx Facilities
Throughout the rulemaking process, staff has worked closely with stakeholders from various industries to address their comments and resolve any key issues. Staff is not aware of any remaining key issues.

ATTACHMENT C
RULE DEVELOPMENT PROCESS

Proposed Amended Rules 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, and Rule 1100 – Implementation Schedule for NOx Facilities

Initiated Rule Development: April 2018

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Working Group Meetings (6): June 28, 2018, September 27, 2018, February 6, 2019, April 24, 2019, May 30, 2019, and August 20, 2019

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75-Day Public Notice: July 19, 2019

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Draft Subsequent Environmental Assessment: July 26, 2019

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Public Workshop: July 31, 2019

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Stationary Source Committee Briefing: September 20, 2019

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30-Day Notice of Public Hearing: October 1, 2019

↓

Set Public Hearing: October 4, 2019

↓

Public Hearing: November 1, 2019

Twenty (20) months spent in rule development.

One (1) Public Workshop.

One (1) Stationary Source Committee Meeting.

Six (6) Working Group Meetings.

ATTACHMENT D

KEY CONTACTS LIST

Proposed Amended Rules 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, and Rule 1100 – Implementation Schedule for NOx Facilities

* Almega Environmental
* Amplify Energy Corporation
* Associates Environmental
* Beta Offshore
* Boeing
* Breitburn Operating LP
* California Air Resources Board
* California Boiler
* California Council for Environmental and Economic Balance
* California Resources Corporation
* Clyde and Company
* City of Glendale
* City of Los Angeles, Harbor Dept
* County of Riverside, Information Technology Division
* DCOR
* Disneyland Resort
* Eastern Municipal Water District
* EtaGen
* Greka Oil & Gas
* Hoag Hospital
* Lapeyre Industrial Sands, Inc.
* Los Angeles County Sanitation Districts
* M&C Tech Group
* Marathon Petroleum Corporation
* Millercoors, LLC
* Miratech
* Montrose Environmental
* Nationwide Boiler Incorporated
* Orange County Sanitation District
* Quemetco Inc.
* Quinn Power Systems
* Pacific Standard Environmental
* Plains All American
* Ramboll
* SA Recycling
* San Bernardino Water District
* San Diego Gas & Electric
* Snow Summit
* South Orange County Wastewater Authority
* Southern California Air Quality Alliance
* Southern California Alliance of Publicly Owned Treatment Works
* Southern California Edison
* Southern California Gas Company
* Tamco
* Tidelands Oil Production Company Etal
* United Airlines
* U.S. Environmental Protection Agency
* Wärtsilä North America
* Western States Petroleum Association
* Yorke Engineering

ATTACHMENT E

RESOLUTION NO. 19-____

A Resolution of the Governing Board of the South Coast Air Quality Management District (South Coast AQMD) certifying the Final Subsequent Environmental Assessment (SEA) for Proposed Amended Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities.

WHEREAS, the South Coast AQMD Governing Board finds and determines with certainty that Proposed Amended Rules 1110.2 and 1100 are considered a “project” as defined by the California Environmental Quality Act (CEQA); and

WHEREAS, the South Coast AQMD 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 1110.2 and 1100 pursuant to such program (South Coast AQMD Rule 110); and

WHEREAS, the South Coast AQMD 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 South Coast AQMD’s certified regulatory program, is appropriate; and

WHEREAS, the South Coast AQMD has prepared a 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 1110.2 and 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 46-day public review and comment period from July 26, 2019 to September 2019 and five comment letters were received; and

WHEREAS, the Draft SEA has been revised to include the comment letters received on the Draft SEA and the responses, so that it is now a Final SEA; and

WHEREAS, it is necessary that the South Coast AQMD 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 1110.2 and 1100, including responses to comments relative to the Draft SEA; 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 South Coast AQMD 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 South Coast AQMD Governing Board voting to adopt Proposed Amended Rules 1110.2 and 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 1110.2 and 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 South Coast AQMD Governing Board and the South Coast AQMD 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 South Coast AQMD; and

WHEREAS, the South Coast AQMD Governing Board finds and determines that all changes made in the Final SEA after the public notice of availability of the 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 Draft SEA, and recirculation is therefore not required; and

WHEREAS, the South Coast AQMD 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 Rule 1110.2 subparagraphs (d)(1)(I), (d)(1)(L), and (i)(1)(J) 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 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 Rule 1110.2 do not exceed the effects of the range of alternatives analyzed in the CEQA document; and

WHEREAS, the South Coast AQMD 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 Rule 1110.2 subparagraph (d)(1)(B) and paragraph (i)(1)(O) since the Notice of Public Hearing was published provides an exemption for offshore crane engines are not so substantial as to significantly affect the meaning of the proposed amended rules within the meaning of Health and Safety Code Section 40726 because: (a) the changes do not impact emission reductions because the engines meet Tier IV Final emissions standards, (b) the changes do not affect the number or type of sources regulated by the rules since these engines must still comply with monitoring, reporting, and recordkeeping requirements, (c) the changes are consistent with the information contained in the notice of public hearing, and (d) the effects of Proposed Amended Rule 1110.2 do not exceed the effects of the range of alternatives analyzed in the CEQA document; and

WHEREAS, the South Coast AQMD 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 Rule 1100 paragraphs (d)(6) and (d)(8) 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 within the meaning of Health and Safety Code Section 40726 because:(a) the changes do not impact emission reductions because a clarification is provided for the prorated payment of a mitigation fee, (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 Rule 1100 do not exceed the effects of the range of alternatives analyzed in the CEQA document; and

WHEREAS, Proposed Amended Rules 1110.2 and 1100 will be submitted for inclusion into the State Implementation Plan; and

WHEREAS, the South Coast AQMD staff conducted a combined Public Workshop and CEQA Scoping regarding Proposed Amended Rules 1110.2 and 1100 on July 31, 2019; and

WHEREAS, the South Coast AQMD Governing Board has determined that Proposed Amended Rules 1110.2 and 1100 are needed to continue with the transition of facilities in the RECLAIM program to a command-and-control regulatory structure by setting Best Available Retrofit Control Technology (BARCT) and a transition schedule to meet the commitments of Control Measure CMB-05 of the Final 2016 Air Quality Management Plan; and

WHEREAS, the South Coast AQMD 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 South Coast AQMD Governing Board finds that there is an ozone problem that Proposed Amended Rules 1110.2 and 1100 will alleviate and will promote the attainment or maintenance of state or federal ambient air quality standards; and

WHEREAS, Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the South Coast AQMD 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 South Coast AQMD Governing Board finds that Proposed Amended Rules 1110.2 and 1100 are written or displayed so that the meaning can be easily understood by the persons directly affected by it; and

WHEREAS, the South Coast AQMD Governing Board finds that Proposed Amended Rules 1110.2 and 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 South Coast AQMD Governing Board finds that Proposed Amended Rules 1110.2 and 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, South Coast AQMD; and

WHEREAS, the South Coast AQMD Governing Board, in amending Rules 1110.2 and 1100, finds and references the following statutes which the South Coast AQMD hereby implements, interprets, or makes specific: Assembly Bill 617, Health and Safety Code Sections 39002, 40001, 40702, 40440(a), and 40725 through 40728.5; and

WHEREAS, California Health and Safety Code Section 40727.2 requires the South Coast AQMD to prepare a written analysis of existing federal air pollution control requirements applicable to the same source type being regulated whenever it adopts, or amends a rule, and the South Coast AQMD's comparative analysis of Proposed Amended Rules 1110.2 and 1100 is included in the staff report; and

WHEREAS, the South Coast AQMD Governing Board has determined that the Socioeconomic Impact Assessment of Proposed Amended Rules 1110.2 and 1100 is consistent with the March 17, 1989 Governing Board Socioeconomic Resolution for rule adoption; and

WHEREAS, the South Coast AQMD 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 South Coast AQMD Governing Board finds that the proposed control options in Proposed Amended Rules 1110.2 and 1100 are being adopted because they constitute BARCT, as required by AB 617, and that the other control options did not meet BARCT; and

WHEREAS, the South Coast AQMD Governing Board has determined that Proposed Amended Rules 1110.2 and 1100 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 South Coast AQMD Governing Board has actively considered the Socioeconomic Impact Assessment and has made a good faith effort to minimize such impacts; and

WHEREAS, the South Coast AQMD specifies that the Planning and Rules Manager of Rules 1110.2 and 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 South Coast AQMD Governing Board has held a public hearing in accordance with all applicable provisions of state and federal law; and

NOW, THEREFORE, BE IT RESOLVED, that the South Coast AQMD Governing Board has considered the Final SEA for Proposed Amended Rules 1110.2 and 1100 together with all comments received during the public review period, and on the basis of the whole record before it, the South Coast AQMD Governing Board: 1) finds that the Final SEA, including the responses to the comment letters, was completed in compliance with CEQA and the South Coast AQMD's Certified Regulatory Program, 2) finds that the Final SEA and all supporting documents were presented to the Governing Board, whose members exercised their independent judgment and reviewed, considered, and approved the information therein prior to acting on Proposed Amended Rules 1110.2 and 1100, and 3) certifies the Final SEA; and

BE IT FURTHER RESOLVED, that the South Coast AQMD 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 South Coast AQMD Governing Board does hereby adopt, pursuant to the authority granted by law, Proposed Amended Rules 1110.2 and 1100 as set forth in the attached, and incorporated herein by reference; and

BE IT FURTHER RESOLVED, that the South Coast AQMD Governing Board requests that Proposed Amended Rules 1110.2 and 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 1110.2 and 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 Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, and Proposed Amended Rule 1100 – Implementation Schedule for NOx

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

State Clearinghouse No: 2016071006
South Coast AQMD No. 07252019TT

October 2019

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TABLE OF CONTENTS

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 (South Coast AQMD) Governing Board directed staff to begin the process of transitioning the current regulatory structure for facilities subject to South Coast AQMD 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 South Coast AQMD Regulation XI – Source Specific Standards. South Coast AQMD 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 South Coast AQMD 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, South Coast AQMD staff determined that RECLAIM facilities should not exit RECLAIM unless their NOx emitting equipment is subject to an adopted BARCT rule.

As such, South Coast AQMD staff is proposing amendments to Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, to facilitate the transition of affected equipment subject to the NOx RECLAIM program to a command-and-control regulatory structure and to implement Control Measure CMB-05. Proposed Amended Rule (PAR) 1110.2 applies to all stationary and portable gaseous- and liquid-fueled engines with a rating greater than 50 brake horsepower (bhp) operated at RECLAIM and non-RECLAIM facilities. PAR 1110.2 is proposing to: 1) include internal combustion engines operated at current and former RECLAIM facilities which were not previously subject to Rule 1110.2 and require them to comply with BARCT; 2) exempt non-emergency engines operated at remote two-way radio transmission towers; 3) establish an interim VOC limit of 25 parts per million by volume, dry (ppmvd) for electric generating units that do not have ammonia emissions from add-on control equipment and also meets the NOx limit of Rule 1110.2 Table IV and installed before January 1, 2024; and 4) exempt Tier 4 – Final diesel engines powering cranes operated in the Southern California Coastal Waters or Outer Continental Shelf. Additionally, staff is proposing to add definitions for additional clarity, add language to help facilitate the transition from RECLAIM, and revise exemptions to remove provisions that are obsolete.

South Coast AQMD staff is also proposing amendments to Rule 1100 – Implementation Schedule for NOx Facilities, to: 1) require two- and four-stroke lean-burn compressor gas engines to comply with the NOx emission limits in PAR 1110.2 within 24 months after a permit to construct is issued and require the permit application be submitted by July 1, 2021; 2) require all other qualifying engines to meet the NOx emission limits by December 31, 2023; 3) extend the compliance date for achieving the emission limits specified in the rule and adding interim emission limits for compressor gas lean-burn engines if the owners or operators submit a request for a time extension; 4) add provisions to establish alternative emission limits for compressor gas lean-burn engines; 5) extend the compliance date for achieving the emission limits for compressor gas lean-burn engines undergoing a facility-wide engine modernization; 6) add a requirement for permit applications to be submitted by July 1, 2021; and 7) add low-use criteria for diesel engines operated at ski resorts. Staff will also add definitions to PAR 1100 for clarity.

Implementation of the proposed project is estimated to reduce NOx emissions by 0.29 ton per day, and is expected to be achieved by retrofitting existing internal combustion engines with air pollution control equipment (e.g., selective catalytic reduction (SCR) technology/systems, or by repowering or replacing existing internal combustion engines.

PARs 1110.2 and 1100 are considered a "project" as defined by the California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000 et seq.). The South Coast AQMD, 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 1110.2 and 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 in the topic area of hazards and hazardous materials. For example, in order to comply with the proposed emission limits, owners/operators may need to retrofit existing stationary engines with air pollution control equipment (e.g., SCR technology/system installations), or repowering or replacing existing stationary engines.

The SEA identified and analyzed activities associated with installing new or modifying existing air pollution control equipment, or repowering, or replacing existing stationary engines in order to reduce NOx emissions. 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 46-day public review and comment period from July 26, 2019 to September 10, 2019 and five comment letters were received. Subsequent to release of the Draft SEA for public review and comment, minor modifications were made to PARs 1110.2 and 1100. Staff has reviewed the modifications to PARs 1110.2 and 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 Draft SEA. In addition, revisions to the proposed project and analysis 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 Draft SEA pursuant to CEQA Guidelines Sections 15073.5 and 15088.5. The Draft SEA has been revised to include the aforementioned modifications such that it is now the Final SEA. The comment letters and responses relative to the Draft SEA have been included in Appendix G of the Final SEA.

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

The Final SEA for PARs 1110.2 and 1100 relies on the previous CEQA analysis in 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 that document as evidence for environmental areas where impacts were found not to be significant. The previous CEQA document reviewed approximately 17 environmental topic areas and analyzed whether the respective project would create potentially significant adverse impacts. 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 1110.2 and 1100. 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 PARs 1110.2 and 1100.

Table 1
Applicability of Significant Impacts Identified in the March 2017 Final Program EIR to Proposed Project (PARs 1110.2 and 1100)

CONCLUSION OF SIGNIFICANT IMPACTS IN MARCH 2017 FINAL PROGRAM EIR[1]	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	This environmental topic area is not applicable to the proposed project because neither catenary lines nor the use of bonnet technology for ships are applicable to stationary engines and the corresponding NOx emission controls (e.g., SCR technology). Therefore, this conclusion is not applicable to the proposed project.
Construction air quality and GHGs	Yes, but less than significant	These environmental topic areas are applicable to the proposed project. The impacts for these environmental topics areas are analyzed in the Final SEA (see pp. 4-3 to 4-28 for construction air quality and GHGs), and the analysis concluded less than significant impacts.

[1] 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

Table 1
Applicability of Significant Impacts Identified in the March 2017 Final Program EIR to Proposed Project (PARs 1110.2 and 1100) (continued)

CONCLUSION OF SIGNIFICANT IMPACTS IN MARCH 2017 FINAL PROGRAM EIR[1]	APPLICABLE TO/SIGNIFICANT FOR THE PROPOSED PROJECT?	EXPLANATION
Energy due to increased electricity demand	No	While the use of SCR technology will require some electricity to operate, the amount of electricity that would be needed to install SCR technology as a result of implementing the proposed project would be less than significant.
Hazards and hazardous materials due the increased flammability of solvents	No	Internal combustion engines and the corresponding NOx emission controls (e.g., SCR 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 environmental topic area is applicable to the proposed project because SCR technology utilizes ammonia. The impacts for this environmental topic area are analyzed in the Final SEA (see pp. 4-28 to 4-36). The analysis concluded significant impacts for the storage and accidental release of ammonia and less than significant impacts for the transportation of ammonia.
Hazards and hazardous materials due to the storage and transportation of LNG	No	Affected internal combustion engines and the corresponding NOx emission controls (e.g., SCR technology) do not utilize LNG for their operation. Therefore, this conclusion is not applicable to the proposed project.
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 new SCR systems are located near schools. The impacts for this environmental topic area are analyzed in the Final SEA (see pp. 4-28 to 4-36).
Hydrology (water demand)	No	Stationary engines and the corresponding NOx emission controls (e.g., SCR technology) do not utilize water for their operation. Therefore, this conclusion is not applicable to the proposed project.

1. The March 2017 Final Program EIR for the 2016 AQMP concluded that impacts on biological resources were less than significant. However, one of the affected facilities is located near a wetland. A review of the site shows that the affected engines are located in the upper bluff and not directly adjacent to the wetland. Additionally, based on South Coast AQMD staff's discussion with the facility during a site visit in December 2018, construction will occur within an existing building with minimal construction on the exterior of the building. Therefore, significant impacts to biological resources are not expected as a result of the proposed project.

Table 1
Applicability of Significant Impacts in March 2017 Final Program EIR to Proposed Project (concluded)

CONCLUSION OF SIGNIFICANT IMPACTS IN MARCH 2017 FINAL PROGRAM EIR[1]	APPLICABLE TO/SIGNIFICANT FOR THE PROPOSED PROJECT?	EXPLANATION
Construction noise and vibration	No	While the construction activities associated with installing new SCR technology for affected stationary engines may create some noise and vibration, the existing noise environment at each facility is typically dominated by noise from existing equipment on-site, vehicular traffic around the facilities, and trucks entering and existing facility premises. Operation of the construction equipment would be expected to comply with all existing noise control laws and ordinances. Further, since the facilities are located in industrial or commercial land use areas, the noise generated during construction will likely be indistinguishable from the background noise levels at the property line. Therefore, the potential noise increases are expected to be within the allowable noise levels established by the local noise ordinances for industrial areas, and thus are expected to be less than significant.
Solid construction waste and operational waste from vehicle and equipment scrapping	No	Vehicle scrapping is not applicable to stationary engines and the corresponding NOx emission controls (e.g., SCR 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 harbors are not applicable to stationary engines and the corresponding NOx emission controls (e.g., SCR technology). Therefore, this conclusion is not applicable to the proposed project.

PARs 1110.2 and 1100 are expected to have: 1) significant effects that were not discussed in the previous 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 March 2017 Final Program EIR for the 2016 AQMP. [CEQA Guidelines Section 15162(a)(3)(B)].

As summarized in Table 1, the topic of hazards and hazardous materials is the only environmental topic area that would be affected by PARs 1110.2 and 1100 due to the storage and use of aqueous ammonia in proximity to sensitive receptors at some affected facilities.

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 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 the proximity of facilities 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.

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. SCR systems which require the use of ammonia are the most likely air pollution control equipment currently available on the market that is capable of reducing NOx emissions to the levels prescribed in PARs 1110.2 and 1100. 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 hazards and hazardous materials 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 one or more SCR systems that the significant adverse hazards and hazardous materials impacts for the storage and use of aqueous ammonia would be able to be fully eliminated or reduced 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 the proposed project 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 South Coast AQMD 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 South Coast AQMD Governing Board are based on the following significant adverse hazards and hazardous materials impacts 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.

<u>Finding and Explanation</u>:

PARs 1110.2 and 1100 is concluded to result in significant adverse hazards and hazardous materials impacts for the storage and use of aqueous ammonia. 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), there are no other alternatives that would reduce to insignificant levels the significant adverse 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.

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 1110.2 and 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 South Coast AQMD's Clerk of the Board's Office located at South Coast AQMD 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 hazards and hazardous materials 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 materials impacts to a level of insignificance; the South Coast AQMD'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, which is based on 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 implementation of the proposed project could result in: 1) 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 engine, cost, etc.); or 2) some facilities with applicable stationary engines could replace an entire engine with new equipment 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, it is possible that 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 would create a significant offsite consequence. For the offsite consequence analysis, South Coast AQMD staff utilized U.S. EPA's RMP*Comp model[2], an online tool that has the capability of evaluating the hazard potential of aqueous ammonia at a 20 percent concentration, by weight. Therefore, the potentially significant adverse impacts from the storage and use aqueous ammonia was evaluated in the Final SEA based on aqueous ammonia at a 20 percent concentration, by weight. However, to minimize the hazards associated with using aqueous ammonia, South Coast AQMD policy requires the use of aqueous ammonia at a concentration less than or equal to 19 percent, by weight for air pollution control equipment that utilizes ammonia for the following reasons: 1) aqueous ammonia at a concentration less than or equal to 19 percent, by weight, does not travel as a dense gas like anhydrous ammonia; and 2) aqueous ammonia at a concentration less than or equal to 19 percent, by weight is not on any acutely hazardous materials lists unlike anhydrous ammonia or aqueous ammonia at higher percentages. As such, South Coast AQMD staff does not typically issue permits for the use of anhydrous ammonia or aqueous ammonia in concentrations higher than 19 percent by weight for use in SCR systems. Thus, the offsite consequence analysis for an aqueous ammonia release at a 20 percent concentration, by weight, likely overestimates the risk.

2. Although the prescribed mitigation measures may be able to reduce or eliminate the hazards and hazardous impacts associated with aqueous ammonia 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, South Coast AQMD 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 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 potentially significant if the proposed project is implemented, only the use and storage of aqueous ammonia for SCR

[2] United States Environmental Protection Agency, Risk Management Program Rule, RMP*Comp, https://www.epa.gov/rmp/rmpcomp.

systems 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, 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 and resulting ozone and PM 2.5. 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 South Coast AQMD into attainment with all national and most state ambient air quality standards. The 2016 AQMP also predicts that ozone 8-hour ozone standard will be achieved 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 stationary engines.

The South Coast AQMD'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 South Coast AQMD 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 installation of a SCR system at a facility, that each facility owner or operator 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 the operation of SCR systems would remain significant if the proposed project is implemented, even after mitigation measures are applied. Thus, a mitigation, monitoring, and reporting plan has been developed for the proposed project.

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 South Coast AQMD 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 the proposed project. Each owner or 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 new or increased storage and handling of aqueous ammonia at facilities subject to PARs 1110.2 and 1100 could create significant adverse hazards and hazardous materials impacts 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 Safety Data Sheet (SDS) 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, 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. 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, for any facility that installs air pollution control technology that utilizes ammonia, such as a SCR system, 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, 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 an individual facility's potential significant hazards and hazardous materials impact due to storage and use of aqueous ammonia to less than significant levels. The analysis conducted in the Final SEA made conservatively assumed that some of the facilities affected by the proposed project would likely retrofit each engine with a SCR system requiring an ammonia storage tank for its operation. Although the mitigation measures would reduce the potential impacts for hazards and hazardous materials for any facility owner or operator choosing to install a SCR system with an accompanying aqueous ammonia storage tank, without knowing the exact location where each new storage tank will be sited, the number of ammonia storage tanks to be installed at any one facility, and the corresponding size of each ammonia storage tank to be installed at each facility, the Final SEA concluded that the proposed project will result in significant adverse hazards and hazardous materials impacts from the storage and use of aqueous ammonia.

Current South Coast AQMD practice typically does not allow the use of anhydrous ammonia for the operation of air pollution control equipment. Further, to minimize the hazards associated with using ammonia for air pollution control equipment, the current South Coast AQMD policy typically requires the use of aqueous ammonia at a concentration of less than or equal to 19 percent, by weight, for air pollution control equipment that utilizes ammonia for the following reasons: 1) aqueous ammonia at a concentration of less than or equal to 19 percent, by weight does not travel as a dense gas like anhydrous ammonia; and 2) aqueous ammonia at a concentration of less than or equal to 19 percent, by weight is not on any acutely hazardous material lists unlike anhydrous ammonia or aqueous ammonia at higher percentages. As such, South Coast AQMD staff does not typically issue permits for the use of anhydrous ammonia or aqueous ammonia in concentrations higher than 19 percent, by weight, for use in SCR systems. As a result, this impact summary focuses on the use of 19 percent by weight aqueous ammonia. Thus, because aqueous ammonia at a concentration of 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 weight, 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: 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. South Coast AQMD 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 South Coast AQMD permits to construct for the facility-specific project. The mitigation measures will be enforceable by South Coast AQMD 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 weight.

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 minimize the offsite hazards impacts to the maximum extent feasible 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 each 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 will remain significant after mitigation measures are applied.

Implementing Parties: The South Coast AQMD'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 South Coast AQMD 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 South Coast AQMD'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 South Coast AQMD 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 or equal to 19 percent by weight.

Each facility operator shall ensure the concentration of aqueous ammonia used and stored onsite is less than or equal to 19 percent by weight. The percent concentration by weight of aqueous ammonia shall be posted on the aqueous ammonia tank at all times. The South Coast AQMD 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 minimize the offsite hazards impacts to the maximum extent feasible 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 an underground gravity drain that flows to a large on-site retention basin to provide sufficient ammonia dilution to minimize the offsite hazards impacts to the maximum extent feasible 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 1110.2 and 1100 are considered significant and unavoidable. Some feasible mitigation measures have been identified that would somewhat reduce the level of significant adverse hazards and hazardous materials impacts associated with implementing the PARs 1110.2 and 1100; however, the mitigation measures cannot be guaranteed 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.

ATTACHMENT G

(Adopted August 3, 1990)(Amended September 7, 1990)(Amended August 12, 1994)
(Amended December 9, 1994)(Amended November 14, 1997)(Amended June 3, 2005)
(Amended February 1, 2008)(Amended July 9, 2010)(Amended September 7, 2012)
(Amended December 4, 2015)(Amended June 3, 2016)(PAR 1110.2 November 2019)

[*Rule Index to be included after adoption*]

PROPOSED AMENDED RULE 1110.2 EMISSIONS FROM GASEOUS- AND LIQUID-FUELED ENGINES

(a) Purpose

The purpose of Rule 1110.2 is to reduce Oxides of Nitrogen (NO_x), Volatile Organic Compounds (VOCs), and Carbon Monoxide (CO) from engines.

(b) Applicability

All stationary and portable engines over 50 rated brake horsepower (bhp) are subject to this rule.

(c) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) AGRICULTURAL STATIONARY ENGINE is a non-portable engine used for the growing and harvesting of crops of the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. An engine used for the processing or distribution of crops or fowl or animals is not an agricultural engine.

(2) APPROVED EMISSION CONTROL PLAN is a control plan, submitted on or before December 31, 1992, and approved by the Executive Officer prior to November 14, 1997, that was required by subdivision (d) of this rule as amended September 7, 1990.

(3) BREAKDOWN is a physical or mechanical failure or malfunction of an engine, air pollution control equipment, or related operating equipment that is not the result of operator error, neglect, improper operation or improper maintenance procedures, which leads to excess emissions beyond rule related emission limits or equipment permit conditions.

(4) CERTIFIED SPARK-IGNITION ENGINE means engines certified by California Air Resources Board (CARB) to meet emission standards in accordance with Title 13, Chapter 9, Article 4.5 of the California Code of Regulations (CCR).

(5) COMPRESSOR GAS LEAN-BURN ENGINE is a stationary gaseous-fueled two-stroke or four-stroke lean-burn engine used to compress natural

gas or pipeline quality natural gas for delivery through a pipeline or into storage.

(~~5~~6) EMERGENCY STANDBY ENGINE is an engine which operates as a temporary replacement for primary mechanical or electrical power during periods of fuel or energy shortage or while the primary power supply is under repair.

(~~6~~7) ENGINE is any spark- or compression-ignited internal combustion engine, including engines used for control of VOC's, but not including engines used for self-propulsion.

(8) ESSENTIAL PUBLIC SERVICE includes any facility or operator as defined in Rule 1302.

(~~7~~9) EXEMPT COMPOUNDS are defined in South Coast AQMD ~~District~~ Rule 102 – Definition of Terms.

(~~8~~10) FACILITY means any source or group of sources or other air contaminant emitting activities which are located on one or more contiguous properties within the South Coast AQMD~~District~~, in actual physical contact or separated solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or by persons under common control), or an outer continental shelf (OCS) source as determined in Section 55.2 of Title 40, Part 55 of the Code of Federal Regulations (40 CFR Part 55). Such above-described groups, if noncontiguous, but connected only by land carrying a pipeline, shall not be considered one facility. Sources or installations involved in crude oil and gas production in Southern California Coastal or OCS Waters and transport of such crude oil and gas in Southern California Coastal or OCS Waters shall be included in the same facility which is under the same ownership or use entitlement as the crude oil and gas production facility on-shore.

(11) 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.

(~~9~~12) LEAN-BURN ENGINE means an engine that operates with high levels of excess air and an exhaust oxygen concentration of greater than 4 percent.

(~~10~~13) LOCATION means any single site at a building, structure, facility, or installation. For the purpose of this definition, a site is a space occupied or to be occupied by an engine. For engines which are brought to a facility to perform maintenance on equipment at its permanent or ordinary location, each maintenance site shall be a separate location.

(~~11~~14) NET ELECTRICAL ENERGY means the electrical energy produced by a generator, less the electrical energy consumed by any auxiliary equipment necessary to operate the engine generator and, if applicable, any heat recovery equipment, such as heat exchangers.

(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.

(~~12~~16) NON-ROAD ENGINE is any engine, defined under 40 CFR Part 89, that does not remain or will not remain at a location for more than 12 consecutive months, or a shorter period of time where such period is representative of normal annual source operation at a stationary source that resides at a fixed location for more than 12 months (e.g., seasonal operations such as canning facilities), and meets one of the following:

(A) Is used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as a mobile crane); or

(B) Is used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawn mowers and string trimmers); or

(C) By itself, or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Transportability includes, but is not limited to, wheels, skids, carrying handles, dolly, trailer, platform or mounting.

(~~13~~17) OPERATING CYCLE means a period of time within which a round of regularly recurring events is completed, and cannot be stopped without the risk of endangering public safety or health, causing material damage to the equipment or product, or cannot be stopped due to technical constraints. Economic reasons alone will not be sufficient to extend this time period. The operating cycle includes batch processes that may start and finish several times within a twenty-four hour period, in which case each start to finish interval is considered a complete cycle.

(~~14~~18) OXIDES OF NITROGEN (NOx) means nitric oxide and nitrogen dioxide.

(~~15~~19) PORTABLE ENGINE is an engine that, by itself or in or on a piece of equipment, is designed to be and capable of being carried or moved from one location to another. Indications of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, platform or mounting. The operator must demonstrate the necessity of the engine being periodically moved from one location to another because of the nature of the operation.

An engine is not portable if:

(A) The engine or its replacement remains or will reside at the same location for more than 12 consecutive months. Any engine, such as a back-up or stand-by engine, that replaces an engine at a location and is intended to perform the same function as the engine being replaced, will be included in calculating the consecutive time period. In that case, the cumulative time of both engines, including the time between the removal of the original engine and installation of the replacement engine, will be counted toward the consecutive time period; or

(B) The engine remains or will reside at a location for less than 12 consecutive months where such a period represents the full length of normal annual source operations such as a seasonal source; or

(C) The engine is removed from one location for a period and then it or its equivalent is returned to the same location thereby circumventing the portable engine residence time requirements.

The period during which the engine is maintained at a designated storage facility shall be excluded from the residency time determination.

(~~16~~20) RATED BRAKE HORSEPOWER (bhp) is the rating specified by the manufacturer, without regard to any derating, and listed on the engine nameplate.

(21) 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.

(~~17~~22) RICH-BURN ENGINE WITH A THREE-WAY CATALYST means an engine designed to operate near stoichiometric conditions with a catalytic control device that simultaneously reduces emissions of NOx, CO and VOC.

(~~18~~2 STATIONARY ENGINE is an engine which is either attached to a

3) foundation or if not so attached, does not meet the definition of a portable or non-road engine and is not a motor vehicle as defined in Section 415 of the California Vehicle Code.

(~~19~~24) TIER 2 AND TIER 3 DIESEL ENGINES mean engines certified by CARB to meet Tier 2 or Tier 3 emission standards in accordance with Title 13, Chapter 9, Article 4 of the CCR.

(~~20~~25) USEFUL HEAT RECOVERED means the waste heat recovered from the engine exhaust and/or cooling system that is put to productive use. The waste heat recovered may by assumed to be 100% useful unless the hot water, steam or other medium is vented to the atmosphere, or sent directly to a cooling tower or other unproductive use.

(~~21~~26) VOLATILE ORGANIC COMPOUND (VOC) is as defined in Rule 102.

(d) Requirements

(1) Stationary Engines:

(A) Operators of stationary engines with an amended Rule 1110.1 Emission Control Plan submitted by July 1, 1991, or an Approved Emission Control Plan, designating the permanent removal of engines or the replacement of engines with electric motors, in accordance with subparagraph (d)(1)(B), shall do so by December 31, 1999, or not operate the engines on or after December 31, 1999 in a manner that exceeds the emission concentration limits listed in Table I:

TABLE I ALTERNATIVE TO ELECTRIFICATION CONCENTRATION LIMITS		
NO_x (ppmvd)[1]	VOC (ppmvd)[2]	CO (ppmvd)[1]
11	30	70

1 Parts per million by volume, corrected to 15% oxygen on a dry basis and averaged over 15 minutes.

2 Parts per million by volume, measured as carbon**,** corrected to 15% oxygen on a dry basis and averaged over the sampling time required by the test method.

(B) The operator of any other stationary engine not covered by subparagraph (d)(1)(A) ~~and not exempt from this rule~~ shall:

(i) Remove such engine permanently from service or replace the engine with an electric motor, or alternatively comply with the following, if applicable:

(ii) Comply with ~~Not operate the engine in a manner that exceeds~~ the applicable emission concentration limits listed in either Table II or Table III-A or B, or technologically achievable case-by-case VOC or CO emission concentration limits approved by the Executive Officer pursuant to clause (d)(1)(B)(vii), averaged over 15 minutes or other averaging time period allowed by clauses (d)(1)(B)(iii) through (d)(1)(B)(v);

(iii) Use an averaging time approved by the Executive Officer for an engine that uses non-pipeline quality natural gas that has demonstrated that due to the varying heating value of the gas a longer averaging time was necessary. The fixed-interval averaging time shall not exceed six hours for any of the concentration limits of Table II, unless an engine is subject to an existing permit condition allowing for an averaging time greater than six hours. Non-pipeline quality natural gas is a gas that does not meet the gas specifications of the local gas utility and is not supplied to the local gas utility;

(iv) Use a fixed-interval averaging time of one hour for engines equipped with a continuous emissions monitoring system (CEMS), to demonstrate compliance with the emission concentration limits of Table II or Table III-B;

(v) Use a fixed-interval averaging time of three hours for compressor gas lean-burn engines equipped with selective catalytic reduction pollution control equipment and a CEMS, to demonstrate compliance with the NOx emission concentration limit of Table II;

(vi) Comply with the emission concentration limits listed in Table II for Low-Use Engines. A Low-Use engine is an engine that operates less than 500 hours per year or uses less than 1 x 10^9 British Thermal Units (Btus) per year (higher heating value) of fuel;

(vii) Comply with any technologically achievable case-by-case CO and VOC limits that were approved by the Executive Officer in lieu of the concentration limits in Table II effective on and after July 1, 2011 for a two-stroke engine equipped with an oxidation catalyst and insulated exhaust ducts and catalyst housing that has demonstrated that the CO and VOC limits effective on and after July 1, 2011 were not achievable. The case-by-case limits shall not exceed 250 ppmvd VOC and 2000 ppmvd CO, but must comply with the applicable NOx concentration limit in Table II.

~~(viii) Comply with a technologically achievable case-by-case NOx limit approved by the Executive Officer in lieu of the NOx concentration limit in Table II effective on and after July 1, 2011 for an engine operated in either the Southern California Coastal Waters or Outer Continental Shelf Waters provided:~~

~~(I) The engine is used to power a crane; and~~

~~(II) The engine is certified by CARB to meet the Tier 4 – Final emission standards of 40 CFR Part 1039 Section 1039.101 Table 1; and~~

~~(III) The NOx limit is demonstrated through an approved source test; and~~

~~(IV) The case-by-case NOx concentration limit shall not exceed 45 ppmvd, unless an alternate emission limit is necessary.~~

TABLE II
CONCENTRATION LIMITS FOR LOW-USE ENGINES

NO_x (ppmvd)[1]	VOC (ppmvd)[2]	CO (ppmvd)[1]
bhp ≥ 500: 36 bhp < 500: 45	250	2000
~~**CONCENTRATION LIMITS EFFECTIVE JULY 1, 2010**~~		

~~NO_x (ppmvd)[1]~~	~~VOC (ppmvd)[2]~~	~~CO (ppmvd)[1]~~
~~bhp ≥ 500: 11~~ ~~bhp < 500: 45~~	~~bhp ≥ 500: 30~~ ~~bhp < 500: 250~~	~~bhp ≥ 500: 250~~ ~~bhp < 500: 2000~~
CONCENTRATION LIMITS EFFECTIVE JULY 1, 2011		
NO_x (ppmvd)[1]	VOC (ppmvd)[2]	CO (ppmvd)[1]
11	30	250

1 Parts per million by volume, corrected to 15% oxygen on a dry basis ~~and averaged over 15 minutes~~.

2 Parts per million by volume, measured as carbon**,** corrected to 15% oxygen on a dry basis and averaged over the sampling time required by the test method.

~~The concentration limits effective on and after July 1, 2010 shall not apply to engines that operate less than 500 hours per year or use less than 1 x 10^9 British Thermal Units (Btus) per year (higher heating value) of fuel.~~

~~If the operator of a two-stroke engine equipped with an oxidation catalyst and insulated exhaust ducts and catalyst housing demonstrates that the CO and VOC limits effective on and after July 1, 2010 are not achievable, then the Executive Officer may, with United States Environmental Protection Agency (EPA) approval, establish technologically achievable, case-by-case CO and VOC limits in place of the concentration limits effective on and after July 1, 2010. The case-by-case limits shall not exceed 250 ppmvd VOC and 2000 ppmvd CO.~~

~~If the operator of an engine that uses non-pipeline quality natural gas demonstrates that due to the varying heating value of the gas a longer averaging time is necessary, the Executive Officer may establish for the engine a longer averaging time, not to exceed six hours, for any of the concentration limits of Table II. Non-pipeline quality natural gas is a gas that does not meet the gas specifications of the local gas utility and is not supplied to the local gas utility.~~

(C) The operator of any stationary engine fired by landfill or digester gas (biogas) shall not operate the engine in a manner that exceeds the emission concentration limits of Table III-A, provided that the facility monthly average biogas usage by the biogas engine -is 90% or more, based on the higher heating value of the fuels used. The calculation of the monthly facility biogas use percentage may exclude natural gas fired during: any electrical outage at the facility; a Stage 2 or higher electrical emergencies called by the California Independent System Operator Corporation; and when a sewage treatment plant activates an Emergency Operations Center or Incident Command System, as part of an emergency response plan, because of either high influent flows caused by precipitation or a disaster.

TABLE III-A
CONCENTRATION LIMITS FOR LANDFILL AND DIGESTER GAS (BIOGAS)-FIRED LOW-USE ENGINES

NO_x (ppmvd)[1]	VOC (ppmvd)[2]	CO (ppmvd)[1]
bhp ≥ 500: 36 x ECF[3] bhp < 500: 45 x ECF[3]	Landfill Gas: 40 Digester Gas: 250 x ECF[3]	2000

TABLE III-B
CONCENTRATION LIMITS FOR LANDFILL AND DIGESTER GAS (BIOGAS)-FIRED ENGINES EFFECTIVE JANUARY 1, 2017

NO_x (ppmvd)[1]	VOC (ppmvd)[2]	CO (ppmvd)[1]
11	30	250

1 Parts per million by volume, corrected to 15% oxygen on a dry basis ~~and averaged over 15 minutes~~.

2 Parts per million by volume, measured as carbon**,** corrected to 15% oxygen on a dry basis and averaged over the sampling time required by the test method.

3 ECF is the efficiency correction factor.

The ECF shall be 1.0 unless:

(i) The engine operator has measured the engine's net specific energy consumption (q_a), in compliance with ASME Performance Test Code PTC 17 -1973, at the average load of the engine; and

(ii) The ECF-corrected emission limit is made a condition of the engine's permit to operate.

The ECF is as follows:

$$ECF = \frac{9250 \text{ Btus/hp-hr}}{\text{Measured } q_a \text{ in Btus/hp-hr}}$$

Measured q_a shall be based on the lower heating value of the fuel. ECF shall not be less than 1.0.

The Executive Officer may approve the burning of more than 10% natural gas in a landfill or digester gas-fired engine, when it is necessary, if: the only alternative to limiting natural gas to 10% would be shutting down the engine and flaring more landfill or digester gas; or the engine requires more natural gas in order for a waste heat recovery boiler to provide enough thermal energy to operate a sewage treatment plant, and other boilers at the facility are unable to provide the necessary thermal energy.

(D) Notwithstanding the provisions of subparagraph (d)(1)(B), the operator of any stationary engine fired by landfill or digester gas (biogas) shall not operate the engine in a manner that exceeds the emission concentration limits of Table III.

(E) Biogas engine operators that establish to the satisfaction of the Executive Officer that they have complied with the emissions limits of Table III-B by January 1, 2015 will have their respective engine permit application fees refunded.

(F) For the City of San Bernardino, Orange County Sanitation District, and Eastern Municipal Water District that commenced and implemented technology demonstration projects prior to January 1, 2015, all their biogas engines shall have until January 1, 2018 to comply with the requirements of Table III-B.

(G) Once an engine complies with the concentration limits as specified in Table III-B, there shall be no limit on the percentage of natural gas burned.

(H) The concentration limits effective as specified in Table III-~~B~~A shall ~~not~~ apply to engines that are biogas-fired Low-Use engines. A biogas-fired Low-Use engine is an engine that operates fewer than 500 hours per year or use less than 1 x 10^9 Btus per year (higher heating value) of fuel.

(I) An operator of a biogas engine with a CEMS shall meet either:

(i) The NOx and CO limits of Table III-B, averaged pursuant to the specified averaging provisions in subparagraph (d)(1)(B);~~ or~~

(ii) The emission limits at or below ~~9.9~~ 11 ppmvd for NOx and ~~225~~ 250 ppmvd for CO (if CO is selected for averaging), each corrected to 15% O2 and averaged over a ~~48~~ 24-hour fixed interval, with the emission limits and averaging time specified as a condition in the engine's permit to operate on or before the [*Date of Amendment*]; or~~.~~

(iii) The emission limits at or below 9.9 ppmvd for NOx and 225 ppmvd for CO (if CO is selected for averaging), each corrected to 15% O2 and averaged over a 48-hour fixed interval, with emission limits and averaging time specified as a condition in the engine's permit to operate.

~~(A) Until Rules 218 and 218.1 are amended after [*Date of Amendment*], an operator shall not average data during one-minute periods in which the underlying equipment is not operated or when the CEMS is undergoing zero or calibration checks, cylinder gas audits, or routine maintenance in accordance with the provisions in Rules 218 and 218.1.~~

~~An operator of a biogas engine may determine compliance with the NOx and/or CO limits of Table III-B by utilizing a longer averaging time as set forth below, provided the operator demonstrates through CEMS data that the engine is achieving a concentration at or below 9.9 ppmv for NOx and 225 ppmv for CO (if CO is elected for averaging), each corrected to 15%~~ O_2~~, over a 4 month time period. An operator may utilize a monthly fixed interval averaging time for the first 4 months of the retrofitted engine's operation and up to a 24 hour fixed interval averaging time thereafter. For purposes of determining compliance using a longer averaging time:~~

~~(i) An operator shall not average data during one-minute periods in which the underlying equipment is not operated or when the CEMS is undergoing zero or calibration~~

~~checks, cylinder gas audits, or routine maintenance in accordance with the provisions in Rules 218 and 218.1.~~

~~(ii)~~ ~~Notwithstanding the requirements of Rules 218 and 218.1, for one-minute time periods where NOx and/or CO CEMS data are greater than 95 percent of the Rule 218.1 Full Scale Range while the underlying equipment is operating, an operator shall use substitute data. A concentration equivalent to 3 times the NOx and/or CO emission limits in Table III-B (each corrected to 15% O2) shall be used as substitute data.~~

~~(iii)~~ ~~The intentional shutdown of a CEMS to circumvent the emission limits of Table III-B while the underlying equipment is in operation shall constitute a violation of this rule.~~

~~(iv)~~ ~~The averaging provisions of this subparagraph shall not apply to CEMS that are time shared by multiple biogas engines.~~

(J) The operator of any new engine subject to subparagraph (e)(1)(B) shall:

(i) Comply with the requirements of Best Available Control Technology in accordance with Regulation XIII if the engine requires a South Coast AQMD ~~District~~ permit; or

(ii) Not operate the engine in a manner that exceeds the emission concentration limits in Table I if the engine does not require a South Coast AQMD ~~District~~ permit.

(K) By February 1, 2009, the operator of a spark-ignited engine without a Rule 218-approved continuous emission monitoring system (CEMS) or a Regulation XX (RECLAIM)-approved CEMS shall equip and maintain the engine with an air-to-fuel ratio controller with an oxygen sensor and feedback control, or other equivalent technology approved by the Executive Officer, CARB and EPA.

(L) New Non-Emergency Electrical Generators

(i) All new non-emergency engines driving electrical-generators shall comply with the following emission standards in lbs/MW-hr:

TABLE IV EMISSION STANDARDS FOR NEW ELECTRICAL GENERATION DEVICES		
Pollutant	**Emission Standard (lbs/MW-hr)[1]**	**Concentration Limit[3] (ppmvd)[4]**
NOx	0.070	2.5
CO	0.20	12
VOC	0.-10[2]	10

1 The averaging time of the emission standard~~s~~ for VOC is ~~15 minutes for NOx and CO and~~ the sampling time required by the test method ~~for VOC, except as described in the following clause~~.

2 Mass emissions of VOC shall be calculated using a ratio of 16.04 pounds of VOC per lb-mole of carbon.

3 Concentration limit is calculated using a 40% engine efficiency and no applied thermal credit.

4 Parts per million by volume, corrected to 15% oxygen on a dry basis.

(ii) Engines subject to this subparagraph that produce combined heat and electrical power may include one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered (MW_{th}-hr), in addition to each MW-hr of net electricity produced (MW_e-hr). The compliance of such engines shall be based on the following equation:

$$\frac{Lbs}{MW\text{-}hr} = \frac{Lbs}{MW_e\text{-}hr} \times \text{Electrical Energy Factor (EEF)}$$

Where:

Lbs/MW-hr = The calculated emissions standard~~that shall comply with the emission standards in Table IV~~

Lbs/MW_e-hr = The short-term engine emission limit in pounds per MWe-hr of net electrical energy produced.~~, averaged over 15 minutes. The engine shall comply with this limit at all times.~~

EEF = The annual MW_e-hrs of net electrical energy produced divided by the sum of annual MW_e-hrs plus annual MW_{th}-hrs of useful heat recovered. ~~The engine operator shall demonstrate annually that the EEF is less than the value required for compliance.~~

(iii) For combined heat and power engines, the short-term emission limits in lbs/MW_e-hr and the maximum allowed annual EEF must be selected by operator and stated on the operating permit.

(iv) ~~Notwithstanding Rule 2001, t~~The requirements of this subparagraph shall apply to NOx emissions from new non-emergency engines driving electrical-generators subject to Regulation XX (RECLAIM).

(v) This subparagraph does not apply to: engines installed prior to February 1, 2008; engines issued a permit to construct prior to February 1, 2008 and installed within 12 months of the date of the permit to construct; engines for which an application is deemed complete by October 1, 2007; engines installed by an electric utility on Santa Catalina Island; engines installed at remote locations without access to natural gas and electric power; engines used to supply electrical power to ocean-going vessels while at berth, prior to January 1, 2014; or landfill or digester gas-fired engines that meet the requirements of subparagraph (d)(1)(C).

(vi) For engines driving electrical generators and operating with a CEMS, a fixed-interval averaging time of one hour shall be used to demonstrate compliance with the NOx and CO emission standard ~~concentration~~ requirements of Table IV in lbs/MW-hr. For engines driving electrical generators and operating without a CEMS, the NOx and CO emission standard~~concentration~~ requirements of Table IV in lbs/MW-hr shall be averaged over 15 minutes.

(vii) ~~For o~~Owners and operators of new engines installed prior to January 1, 2024 with no ammonia emissions from ~~selective catalytic reduction pollution~~ add-on control equipment and where NOx emissions meet the concentration limit~~s~~ of

Table IV at all times~~during start-up,~~ may elect to apply for and comply with the concentration limits of Table IV, expressed in ppmvd, except an alternative VOC concentration limit that is equal to or less than ~~of~~ 25 ppmvd may be complied with~~used in lieu of the VOC concentration limit in Table IV for any new unit, up to 45 lbs of cumulative VOC emissions per day, installed before January 1, 2024~~. The Executive Officer shall accumulate daily VOC emissions in excess of the concentration limit of Table IV based on the permitted VOC limits from each such engine and shall not approve any additional permit for such engine that will cause the total accumulated daily VOC emissions to exceed 45 lbs per day. Any new installation on or after January 1, 2024 shall comply with the VOC concentration limit in Table IV in ppmvd.

~~(viii) The limits established by Table IV for a pollutant shall be specified in the permit to operate an as either an emission standard given in lbs/MW-hr or for engines with no ammonia emissions from selective catalytic control equipment and where NOx emissions meet the concentration limits, of Table IV during startup, as a concentration limit given in ppmvd.~~

(2) Portable Engines:

(A) The operator of any portable engine generator subject to this rule shall not use the portable generator for:

(i) Power production into the electric grid, except to maintain grid stability during an emergency event or other unforeseen event that affects grid stability; or

(ii) Primary or supplemental power to a building, facility, stationary source, or stationary equipment, except during unforeseen interruptions of electrical power from the serving utility, maintenance and repair operations, and remote operations where grid power is unavailable. For interruptions of electrical power, the operation of a portable generator shall not exceed the time of the actual interruption of power.

This subparagraph shall not apply to a portable generator that complies with emission concentration limits of Table I and the other requirements in this rule applicable to stationary engines.

(B) The operator of any portable diesel engine shall comply with the applicable requirements of the Subchapter 7.5 Airborne Toxic Control Measures for diesel particulate matter in Chapter 1, Division 3, Title 17 of the California Code of Regulations.

(C) The operator of any portable spark-ignited engine shall comply with the applicable requirements of the Large Spark Ignition Engine Fleet Requirements, Article 2, Chapter 15, Division 3, Title 13 of the California Code of Regulations.

(e) Compliance

(1) Agricultural Stationary Engines:

(A) The operator of any agricultural stationary engine subject to this rule and installed or issued a permit to construct prior to June 3, 2005 shall comply with subparagraph (d)(1)(B) and the other applicable provisions of this rule in accordance with the compliance schedules in Table V:

TABLE V
COMPLIANCE SCHEDULES FOR STATIONARY AGRICULTURAL ENGINES

Action Required	**Tier 2 and Tier 3 Diesel Engines, Certified Spark-Ignition Engines, and All Engines at Facilities with Actual Emissions Less Than the Amounts in the Table of Rule 219(q)**	**Other Engines**
Submit notification of applicability to the Executive Officer	January 1, 2006	January 1, 2006
Submit to the Executive Officer applications for permits to construct engine modifications, control equipment, or	March 1, 2009	September 1, 2007

replacement engines		
Initiate construction of engine modifications, control equipment, or replacement engines	September 30, 2009, or 30 days after the permit to construct is issued, whichever is later	March 30, 2008, or 30 days after the permit to construct is issued, whichever is later
Complete construction and comply with applicable requirements	January 1, 2010, or 60 days after the permit to construct is issued, whichever is later	July 1, 2008, or 60 days after the permit to construct is issued, whichever is later
Complete initial source testing	March 1, 2010, or 120 days after the permit to construct is issued, whichever is later	September 1, 2008, or 120 days after the permit to construct is issued, whichever is later

The notification of applicability shall include the following for each engine:

(i) Name and mailing address of the operator

(ii) Address of the engine location

(iii) Manufacturer, model, serial number, and date of manufacture of the engine

(iv) Application number

(v) Engine type (diesel, rich-burn spark-ignition or lean-burn spark-ignition)

(vi) Engine fuel type

(vii) Engine use (pump, compressor, generator, or other)

(viii) Expected means of compliance (engine replacement, control equipment installation, or electrification)

(B) The operator of any new agricultural stationary engine that is not subject to the compliance schedule of subparagraph (e)(1)(A) for existing engines shall comply with the requirements of subparagraph (d)(1)(J) immediately upon installation.

(2) Non-Agricultural Stationary Engines:

(A) The operator of any stationary engine not meeting the requirements of subparagraph~~s~~ (d)(1)(B) or (d)(1)(C) that go into effect in 2010 or later, shall comply with the compliance schedule in Table VI:

TABLE VI
COMPLIANCE SCHEDULE FOR NON -AGRICULTURAL STATIONARY ENGINES

Action Required	Applicable Compliance Date
Submit to the Executive Officer applications for permits to construct engine modifications, control equipment, or replacement engines	Twelve months before the final compliance date
Initiate construction of engine modifications, control equipment, or replacement engines	Three months before the final compliance date, or 60 days after the permit to construct is issued, whichever is later
Complete construction and comply with applicable requirements	The final compliance date, or 120 days after the permit to construct is issued, whichever is later
Complete initial source testing	60 days after the final compliance date in subparagraph (d)(1)(B) or (d)(1)(C), or 180 days after the permit to construct is issued, whichever is later

(B) The operator of any stationary engine that elects to amend a permit to operate to incorporate ECF-adjusted emission limits shall submit to the Executive Officer an application for a change of permit conditions by August 1, 2008, and comply with emission limits of the previous version of this rule until February 1, 2009 when the engine shall be in compliance with the emission limits of this rule.

(C) The operator of any stationary engine that is required to add operating restrictions to a permit to operate to meet the requirements of this rule shall submit to the Executive Officer an application for a change of permit conditions by August 1, 2008.

(3) Stationary Engine CEMS

(A) The operator of any stationary engine with an existing CEMS shall commence the reporting required by Rule 218 Subdivision (f) on January 1, 2008. The first summary report for the six months ending June 30, 2008 shall be due on July 30, 2008.

(B) The operator of any stationary engine that is required to modify an existing CEMS or install a CEMS on an existing engine shall comply with the compliance schedule in Table VII. Public agencies shall be allowed one year more than the dates in Table VII, except for biogas engines.

(C) The operator of any stationary engine that is located at a RECLAIM or former RECLAIM facility that is required to modify an existing CEMS or install a CEMS on an existing engine that is subject to paragraph (f)(1) shall comply with the compliance schedule in Table VII except that the operator shall submit to the Executive Officer applications for a new or modified CEMS within 90 days of becoming a former RECLAIM facility.

(i) For engines at a RECLAIM or former RECLAIM facility, installation of a CEMS is required concurrently with the installation of retrofit control technologies or new engine replacements to meet the requirements of paragraph (d)(1).

TABLE VII
COMPLIANCE SCHEDULE FOR NEW OR MODIFIED CEMS ON EXISTING ENGINES

Action Required	**Applicable Compliance Dates For:**		
	Non-Biogas Engines Rated at 750 bhp or More	**Non-Biogas Engines Rated at Less than 750 bhp**	**Biogas Engines***
Submit to the Executive Officer applications for new or modified CEMS	August 1, 2008	August 1, 2009	January 1, 2011
Complete installation and commence CEMS operation, calibration, and reporting requirements	Within 180 days of initial approval	Within 180 days of initial approval	Within 180 days of initial approval

Complete certification tests	Within 90 days of installation	Within 90 days of installation	Within 90 days of installation
Submit certification reports to Executive Officer	Within 45 days after tests are completed	Within 45 days after tests are completed	Within 45 days after tests are completed
Obtain final approval of CEMS	Within 1 year of initial approval	Within 1 year of initial approval	Within 1 year of initial approval

* A biogas engine is one that is subject to the emission limits of Table III.

(4) Stationary Engine Inspection and Monitoring (I&M) Plans:

The operator of stationary engines subject to the I&M plan provisions of subparagraph (f)(1)(D) shall:

(A) By August 1, 2008, submit an initial I&M plan application to the Executive Officer for approval;

(B) By December 1, 2008, implement an approved I&M plan or the I&M plan as submitted if the plan is not yet approved.

Any operator of 15 or more stationary engines subject to the I&M plan provisions shall comply with the above schedule for at least 50% of engines, and for the remaining engines shall:

(C) By February 1, 2009, submit an initial I&M plan application to the Executive Officer for approval;

(D) By June 1, 2009, implement an approved I&M plan or the I&M plan as submitted if the plan is not yet approved.

(5) Stationary Engine Air-to-Fuel Ratio Controllers

(A) The operator of any stationary engine that does not have an air-to-fuel ratio controller, as required by subparagraph (d)(1)(K), shall comply with those requirements in accordance with the compliance schedule in Table V, except that the application due date is no later than May 1, 2008 and the initial source testing may be conducted at the time of the testing required by subparagraph (f)(1)(C).

(B) The operator of any stationary engine that has the air-to-fuel ratio controller required by subparagraph (d)(1)(K), but it is not listed on the permit to operate, shall submit to the Executive Officer an application to amend the permit by April 1, 2008.

(C) The operator of more than five engines that do not have air-to-fuel ratio controllers may take an additional three months, to May 1, 2009, to install the equipment on up to 50% of the affected engines.

(6) New Stationary Engines

The operator of any new stationary engine issued a permit to construct after February 1, 2008 shall comply with the applicable I&M or CEMS requirements of this rule when operation commences. If applicable, the operator shall provide the required information in subparagraph (f)(1)(D) to the Executive Officer prior to the issuance of the permit to construct so that the I&M procedures can be included in the permit. A separate I&M plan application is not required.

(7) Biogas Engines

For any biogas engine for which the operator applies to the Executive Officer by April 1, 2008 for a change of permit conditions for ECF-corrected emission limits, or the approval to burn more than 10 percent natural gas in accordance with subparagraph (d)(1)(C), the biogas engine shall not be subject to the initial concentration limits of Tables II or III until August 1, 2008, provided the operator continues to comply with all emission limits in effect prior to February 1, 2008.

(8) Compliance Schedule Exception

If an engine operator submits to the Executive Officer an application for an administrative change of permit conditions to add a permit condition that causes the engine permit to expire by the effective date of any requirement of this rule, then the operator is not required to comply with the earlier steps required by this subdivision for that requirement. The effective date for the CEMS requirements shall be one year after the date that a CEMS application is due.

(9) Exceedance of Usage Limits

(A) If an engine was initially exempt from the new concentration limits in subparagraph (d)(1)(B) or subparagraph (d)(1)(C) that take effect on or after July 1, ~~2010~~ 2011 because of low engine use but later exceeds the low-use criteria, the operator shall bring the engine into compliance with the rule in accordance with the schedule in Table VI with the final compliance date in Table VI being twelve months after the conclusion of the first twelve-month period for which the engine exceeds the low-use criteria.

(B) If engines that were initially exempt from new CEMS by the low-use criterion in subclause (f)(1)(A)(ii)(I) later exceed that criterion, the operator shall install CEMS on those engines in accordance with the schedule in Table VII, except that the date for submitting the CEMS application in Table VII shall be six months after the conclusion of the first twelve-month period for which the engines exceed the criterion.

<u>(10)</u> <u>RECLAIM or Former RECLAIM Facilities</u>

<u>The owner or operator of a RECLAIM or former RECLAIM facility with any unit(s) subject to subdivision (d) shall meet the applicable NOx emission limit in Table II or III-B in accordance with the schedule specified in Rule 1100 – Implementation Schedule for NOx Facilities.</u>

(f) Monitoring, Testing, Recordkeeping and Reporting

(1) Stationary engines:

The operator of any engine subject to the provisions of paragraph (d)(1) of this rule shall meet the following requirements:

(A) Continuous Emission Monitoring

(i) For engines of 1000 bhp and greater and operating more than two million bhp-hr per calendar year, a NO_x and CO ~~continuous emission monitoring system (~~CEMS~~)~~ shall be installed, operated and maintained in calibration to demonstrate compliance with the emission limits of this rule.

(ii) (I) For facilities with engines subject to paragraph (d)(1), having a combined rating of 1500 bhp or greater at the same location, and having a combined fuel usage of more than 16 x 10^9 Btus per year (higher heating value), CEMS shall be installed, operated and maintained in calibration to demonstrate compliance of those engines with the applicable NO_x and CO emission limits of this rule.

(II) Any engine that as of October 1, 2007 is located within 75 feet of another engine (measured from engine block to engine block) is considered to be at the same location. Operators of new engines shall not install engines farther than 75 feet from another engine unless the operator demonstrates to the Executive Officer that operational needs or space limitations require it.

(III) The following engines shall not be counted toward the combined rating or required to have a CEMS by this clause: engines rated at less than 500 bhp; standby engines that are limited by permit conditions to only operate when other primary engines are not operable; engines that are limited by permit conditions to operate less than 1000 hours per year or a fuel usage of less than 8 x 10^9 Btus per year (higher heating value of all fuels used); engines that are used primarily to fuel public natural gas transit vehicles and that are required by a permit condition to be irreversibly removed from service by December 31, 2014; and engines required to have a CEMS by the previous clause. A CEMS shall not be required if permit conditions limit the simultaneous use of the engines at the same location in a manner to limit the combined rating of all engines in simultaneous operation to less than 1500 bhp.

(IV) For engines rated below 1000 bhp, the CEMS may be time shared by multiple engines.

(V) Operation of engines by the electric utility in the Big Bear Lake area during the failure of a transmission line to the utility may be excluded from an hours-per-year or fuel usage limit that is elected by the operator pursuant to subclause (f)(1)(A)(ii)(III).

(VI) In lieu of complying with subclause (f)(1)(A)(ii)(I), an operator that is a public agency, or is contracted to operate engines solely for a public agency, may comply with the Inspection and Monitoring Plan requirements of subparagraph (f)(1)(D), except that the operator shall conduct diagnostic emission checks at least weekly or every 150 operating hours, whichever occurs later. If any such engine is found to exceed an applicable NOx or CO limit by a source test required by subparagraph (f)(1)(C) or South Coast AQMD ~~District~~ test using a portable analyzer on three or more occasions in any 12-month period, the operator shall comply with the CEMS requirements of this subparagraph for such engine in accordance with the compliance schedule of Table VII, except that the operator shall submit a CEMS application to the Executive Officer within six months of the third exceedance.

(iii) All CEMS required by this rule shall:

(I) Comply with the applicable requirements of Rules 218 and 218.1, including equipment specifications and certification, operating, recordkeeping, quality assurance and reporting requirements, except as otherwise authorized by this rule;

(II) Include equipment that measures and records exhaust gas concentrations, both uncorrected and corrected to 15 percent oxygen on a dry basis; and

(III) Have data gathering and retrieval capability approved by the Executive Officer

(iv) The operator of an engine that is required to install CEMS may request the Executive Officer to approve an alternative monitoring device (or system components) to demonstrate compliance with the emission limits of this rule. The applicant shall demonstrate to the Executive Officer that the proposed alternative monitoring device is at a minimum equivalent in relative accuracy, precision, reliability, and timeliness to a CEMS for that engine, according to the criteria specified in 40 CFR Part 75 Subpart E. In lieu of the criteria specified in 40 CFR Part 75 Subpart E, substitute criteria is acceptable if the applicant demonstrates to the Executive Officer that the proposed alternative monitoring device is at minimum equivalent in relative accuracy, precision, reliability, and timeliness to a CEMS for that engine. Upon approval by the Executive Officer, the substitute criteria shall be submitted to EPA as an amendment to the State Implementation Plan (SIP).

If the alternative monitoring device is denied or fails to be recertified, a CEMS shall be required.

(v) Notwithstanding the requirements of Rules 218 and 218.1, operators of engines that are required to install a CEMS by clause (f)(1)(A)(ii) may:

(I) Store data electronically without a strip chart recorder, but there shall be redundant data storage capability for at least 15 days of data. The operator must demonstrate that both sets of data are equivalent.

(II) Conduct relative accuracy testing on the same schedule for source testing in clause (f)(1)(C)(i), instead of annually. The minimum sampling time for each test is 15 minutes.

(vi) Notwithstanding the requirements of Rules 218 and 218.1, operators of engines that are required to install a CEMS by clause (f)(1)(A)(ii), and that are to be monitored by a timeshared CEMS, may:

(I) Monitor an engine with the CEMS for 15 consecutive minutes, purge for the minimum required purge time, then monitor the next engine for 15 consecutive minutes. The CEMS shall operate continuously in this manner, except for required calibrations.

(II) Record the corrected and uncorrected NOx, CO and diluent data at least once per minute and calculate and record the 15-minute average corrected concentrations for each sampling period.

(III) Have sample lines to each engine that are not the same length. The purge time will be based on the sample line with the longest response time. Response times shall be checked during cylinder gas audits. Sample lines shall not exceed 100 feet in length.

(IV) Conduct a minimum of five tests for each engine during relative accuracy tests.

(V) Perform a cylinder gas audit every calendar quarter on each engine, except for engines for which relative accuracy testing was conducted that quarter.

(VI) Exclude monitoring of nitrogen dioxide (NO_2) for rich-burn engines, unless source testing demonstrates that NO_2 is more than 10 percent of total NOx.

(VII) Conduct daily calibration error (CE) tests by injecting calibration gases at the analyzers, except that at least once per week the CE test shall be conducted by injecting calibration gases as close to the probe tip as practical.

(VIII) Stop operating and calibrating the CEMs during any period that the operator has a continuous record that the engine was not in operation.

(vii) A CO CEMS shall not be required for lean-burn engines or an engine that is subject to Regulation XX (RECLAIM), and not required to have a NOx CEMS by that regulation.

(viii) Notwithstanding the requirements of this paragraph and paragraph (c)(2) of Rule 2012, an operator may take an existing NOx CEMS out of service for up to two weeks (cumulative) in order to modify the CEMS to add CO monitoring.

<u>(ix)</u> <u>In lieu of clause (f)(1)(A)(i), an Essential Public Service or a contractor for an Essential Public Service that is operating a biogas engine of 1000 bhp and greater and less than 1200 bhp, may alternatively comply with the Inspection and Monitoring Plan requirements of subparagraph (f)(1)(D), provided the operator conducts diagnostic emission checks at least weekly or every 150 operating hours, whichever</u>

occurs later.

(x) If an Essential Public Service or a contractor for an Essential Public Service has elected to comply with the Inspection and Monitoring Plan provisions pursuant to clause (f)(1)(A)(ix) for biogas engines is found to exceed an applicable NOx or CO limit by a source test required by subparagraph (f)(1)(C) or South Coast AQMD test using a portable analyzer on three or more occasions in any 12-month period, the operator shall comply with the CEMS requirements of clause (f)(1)(A)(i) for such biogas engine in accordance with the compliance schedule of Table VII except that the operator shall submit a CEMS application to the Executive Officer within six months of the third exceedance.

(B) Elapsed Time Meter

Maintain an operational non-resettable totalizing time meter to determine the engine elapsed operating time.

(C) Source Testing

(i) Effective August 1, 2008, conduct source testing for NO_x, VOC reported as carbon, and CO concentrations (concentrations in ppm by volume, corrected to 15 percent oxygen on dry basis) at least once every two years from the date of the previous source test, no later than the last day of the calendar month that the test is due, or every 8,760 operating hours, whichever occurs first. Relative accuracy tests required by Rule 218.1 or 40 CFR Part 75 Subpart E shall~~will~~ satisfy this requirement for those pollutants monitored by a CEMS. The above source test frequency may be reduced to once every three years if the engine has operated less than 2,000 hours since the last source test. If the engine has not been operated before ~~within three months of~~ the date a source test is ~~required~~due, the source test shall be conducted by the end of~~when the engine resumes operation for a period longer than either~~ seven consecutive days or 15 cumulative days of resumed operation. The operator of the engine shall keep sufficient operating records to demonstrate that it meets the requirements for extension of the source testing deadlines.

(ii) Conduct source testing for at least 30 minutes during normal operation (actual duty cycle). This test shall not be conducted under a steady-state condition unless it is the normal operation. In addition, conduct source testing for NOx and CO emissions for at least 15 minutes at: an engine's actual peak load, or the maximum load that can be practically achieved during the test, and; at actual minimum load, excluding idle, or the minimum load that can be practically achieved during the test. These additional two tests are not required if the permit limits the engine to operating at one defined load, ± 10%. No pre-tests for compliance are permitted. The emission test shall be conducted at least 40 operating hours, or at least 1 week, after any engine servicing or tuning. If an emission exceedance is found during any of the three phases of the test, that phase shall be completed and reported. The operator shall correct the exceedance, and the source test may be immediately resumed. Relative accuracy tests required by Rule 218.1 or 40 CFR Part 75 Subpart E shall satisfy this requirement for those pollutants monitored by a CEMS for all applicable operating loads specified in this clause (f)(1)(C)(ii).

(iii) Use a contractor to conduct the source testing that is approved by the Executive Officer under the Laboratory Approval Program for the necessary test methods.

(iv) Submit a source test protocol to the Executive Officer for written approval at least 60 days before the scheduled date of the test. The source test protocol shall include the name, address and phone number of the engine operator and a South Coast AQMD ~~District-~~approved source testing contractor that will conduct the test, the application and permit number(s), emission limits, a description of the engine(s) to be tested, the test methods and procedures to be used, the number of tests to be conducted and under what loads, the required minimum sampling time for the VOC test, based on the analytical detection limit and expected VOC levels, and a description of the parameters to be measured in accordance with the I&M plan required by subparagraph (f)(1)(D). The source test protocol shall be approved by the Executive Officer prior to any testing. The operator is not required to submit a protocol for approval if: there is a previously approved protocol that meets these requirements; the engine has not been altered in a manner that requires a permit alteration; and emission limits have not changed since the previous test. If the operator submits the protocol by the required date, and the Executive Officer takes longer than 60 days to approve the protocol, the operator shall be allowed the additional time needed to conduct the test.

(v) Provide the Executive Officer at least 30 days prior notice of any source test to afford the Executive Officer the opportunity to have an observer present. If after 30 days notice for an initially scheduled performance test, there is a delay (due to operational problems, etc.) in conducting the scheduled performance test, the engine operator shall notify the Executive Officer as soon as possible of any delay in the original test date, either by providing at least seven days prior notice of the rescheduled date of the performance test, or by arranging a rescheduled date with the Executive Officer by mutual agreement.

(vi) Submit all source test reports, including a description of the equipment tested, to the Executive Officer within 60 days of completion of the test.

(vii) By February 1, 2009, provide, or cause to be provided, source testing facilities as follows:

(I) Sampling ports adequate for the applicable test methods. This includes constructing the air pollution control system and stack or duct such that pollutant concentrations can be accurately determined by applicable test methods;

(II) Safe sampling platform(s), scaffolding or mechanical lifts, including safe access, that comply with California General Safety Orders. Agricultural stationary engines are excused from this subclause if they are in remote locations without electrical power;

(III) Utilities for sampling and testing equipment. Agricultural stationary engines are exempt from this subclause if they are on wheels and moved to storage during the off season.

(D) Inspection and Monitoring (I&M) Requirements

(i) I&M Plan. The operator shall:

(I) Submit to the Executive Officer for written approval an I&M plan. One plan application is required for each facility that does not have a NOx and CO CEMS for each engine. The I&M plan shall include all items listed in Attachment 1. <u>The owner or operator may request an alternative item(s) in Attachment 1 that is determined by the Executive Officer to be equivalent in meeting the same objectives.</u>

(II) Upon written approval by the Executive Officer, implement the I&M plan as approved.

(III) Submit an I&M plan for approval to the Executive Officer for a plan revision before any change in I&M plan operations can be implemented. The operator shall apply for a plan revision prior to any change in emission limits or control equipment.

(ii) Diagnostic emission checks by a portable NOx, CO, and oxygen analyzer shall be conducted at least weekly or every 150 engine operating hours, whichever occurs later.

(I) If an engine is in compliance for three consecutive diagnostic emission checks, without any adjustments to the oxygen sensor set points, then the engine may be checked monthly or every 750 engine operating hours, whichever occurs later, until there is a noncompliant diagnostic emission check or, for rich-burn engines with three-way catalysts, until the oxygen sensor is replaced. When making adjustments to the oxygen sensor set points that are not within 72 hours prior to the diagnostic emission check, returning to a more frequent diagnostic emission check schedule is not required if the engine is in compliance with the applicable emission limits prior to and after the set point adjustments.

(II) For diesel engines and other lean-burn engines that ~~are subject to Regulation XX~~operate at a RECLAIM or former RECLAIM facility or have a NOx CEMS, and that are subject to a CO limit more stringent than the 2000 ppmvd limit of Tables II or III, a CO diagnostic emission check shall be performed at least quarterly, or every 2,000 engine operating hours, whichever occurs later.

(III) For diesel engines and other lean-burn engines that ~~are subject to Regulation XX~~operate at a RECLAIM or former RECLAIM facility or have a NOx CEMS, and that are not subject to a CO limit more stringent than the 2000 ppmvd limit of Tables II or III, diagnostic emission checks are not required.

(IV) No engine or control system maintenance or tuning may be conducted within 72 hours prior to the diagnostic emission check, unless it is an unscheduled, required repair.

(V) The portable analyzer shall be calibrated, maintained and operated in accordance with the manufacturer's specifications and recommendations and the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Stationary Engines Subject to South Coast Air Quality Management District Rule 1110.2, approved on February 1, 2008, or subsequent protocol approved by EPA and the Executive

Officer.

(iii) Requirements for responding to, diagnosing and correcting breakdowns, faults, malfunctions, alarms, diagnostic emission checks finding emissions in excess of rule or permit limits, and parameters out-of-range.

(I) For any diagnostic emission check or breakdown that results in emissions in excess of those allowed by this rule or a permit condition, the operator shall correct the problem as soon as possible and demonstrate compliance with another diagnostic emission check, or shut down an engine by the end of an operating cycle, or within 24 hours from the time the operator knew of the breakdown or excess emissions, or reasonably should have known, whichever is sooner.

(II) For excess emissions due to breakdowns that result in NOx or CO emissions greater than the concentrations specified in Table VIII, the operator shall not be considered in violation of this rule if the operator demonstrates the all of the following: (1) compliance with subclause (f)(1)(D)(iii)(I), (2) compliance with the reporting requirements of subparagraph (f)(1)(H), and (3) the engine with excess emissions has no more than three incidences of breakdowns with emissions exceeding Table VIII limits in the calendar quarter.

TABLE VIII
EXCESS EMISSION CONCENTRATION THRESHOLDS FOR BREAKDOWNS

	NO_x (ppmvd)[1]	CO (ppmvd)[1]
Lean-Burn Engines	45	250
Rich-Burn Engines	150	2000
Biogas Engines[2]	185	2000

[1] Corrected to 15% oxygen.

[2] Effective up to the time of compliance with the limits specified in Table III-B, after which the thresholds revert to the applicable lean or rich-burn engine limits.

(III) Any emission check conducted by South Coast AQMD ~~District~~ staff that finds excess emissions will be treated as a violation.

(IV) For other problems, such as parameters out-of-range, an operator shall correct the problem and demonstrate compliance with another diagnostic emission check within 48 hours of the operator first knowing of the problem.

(iv) If an engine has a NOx CEMS and does not have a CO CEMS, it is subject to this subparagraph (f)(1)(D) as it pertains to CO only.

(E) Operating Log

Maintain a monthly engine operating log that includes:

(i) Total hours of operation;

(ii) Type of liquid and/or type of gaseous fuel;

(iii) Fuel consumption (cubic feet of gas and gallons of liquid); and

(iv) Cumulative hours of operation since the last source test required in subparagraph (f)(1)(C).

Facilities subject to Regulation XX may maintain a quarterly log for engines that are designated as a process unit on the facility permit until such time that the facility becomes a former RECLAIM facility. The facility shall maintain a monthly engine log starting in the month that it has become a former RECLAIM facility.

(F) New Non-Emergency Electrical Generating Engines

Operators of engines subject to the requirements of subparagraph (d)(1)(L) shall also meet the following requirements.

(i) The engine generator shall be monitored with a calibrated electric meter that measures the net electrical output of the engine generator system, which is the difference between the electrical output of the generator and the electricity consumed by the auxiliary equipment necessary to operate the engine generator.

(ii) For engines monitored with a CEMS, the emissions of the monitored pollutants in ppmvd corrected to 15% O2, lbs/hr, and lbs/MW_e-hr and the net MW_e-hrs produced shall be calculated and recorded for the four 15-minute periods of each hour of operation. The mass emissions of NOx shall be calculated based on the measured fuel flow and one of the F factor methods of 40 CFR Part 60, Appendix A, Method 19, or other method approved by the Executive Officer. Mass emissions of CO shall be calculated in the same manner as NOx, except that the ppmvd CO shall be converted to lb/scf using a conversion factor of 0.727×10^{-7}.

(iii) For NOx and CO emissions from engines not monitored with a CEMS and VOC emissions from all engines, the emissions of NOx, CO and VOC in lbs/MW_e-hr shall be calculated and recorded whenever the pollutant is measured by a source test or diagnostic emission check. Mass emissions of NOx and CO shall be calculated in the same manner as the previous clause. Mass emissions of VOC shall be calculated in the same manner, except that the ppmvd VOC as carbon shall be converted to lb/scf using a conversion factor of 0.415×10^{-7}.

(iv) For engines generating combined heat and power that rely on the EEF to comply with Table IV emission standards, the daily and annual useful heat recovered (MW_{th}-hrs), net electrical energy generated (MW_e-hrs) and EEF shall be monitored and recorded.

(v) Other methods of calculating mass emissions than those specified, such as by direct measurement of exhaust volume, may be used if approved by the Executive Officer. All monitoring, calculation, and recordkeeping procedures must be approved by the Executive Officer.

(vi) Operators of combined heat and power engines shall submit to the Executive Officer the reports of the following information within 15 days of the end of the first year of operation, and thereafter within 15 days of the end of each calendar year: the annual net electrical energy generated (MW_e-hrs); the annual useful heat recovered (MW_{th}-hrs), the annual EEF calculated in accordance with clause (d)(1)(L)(ii); and the maximum annual EEF allowed by the operating permit. If the actual annual EEF exceeds the allowed EEF, the report shall also include the time periods and emissions for all instances where emissions exceeded any emission standard in Table IV.

(G) Portable Analyzer Operator Training

The portable analyzer tests required by the I&M Plan requirements of subparagraph (f)(1)(D) shall only be conducted by a person who has completed an appropriate South Coast AQMD ~~District~~-approved training program in the operation of portable analyzers and has received a certification issued by the District.

(H) Reporting Requirements

(i) The operator shall report to the Executive Officer, by telephone (1-800-CUT-SMOG or 1-800-288-7664) or other South Coast AQMD ~~District~~-approved method, any breakdown resulting in emissions in excess of rule or permit emission limits within one hour of such noncompliance or within one hour of the time the operator knew or reasonably should have known of its occurrence. Such report shall identify the time, specific location, equipment involved, responsible party to contact for further information, and to the extent known, the causes of the noncompliance, and the estimated time for repairs. In the case of emergencies that prevent a person from reporting all required information within the one-hour limit, the Executive Officer may extend the time for the reporting of required information provided the operator has notified the Executive Officer of the noncompliance within the one-hour limit.

(ii) Within seven calendar days after the reported breakdown has been corrected, but no later than thirty calendar days from the initial date of the breakdown, unless an extension has been approved in writing by the Executive Officer, the operator shall submit a written breakdown report to the Executive Officer which includes:

(I) An identification of the equipment involved in causing, or suspected of having caused, or having been affected by the breakdown;

(II) The duration of the breakdown;

(III) The date of correction and information demonstrating that compliance is achieved;

(IV) An identification of the types of excess emissions, if any, resulting from the breakdown;

(V) A quantification of the excess emissions, if any, resulting from the breakdown and the basis used to quantify the emissions;

(VI) Information substantiating whether the breakdown resulted from operator error, neglect or improper operation or maintenance procedures;

(VII) Information substantiating that steps were immediately taken to correct the condition causing the breakdown, and to minimize the emissions, if any, resulting from the breakdown;

(VIII) A description of the corrective measures undertaken and/or to be undertaken to avoid such a breakdown in the future; and

(IX) Pictures of any equipment which failed, if available.

(iii) Within 15 days of the end of each calendar quarter, the operator shall submit to the Executive Officer a report that lists each occurrence of a breakdown, fault, malfunction, alarm, engine or control system operating parameter out of the acceptable range established by an I&M plan or permit condition, or a diagnostic emission check that finds excess emissions. Such report shall be in a South Coast AQMD ~~District~~ approved format, and for each incident shall identify the time of the incident, the time the operator learned of the incident, specific location, equipment involved, responsible party to contact for further information, to the extent known the causes of the event, the time and description of corrective actions, including shutting an engine down, and the results of all portable analyzer NOx and CO emissions checks done before or after the corrective actions. The operator shall also report if no incidents occurred.

(2) Portable engines:

The operator of any portable engine shall maintain a monthly engine operating log that includes:

(i) Total hours of operation; or

(ii) Type of liquid and/or type of gaseous fuel; and

(iii) Fuel consumption (cubic feet of gas and gallons of liquid).

Facilities subject to Regulation XX may maintain a quarterly log for engines that are designated as a process unit on the facility permit until such time that the facility becomes a former RECLAIM facility. The facility shall maintain a monthly engine log starting in the month that it has become a former RECLAIM facility.

(3) Recordkeeping for All Engines

All data, logs, test reports and other information required by this rule shall be maintained for at least five years and made available for inspection by the Executive Officer.

(g) Test Methods

Testing to verify compliance with the applicable requirements shall be conducted in accordance with the test methods specified in Table IX, or any test methods approved by CARB and EPA, and authorized by the Executive Officer.

TABLE IX
TESTING METHODS

Pollutant	**Method**
NO_x	South Coast Air Quality Management District Method 100.1
CO	South Coast Air Quality Management District Method 100.1
VOC	South Coast Air Quality Management District Method 25.1* or ~~District~~ Method 25.3*

* Excluding ethane and methane

A violation of any standard of this rule established by any of the specified test methods, or any test methods approved by the CARB or EPA, and authorized by the Executive Officer, shall constitute a violation of this rule.

(h) Alternate Compliance Option

(1) In lieu of complying with the applicable emission limits by the effective date specified in Table III-B or subparagraph (d)(1)(F), owners or operators of biogas-fired units may elect to defer compliance in quarterly increments up to one additional year, provided the owner or operator:

(A) Submits an alternate compliance plan and pays a Compliance Flexibility Fee, as provided for in paragraph (h)(2), to the Executive Officer at least 60 days prior to the applicable compliance date in either Table III-B or subparagraph (d)(1)(F) for qualified biogas technology demonstration project engines, and

(B) Maintains on-site a copy of verification of Compliance Flexibility Fee payment and ~~AQMD~~ South Coast AQMD approval of the alternate compliance plan that shall be made available upon request to South Coast AQMD ~~AQMD~~ staff.

(2) Plan Submittal

The alternate compliance plan submitted pursuant to paragraph (h)(1) shall include:

(A) A completed South Coast AQMD ~~AQMD~~ Form 400A with company name, South Coast AQMD ~~AQMD~~ Facility ID, identification that application is for a compliance plan (Section 7a of form), and identification that request is for Rule 1110.2 Compliance Flexibility Fee option (Section 9 of form);

(B) Attached documentation of unit permit ID, unit rated brake horsepower (bhp), and fee calculation;

(C) Filing Fee payment; and

(D) Compliance Flexibility Fee payment as calculated by the following equation:

CFF = bhp x R x Q

Where,

CFF = Compliance Flexibility Fee, $

bhp = rated brake horsepower of unit

R = Fee Rate = $11.75 per brake horsepower per quarter

Q = Number of quarters (up to four)

(3) Usage of Compliance Flexibility Fee funds

The funds collected from the Compliance Flexibility Fee will be applied to South Coast AQMD ~~AQMD~~ NOx reduction programs pursuant to protocols approved under South Coast AQMD ~~District~~ rules.

(i) Exemptions

(1) The provisions of subdivision (d) shall not apply to:

(A) All orchard wind machines powered by an internal combustion engine.

(B) Emergency standby engines, engines used for fire-fighting and flood control, and any other emergency engines approved by the Executive Officer, which have permit conditions that limit operation to 200 hours or less per year as determined by an elapsed operating time meter, and agricultural emergency standby engines that are exempt from a South Coast AQMD ~~District~~ permit and operate 200 hours or less per year as determined by an elapsed operating time meter.

(C) Laboratory engines used in research and testing purposes.

(D) Engines operated for purposes of performance verification and testing of engines.

(E) Auxiliary engines used to power other engines or gas turbines during start-ups.

(F) Portable engines that are registered under the state registration program pursuant to Title 13, Article 5 of the CCR.

(G) Nonroad engines, with the exception that subparagraph (d)(2)(A) shall apply to portable generators.

(H) Engines operating on San Clemente Island~~; and engines operated by the County of Riverside for the purpose of public safety communication at Santa Rosa Peak in Riverside County, where the site is located at an elevation of higher than 7,400 feet above sea level and is without access to electric power and natural gas~~.

(I) Agricultural stationary engines provided that:

(i) The operator submits documentation to the Executive Officer by the applicable date in Table V when permit applications are due that the applicable electric utility has rejected an application for an electrical line extension to the location of the engines, or the Executive Officer determines that the operator does not qualify, due to no fault of the operator, for funding authorized by California Health and Safety Code Section 44229; and

(ii) The operator replaces the engines, in accordance with the compliance schedule of Table X, with engines certified by CARB to meet the Tier 4 emission standards of 40 CFR Part 1039 Section 1039.101, Table 1. These Tier 4 replacement engines shall be considered to comply with Best Available Control Technology; and

(iii) The operator does not operate the Tier 4 engines in a manner that exceeds the not-to-exceed standards of 40 CFR Part 1039 Section 1039.101~~, Paragraph~~ (e), as determined by the test methods of subdivision (g) of this rule.

TABLE X
COMPLIANCE SCHEDULE FOR INSTALLATION OF NEW TIER 4 STATIONARY AGRICULTURAL ENGINES

Action Required	Due Date
Submit to the Executive Officer applications for permits to construct engine modifications, control equipment, or replacement engines	March 1, 2013
Initiate construction of engine modifications, control equipment, or replacement engines	September 30, 2013, or 30 days after the permit to construct is issued, whichever is later
Complete construction and comply with applicable requirements	January 1, 2014, or 60 days after the permit to construct is issued, whichever is later
Complete initial source testing	March 1, 2014, or 120 days after the permit to construct is issued, whichever is later

(J) An engine start-up, until sufficient operating temperatures are reached for proper operation of the emission control equipment or for the tuning of the engine and/or emission control equipment, and an engine shutdown period. The periods shall not exceed 30 minutes, unless the Executive Officer approves in writing a longer period not exceeding two hours for an engine and makes it a condition of the engine permit.

(K) An engine start-up, after an engine overhaul or major repair requiring removal of a cylinder head or for the installation or the replacement of catalytic emission control equipment, for a period not to exceed four operating hours.

(L) The initial commissioning of a new engine for a period specified by permit conditions, provided the operator takes measures to reduce emissions and the duration of the commissioning to the extent possible. The commissioning period shall not exceed 150 operating hours.

(M) An engine used exclusively for electrical generation at remote two-way radio transmission towers where no utility, electricity, or natural gas is available within a ½ mile radius, has a manufacturer's rating of 100 bhp or less, and is fired exclusively on diesel #2, compressed natural gas, or liquefied petroleum gas.

(N) Any engine 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.

(O) An engine operated in either the Southern California Coastal Waters or Outer Continental Shelf Waters provided:

(i) The engine is used to power a crane;

(ii) The engine is certified by CARB to meet the Tier 4 – Final emission standards of 40 CFR Part 1039 Section 1039.101 Table 1;

(iii) The engine is operated per the specifications of the engine manufacturer; and

(iv) The operator submits an I&M Plan to the Executive Officer for approval and implementation, pursuant to the requirements of subparagraph (f)(1)(D).

(2) The facility operator of MM PRIMA DESHECHA ENERGY, LLC, or any of its successors, shall not be required to meet the emissions requirements

specified in Table III-B if they submit a detailed retirement plan that is approved by the Executive Officer for the permanent shutdown of all equipment subject to Rule 1110.2 by October 1, 2022. The plan shall describe in detail the steps and schedule that will be taken to remove the equipment or render the equipment permanently inoperable by October 1, 2022 and shall require the surrendering of the permits for the equipment by that date. The plan shall be submitted before July 1, 2016 and include:

(A) South Coast AQMD ~~SCAQMD~~ Form 400A with company name, South Coast AQMD ~~SCAQMD~~ Facility ID, and permit number(s) for the subject equipment; and

(B) Filing Fee payment pursuant to Rule 306.

The Executive Officer shall act on the plan before January 1, 2017.

(3) The provisions of this rule shall not apply to units located at landfills or publicly owned treatment works that are subject to a NOx emission limit in a Regulation XI rule adopted or amended after *[Date of Amendment]*.

ATTACHMENT 1

An I&M Plan submitted to the Executive Officer for approval and implementation, pursuant to the requirements of paragraphs (e)(4) and (e)(6), and subparagraph (f)(1)(D) of the rule, shall include:

A. Identification of engine and control equipment operating parameters necessary to maintain pollutant concentrations within the rule and permit limits. This shall include, but not be limited to:

   1. Procedures for using a portable NOx, CO and oxygen analyzer to establish the set points of the air-to-fuel ratio controller (AFRC) at 25%, 60% and 95% load (or fuel flow rate), ± 5%, or the minimum, midpoint and maximum loads that actually occur during normal operation, ± 5%, or at any one load within the ± 10% range that an engine permit is limited to in accordance with clause (f)(1)(C)(ii) of the rule;
   2. Procedures for verifying that the AFRC is controlling the engine to the set point during the daily monitoring required by subdivision D of this attachment;
   3. Procedures for reestablishing all AFRC set points with a portable NOx, CO and oxygen analyzer whenever a set point must be readjusted, within 24 hours of an oxygen sensor replacement, and, for rich-burn engines with three way catalysts, between 100 and 150 engine operating hours after an oxygen sensor replacement;
   4. For engines with catalysts, the maximum allowed exhaust temperature at the catalyst inlet, based on catalyst manufacturer specifications;
   5. For lean-burn engines with selective catalytic control devices, the minimum exhaust temperature at the catalyst inlet required for reactant flow (ammonia or urea), and procedures for using a portable NOx and oxygen analyzer to establish the acceptable range of reactant flow rate, as a function of load.

   Parameter monitoring is not required for diesel engines without exhaust gas recirculation and catalytic exhaust control devices.

B. Procedures for alerting the operator to emission control malfunctions. Engine control systems, such as air-to-fuel ratio controllers, shall have a malfunction indicator light and audible alarm.

C. Procedures for diagnostic emission checks conducted by a portable NOx, CO, and oxygen analyzer per the requirements of clause (f)(1)(D)(ii) of the rule.

D. Procedures for at least daily monitoring, inspection and recordkeeping of:

1. engine load or fuel flow rate;
2. the set points, maximums and acceptable ranges of the parameters identified by subdivision A of this attachment, and the actual values of the same parameters;
3. the engine elapsed time meter operating hours;
4. the operating hours since the last diagnostic emission check required by clause (f)(1)(D)(ii) of the rule;
5. for rich-burn engines with three-way catalysts, the difference of the exhaust temperatures (ΔT) at the inlet and outlet of the catalyst (changes in the ΔT can indicate changes in the effectiveness of the catalyst);
6. engine control system and AFRC system faults or alarms that affect emissions.

The daily monitoring and recordkeeping may be done in person by the operator, or by remote monitoring.

E. Procedures for responding to, diagnosing and correcting breakdowns, faults, malfunctions, alarms, diagnostic emission checks finding emissions in excess of rule or permit limits, and parameters out-of-range, per the requirements of clause (f)(1)(D)(iii) of the rule.

F. Procedures and schedules for preventive and corrective maintenance.

G. Procedures for reporting noncompliance to the Executive Officer in accordance with subparagraph (f)(1)(H) of the rule.

H. Procedures and format for the recordkeeping of monitoring and other actions required by the plan.

ATTACHMENT H

(Adopted December 7, 2018)(PAR 1100 November 2019)

PROPOSED AMENDED RULE 1100. IMPLEMENTATION SCHEDULE FOR NOx FACILITIES

[*Rule Index to be included after adoption*]

(a) Purpose

The purpose of this rule is to establish the implementation schedule for ~~Regulation XX NOx~~ RECLAIM and former 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 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines;

(~~1~~2) Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; or

(~~2~~3) 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.

(2) COMPRESSOR GAS LEAN-BURN ENGINE means a Rule 1110.2 unit as defined in Rule 1110.2.

(3) ENGINE means a Rule 1110.2 unit as defined in Rule 1110.2.

(~~2~~4) FORMER RECLAIM FACILITY means a facility, or any of its successors, that was in the NOx Regional Clean Air Incentives Market (RECLAIM) as of January 5, 2018, as established in Regulation XX, that has received a final determination notification, and is no longer in the NOx RECLAIM program.

(~~3~~5) 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.

(~~4~~6) 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.

(7) LEAN-BURN ENGINE means a Rule 1110.2 unit as defined in Rule 1110.2.

(~~7~~8) LOCATION means any single site at a building, structure, facility, or installation. For the purpose of this definition, a site is a space occupied or to be occupied by a Rule 1110.2 unit. For Rule 1110.2 units which are brought to a facility to perform maintenance on equipment at its permanent or ordinary location, each maintenance site shall be a separate location.

(~~5~~9) NOx EMISSIONS means the sum of nitric oxides and nitrogen dioxides emitted, calculated as nitrogen dioxide.

(10) PORTABLE ENGINE means a Rule 1110.2 unit as defined in Rule 1110.2.

(~~6~~11) 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.

(~~7~~12) RECLAIM FACILITY means a facility, or any of its successors, that was in the NOx Regional Clean Air Incentives Market as of January 5, 2018, as established in Regulation XX.

(13) RULE 1110.2 UNIT means any stationary and portable engine over 50 rated brake horsepower (bhp) subject to Rule 1110.2.

(~~8~~14) 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 five million Btu per hour, excluding units specified in Rule 1146 exemptions.

(~~9~~15) 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 two million Btu per hour and less than five million Btu per hour, excluding units specified in Rule 1146.1 exemptions.

(16) STATIONARY ENGINE means a Rule 1110.2 unit as defined in Rule 1110.2.

(~~10~~17) TITLE V FACILITY means any facility that meets the criteria set forth in Rule 3001 – Applicability.

(d) Rule 1110.2 Implementation Schedule

(1) An owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1110.2 with a stationary engine that before *[Date of Amendment]*

does not meet the NOx concentration limit specified in Rule 1110.2 paragraph (d)(1) shall:

(A) On or before July 1, 2021, submit a permit application for each stationary engine that does not meet the NOx concentration limit specified in Rule 1110.2 paragraph (d)(1); and

(B) On or before December 31, 2023, meet the emission limits specified in Rule 1110.2 paragraph (d)(1).

(2) An owner or operator of a RECLAIM or former RECLAIM facility with a portable engine subject to Rule 1110.2 shall meet the requirements specified in Rule 1110.2 paragraph (d)(2).

(3) An owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1110.2 with a compressor gas lean-burn engine that before *[Date of Amendment]* does not meet the NOx concentration limit specified in Rule 1110.2 paragraph (d)(1) shall:

(A) On or before July 1, 2021, submit a permit application for each compressor gas lean-burn engine to meet the applicable NOx concentration limit specified in Rule 1110.2 paragraph (d)(1);

(B) No later than 24 months after a permit to construct is issued by the Executive Officer, meet the emission limits specified in Rule 1110.2 paragraph (d)(1); and

(C) Provide quarterly reports to the Executive Officer that include NOx continuous emissions monitoring system (CEMS) minute data, source test data, and identification of applicable engine and control equipment parameters necessary to maintain pollutant concentrations within the permit limits. Detailed increments of progress or measures that have been taken to meet the NOx emission limit specified in Rule 1110.2 paragraph (d)(1), why the NOx emission limit cannot be met, the number of occurrences that the NOx emission limit was exceeded, and the duration and NOx concentrations that exceeded the limit in Rule 1110.2 paragraph (d)(1) are also required. Other applicable parameters, as well as any corrective actions shall include, but not be limited to, those specified in Attachment 1 of Rule 1110.2.~~; and~~

(4) Retirement Plan for Compressor Gas Lean-Burn Engine Replacement with Compressor Gas Turbines

(A) An owner or operator of compressor gas lean-burn engines not being retrofitted pursuant to the requirements of paragraph (d)(3) and subject to replacement with equipment subject to Rule 1134 shall submit a detailed retirement plan no later than July 1, 2021, with a filing fee payment pursuant to Rule 306 – Plan Fees, for the permanent shutdown of the engines. The owner or operator shall permanently remove the engines from service either by December 31, 2023 or pursuant to the implementation schedule in Rule 1134 paragraph (d)(4), whichever is later. Installation of CEMS is not required for engines that are subject to replacement.

(5) Time Extension for Meeting Rule 1110.2 Emission Limits for Compressor Gas Lean-Burn Engines

(A) An owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1110.2 with a compressor gas lean-burn engine that elects to request an extension of up to 24 months to meet the emission limits specified in Rule 1110.2 paragraph (d)(1), shall:

(i) Submit an application for a compliance plan, with a filing fee payment pursuant to Rule 306 – Plan Fees, no later than 22 months after the permit to construct is issued by the Executive Officer, as specified in subparagraph (d)(3)(B);

(ii) Provide reason(s) for the time extension; and

(iii) Provide all quarterly report data since the startup of the retrofitted equipment, pursuant to subparagraph (d)(3)(C).

(B) A compliance plan shall be approved for a time extension of up to 24 months if:

(i) The information provided in subparagraph (d)(5)(A) is complete and accurate;

(ii) The air pollution controls specified in the permit to construct issued by the Executive Officer, pursuant to subparagraph (d)(3)(B), are installed and operational; and

(iii) The owner or operator provides in detail, the steps that will be taken to demonstrate to the satisfaction of the Executive Officer that additional and appropriate steps have been taken to meet the emission limits specified in Rule 1110.2 paragraph (d)(1).

(C) If the compliance plan is approved, an owner or operator of a RECLAIM or former RECLAIM facility shall meet the emission limits specified in Rule 1110.2 paragraph (d)(1) no later than the time specified by the Executive Officer in the compliance plan and until that date, shall continue with efforts to achieve the emission limits specified in Rule 1110.2 paragraph (d)(1), but shall not exceed the following interim emission limits:

(i) NOx concentration of 45 ppm, corrected to 15% oxygen on a dry basis, averaged over fixed-interval averaging time of three hours; and

(ii) Volatile organic compounds concentration specified in Rule 1110.2 paragraph (d)(1), including any previously approved alternate emission limits.

(D) If the compliance plan is not approved, the owner or operator of a RECLAIM or former RECLAIM facility with a Rule 1110.2 compressor gas lean-burn engine shall meet the emission limits specified in Rule 1110.2 paragraph (d)(1) no later than 60 days after the owner or operator is notified by the Executive Officer that the compliance plan is not approved.

(6) Revised Compliance Plan for Alternative Emission Limits for Compressor Gas Lean-Burn Engines

(A) An owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1110.2 with a compressor gas lean-burn engine that demonstrates the emission limits specified in Rule 1110.2 paragraph (d)(1) are not achievable shall:

(i) Submit an application for a revised compliance plan, with a filing fee payment pursuant to Rule 306 – Plan Fees, no later than four months prior to the compliance date specified in subparagraph (d)(5)(C) to notify the Executive Officer of a proposed alternative NOx emission limit with supporting information as required by clause (d)(6)(A)(ii); and

(ii) Provide all quarterly report data since the startup of any retrofitted equipment, pursuant to subparagraph (d)(3)(C), including, but not limited to:

(I) At least two years of NOx CEMS data for each compressor gas lean-burn engine including exhaust gas concentrations, both uncorrected and corrected to 15 percent oxygen on a dry basis;

(II) All source test data and/or portable analyzer data for the previous two years for volatile organic compounds, carbon monoxide, and ammonia;

(III) All operating logs maintained pursuant to Rule 1110.2 paragraph (f)(3); and

(IV) Detailed increments of progress or measures that have been taken to meet the NOx emission limit specified in Rule 1110.2 paragraph (d)(1), why the NOx emission limit cannot be met, the number of occurrences that the NOx emission limit specified in Rule 1110.2 paragraph (d)(1) was exceeded, an averaging period in which the NOx concentration limit specified in Rule 1110.2 paragraph (d)(1) can be achieved 95% of the time the engine is operated, and the duration and NOx concentrations that exceeded the limit in Rule 1110.2 paragraph (d)(1).

(B) The Executive Officer shall review the information provided pursuant to subparagraph (d)(6)(A) and either approve or disapprove the application and require that the NOx emission limits specified in Rule 1110.2 paragraph (d)(1) be met, or establish as part of the revised compliance plan, technologically achievable case-by-case emission limits with a corresponding averaging period.

(C) An owner or operator of a RECLAIM or former RECLAIM facility shall meet the emission limits specified in clause (d)(5)(C)(i) until one of the following is achieved:

(i) Meet the emission limits specified by the Executive Officer pursuant to subparagraph (d)(6)(B) under the compliance plan no later than 30 days after notification of the emission limits; or

(ii) No later than 12 months after receiving notification of the emission limits pursuant to subparagraph (d)(6)(B), submit an application for a new engine to meet the applicable NOx emission limits specified in Rule 1110.2 paragraph (d)(1) and remove from service any compressor gas lean-burn engines that do not meet the emission limits of Rule 1110.2 paragraph (d)(1). A mitigation fee of $100,000 shall be paid per facility per year ~~and any portion of a year until installation of the new engines~~ or prorated portion thereof.

(7) Facility-Wide Engine Modernization Compliance Plan

(A) The owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1110.2 with a compressor gas lean-burn engine that elects to reduce NOx emissions to meet the emission limits specified in Rule 1110.2 paragraph (d)(1) through the replacement or removal of all existing compressor gas lean-burn engines subject to Rule 1110.2 located at a single RECLAIM or former RECLAIM facility, shall:

(i) On or before January 1, 2021, submit a Facility-Wide Engine Modernization Compliance Plan to the Executive Officer, pursuant to Rule 306 – Plan Fees, for approval that:

(I) Lists each existing engine subject to Rule 1110.2 and provides a description of the control approach that will be used for each engine; and

(II) Provides a replacement or removal schedule for each engine that includes submittal of permit applications, other agency approvals, estimated delivery, and installation of equipment.

(ii) On or before July 1, 2022, submit a permit application for any equipment in the approved Facility-Wide Engine Modernization Compliance Plan.

(iii) On or before 36 months after the permit to construct is issued by the Executive Officer, replace or remove engines identified in the approved Facility-Wide Engine Modernization Compliance Plan, but no later than six months from commencement of operation of the replacement equipment.

(B) The Executive Officer will review a Facility-Wide Engine Modernization Compliance Plan and approve it if:

(i) Information provided in clause (d)(7)(A)(i) is complete and accurate;

(ii) All compressor gas lean-burn engines that do not meet the emission limits specified in Rule 1110.2 paragraph (d)(1) will be replaced or removed; and

(iii) 20% of the total horsepower, represented by all Rule 1110.2 engines replaced or removed, use a zero-emission technology such as an electric motor or fuel cell technology.

(C) Time Extension for Implementation of a Facility-Wide Engine Modernization Compliance Plan

(i) An owner or operator of a RECLAIM or former RECLAIM facility with an approved Facility-Wide Engine Modernization Compliance Plan that elects to request an extension of up to 36 months to replace or remove engines, shall:

(I) Notify the Executive Officer on or before 32 months after the permit to construct is issued by the Executive Officer; and

(II) Provide an explanation for the reason(s) there is a delay in the replacement or removal of equipment.

(ii) The Executive Officer will approve a time extension to the Facility-Wide Engine Modernization Compliance Plan if:

(I) Information provided in clause (d)(7)(C)(i) is complete and accurate;

(II) All permit applications for engines in the approved Facility-Wide Engine Modernization Compliance Plan were submitted by July 1, 2022; and

(II) Documentation demonstrates that the equipment has been ordered and submittals, applications, and requests for other agency approvals have been initiated.

(iii) An owner or operator of a RECLAIM or former RECLAIM facility shall implement the approved Facility-Wide Engine Modernization Compliance Plan:

(I) No later than 36 months after the permit to construct is issued by the Executive Officer if the request for a time extension is not approved; or

(II) No later than the time specified by the Executive Officer in the approval for the time extension, not to exceed 72 months after the permit to construct is issued by the Executive Officer, if the request for a time extension is approved. Any engines that are subject to the Facility-Wide Engine Modernization

Compliance Plan pursuant to paragraph (d)(7) shall be replaced or removed from service no later than six months from commencement of operation of the replacement equipment.

(D) For engines that will be replaced with units that will be subject to the provisions of a different Regulation XI rule, an owner or operator of a RECLAIM or former RECLAIM facility shall permanently shut down the engines and shall require the surrendering of the permits no later than six months from commencement of operation of the replacement units.

(8) An owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1110.2 with a compressor gas lean-burn engine that has an approved time extension pursuant to paragraph (d)(5) or subparagraph (d)(7)(C) shall pay a mitigation fee within 30 days of the date of approval of the time extension. The mitigation fee shall be $100,000 per facility per year ~~and any portion of a year for the length of the time extension~~ or prorated portion thereof.

(9) Alternative Compliance Approach for Diesel-Fired Electrical Generators at Ski Resorts

(A) Low-Use

An owner or operator of a ski resort that operates Rule 1110.2 units that are diesel-fired electrical generators that were installed prior to *[Date of Amendment]* shall not be subject to the NOx emission limits specified in Rule 1110.2 paragraph (d)(1) provided that:

(i) Each unit operates no more than 500 hours per year or uses less than 1×10^9 Btu per year (higher heating value) of fuel;

(ii) Each unit retains the NOx and ammonia limits, as well as the monitoring and source testing requirements specified on the South Coast AQMD permit to operate;

(iii) Permit applications for each unit requesting the change of South Coast AQMD permit conditions to incorporate the low-use exemption are submitted by July 1, 2021; and

(iv) The South Coast AQMD permit to operate limits use of each unit consistent with the low-use requirements of this subparagraph.

(B) Exceedance of Low-Use

If a Rule 1110.2 unit with a low-use exemption pursuant to subparagraph (d)(9)(A) exceeds the annual hours or fuel usage requirements, the owner or operator shall submit complete South Coast AQMD applications to repower, retrofit, or retire that unit within six months from the date of the reported exceedance of subparagraph (d)(9)(A). The Rule 1110.2 unit must be removed from service or meet the applicable emission limits in Rule 1110.2 paragraph (d)(1) within two years of the exceedance.

(e~~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 December 7, 2019, submit complete South Coast AQMD ~~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~~e)(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~~e)(1)(B) and (~~d~~e)(1)(C) provided the owner or operator:

(A) On or before December 7, 2019, submits complete South Coast AQMD~~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~~e)(1)(B) and (~~d~~e)(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~~e)(3), the owner or operator of the following unit(s) in operation prior to December 7, 2019 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 South Coast AQMD~~SCAQMD~~ Permit to Operate as of December 7, 2018.

(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~~e)(1), an owner or operator of a RECLAIM or former RECLAIM facility that has installed, modified, or has been issued a South Coast AQMD~~SCAQMD~~ Permit to Construct or Permit to Operate for the following Rule 1146 or Rule 1146.1 units prior to December 7, 2018 shall meet the NOx emission limit specified in paragraph (~~d~~e)(3) by December 7, 2033 or when 50 percent or more of the unit's burners are replaced, whichever is earlier:

(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)(H) 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) 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~~

(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

(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~~e)(1), by December 7, 2033 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 South Coast AQMD~~SCAQMD~~ Permit to Construct or Permit to Operate prior to December 7, 2018 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~~e)(6)(A) that exceeds 300,000 therms of annual heat input from all fuels used shall:

(A) Within four months after exceeding 300,000 therms of annual heat input, submit complete South Coast AQMD~~SCAQMD~~ permit applications for the unit that does not meet the applicable NOx concentration limit specified in paragraph (~~d~~e)(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~~e)(3) for the life of the unit.

(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~~f) 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~~ an 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 I

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Staff Report
Proposed Amended Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines
Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities

November 2019

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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WAYNE NASTRI

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Regional Clean Air Incentives Market (RECLAIM) program was adopted in October 1993 under Regulation XX. RECLAIM is a market-based emissions trading program designed to reduce NOx and SOx emissions and includes facilities with NOx or SOx emissions greater than 4 tons per year. The 2016 Final Air Quality Management Plan (2016 AQMP) included Control Measure CMB-05: Further NOx Reductions from RECLAIM Assessment (CMB-05) to ensure the NOx RECLAIM program was achieving equivalency with command-and-control rules that are implementing Best Available Retrofit Control Technology (BARCT) and to generate further NOx emission reductions at RECLAIM facilities. The adoption resolution for the 2016 AQMP directed staff to achieve five tons per day of 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 BARCT as soon as practicable. On July 26, 2017 the Governor approved California State Assembly Bill 617, which required air districts to develop, by January 1, 2019, an expedited schedule for the implementation of BARCT no later than December 31, 2023 for industrial facilities that are in the State greenhouse gas cap-and-trade program with priority given to older higher polluting sources that need to install BARCT.

As facilities transition out of NOx RECLAIM, a command-and-control rule that includes NOx emission standards that reflect BARCT will be needed for all equipment categories. Proposed Amended Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines (PAR 1110.2) is a command-and-control rule for RECLAIM facilities with internal combustion engines. Proposed Amended Rule 1110.2 will remove exemptions previously allowed under the NOx RECLAIM program pertaining to internal combustion engines with a rating greater than 50 brake horsepower. As a result, engines at existing RECLAIM facilities will be required to comply with the NOx emission standards under Proposed Amended Rule 1110.2, and with existing monitoring, reporting, and recordkeeping requirements. PAR 1100 is also being amended to include the compliance schedule for equipment at RECLAIM facilities that will be subject to PAR 1110.2.

Of the facilities in RECLAIM, twenty-one will be affected by PAR 1110.2 and seventy-six engines will become subject to the NOx requirements in the rule. Currently, 21 engines meet an emission limit of 11 ppmvd[1] required by PAR 1110.2. Because engines in RECLAIM are already required to comply with the VOC and CO requirements in Rule 1110.2, no further requirements are proposed for these pollutants. Eight engines are portable engines and will be subject to the state's Air Toxic Control Measure (ATCM). For the remaining 47 engines that will be required to meet the NOx emission limits under PAR 1110.2, the overall rule cost-effectiveness is approximately $33,800 per ton of NOx reduced. As a result of PAR 1110.2, NOx emissions are expected to decrease by approximately 0.29 tons per day.

In addition, PAR 1110.2 is being amended to remove obsolete provisions, to add provisions for linear generators and for cranes operated on offshore facilities, to update provisions for monitoring, reporting, and recordkeeping, and to provide clarifications to rule applicability and implementation. Other revisions include the addition of specific averaging options to demonstrate

[1] Parts per million by volume, corrected to 15% oxygen on a dry basis.

compliance to emission limits and the harmonization of the rule with Rules 219 and 222 for remote radio transmission towers.

The rule development process has been a public one. Six Working Group meetings and one Public Workshop have been held. Multiple stakeholders including affected facilities, the public, other government agencies, and interdepartmental staff have provided input into the process. Although PAR 1110.2 is adding provisions for linear generators, this technology is new to the South Coast AQMD. How this technology impacts air emissions will be determined through future assessments.

CHAPTER 1: BACKGROUND

BACKGROUND

In October 1993, Regulation XX- RECLAIM was adopted. The purpose of the RECLAIM program was to provide industry with a flexible, market-based approach to reduce NOx and SOx emissions. Participants were initially allocated RECLAIM Trading Credits (RTCs) based on emissions from their highest production level from 1989 to 1992. With the adoption of RECLAIM, engines that had been regulated under Rule 1110.2 were exempt from NOx emission standards.

Over time, the allocation of RTCs was gradually reduced requiring businesses to either install new emissions controls, replace older equipment, or purchase unused RTCs from other sources. In response to concerns regarding actual emission reductions and implementation of BARCT under RECLAIM, Control Measure CMB-05 of the 2016 AQMP committed to an assessment of the RECLAIM program in order to achieve further NOx emission reductions of five tons per day, including actions to transition the program and ensure future equivalency to command-and-control regulations. During the adoption of the 2016 AQMP, the resolution directed staff to modify Control Measure CMB-05 to achieve the five tons per day NOx emission reduction as soon as feasible but 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.

In addition, on July 26, 2017, Governor Brown signed AB 617 which addressed non-vehicular air pollution. AB 617 was companion legislation to AB 398 which extended California's cap-and-trade program for reducing greenhouse gas emissions from stationary sources. RECLAIM facilities that are part of the cap-and-trade program are now also subject to the requirements of AB 617. AB 617 requires an expedited schedule for implementing BARCT for cap-and-trade facilities. Under AB 617, the State's air districts were to develop a schedule by January 1, 2019 for the implementation of BARCT no later than December 31, 2023. The highest priority would be given to older, higher polluting units that would need to install retrofit controls.

The October 5, 2018 amendment to Rule 2001 established procedures for facilities to opt out of RECLAIM before receiving an initial determination notification, provided the equipment at the facility met specified criteria. Facilities that satisfied the requirements to opt out would have then received an initial determination notification and would have become subject to Rule 2002. However, this opt-out option was superseded and rescinded.

Staff has been in discussions with the United States Environmental Protection Agency (USEPA) on all elements of transitioning RECLAIM sources to a command-and-control regulatory structure to ensure that the rules relating to the transition would be approved into the State Implementation Plan (SIP). However, the USEPA had expressed concern over facilities exiting RECLAIM before all command-and-control and New Source Review (NSR) requirements had been adopted to clearly demonstrate equivalency to the replaced program. The USEPA has since recommended keeping facilities in RECLAIM until all the rules associated with the transition have been adopted and approved into the SIP.

In consideration of USEPA's recommendation, staff removed the opt-out provisions in Rule 2001 and now prohibits facilities from exiting the RECLAIM program. Until facilities exit RECLAIM, they will continue to be subject to all RECLAIM requirements including Rule 2005 – New Source

Review for RECLAIM, for permitting of new or modified NOx sources that undergo emission increases. In addition, these facilities will also be required to comply with all the requirements in adopted and amended command-and-control rules that apply to RECLAIM facilities, including the implementation schedules and NOx limitations. Staff will continue to work with USEPA on NSR for former RECLAIM facilities as well as on all the relevant command-and-control rules for the RECLAIM transition.

As facilities transition out of NOx RECLAIM, a command-and-control rule that includes NOx emission standards that reflect BARCT will be needed for all equipment categories. Proposed Amended Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines (PAR 1110.2) is a command-and-control "landing" rule for RECLAIM facilities with internal combustion engines. Proposed Amended Rule 1110.2 will remove exemptions previously allowed for the NOx RECLAIM facilities pertaining to internal combustion engines with a rating greater than 50 brake horsepower. Engines at existing RECLAIM facilities will be required to comply with the NOx emission standards under Proposed Amended Rule 1110.2 and with existing monitoring, reporting, and recordkeeping requirements contained in PAR 1110.2. PAR 1110.2 will also add clarification to its applicability to engines operated at remote radio transmission towers.

With the transition of the RECLAIM program to a command-and-control regulatory structure, internal combustion engines that were once exempt would now be subject to Rule 1110.2. As part of the transition from RECLAIM to a command-and-control structure, staff conducted an analysis to determine if Rule 1110.2 reflects current BARCT and to provide an implementation timeframe for achieving BARCT compliance limits for certain RECLAIM internal combustion engines.

REGULATORY HISTORY

The following provides a regulatory history of Rule 1110.2 and associated actions affecting internal combustion engines.

- In October 1984, Rule 1110.1 was adopted, which regulated emissions from internal combustion engines. Rule 1110.1 required reductions of NOx and carbon monoxide (CO) emissions from gaseous-fueled internal combustion engines rated greater than 50 bhp. This rule was the precursor to Rule 1110.2.

- In August 1990, the Board adopted Rule 1110.2, which required additional reductions for NOx and also volatile organic compounds (VOC) from stationary, non-emergency gaseous- and liquid-fueled internal combustion engines.

- In October 1993, Regulation XX was adopted, which established the RECLAIM program. Engines at RECLAIM facilities were exempted from Rule 1110.2 for NOx.

- In June 2005, Rule 1110.2 was amended to comply with California Senate Bill (SB) 700, which eliminated a statewide agricultural operations exemption. It required that BARCT be applied to previously-exempted agricultural engines.

- In February 2008, Rule 1110.2 was amended, lowering NOx, VOC, and CO emission limits for stationary, non-emergency engines. It also established lower emission standards for new, non-emergency electrical generation engines. The amendment also increased monitoring requirements to include more frequent emissions testing and the development of Inspection and Monitoring (I&M) plans. The amendment affected 859 engines at 405 facilities.

- In July 2010, Rule 1110.2 was amended to provide an exemption from the emissions requirements for engines operated by the County of Riverside for the purpose of public safety communication at one remote location.

- In September 2012, Rule 1110.2 was amended to establish biogas engine emissions limits equivalent to those for natural gas engines. The amendment included an accompanying technology assessment for biogas engine control technology.

- In May 2013, Rules 219 and 222 were amended to exempt engines powering remote radio transmission towers from permitting requirements. The exemption applied to any compression-ignited reciprocating internal combustion engine used exclusively for electrical generation at remote two-way radio transmission towers where no utility, electricity, or natural gas is available within ½ mile radius, has a manufacturer's rating of 100 bhp or less, and is fired exclusively on diesel #2 fuel, compressed natural gas, or liquefied petroleum gas.

- In December 2015, Rule 1110.2 was amended to extend the compliance deadline for biogas engines by one year. The amendment also addressed concerns raised by USEPA related to SIP approval issues contained in the rule language regarding excess emissions from startup, shutdown, and malfunction.

- In June 2016, Rule 1110.2 was amended to extend the compliance deadline for one landfill gas facility due to economic concerns related to its power purchase agreement. The facility is required to retire its engines subject to the rule by October 1, 2022.

AFFECTED FACILITIES AND EQUIPMENT

RECLAIM Facilities and Associated Engines

Out of the 254 facilities currently in the NOx RECLAIM program, approximately 21 facilities were identified as facilities with engines subject to PAR 1110.2. Appendix B contains a list of RECLAIM facilities that operate engines affected by PAR 1110.2.

As part of the RECLAIM transition, several source-specific rules are also being adopted and amended. In addition, several new industry-specific rules are being developed. In such cases, facilities that are affected by these industry-specific rules may have non-emergency, internal combustion engines that are excluded from Rule 1110.2 (e.g., engines operated at electricity generating facilities and in refineries).

Rule 222-RT Engines

In May 2013, Rules 219 and 222 were amended to allow engines that provide power to remote radio transmission towers and that meet specific criteria to be exempt from permitting. At the time of the rule adoption, these engines were also to be exempted from the emission limits in Rule 1110.2 because these engines were considered essential for public safety operations. However, only the exemption from permitting was implemented and there was no corresponding explicit exemption from the emission levels written into Rule 1110.2. To harmonize Rules 219, 222, and 1110.2, staff recommends that Rule 1110.2 be updated to explicitly exempt engines registered under Rule 222-RT from emission requirements. The facilities impacted are not RECLAIM sources.

Biogas Engines

In the 2012 rule amendment, several provisions were added related to the operation of engines fueled by biogas. Stakeholders have expressed confusion on the interpretation and implementation of these provisions. In PAR 1110.2, staff is revising the biogas provisions to update and clarify the intended requirements. The clarifications center on averaging provisions for emissions compliance and on monitoring requirements. Currently, there are 8 facilities that are biogas facilities (e.g., operate engines fueled by digester gas or landfill gas) with 23 biogas engines that operate with continuous emissions monitoring systems (CEMS).

PUBLIC PROCESS

The development of PAR 1110.2 was conducted through a public process. Five Working Group meetings were held on: June 28, 2018, September 27, 2018, February 6, 2019, April 24, 2019 and May 30, 2019. Working Group meetings included staff and representatives from affected businesses, environmental groups, public agencies, consultants, and other interested parties. The purpose of the Working Group meetings is to discuss details of proposed amendments and to listen to concerns and issues with the objective to build consensus and resolve key issues.

In addition, one Public Workshop was held on July 31, 2019. The purpose of the Public Workshop was to present the preliminary staff report and proposed rule language to the general public and to stakeholders. Concurrently with the Public Workshop, a California Environmental Quality Act (CEQA) scoping meeting was held.

Based on additional concerns expressed by stakeholders, a sixth Working Group meeting was held on August 20, 2019.

Staff also has had numerous meetings with stakeholders and has conducted multiple site visits as part of this rulemaking process. In addition, staff has had discussions with compliance staff from the USEPA related to the amendments proposed for Rule 1110.2.

CHAPTER 2: BARCT ASSESSMENT

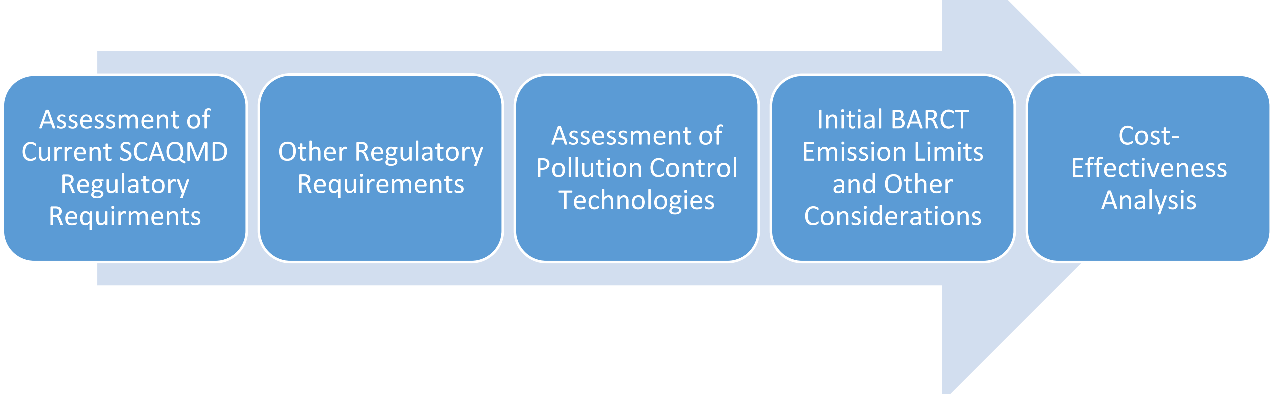
INTRODUCTION

Staff conducted an assessment of the NOx emission limit under Rule 1110.2 to ensure it is still representative of BARCT for engines. BARCT analyses are periodically performed for equipment categories to assess technological changes that may reflect a lower emission limit. The 2008 amendments to Rule 1110.2 represent the most recent BARCT analysis for engines. Under California Health and Safety Code § 40406, BARCT is defined 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."

The BARCT assessment for this rule development consisted of a multi-step analysis. The first three steps represent the technology assessment where staff first conducts a review of current South Coast AQMD regulatory requirements, staff then surveys other air districts and agencies outside of the South Coast AQMD's jurisdiction to identify emission limits that exist for similar equipment, and in the third step, staff identifies and assesses pollution control technologies to determine what degree of reduction could be achievable for the affected sources. Based on the collected information, initial BARCT emission limits were then established. Once the initial BARCT emission limits are determined, a cost-effectiveness analysis is conducted.

Figure 2-1: BARCT Analysis Approach



BARCT ANALYSIS APPROACH

Assessment of Current South Coast AQMD Regulatory Requirements

In the first step of the BARCT analysis, staff reviewed South Coast AQMD rules that affect engines operating within its jurisdiction: Rule 1470 and Rule 1110.2. Each rule was evaluated based on their respective regulatory effect on emission of NOx, VOC, and CO.

<u>South Coast AQMD Rule 1470</u>

Rule 1470 is a toxics rule designed to reduce diesel particulate emissions, which is a carcinogen. Rule 1470 applies to stationary, diesel-fueled engines owned or operated with a rated brake horsepower greater than 50 bhp with limited exceptions and regulates particular matter (PM) emissions from diesel engines. Within Rule 1470, any reference to NOx, VOC, and CO for prime engines is referred to Rule 1110.2.

- Rule 1470 states that all new stationary prime diesel-fueled compression-ignition engines (> 50 bhp) shall meet the applicable emission standards specified in Rule 1110.2.

- Rule 1470 states that owners or operators that choose to meet the diesel PM limits with emission control strategies that are not verified through the Verification Procedure shall meet the applicable HC, NOx, NMHC+NOx, and CO emission standards specified in South Coast AQMD Rule 1110.2 – Emissions From Gaseous and Liquid-Fueled Engines.

Although engines in the RECLAIM program were exempt from the requirements of Rule 1110.2, compliance to Rule 1470 is still mandatory for PM emissions to address diesel PM. For specific NOx limits, Rule 1470 defers to Rule 1110.2. Rule 1470 primarily applies to emergency engines that operate under the Rule 1110.2 exemption of 200 hours per year. Emergency engines operated at RECLAIM facilities that are subject to Rule 1470 are not proposed to be subject to PAR 1110.2.

South Coast AQMD Rule 1110.2

Rule 1110.2 applies to engines with a rated brake horsepower greater than 50 bhp. The rule separates engines into two sub-categories: stationary or portable.

For existing stationary prime engines, the NOx, VOC, and CO emission limits are listed in Table 2-1. The rule does not distinguish by engine type (e.g., whether the engine is two-cycle, four-cycle, lean-burn, or rich-burn). The limits have been in effect for gaseous- and liquid-fueled engines since July 1, 2011 and for biogas engines since January 1, 2017.

Table 2-1: Rule 1110.2 Emissions

Emission Limits for Stationary Prime Engines (ppmvd)	
NOx[1]	11
VOC[2]	30
CO[1]	250

[1] Corrected to 15% O_2 on a dry basis
[2] Measured as carbon, corrected to 15% O_2 on a dry basis, averaged over 15 minutes

For new non-emergency engines driving electrical generators, the emission limits differ from those for existing stationary prime engines. The emission limits were established during the 2008 rule amendment and modeled in part from CARB’s approach for distributed generation (DG) equipment that does not require local district permits. The CARB standards were based on the emissions from large new central generating stations (e.g., electricity generating facilities or utility power plants) equipped with best available control technology (BACT). Rule 1110.2 differs slightly from the CARB standards for VOC and CO which are set at .02 lb/MW-hr and 0.10 lb/MW-hr, respectively in that Rule 1110.2 contains slightly higher emission limits.

At the time of rule adoption in 2008, staff originally had proposed emission standards that, as of January 1, 2007, CARB already enforced for distributed generation equipment that do not require local district permits. However, the Engine Manufacturers Association commented that by increasing the proposed limits, in lbs/MW-hr, from 0.10 to 0.20 for CO and from 0.02 to 0.10 for VOC, some advanced engines may be able to comply. The revised limits were considered to still achieve the same NOx reductions as the original proposal, and for an electrical generator without heat recovery, the revised limits would still achieve an 89% reduction of CO and a 77% reduction of VOC, compared to the current BACT limits for typical new engines.[1]

Table 2-2 lists the emission limits for all new, non-emergency engines driving electrical-generators. These limits are for new installations and do not apply to retrofits.

Table 2-2: Comparison of Emission Limits

Limits for New Electrical Generation Devices (lbs/MW-hr)		
	South Coast AQMD	CARB
NOx[1]	0.07	0.07
VOC[2]	0.10	0.02
CO[1]	0.20	0.10

[1] Corrected to 15% O_2 on a dry basis, averaged over 15 minutes
[2] Calculated using a ratio of 16.04 lbs of VOC per lb-mole of carbon

For portable prime engines, Rule 1110.2 refers to state regulations for emissions limitations (State Air Toxics Control Measure).

Other Regulatory Requirements

Staff compared emission limits for similar equipment in other air districts (contained in Table 2-3). Equipment categories varied, but the most stringent emission limit relevant to stationary prime engines was selected for comparison. Based on staff's review, the South Coast AQMD has the lowest NOx limits for stationary internal combustion engines of 11 ppmvd (corrected to 15% O2 on a dry basis), relative to other air districts. In addition, the South Coast AQMD has the lowest emission standards for CO and VOC relative to other air districts.

Within California, staff reviewed regulations in the following air districts (listed alphabetically):

[1] Information taken from The Final Staff Report for Proposed Amended Rule 1110.2, December 2007.

- Antelope Valley
- Bay Area
- Mojave Desert
- Santa Barbara
- San Diego
- San Joaquin Valley
- San Luis Obispo
- Ventura County

Outside California, staff reviewed regulations in the following air districts (listed alphabetically):

- New Jersey
- New York
- Pennsylvania
- Texas

Table 2-3: Lowest NOx Emission Limits in Other Jurisdictions

Jurisdiction	Type of Engine	Limit (ppmvd[1])
Antelope Valley AQMD	General, spark-ignited	36
Bay Area AQMD	Fossil-derived fuel, rich-burn	25
Mojave Desert APCD	Non-agriculture, rich-burn, spark-ignited engines	50
Santa Barbara APCD	Rich-burn, noncyclically-loaded spark ignition engines	50
San Diego APCD	Gaseous fuel or gasoline, rich-burn	25
San Joaquin Valley APCD	Non-exempted ICEs	11
San Luis Obispo APCD	Spark-ignited, rich-burn	50
Ventura County APCD	General, rich-burn	25
New Jersey	Non-exempted ICEs	70
New York	Natural gas, >200 hp	116
Pennsylvania	Rich-burn, natural gas	155
Texas (Dallas-Fort Worth Area)	Non-exempted ICEs	39
[1] ppmvd corrected to 15% oxygen, dry basis		

Assessment of Pollution Control Technologies

Current air pollution control technology for internal combustion engines can be divided into two commercially available systems: Non-Selective Catalytic Reduction (NSCR) and Selective Catalytic Reduction (SCR).

NSCR

NSCR is a commercially available air pollution control system used to reduce emissions from rich-burn, stationary engines. The system has been commercially available for many years from different sources and is considered cost effective to install. It uses a precious metal catalyst base to reduce NOx to nitrogen, to oxidize CO to carbon dioxide (CO_2), and to convert VOCs to CO_2 and water. Catalyst efficiency relies on good air-to-fuel ratio (A/F) control. Most systems control the A/F ratio using exhaust oxygen measurement, along with air/fuel ratio controllers. Removal efficiencies for a 3-way catalyst are greater than 90 percent for NOx, greater than 80 percent for CO, and greater than 50 percent for VOC. Greater efficiencies, below 10 parts per million NOx, are possible through use of an improved catalyst containing a greater concentration of active catalyst materials, use of a larger catalyst to increase residence time, or through use of a more precise air/fuel ratio controller.

As part of this evaluative process, staff solicited and received information from catalyst vendors related to the installation and/or retrofitting of NSCR systems for various engine sizes. This data was used to calculate cost-effectiveness in achieving proposed emission limits for these type of engines.

SCR

SCR is another commercially available air pollution control system used to reduce NOx emissions from diesel or other lean-burn, stationary engines. SCR technology injects ammonia into an engine's exhaust. The exhaust is then passed through a fixed catalyst bed where NOx reacts with the ammonia and is converted into nitrogen. If CO and VOCs are also to be controlled, then an oxidation catalyst is added to the exhaust stream typically upstream of the SCR. Catalyst efficiency relies on good dispersion and mixing. Typical conversion efficiencies for SCR systems range between 90 – 95% for NOx.

As part of this evaluative process, staff solicited and received information related to the installation and/or retrofitting of SCR systems. In addition, data from previous rulemaking efforts was reviewed and considered. This data was used to calculate cost-effectiveness in achieving proposed emission limits for these type of engines.

Other Technology Options

Staff reviewed two alternative technologies to NSCR and SCR. The first alternative that was considered was developed by a company called Tecogen. Tecogen has a patented, 3-step emissions control system that can be retrofitted onto an existing engine. The technology is currently applied only on select rich-burn natural gas fueled engines. Compared to a standard NSCR system, the

Tecogen product is designed to provide an operator with a wider air-to-fuel ratio control window by utilizing its dual catalyst system.

Within the South Coast AQMD's jurisdiction, several engines equipped with the Tecogen system have been recently permitted. The initial testing results indicate that these engines meet Rule 1110.2 NOx and CO limits. At this time, however, the technology has been installed on mostly smaller engines under 1,000 brake horsepower and it has not been demonstrated whether this technology can be applied to a wider range of engines, especially larger engines. This technology is capable of achieving the lower emission standard for non-emergency electrical generators. In addition, operators have expressed that when employed for compliance with the 11 ppm NOx limit, it offers a larger and safer compliance margin than in utilizing only a single catalyst. Staff will continue to monitor and evaluate future installations.

The second alternative was developed by a company called EtaGen, who~~. EtaGen~~ has designed and constructed a linear generator-based technology for electrical generation. The linear generator produces electricity ~~unlike a traditional combustion engine. In this design,~~with magnets that are driven linearly through copper coils to directly produce electricity without rotating motion and without conventional crankshaft mechanical work. This type of technology operates using a thermodynamic gas cycle similar to that of the Otto cycle, where the fuel/air mixture is compressed until a reaction occurs at near constant volume and ~~However, this type of engine is similar to a compression-ignited engine where a mix of gas undergoes a compression phase and products of~~ combustion products are generated. This reaction takes place at lower temperatures without a flame and associated burning, and is expected to result in low NOx emissions without the need for after-treatment, and lower exhaust temperatures ~~One feature that distinguishes this engine from traditional engines is that combustion reaction takes place at lower temperatures. At lower temperatures, engine thermal efficiency is expected to be higher, but at lower temperatures, the exhaust gas temperature will be lower~~ compared to traditional engines. Linear generators do not need aftertreatment technologies such as SCR to control NOx emissions and will have lower start-up emissions since it is not dependent on a catalyst to reach a destruction temperature. However, ~~A~~at lower exhaust temperatures, destruction of any residual VOCs through exhaust controls such as an oxidation catalyst system may be negatively impacted. The linear generator technology ~~This type of engine~~ is expected to produce lower NOx and CO emissions ~~approaching~~ meeting Distributed Generation (DG) ~~levels~~limits, but VOC emission concentrations levels may be higher than current DG limits. At this time, no linear generator systems have~~s~~ been installed or are in operation within the South Coast AQMD jurisdiction. One application for a permit to construct has been filed and is under evaluation by permitting staff.

BARCT Emission Limits and Other Considerations

The 2008 Rule 1110.2 amendment established a NOx emission limit of 11 ppmvd @ 15% O_2 for non-RECLAIM engines effective July 1, 2011 except for engines fueled by landfill or digester gas (biogas). Subsequently, engines fueled by landfill or digester gas (biogas) were required to meet this limit by July 1, 2017.

Currently, the NSCR and SCR are commercially available and cost-effective to establish a NOx emission limit of 11 ppmvd @ 15% O_2. NSCR systems can be used for rich-burn engines and SCR systems can be used for lean-burn engines. As part of its analysis of non-RECLAIM engines operating within the South Coast AQMD's jurisdiction, staff reviewed available source test data for stationary, non-emergency engines and found that existing engines are complying with a NOx emission limit of 11 ppmvd @ 15% O_2.

Engine Categories

Seventy-six engines that are currently in the RECLAIM program would be subject to Rule 1110.2. As part of the BARCT analysis, engines were subdivided into four categories based on the unique characteristics of each type of engine and the associated emissions controls available to each category:

- Lean-Burn, 2 stroke
- Lean-Burn, 4 stroke
- Rich-Burn
- Portable Engines, subject to the ATCM

Figure 2-2 lists the number of RECLAIM engines by type and by the number of engines that meet the current emission limit of 11 ppmvd[1] NOx. Engines subject to the State ATCM will not be affected due to PAR 1110.2. These engines have been identified as portable diesel engines subject to Rule 1110.2 (d)(2)(B). Currently, Rule 1110.2 (d)(2)(B) defers emission limits to the State ATCM for any portable diesel engines. In general, these engines either will be phased out or will be operated as low-use engines under 200 hours or less in a calendar year, per the provisions of the ATCM.

Figure 2-2: RECLAIM Engines by Type

Lean Burn (2-stroke)	Lean Burn (4-stroke)	Rich Burn	Engines subject to ATCM
Count 11	Count 34	Count 23	Count 8
Engines meeting 11 ppmvd[1] NOx 0	Engines meeting 11 ppmvd[1] NOx 8	Engines meeting 11 ppmvd[1] NOx 13	Engines meeting 11 ppmvd[1] NOx 0

[1] Parts per million by volume, corrected to 15% oxygen on a dry basis

CHAPTER 3: PROPOSED AMENDMENTS TO RULE 1110.2

INTRODUCTION

PAR 1110.2 is a landing rule for facilities in RECLAIM that establishes NOx emission limit for engines over 50 bhp. The purpose of the proposed amendments is to remove the exemption for RECLAIM facilities to help with the transition of facilities in the RECLAIM program to a command-and-control regulatory structure. Through this rulemaking process, staff conducted a BARCT analysis of the NOx emission limit, consistent with AB 617. In addition, the proposed amended rule has a number of additional revisions to address various issues raised by stakeholders. Proposed revisions to Rule 1110.2 include the removal of obsolete provisions, the inclusion of specific averaging options, updating reporting and recordkeeping requirements, the harmonization of remote radio transmission tower exemptions with existing rules, the clarification of CEMS provisions for biogas engines, and the addition of requirements for offshore crane engines. Proposed revisions to Rule 1100 introduces an implementation schedule for facilities exiting RECLAIM and provides additional time and consideration for compressor gas lean-burn engines to meet the emission concentration limits in Rule 1110.2.

PROPOSED AMENDMENTS TO RULE 1110.2

Definitions – Subdivision (c)

Subdivision (c) was revised to reflect the transition of equipment from the RECLAIM program to a command-and-control regulatory structure. Staff included definitions to differentiate between a FORMER RECLAIM FACILITY, NON-RECLAIM FACILITY, and RECLAIM FACILITY. In addition, staff included a definition for COMPRESSOR GAS LEAN-BURN ENGINE, and ESSENTIAL PUBLIC SERVICE to clarify use within the rule.

- COMPRESSOR GAS LEAN-BURN ENGINE means a stationary gaseous-fueled two-stroke or four-stroke lean-burn engine used to compress natural gas or pipeline quality natural gas for delivery through a pipeline or into storage.

- ESSENTIAL PUBLIC SERVICE means any facility or operator as defined in Rule 1302.

- 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.

- 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.

- 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.

Modification of RECLAIM Language

The existing language in the clauses and subclauses listed below were changed from “subject to Regulation XX (RECLAIM)” to “at RECLAIM or former RECLAIM facilities”. The purpose of the change was to reflect that the provisions will apply to facilities that are in RECLAIM and to these facilities after they transition out of RECLAIM as they transition from the RECLAIM program to a command-and-control regulatory structure:

- (f)(1)(D)(ii)(II)
- (f)(1)(D)(ii)(III)

Clarification of Rule Language in Subparagraph (d)(1)(B)

In the current version of Rule 1110.2, subparagraph (d)(1)(B) contained three undesignated clauses listed after Table II that included provisions pertaining to Pre-2010 emission limits that were for low-use engines, alternative CO and VOC limits, and engines operating with non-pipeline quality natural gas.

To provide additional clarity, the first section of emission limits in Table II has been labeled as “Low-Use Engines” as those limits are for low-use engines. In addition, the section of Table II where the concentration limits “effective July 1, 2010” has been removed as these limits are obsolete and have been superseded by concentration limits “effective July 1, 2011.

Subparagraph (d)(1)(B) has been restructured to contain individual clauses specific to meeting the emission requirements of Table II, including provisions for averaging and alternative averaging times, low-use engines, and alternative emission limits. The following discussion provides an overview of each clause that has been revised or has been inserted under subparagraph (d)(1)(B).

- ❖ (d)(1)(B)(i) – No changes are suggested to this existing clause except to note that other subclauses may be applicable.

- ❖ (d)(1)(B)(ii) – The language was revised for grammatical agreement to the subparagraph. In addition, staff recognizes that there are special operational situations which may result in alternative emission concentrations limits as approved by the Executive Officer. The footnotes to the Tables I, II, III-A, III-B, and IV that list emission limits have been revised to not specify the averaging over 15 minutes. This clause states that unless otherwise provided in another section of the rule, concentration limits listed in either Tables II, Table III-A or III-B or technologically achievable case-by-case VOC or CO emission concentration limits approved by the Executive Officer will be averaged over 15 minutes. Clauses (d)(1)(B)(iii) through (d)(1)(B)(v), however, allow for alternate averaging times for unique situations. Under this clause the operator shall:

    - Comply with the applicable emission concentration limits listed in either Table II or Table III-A or B, or alternate emission concentration limits approved by the Executive Officer, averaged over 15 minutes or other averaging time period allowed by clauses (d)(1)(B)(iii) through (d)(1)(B)(v).

- (d)(1)(B)(iii) – This is an existing provision that allowed the operator of an engine that uses non-pipeline natural gas that demonstrates that due to the varying heat value of the gas, a longer averaging time is necessary. The language was revised for grammatical agreement to the subparagraph. The use of a fixed-interval averaging time was inserted for clarification. The revised provision, however, does allow for use of a longer averaging period if an engine is subject to an existing permit condition allowing for an averaging time greater than six hours. Staff has identified one engine in RECLAIM that currently contains a permit limit of 24 hours, and there is no proposed change to that existing requirement. Under this clause, the operator shall:

    - Use an averaging time approved by the Executive Officer for an engine that uses non-pipeline quality natural gas that has demonstrated that due to the varying heating value of the gas a longer averaging time was necessary. The fixed-interval averaging time shall not exceed six hours for any of the concentration limits of Table II, unless an engine is subject to an existing permit condition allowing for an averaging time greater than six hours. Non-pipeline quality natural gas is a gas that does not meet the gas specifications of the local gas utility and is not supplied to the local gas utility.

    The following two clauses address the use of longer averaging times and specify the use of a fixed-interval, or a "block" averaging approach. Unlike a rolling average, the operator that averages over a fixed-interval is required to collect and average data over a fixed amount of time. For example, if an operator of an engine is using a six-hour fixed-interval averaging option, then the operator would collect data from 12:01 am to 6:00 am and average over this time period to demonstrate compliance with a given emission limit. The next subsequent intervals would then be taken from 6:01 am to 12:00 pm, from 12:01 pm to 6:00 pm, and 6:01 pm to 12:00 am, and so forth, and the data would then be averaged over these discrete and fixed intervals. Stakeholders have raised several concerns with using a fixed-interval system to determine compliance:

    - The first concern is regarding which data interval or frequency should data be collected. If an operator is using a CEMS unit to monitor the emissions from an engine, Rule 218.1 (b)(1)(E), the Data Acquisition System (DAS) for the CEMS shall acquire data from monitored parameters at least once every minute and all valid data points shall be used to determine compliance with applicable limit(s). Rules 218 and 218.1 contain the requirements and specifications for the operation of CEMS.

    - The second concern is regarding the situation where an operator is using a 6-hour interval with the averaging starting at 12:01 am, but starts an engine at 3:00 am. Does the averaging start at 3:00 am? In this example, even if not all data is recorded during the 6-hour block, the average is taken from only the data that has been collected from 12:01 am to 6:00 am. Staff believes that as long as there is at least one valid data point in the block, an operator can use it for that fixed-interval. Rule 218.1 provides guidance for reporting values when any data points fall below 10 percent or exceed 95 percent of the full span range.

- Another concern is regarding if a non-operation period of the engine can be counted in the averaging. Valid data should be produced, pursuant to Rules 218 and 218.1. In general, periods of non-operation should not be counted towards the averaging provision because these periods can artificially bias any valid readings downward. However, staff is working on proposed amendments to Rules 218 and 218.1 that would contain requirements for these types of situations for all CEMS installations outside of RECLAIM that would correspond to requirements currently contained in the Code of Federal Regulations for CEMS installations (40 CFR Part 60 and Part 75).

- The last concern is regarding if an operator has to source test an engine, how can compliance be determined for a six-hour averaging period if the test does not last that long. In this situation, the source test protocol or RATA and associated averaging requirements would be followed.

Clause (d)(1)(b)(iv) provides for one hour averaging and clause (d)(1)(B)(v) provides for three hour averaging:

❖ (d)(1)(B)(iv) – Stakeholders have requested for a longer allowance for the averaging time for units equipped with CEMS to increase from 15 minutes to one hour. Stakeholders feel that 15 minutes is too short of an interval to allow for operational transient emissions. In particular, one facility operator has followed the practice of shutting down an engine when that engine has approached an exceedance of an emission limit averaged over 15 minutes. The operator claimed that if they had been able to average emissions over a one hour period, fluctuations associated with load demand changes could be better controlled and responded to. In addition, with each new start-up, some uncontrolled emissions would be emitted. Staff reviewed CEMS data from the facility and determined that if a one hour averaging provision had been allowed, the operator would not have had to shut down an engine. As a result, there would be an emissions benefit by not shutting down an engine and then starting back up relative to transient emissions affecting the 15-minute average. The analysis for this continuous data is presented in Appendix E.

  Under RECLAIM, the averaging time for engines with CEMS consisted of a one-hour averaging time over four 15 minute quadrants. Other combustion rules, Rules 1134 for turbines, Rule 1135 for electrical generating facilities, and Rule 1146 for boilers and heaters allow a one-hour averaging period, similar to RECLAIM. PAR 1110.2 has been modified to allow a fixed-interval averaging approach for one hour averaging that can be utilized for engines with CEMS. For example if an operator of an engine in this situation is using a 1-hour fixed-interval averaging option, then the operator would collect data from 12:01 am to 1:00 am and average over this time period to demonstrate compliance with a given emission limit. The next subsequent intervals would then be taken from 1:01 am to 2:00 am, from 2:01 am to 3:00 am, and 3:01 am to 4:00 am, and so forth and the data would then be averaged over these discrete and fixed one-hour intervals. Under this clause, the operator shall:

  - Use a fixed-interval averaging time of one hour for engines equipped with a continuous emissions monitoring system (CEMS), to demonstrate compliance with the emission concentration limits of Table II or Table III-B.

- (d)(1)(B)(v) – This new clause addresses concerns raised by an affected stakeholder for the operation of their compressor gas lean-burn engines. Their engines are fueled with natural gas and are used for natural gas compression and pipeline transportation. Due to challenges associated with design and operation of these engines, the engines are more prone to emissions fluctuations to load demand changes. Staff recognizes these issues and provides an option for the operator to average emissions over a three-hour period for these engines that are equipped with an SCR and a CEMS. Staff also recommends a fixed-interval averaging approach. For example, if an operator of engine under this clause is using a 3-hour fixed-interval average, the operator would collect data from 12:01 am to 3:00 am and average over this time period to demonstrate compliance with a given emission limit. The next subsequent intervals would then be taken from 3:01 am to 6:00 am, from 6:01 am to 9:00 am, and 9:01 am to 12:00 pm, and so forth, and the data would then be averaged over these discrete and fixed three hour intervals. Under this clause, the operator shall:

    - Use a fixed-interval averaging time of three hours for compressor gas lean-burn engines equipped with selective catalytic reduction pollution control equipment and a CEMS, to demonstrate compliance with the NOx emission concentration limit of Table II.

- (d)(1)(B)(vi) – This is an existing provision that was not designated as a clause that provides a low use exemption for engines that operate fewer than 500 hours per year or use less than 1 x 10^9 Btus per year (higher heating value) of fuel. If an engine meets the criteria for low-use, then the limits for emissions in Table II effective before July 1, 2011 would apply. This clarification addresses concerns brought to the attention of staff. This low use exemption was read by some to mean that if an engine operated less than 500 hours or used less than 1 x 10^9 Btus per year (higher heating value) of fuel, then the engine was exempt from all emission limits. This is not the correct interpretation. To add clarity, Table II states for "Low-Use Engines" to clarify that engines that are below the annual hourly usage or heating value, the engines are subject to the limits for low-use engines. For example, a non-biogas engine that is rated less than 500 bhp and is operated less than 500 hours per year or uses less 1 x 10^9 Btus per year (higher heating value) of fuel would be subject to the following emission limits: 45 ppmvd[1] NOx, 250 ppmvd[2] VOC, and 2000 ppmvd[1] CO.

- (d)(1)(B)(vii) – This is also an existing provision that was not designated in a clause that provides alternative CO and VOC emissions limits that were approved by the Executive Officer in lieu of the concentration limits in Table II effective on and after July 1, 2011. This provision applies to two-stroke engines equipped with an oxidation catalyst and insulated exhaust ducts and catalyst housing that demonstrates that the CO and VOC limits in Table II were not achievable. The case-by-case limits shall not exceed 250 ppmvd VOC and 2000 ppmvd CO. There is no proposed change to this provision.

[1] Parts per million by volume, corrected to 15% oxygen on a dry basis.
[2] Parts per million by volume, measured as carbon, corrected to 15% oxygen on a dry basis and averaged over the sampling time required by the test method.

- ~~(d)(1)(B)(viii) – This is a new clause being added to the rule. Staff reviewed concerns raised regarding the intermittent use of diesel-fueled engines used to power cranes located on offshore platforms. Recently, a facility installed new, Tier 4 final engines to replace older, higher-polluting engines. Although a source test was completed on two of the engines indicating compliance to the current NOx emission limits of 11 ppmvd, staff questioned whether the test represents actual operation. As such, staff is working with the facility to establish a technologically achievable NOx limit not to exceed 45 ppmvd. The technological achievable NOx limit was selected as a backstop limit based on the pre-July 1, 2010 limit for engines rated less than 500 bhp. However, an alternative emission limit above 45 ppmvd may be approved by the Executive Officer based on approved source test results.~~

Ammonia Emission Limits for New Engine Installation with SCRs

Staff initially proposed including an ammonia slip concentration limit for engines that install post-combustion emission controls, such as SCR. Currently when engines are permitted with post-combustion controls such as SCR or an SCR is added to a new engine, a BACT ammonia concentration limit of 5 ppmvd is specified in the permit. Staff decided to remove the ammonia concentration limit from PAR 1110.2 as this is a Regulation XIII – New Source Review BACT issue that has and will continue to be addressed during permitting of new engines with SCR and existing engines with new SCR systems. Provisions for monitoring ammonia have also been removed from PAR 1110.2 since monitoring requirements will also be addressed during permitting. If an existing SCR is replaced with a new SCR, the existing ammonia slip requirements can be retained provided there is no emissions increase of ammonia as a result of the modification.

Averaging Time Provisions for Biogas Engines (d)(1)(I)

The 2012 amendments to Rule 1110.2 established emission limits for biogas engines that would correspond to those for natural gas engines. Due to the unique nature of this type of biogas fuel (e.g., lower heating value and contaminant loading), provisions that would allow a longer averaging time were included. The current language contained in subparagraph (d)(1)(I) states that provided the operator of a retrofitted biogas engine can demonstrate through CEMS that NOx emissions are achieving levels of at least 10% below the 11 ppmvd NOx concentration limit (e.g., at or below 9.9 ppmvd for NOx) over a 4-month time period, the use of longer averaging is allowed. This provision would also apply for CO (e.g., at or below 225 ppmvd for CO) if it is also selected for averaging, although CO CEMS is not required for lean burn engines. Once the ability to use a longer averaging time is established, an operator could use a monthly fixed interval averaging time for the first four months of operation and up to a 24-hour fixed averaging time thereafter.

A review of these requirements gave rise to a need for additional clarity, specifically regarding the longer averaging time period that had been allowed immediately upon startup (e.g., before the first four months have elapsed), and how the ongoing requirement would be demonstrated and enforced. Stakeholders also commented on the 24-hour averaging and the need for a longer averaging time. As a result, staff proposes an averaging time for biogas engines equipped with CEMS over a 48-hour fixed interval of time. In exchange for the longer averaging time of 48 hours, the engine would be required to meet a concentration limit of 9.9 ppm for NOx and 225 ppmvd

CO (if CO is selected for averaging). If the owner or operator elects to use the longer averaging time, the emission limits and averaging time must be included in the permit to operate for the engine. Subparagraph (d)(1)(I) would now read:

- An operator of a biogas engine with a CEMS shall either meet:
  - (i) The NOx and CO limits of Table III-B, averaged pursuant to the specified averaging provisions in subparagraph (d)(1)(B); or
  - (ii) Meet the concentration limits at or below ~~9.9~~<u>11</u> ppmvd for NOx and ~~225~~ <u>250</u> ppmvd for CO (if CO is selected for averaging), each corrected to 15% O_2 and averaged over a ~~48~~<u>24</u>-hour fixed interval, with the concentration limits and averaging time specified as a condition in the engine's permit to operate<u> on or before the [*Date of Amendment*]</u>.
  - (iii)<u>Meet the concentration limits at or below 9.9 ppmvd for NOx and 225 ppmvd for CO (if CO is selected for averaging), each corrected to 15% O_2 and averaged over a 48-hour fixed interval, with the concentration limits and averaging time specified as a condition in the engine's permit to operate.</u>

~~Qualitatively, i~~<u>I</u>f a facility uses the 48-hour averaging provision, then the expected benefit in emissions reductions would be 10% of what was previously emitted.

The existing provisions for determining compliance contained in clauses (d)(1)(I)(i) through (iv) are proposed to be removed and replaced with this 48-hour option. ~~In the monitoring, testing, recordkeeping, and reporting section of Rule 1110.2, existing clause (f)(1)(A)(iii) clearly specifies that all CEMS under Rule 1110.2 are required to comply with all applicable requirements of Rule 218 and 218.1.~~

~~In addition, there are specific requirements for biogas averaging in the existing rule language that does not allow the averaging of data when the engine is not in operation or during periods of quality control, such as calibration. This provision is proposed to be kept in the rule and it is anticipated that subsequent amendments to Rules 218 and 218.1 would contain requirements for these types of situations for all CEMS installations outside of RECLAIM. These anticipated amendments would correspond to requirements currently contained in the Code of Federal Regulations for CEMS installations (40 CFR Part 60 and Part 75). Clause (d)(1)(I)(ii)(A) is added to keep the provision in the rule until such time that Rules 218 and 218.1 are amended. This provision states:~~

- ~~Until Rules 218 and 218.1 are amended after [*Date of Amendment*], an operator shall not average data during one-minute periods in which the underlying equipment is not operated or when the CEMS is undergoing zero or calibration checks, cylinder gas audits, or routine maintenance in accordance with the provisions in Rules 218 and 218.1.~~

Addition of Concentration Limits for New Electrical Generation Devices (d)(1)(L)

Staff was approached by a manufacturer of electrical generating devices using linear generator technology with a request to provide concentration limits in addition to the listed emission standards for new electrical generating devices as currently expressed as pounds of NOx per Megawatt-Hour. Staff has updated Table IV, which contains the requirements for new electrical generators to reflect the conversion from a mass-based emission standard to a concentration limit.

The following calculation was used in the conversion from a mass-based emission to a concentration limit:

Step 1: Convert lbs/MW-hr to g/bhp-hr

lbs → grams	Multiply by 453.6
MW → bhp	Multiply by 1341

Pollutant	lbs/MW-hr	g/bhp-hr
NOx	0.07	0.0237
CO	0.2	0.0676
VOC	0.1	0.0338

Step 2: Convert g/bhp-hr to ppmvd

1 lb → grams	(A)	453.6	g
bhp → BTU/hr	(B)	2545	Btu/hp-hr
thermal efficiency	(C)	0.4	
O2	(D)	15	%
molar volume	(E)	385	@68 F and 1 atm
Molecular Weight of Constituents	(W_i)	46	NOx
		28	CO
		16	VOC
F factor	(F)	8710	natural gas

Equation 1: $Ci = M_i/A \times C/B \times E/(W_i \times F) \times (20.9 - D)/20.9 \times 10^{12}$

C_i = Concentration of constituent

M_i = Emissions in g/bhp-hr

NOx Value (g/bhp-hr)	0.0237
Convert NOx (ppmvd)	2.225
CO Value (g/bhp-hr)	0.0676
Convert CO (ppmvd)	10.446

VOC Value (g/bhp-hr)	0.0338
Convert VOC (ppmvd)	9.140

In the conversion from lbs/MW-hr to ppmvd, staff assumed a 40% thermal efficiency value for an engine in this operation. This value may differ due to varying thermal efficiency ratings. The basis for using a 40% thermal efficiency value was derived in part from information contained in a patent filing by the manufacturer. An expected thermal efficiency for a regular combustion engine is about 30%. In comparison, a linear generator has an expected increase in thermal efficiency to about 50%. However, to meet potential VOC requirements in the future, this overall efficiency increase may not be realized in practice. Therefore, an average between 30% and 50% was used. For this rule development, 40% was used as the thermal efficiency value for this technology.

In determining the equivalent emission limits, staff did not include any credit for recovered energy. The final determination of these values included a 10% rounding margin. Based on this evaluation, staff has added concentration limits to Table IV as listed in Table 3-1.

Table 3-1: New Rule 1110.2 Table IV Concentration Limits

Pollutant	Emission Standard (lbs/MW-hr)[1]	Concentration Limit[3] (ppmvd)[4]
NOx	0.070	2.5
CO	0.20	12
VOC	0. 10[2]	10

1 The averaging time of the emission standard for VOC is the sampling time required by the test method.

2 Mass emissions of VOC shall be calculated using a ratio of 16.04 pounds of VOC per lb-mole of carbon.

3 Concentration limit is calculated using a 40% engine efficiency and no applied thermal credit.

4 Parts per million by volume, corrected to 15% oxygen on a dry basis.

At this time, a size limit has not been proposed. The manufacturer of this linear generator technology has informed staff that due to the inherent low temperature of the exhaust, the oxidation catalyst used to reduce VOC emissions cannot reach temperatures to completely oxidize VOC emissions, particularly propane compounds, to meet a VOC concentration limit of 10 ppmvd. The manufacturer has expressed that it is working towards a solution to lower the VOC emissions.

Although VOC emissions from these engines at this time may be higher than the proposed limits, there are, however, several beneficial aspects with linear generators: low NOx emissions at start up and no ammonia emissions associated with an SCR. With linear generators, the NOx concentration limit of 2.5 ppmvd can be achieved at start up with no after-controls such as an SCR. As a result, there is no need for ammonia injection that would result in increased ammonia slip or PM emissions, and the exhaust would achieve immediate compliance with NOx concentration limits. In other combustion technologies where an SCR is used to achieve lower NOx emission limits, start-up emissions are uncontrolled until the SCR catalyst can reach temperatures to control NOx emissions, which can take generally 20 to 30 minutes.

PAR 1110.2 includes a provision that allows engines that can achieve NOx concentration limits at start-up with no ammonia emissions from an SCR to meet an interim VOC concentration limit of 25 ppmvd, until January 1, 2024. Any new installation after this date would be required to meet the lower VOC emission limit of 10 ppmvd in Table IV. Additionally, PAR 1110.2 includes a mass VOC cumulative emissions limit of 45 pounds per day to limit~~cap on~~ the number of units that can be installed meeting the alternative VOC concentration limit. The number of units will be based on the difference between 10 ppmvd and the permitted emission limit that is less than 25 ppmvd. The limit on the number of units with an interim VOC limit, is to ensure that the emissions from such engines would not exceed the VOC significance threshold ~~under CEQA. Staff recommends a total VOC emission cap not to exceed 45 lbs per d~~ay of VOC. The excess VOC emissions represent the difference between a permitted alternative concentration limit and the concentration limit set in Table IV. The South Coast AQMD Air Quality Significance Threshold for VOC emissions due to operation is set at 55 lbs per day.[1] By setting a cap of 45 lbs per day of VOC allows for differences in generator size and operational hours while staying under the significance threshold, which already captures construction and operational VOC emissions as a result of implementation of Proposed Amended Rule 1110.2.

The tracking of installations would be based on the number of applications submitted during the interim period. As part of the tracking, the cumulative amount of excess VOC emissions which is the difference between a permitted alternative concentration limit and the concentration limit set in Table IV will be tabulated internally. Engines that meet the limits in Table IV, would not be counted towards the number of units under the cap of the alternative VOC emission limit totaling less than 45 lbs of VOC per day. Once the cap has been reached, any additional permits with excess VOC emissions will not be approved. After January 1, 2024, all new linear generators will be subject to the same emissions and monitoring requirements as other electrical generating engines. The provision that would directly apply to equipment using this technology [clause (d)(1)(L)(vii)] would read:

- ~~For o~~Owners and operators of new engines installed prior to January 1, 2024 with no ammonia emissions from ~~selective catalytic reduction pollution~~ add-on control equipment and where NOx emissions meet the concentration limit~~s~~ of Table IV at all times ~~during start-up~~, may elect to apply for and comply with the concentration limits of Table IV, expressed in ppmvd, except an alternative VOC concentration limit that is equal to or less

[1] http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf

than ~~of~~ 25 ppmvd may be complied with~~used in lieu of the VOC concentration limit in Table IV for any new unit up to maximum of 45 lbs of VOC emission per day of combined installation from [*Date of Rule Amendment*] that is installed before January 1, 2024~~. The Executive Officer shall accumulate daily VOC emissions in excess of the VOC concentration limit of Table IV based on the permitted VOC limits from each such engine and shall not approve any additional permit for such engine that will cause the total accumulated daily VOC emissions to exceed 45 lbs per day. Any new installation on or after January 1, 2024 shall comply with the VOC concentration limit in Table IV in ppmvd.

~~Clause (d)(1)(L)(viii) is added to specify that either the emission standard or the concentration limit listed in Table IV is used. Application of this provision should be listed on the permit to operate. The provision states:~~

- ~~The limits established by Table IV for a pollutant shall be specified in the permit to operate an as either an emission standard given in lbs/MW-hr or for engines with no ammonia emissions from selective catalytic control equipment that meets the NOx emission limits during startup, and where NOx emissions meet the concentration limits Table IV, as a concentration limit given in ppmvd.~~

Staff is limiting the option of an emissions concentration limit to linear generators where this technology can meet the emission targets upon start-up without an SCR. In addition, staff is concerned that extending a concentration-based limit to non-linear technologies may result in higher emissions. It is expected that non-linear generator technologies have lower thermal efficiencies which would allow for higher mass based emission levels for a set concentration value.

Averaging Time for Electrical Generation Engines

Several stakeholders that represent facilities that operate these electrical generators, as well as original equipment manufacturers and emission control vendors have expressed the need for a one-hour averaging period for electrical generators. Consistent with the averaging period allowed for other engines in PAR 1110.2, staff is proposing to allow the same proposed option as non-electrical generators that is contained in proposed clause (d)(1)(B)(iv). A one-hour averaging time is more consistent with averaging times allowed for other electrical generating equipment allowed under Rule 1135 for equipment at electrical generating facilities. New clause (d)(1)(L)(vi) would read:

- For engines driving electrical generators and operating with a CEMS, a fixed-interval averaging time of one hour shall be used to demonstrate compliance with the NOx and CO emission standard ~~concentration~~ requirements of Table IV in lbs/MW-hr. For engines driving electrical generators and operating without a CEMS, the NOx and CO emission standard requirements of Table IV in lbs/MW-hr shall be averaged over 15 minutes.

Monitoring Requirement Changes (e)(3)(C)

Under the RECLAIM program, engines categorized as large NOx sources are not required to be equipped with a continuous emission monitoring system (CEMS). Per Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions, large NOx sources include any internal combustion engine with rated brake horsepower greater than or equal to 1,000 bhp and operating 2,190 hours per year or less, or greater than or equal to 200 bhp but less than 1,000 bhp and operating more than 2,190 hours per year.

Under Rule 1110.2, however, there is no separate designation of a RECLAIM large source. Under Rule 1110.2, CEMS is required for engines of 1,000 bhp and greater and operating more than two million bhp-hr per calendar year. A NOx and CO CEMS is required to be installed, operated and maintained in calibration to demonstrate compliance with the emission limits of the rule. In addition, for facilities with multiple engines that are individually greater than 500 bhp but less than 1000 bhp and have a combined rating of 1500 bhp or greater at the same location, and having a combined fuel usage of more than 16 x 10^9 Btus per year (higher heating value), an operator is required to install, operate and maintain a CEMS to demonstrate compliance of those engines with the applicable NO_x and CO emission limits.

However, the following engines are not counted toward the combined rating or required to have a CEMS under the current rule:

- engines rated at less than 500 bhp;
- standby engines that are limited by permit conditions to only operate when other primary engines are not operable;
- engines that are limited by permit conditions to operate less than 1,000 hours per year or a fuel usage of less than 8 x 10^9 Btus per year (higher heating value of all fuels used);
- engines that are used primarily to fuel public natural gas transit vehicles and that are required by a permit condition to be irreversibly removed from service by December 31, 2014;
- engines required to have a CEMS by another provision in the rule
- if permit conditions limit the simultaneous use of the engines at the same location in a manner to limit the combined rating of all engines in simultaneous operation to less than 1500 bhp.

For those engines at RECLAIM and former RECLAIM facilities, subparagraph (e)(3)(C) has been added to provide a compliance schedule for CEMS installation once a facility exits from RECLAIM and becomes a former RECLAIM facility. This subdivision is necessary since there are several engines that are in RECLAIM that were not required to have a CEMS installed, but per PAR 1110.2, would now require installation of CEMS. For example, an engine that is classified as a large RECLAIM source without CEMS and is rated greater than 1,000 bhp, PAR 1110.2 would require CEMS upon exiting RECLAIM. In addition, engines that are greater than 500 bhp but less than 1,000 bhp and operate in close proximity to each other with an aggregate rating greater than 1,500 bhp would also require a CEMS outside of RECLAIM. Subparagraph (e)(3)(C) would state:

- The operator of any stationary engine that is located at a RECLAIM or former RECLAIM facility that is required to modify an existing CEMS or install a CEMS on an existing engine that is subject to paragraph (f)(1) shall comply with the compliance schedule in Table VII such that the operator shall submit to the Executive Officer applications for a new or modified CEMS within 90 days of becoming a former RECLAIM facility.

The intent of subparagraph (e)(3)(C) is to provide an operator of a former RECLAIM facility with a timeline to install CEMS engines that would now require one. Staff considers 90 days of becoming a former RECLAIM facility to submit to the Executive Officer an application for a new or modified CEMS a reasonable amount of time.

Once the application is initially approved, then the following actions would be required, per the existing requirements listed in Table 3-2

Table 3-2: Rule 1110.2 Table VII

Action Required	Applicable Compliance Date for
• Complete installation and commence CEMS operation, calibration, and reporting requirements	• Within 180 days of initial approval
• Complete certification tests	• Within 90 days of installation
• Submit certification reports to Executive Officer	• Within 45 days after tests are completed
• Obtain final approval of CEMS	• Within 1 year of initial approval

For purposes of clarification, a day is considered on a calendar day basis.

Clause (e)(3)(C)(i) was added to provide relief to facilities that opt to retrofit existing engines with new emission controls or decide to install new engines. For example, if an engine is retrofitted before it exits RECLAIM, CEMS would be required at the time of retrofitting. However, if an engine has exited from RECLAIM and the compliance deadline is some other date in the future, CEMS would not be required to be installed until the engine is retrofitted or when the engine is replaced. This clause states:

- For engines at a RECLAIM or former RECLAIM facility, installation of a CEMS is required concurrently with the installation of retrofit control technologies or new engine replacements to meet the requirements of paragraph (d)(1).

For RECLAIM or former RECLAIM facilities, paragraph (e)(10) of Rule 1110.2 provides the reference to the implementation schedule proposed per Rule 1100. Specifically, for RECLAIM or former RECLAIM facilities:

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

Threshold for CEMS Requirement at an Essential Public Service (f)(1)(A)

During the rulemaking process, a stakeholder that operates a biogas-fueled engine rated at 1175 bhp requested a provision similar to the provision allowed for CEMS for threshold for the aggregate horsepower provision. Currently under Rule 1110.2 (f)(1)(A)(ii)(VI), the aggregate horsepower CEMS requirement is not applied to public agencies provided that additional diagnostic monitoring is conducted. In response to this request, staff has included the following clauses:

- ❖ (f)(1)(A)(ix) – In lieu of clause (f)(1)(A)(i), an Essential Public Service or a contractor for an Essential Public Service that is operating a biogas engine of 1000 bhp and greater and less than 1200 bhp, may alternatively comply with the Inspection and Monitoring Plan requirements of subparagraph (f)(1)(D), provided the operator conducts diagnostic emission checks at least weekly or every 150 operating hours, whichever occurs later.

- ❖ (f)(1)(A)(x) – If an Essential Public Service or a contractor for an Essential Public Service that has elected to comply with the Inspection and Monitoring Plan provisions pursuant to clause (f)(1)(A)(ix) for biogas engines is found to exceed an applicable NOx or CO limit by a source test required by subparagraph (f)(1)(C) or South Coast AQMD test using a portable analyzer on three or more occasions in any 12-month period, the operator shall comply with the CEMS requirements of clause (f)(1)(A)(i) for such biogas engine in accordance with the compliance schedule of Table VII and submit a CEMS application to the Executive Officer within six months of the third exceedance.

If the facility chooses to remove its CEMS and utilize weekly monitoring with a portable analyzer, the facility would be required to reinstall and recertify a CEMS if there are a number of emissions exceedances per clause (f)(1)(A)(x). What is considered an occasion is a separate instance where a limit is exceeded during a compliance check with a portable analyzer. If an operator determines that a limit has been exceeded, the operator is expected to take any and all necessary steps to remedy the situation. In the course of taking corrective action, if the operator performs additional tests with a portable analyzer and has a high value, this is not considered a separate occasion that counts against the cap. However, additional checks may substantiate the amount of time of non-compliance and may be used to determine the scope of any resulting enforcement action.

Clarified Language Regarding Source Testing Deadlines (f)(1)(C)(i)

Currently, Rule 1110.2 requires source tests once every two years (or once every three years if the engine is below a low use hourly threshold pursuant to clause (f)(1)(C)(i). The proposed rule language clarifies when the source tests must be conducted:

- …at least once every two years from the date of the previous source test, no later than the last day of the calendar month that the test is due…

This ensures that the interval between source tests does not become excessive, while allowing for flexibility up to and including the calendar month for scheduling and re-scheduling a source test. For example, if an engine has been source tested on May 21, 2018 and is on a two-year schedule, then the next source test would be due no later than May 31, 2020. However, if an engine is source tested before May 2020, then the source testing month would be reset to that month. Continuing with this example, if the engine was source tested early on April 1, 2020, then the next source test would be due no later than April 30, 2022.

In addition, if an engine has not been operated prior to the date of a source test, the rule is amended to provide flexibility for when the source test would be required once an engine is operated again. Previously, the rule allowed that if an engine had not been operated within three months of the date a source test is required, then a source test would be required once an engine resumes operation for a period of seven consecutive days or 15 cumulative days of operation. If an engine is shut down prior to the due date of a source test, the source test would then be due seven consecutive days or fifteen cumulative days after resumed operation.

To clarify this issue, the proposed rule language states:

- If the engine has not been operated before the date a source test is due, the source test shall be conducted by the end of seven consecutive days or 15 cumulative days of resumed operation.

Relative Accuracy Testing Inclusion (f)(1)(C)(ii)

An update to the source testing requirement listed in clause (f)(1)(C)(ii) has been added to allow relative accuracy tests to satisfy this requirement for those pollutants monitored by CEMS. This condition mirrors what already exists for clause (f)(1)(C)(i). RATA testing can be used in lieu of source testing and would be required for all loads of the equipment operation.

Flexibility Added to I&M Plans (f)(1)(D)(i)

Stakeholders have requested consideration on how compliance to the conditions contained in Attachment I can be demonstrated. For example, the manufacturer of linear generators has proposed using parametric monitoring as a substitute to using portable analyzers. In response to this request, staff has proposed an option that would allow owner or operators to make this demonstration to the Executive Officer. The standard for compliance is using a portable analyzer, but staff recognizes that as technology advances, diagnostic innovations may provide alternative methods to accomplish similar goals. The following language has been added to clause (f)(1)(D)(i):

- The owner or operator may request an alternative item(s) in Attachment 1 that is determined by the Executive Officer to be equivalent in meeting the same objectives.

This added language is intended to apply to all provisions in Attachment 1. For example, if an owner or operator can successfully demonstrate equivalency by substituting parametric monitoring in lieu of using a portable analyzer, then the engine would not be subject to diagnostic emission checks by a portable analyzer pursuant to provision C of Attachment 1 and by extension, the engine would not be subject to clause (f)(1)(D)(ii), which requires portable analyzer monitoring, and also to the elements in clause (f)(1)(D)(iii) that pertain to portable analyzer monitoring by the facility.

Recordkeeping Revisions (f)(1)(E) and (f)(2)

Under RECLAIM Rule 2012, stationary and portable engines that are designated as a process unit on the facility permit are allowed to maintain a quarterly operating log. An engine is designated as a process unit if it is rated greater than or equal to 200 bhp but less than 1,000 bhp and operating 2,190 hours per year or less; or greater than 50 bhp but less than 200 bhp. Once the facility exits the RECLAIM program, however, the facility shall comply with subparagraph (f)(1)(E) or paragraph (f)(2) which requires a monthly engine operating log for stationary and portable engines, respectively, instead of a quarterly log. Each of these provisions have been modified to reflect this change:

- Facilities subject to Regulation XX may maintain a quarterly log for engines that are designated as a process unit on the facility permit until such time that the facility becomes a former RECLAIM facility. The facility shall maintain a monthly engine log starting in the month that it has become a former RECLAIM facility.

Harmonize with Rule 219 and Rule 222 (i)(1)(H)

In May 2013, Rules 219 and 222 were amended such that engines powering remote radio transmission towers meeting specific criteria were exempt from permitting. The criteria included any engine used exclusively for electrical generation at remote two-way radio transmission towers where no utility, electricity, or natural gas is available within a ½ mile radius, has a manufacturer's rating of 100 bhp or less, and is fired exclusively on diesel #2, compressed natural gas, or liquefied petroleum gas.

Staff determined that not only were these engines to be exempted from permitting, but these engines were to be exempted from Rule 1110.2 emission requirements as well. The engines were considered to provide an essential public service and due to their unique locations required this exemption to be extended to this engine category. Subparagraph (i)(1)(H) has been modified to remove reference to the engines operated at Santa Rosa Peak. Subparagraph (i)(1)(M) has been added to harmonize Rules 1110.2, 219, and 222. Subparagraph (i)(1)(M) states that the emission requirement provisions of subdivision (d) shall not apply to:

- An engine used exclusively for electrical generation at remote two-way radio transmission towers where no utility, electricity, or natural gas is available within a ½ mile radius, has a manufacturer's rating of 100 bhp or less, and is fired exclusively on diesel #2, compressed natural gas, or liquefied petroleum gas.

Although subparagraph (i)(1)(H) removes reference to engines operated at Santa Rosa peak, the engines at Santa Rosa peak have been determined to meet the requirements of subparagraph (i)(1)(M). Staff performed a site visit and confirmed applicability.

Other Exemptions

❖ Rule 1110.2 (i)(1)(J) has been updated to include within this exemption the tuning of the engine and emission control equipment. The Executive Officer may approve up to two hours for tuning of engine and emission control equipment. Some stakeholders have indicated that additional tuning leads to cleaner operating engines.

- Rule 1110.2 (i)(1)(K) has been updated to include the installation of catalytic control equipment. As more operators opt to install this type of equipment, stakeholders requested specific inclusion of this provision to have adequate time to make adjustments after significant equipment changes.

- Rule 1110.2 (i)(1)(N) has been added as an exemption to the emissions requirements of the rule for any engine that is subject to an industry-specific rule. As part of the RECLAIM transition, several new industry-specific rules are being developed. In such cases, facilities that are affected by these industry-specific rules may have non-emergency, internal combustion engines that are excluded from certain Rule 1110.2 requirements (e.g., engines operated at electricity generating facilities and in refineries). Subparagraph (i)(1)(N) will state that the emission requirements in Rule 1110.2 shall not apply to:

  - Any engine at a RECLAM 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.

- Rule 1110.2 (i)(1)(O) has been added as an exemption for engines used to operate cranes in either the Southern California Coastal Waters or the Outer Continental Shelf Waters in the South Coast AQMD jurisdiction. During the rulemaking process, staff was approached by an operator of such equipment where the operator was replacing seven older engines with new CARB-certified Tier-4 diesel-fueled engines. Initially, the operator approached staff with a concern with how these engines were tested to demonstrate compliance to a permitted NOx emission limit. The operator disclosed that the initial source test that had been conducted to demonstrate compliance was completed under abnormal operating conditions where the operator forced the crane to operate under load with full brake application. This abnormal operation was identified by the operator and staff as a safety issue for both the personnel operating the equipment and the equipment itself.

  To address the source testing issue, staff worked with the operator to provide an alternative testing protocol. However, upon further discussion, the operator refused to accept the conditions of the revisions to the protocol and requested consideration for an exemption from the emissions limits in the rule and also from the source testing requirements. To support their request, the operator cited the existing agricultural exemption found in the rule for Tier-4 engines and also the exemption for crane engines operated in the Ventura County Air Pollution Control District (APCD).

  As staff considered the request from the operator, staff reviewed this situation with USEPA and also reviewed the Staff Report for the Ventura County APCD Proposed Revision to Rule 74.9, dated December 21, 1993. It was determined that the engines used in this type of operation were subject to high cyclic variability where achieving proper stack temperature and a sufficient sampling time within a “normal” operation cycle was not reasonable. For situations where an exemption is provided, a demonstration of equivalency would be required by way of ongoing monitoring to assure that the equipment is being operated per the manufacturer’s specifications. The facility has told staff that the engines rely on software parametric monitoring that would alert the operator if any parameter is out of range. These are items that would be required as part of the ongoing maintenance of a facility inspection and monitoring plan (I&M Plan), under Rule 1110.2. Although the exemption provisions under subdivision (i) also exempt ongoing monitoring requirements, the proposed amendments for offshore crane engines would still require the facility to submit an I&M Plan to assure ongoing compliance with the manufacturer's recommended operation to satisfy equivalency. Based on staff's review, the following clause is added to state that the emissions and source testing provisions of the rule would not apply to:

- An engine operated in either the Southern California Coastal Waters or Outer Continental Shelf Waters provided:
  - (i) The engine is used to power a crane;
  - (ii) The engine is certified by CARB to meet the Tier 4 – Final emission standards of 40 CFR Part 1039 Section 1039.101 Table 1;
  - (iii) The engine is operated per the specifications of the engine manufacturer; and
  - ~~(i)~~(iv) The operator submits an I&M Plan to the Executive Officer for approval and implementation, pursuant to the requirements of subparagraph (f)(1)(D).

By maintaining an I&M plan, the engines will still be required to monitor engine parameters and operation although periodic source testing is no longer required. For engines still in RECLAIM and Title V, any provisions related to monitoring, tuning, and testing would still be applicable until the engines transition out of the RECLAIM program, pursuant to the requirements for process units with a concentration limit in Rule 2012.

❖ Rule 1110.2 (i)(3) has been added as an exemption to units located at landfills and publicly owned treatment works (POTW) that are subject to a NOx emission limit in a Regulation XI rule adopted or amended after [*Date of Amendment*]. Staff is working on two proposed rules for combustion equipment located at either landfills or publicly owned treatment works and the possibility of including requirements for engines in these two proposed rules. This provision is a placeholder in the event that NOx, CO, and VOC emissions are addressed in these two proposed rules.

~~*Flexibility Added to I&M Plans*~~

~~❖ Stakeholders have requested consideration on how compliance to the conditions contained in Attachment I can be demonstrated. For example, the manufacturer of linear generators has proposed using parametric monitoring as a substitute to using portable analyzers. In response to this request, staff has proposed an option that would allow owner or operators to make their case to the Executive Officer. The standard for compliance is the portable analyzer, but staff recognizes that as technology advances, diagnostic innovations may provide alternative methods to accomplish similar goals.~~

PROPOSED AMENDMENTS TO RULE 1100

Rule 1100 – Implementation Schedule for NOx Facilities establishes the implementation for Regulation XI rules for RECLAIM and former RECLAIM facilities. Rule 1100 was created to address the implementation schedule for RECLAIM facilities that are subject to Regulation XI particularly for those rules where the compliance date for the non-RECLAIM facilities has past and the NOx emission limits are fully implemented. Proposed Amended Rule 1100 (PAR 1100) establishes the implementation schedule for PAR 1110.2 for RECLAIM and former RECLAIM facilities. PAR 1100 includes engines regulated under PAR 1110.2 in its applicability for owners or operators of RECLAIM or former RECLAIM facilities.

Definitions – Subdivision (c)

PAR1100 includes new definitions that pertain to equipment covered under PAR 1110.2: ~~(~~COMPRESSOR GAS LEAN-BURN ENGINE, ENGINE, LEAN-BURN ENGINE, LOCATION, PORTABLE ENGINE, RULE 1110.2 UNIT, and STATIONARY ENGINE.

- COMPRESSOR GAS LEAN-BURN ENGINE is a stationary gaseous-fueled two-stroke or four-stroke lean-burn engine used to compress natural gas or pipeline quality natural gas for delivery through a pipeline or into storage as defined in Rule 1110.2.

- ENGINE is any spark- or compression-ignited internal combustion engine, including engines used for control of VOCs, but not including engines used for self-propulsion as defined in Rule 1110.2.

- LEAN-BURN ENGINE is an engine that operates with high levels of excess air and an exhaust oxygen concentration of greater than 4 percent as defined in Rule 1110.2.

- LOCATION means any single site at a building, structure, facility, or installation. For the purposes of this definition, a site is a space occupied or to be occupied by an engine. For engines which are brought to a facility to perform maintenance on equipment at its permanent or ordinary location, each maintenance site shall be a separate location.

- PORTABLE ENGINE is an engine that, by itself or in or on a piece of equipment, is designed to be and capable of being carried or moved from one location to another. Indications of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, platform or mounting. The operator must demonstrate the necessity of the engine being periodically moved from one location to another because of the nature of the operation as defined in Rule 1110.2.

  An engine is not portable if:

  (A) The engine or its replacement remains or will reside at the same location for more than 12 consecutive months. Any engine, such as a back-up or stand-by engine, that replaces an engine at a location and is intended to perform the same function as the engine being replaced, will be included in calculating the consecutive time period. In that case, the cumulative time of both engines, including the time between the removal of the original engine and installation of the replacement engine, will be counted towards the consecutive time period; or

(B) the engine remains or will reside at a location for less than 12 consecutive months where such a period represents the full length of normal annual source operations such as a seasonal source; or

(C) The engine is removed from one location for a period and then it or its equivalent is returned to the same location thereby circumventing the portable engine residence time requirements.

The period during which the engine is maintained at a designated storage facility shall be excluded from the residency time determination.

- RULE 1110.2 UNIT means any stationary and portable engine over 50 rated brake horsepower (bhp) subject to Rule 1110.2.

- STATIONARY ENGINE is an engine which is either attached to a foundation or if not so attached, does not meet the definition of a portable or non-road engine and is not a motor vehicle as defined in Section 415 of the California Vehicle Code as defined in Rule 1110.2.

Rule 1110.2 Implementation Schedule

Subdivision (d) of PAR 1100 contains the implementation schedule for engines at RECLAIM and former RECLAIM facilities. The final compliance date for most stationary engines at RECLAIM and former RECLAIM facilities to meet the emission limits listed in Rule 1110.2 paragraph (d)(1) will be December 31, 2023, consistent with the implementation deadline of AB 617.

Portable diesel engines greater than or equal to 50 brake horsepower shall comply with the tier phase-out schedule of the California Air Resources Board Airborne Toxic Control Measure. The tier phase-out schedule is provided below in Table 3-3.

Upon rule adoption, an owner or operator of RECLAIM or former-RECLAIM facility with a portable spark-ignited engine shall meet the compliance schedule of the Large Spark Ignition Engine Fleet Requirements, Article 2, Chapter 15, Division 3, Title 13 of the California Code of Regulations.

Table 3-3: Tier Phase-Out Schedule

Engine Certification	Engines rated 50 to 750 bhp		Engines rated > 750 bhp
	Large Fleet	Small Fleet	
Tier 1	1/1/2020	1/1/2020	1/1/2022
Tier 2 built prior to 1/1/2009	1/1/2022	1/1/2023	1/1/2025
Tier 2 built on or after 1/1/2009	Not Applicable	Not Applicable	1/1/2027
Tier 3 built prior to 1/1/2009	1/1/2025	1/1/2027	Not Applicable
Tier 3 built on or after 1/1/2009	1/1/2025	1/1/2027	Not Applicable
Tier 1,2, and 3 flexibility engines	December 31 of the year 17 years after the date of manufacture		

Compressor Gas Lean-Burn Gas Engines

There is one RECLAIM facility stakeholder that is currently using compressor gas lean-burn engines. This stakeholder has commented that these engines are unique in their application and has requested additional consideration in establishing the emission limits and the compliance schedule. PAR 1100 includes three alternative implementation schedules for compressor gas lean-burn engines for: (1) existing engines that are being retrofitted to meet the emission limits; (2) replacement of compressor gas lean-burn engines at a facility; and (3) engines that are being replaced with equipment regulated under another Regulation XI rule.

- Alternative Compliance Schedule Retrofitting Compressor Gas Lean-Burn Engines

PAR 1100 paragraph (d)(5) includes an alternative compliance approach for owner or operators that are retrofitting compressor gas lean-burn engines to meet the emission limits in paragraph (d)(1) of PAR 1110.2. Owner or operators that elect to use this alternative compliance approach must submit a permit application for each compressor gas lean-burn engine by July 1, 2021 if the engine does not meet the NOx concentration specified in PAR 1110.2. No later than 24 months after the issuance of the permit to construct, the compressor gas lean-burn engine shall comply with the NOx concentration limits in Table II of PAR 1110.2. Until the NOx concentration is met, the owner or operator shall provide quarterly reports of monitoring and source test data, applicable engine parameters, and actions taken towards achieving compliance with the NOx limit. The quarterly reports provide data for the South Coast AQMD staff to assess the emission levels that are being achieved the types of corrective actions, if any, that the operator is implemented to achieve the NOx concentration limits.

A time extension may be requested for up to an additional 24 months, provided a compliance plan is submitted no later than 22 months after the permit to construct is issued. The request for the time extension must provide the reason for the time extension and all quarterly report data since the startup of the retrofitted equipment. If the compliance plan is approved, the engine shall meet a NOx concentration limit not to exceed 45 ppm, corrected to 15% oxygen on a dry basis, averaged over a 3 hour fixed interval until the time specified by the Executive Officer. The engine shall also be required to meet the VOC concentration limits of Rule 1110.2, including any previously approved alternate limits. It is expected that efforts be continued to attempt to meet the 11 ppm NOx limit of Rule 1110.2 during this time period.

At the end of the extension period, the owner or operator may notify the Executive Officer that the emission limits in PAR 1110.2 paragraph (d)(1) cannot be achieved. These requirements are contained in PAR 1100 paragraph (d)(6), which require a revision to the compliance plan submitted previously to obtain the time extension. The owner or operator shall submit the past two years of monitoring data, operation logs, and detailed increments of progress including measures taken to meet the emission limits. The Executive Officer shall review the information and either require that the NOx emissions limit in paragraph (d)(1) be met or establish technologically achievable case-by-case emission limits. The owner or operator shall either meet the case-by-case emission limits within 30 days or replace the compressor gas lean-burn engine within one year. During this period, the engine shall continue to comply with the interim NOx limit in Rule 1100 (d)(5)(C)(i).

If any extension is approved, the owner or operator shall pay the South Coast AQMD a mitigation fee equal to $100,000, with the time period starting after the second year from the issuance of the permit to construct because the engines that would be operating during any granted extension period will be emitting higher levels of emissions than the limits allowed for in the rule. The mitigation fee will be used to fund studies and projects to reduce criteria pollutants and toxic air contaminant emissions. The amount for the mitigation fee is expected to be approximately the amount that the facility would have had to pay to go through the variance process, including excess emissions fees, notification fees, and other procedural fees.

- Alternative Compliance Schedule Facility Modernization with Zero-Emission Technologies for Compressor Gas Lean-Burn Engines

PAR 1100 paragraph (d)(7) includes an alternative compliance approach for facilities that elect to replace existing compressor gas lean-burn engines with new engines or other zero-emission technologies. By January 1, 2021 the facility must submit a compliance plan indicating that the engines at a facility will be replaced or removed. On or before July 1, 2022, permit applications must be submitted. Within 36 months of issuance of the permit to construct, the identified engines must be replaced or removed, with at least 20 percent of the total horsepower using a zero-emission technology such as an electric motor or fuel cell technology. A time extension of up to 36 months may be requested. The request shall be approved provided the information required is complete and accurate, all permit applications were submitted by July 1, 2022, and documentation demonstrates that the replacement equipment has been ordered and necessary applications and approvals have been initiated, along with the reasons for any delay with replacement or removal of the existing equipment. Engines to be replaced as part of a modernization plan with equipment subject to another Regulation XI rule shall be shut down no later than six months of commencement of operation of the replacement units to allow sufficient time to confirm reliability of the replacement equipment. The associated permit to operate for the replacement equipment may require the shutdown at shorter time interval if reliability has been demonstrated sooner.

A mitigation fee of $100,000 per facility shall be assessed per year or prorated~~and any~~ portion of a year for any time extension because the engines that would be operating during any granted extension period will be emitting higher levels of emissions than the limits allowed for in the rule. The mitigation fee will be used to fund studies and projects to reduce criteria pollutants and toxic air contaminant emissions. The amount for the mitigation fee is expected to be approximately the amount that the facility would have had to pay to go through the variance process, including excess emissions fees, notification fees, and other procedural fees.

- Compliance Schedule for Engines Replaced by Equipment Regulated Under Another Regulation XI Rule

PAR 1100 subparagraph (d)(4) provides a schedule for engine removal for compressor gas lean-burn engines that will be replaced with equipment subject to another Regulation XI rule such as a turbine that is covered under Rule 1134. This would require a submittal of a retirement plan that would specify when the engines will be replaced and removed from service. Engines that will be replaced will not be required to install a CEMS. However, if such engine is not replaced for any reason, the engine shall meet the emission limits specified in Rule 1110.2 by December 31, 2023 and require the installation of CEMS.

Compliance Schedule for Diesel Engines at Ski Resorts

Additional consideration is also provided for diesel-fired electrical generators at ski resorts in paragraph (d)(9). If any engine operates less than or equal to 500 hours per year or uses less than 1×10^9 Btu per year, it may retain NOx and ammonia limits as well as the monitoring and source testing requirements specified on the South Coast AQMD permit to operate in effect on the date of rule adoption. The low-use provision must be made a condition of the South Coast AQMD permit to operate. If the engine exceeds the annual hours and fuel use requirements, the owner or operator must submit an application to repower or retrofit the engines within six months. The engine must be retired or meet the emission concentration standards in Rule 1110.2 Table II within two years of the exceedance.

Other minor amendments are made for clarification.

CHAPTER 4: IMPACT ASSESSMENTS

INTRODUCTION

Through the rulemaking process, staff initially identified 98 RECLAIM engines that would potentially subject to PAR 1110.2. Subsequent analysis reduced the number of engines to 76 engines. The reduction in the number of engines came as a result of contact with facilities. Eighteen engines were identified as no longer in operation and removed from service, three engines were identified as engines permitted with the jurisdiction of the South Coast AQMD, but having been shipped out-of-state, and one based on its integration with a connected heater was determined to be regulated by Rule 1146. Of the 76 engines, 14 engines are permitted to meet a NOx emission limit of 11 ppmvd[1]. Staff noted that permits for seven engines listed a NOx limit of 12.3 ppmvd[1]. However, staff determined that the permitted value should have been 11 ppmvd[1], based on State certification levels. The remaining 55 engines are either permitted or operate at an emission level greater than 11 ppmvd[1]. Of the 55 engines that have emissions greater than 11 ppmvd[1], eight are portable engines that would not require changes and will be subject to the State ATCM requirements and 47 are engines that will need changes per the proposed requirements of the rule.

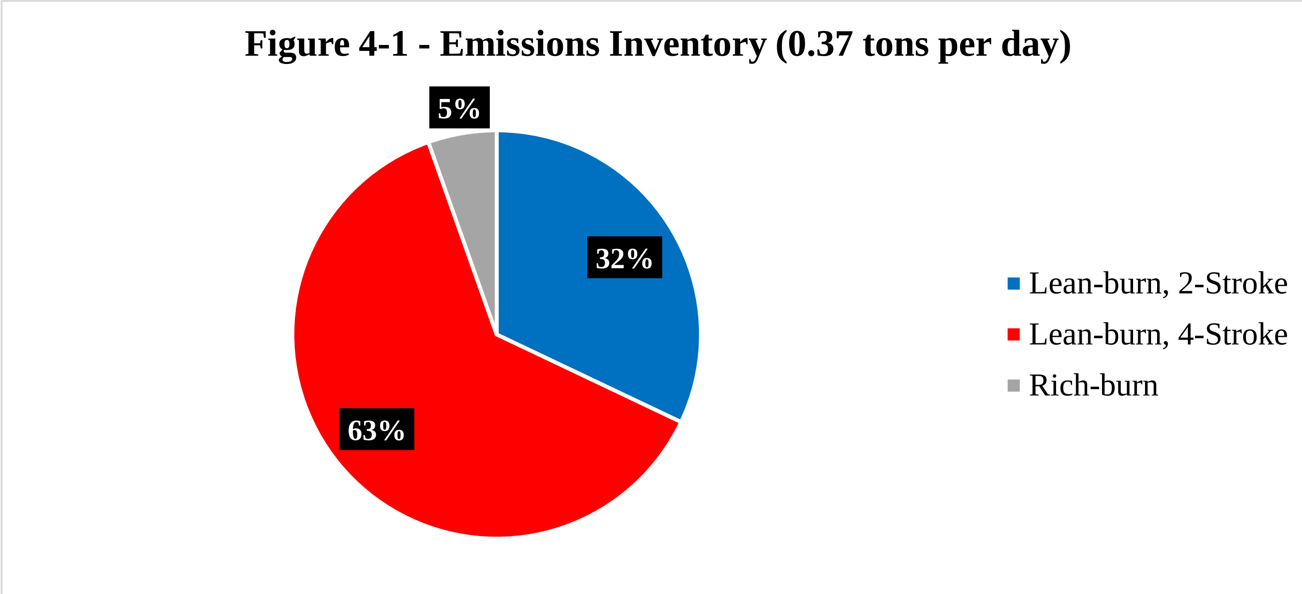
In addition to the working group meetings, staff conducted multiple site visits with stakeholders affected by PAR 1110.2. The purpose of the visits is to evaluate site-specific concerns associated with PAR 1110.2. Staff has also met individually with affected stakeholders.

As part of the rule development process, staff sent surveys to both RECLAIM and non-RECLAIM facilities affected by Rule 1110.2. Surveys were sent to 25 RECLAIM facilities that would potentially be covered under Rule 1110.2 and surveys were also sent to 430 non-RECLAIM facilities identified as owning and/or operating prime engines, both portable and stationary. Staff received surveys from 88% of the RECLAIM facilities and 30% of non-RECLAIM facilities. The data collected from the surveys was used to the verify the engine inventory at RECLAIM sites and to ascertain operational characteristics at non-RECLAIM sites, such as the annual hours of operation.

EMISSION REDUCTIONS

RECLAIM emissions from the 2017 compliance year audits were collected for each device. An exception was given for one facility that was not operational during compliance year 2017. For equipment operated at this facility, staff used data from the 2014 Compliance Year audit as a basis, which was the most recent year of normal operation for the facility. The RECLAIM emissions for the 2017 compliance year were selected as the basis for the emission reduction calculations as representative of actual throughput (emissions) and actual reductions achieved by the transition of engines in the RECLAIM program to a command-and-control regulatory structure. In addition, data from the Annual Emissions Reporting (AER) program for the 2017 Compliance Year was reviewed and the information matched the RECLAIM data. The total NOx inventory for the RECLAIM units affected by PAR 1110.2 is estimated to be 0.37 tons per day.

[1] @ 15% O_2 averaged over 15 minutes



As presented in Figure 4-1, approximately 63% of the 2017 baseline RECLAIM emissions were emitted from lean-burn, 4-stroke engines. Another 32% of the 2017 baseline RECLAIM emissions were emitted from lean-burn, 4-stroke engines, and rich-burn engines accounted for approximately 5% of the emissions. In general, RECLAIM rich-burn engines equipped with NSCR meet the NOx emission limits of Rule 1110.2, are smaller in size, and subsequently have lower total emissions relative to lean-burn engines.

To estimate the emission reductions for Proposed Amended Rule 1110.2, a baseline emission concentration level for each engine was calculated. The estimate used existing emissions limits listed on the engine permits. Where no expressed limit was given (e.g., engines designated as major sources in the RECLAIM program), staff reviewed the engine's permit application file and utilized the engineering basis that was used to process the permit. For some older engines, the engineering basis relied on limits established per Rule 1110.1. For other engines, the engineering basis relied on actual source test results at the time of permitting.

To calculate the NOx emission reductions, the final emission limit was set to 11 ppmvd. Emission reductions were calculated using Equation 4-1. The initial emission factor or concentration level (permitted concentration emission limit) is subtracted by the final emission factor or concentration level (set at 11 ppmvd for NOx). The difference is then multiplied by the throughput (RECLAIM NOx emissions) reported for the 2017 compliance year for each device.

Equation 4-1:

$$\text{Emission Reductions} = (E_{initial} - E_{final}) \times \text{Throughput}$$

Where,

$E_{initial}$ = permitted concentration limit

E_{final} = proposed concentration limit of 11 ppmvd
Throughput = RECLAIM NOx emissions based on 2017 Compliance Year

As presented in Figure 4-2, approximately 59% of the estimated emission reduction is realized from lean-burn, 4-stroke engines. Another 38% of the estimated emission reduction comes from lean-burn, 2-stroke engines. Rich-burn engines account for only approximately 3% of the reductions. As a result of engines transitioning from the RECLAIM program to a command-and-control regulatory structure, NOx emissions are expected to decrease by approximately 0.29 tons per day. For each engine, emission reductions were grouped by engine category. Table 4-1 show the NOx emissions reductions by engine category.

Figure 4-2 - Estimated Emissions Reductions (0.29 tons per day)

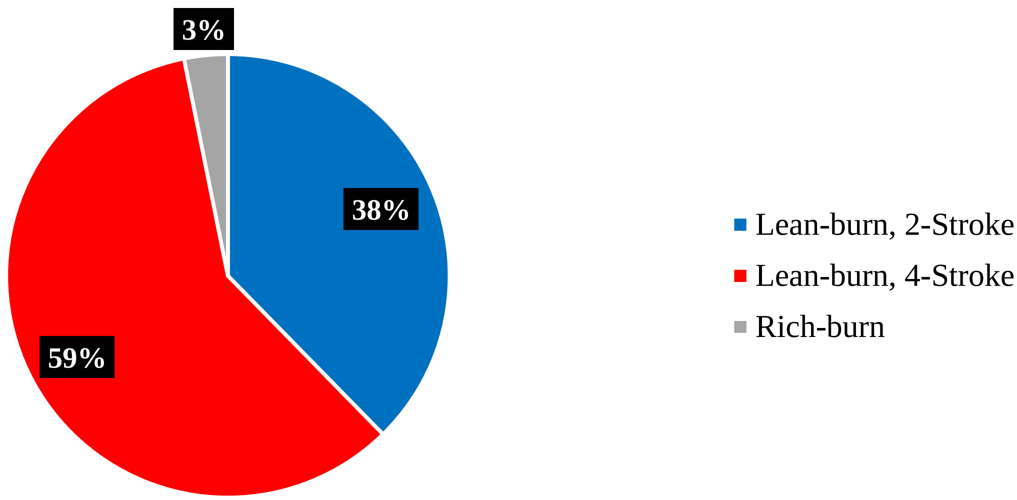


Table 4-1: NOx Emissions Reductions by Engine Category

Category	ton/day
(a) Lean-burn, 2-Stroke	0.109
(b) Lean-burn, 4-Stroke	0.172
(c) Rich-Burn	0.009
Total	0.29

COST-EFFECTIVENESS

Staff conducted a cost-effectiveness analysis for retrofit costs for existing engines. The target pollutant of the analysis is NOx. The RECLAIM program had exempted engines from compliance with the NOx emission limits established under Rule 1110.2. However, limits on other pollutants were not exempted and remained in effect (e.g. VOC and CO). As a result, the proposed amendments will not require VOC or CO reductions.

For this analysis, present worth value (PWV) was calculated for the engines requiring retrofits. Included in the PWV calculation, the total installed cost (TIC) of any proposed modification and the anticipated annual cost were considered. The TIC included the cost for emissions control equipment and associated catalyst. Cost data for equipment and catalyst was collected from vendors and actual stakeholders. The data included costs for several engine sizes. The costs were then fitted into a curve that was used to estimate general cost for potential retrofit applications. In general, a factor of 1.5 times the sum of equipment and catalyst costs was used to estimate the installation costs. However, in one unique case, staff used a factor of 2.5 to estimate installed cost due to the site-specific concerns that may contribute to potential increased installation costs.

In considering Annual Cost, staff included an operations and maintenance factor for an incremental cost associated with additional emissions control equipment of 0.5%. The operations and maintenance cost factor was taken from the EPA's 2016 SCR Cost Manual[1]. In addition, for units that require urea or ammonia injection, the amount of urea or ammonia used whether for new or existing SCRs was calculated from data collected from vendors.

For units that require CEMS due to their transition from the RECLAIM program to Rule 1110.2, equipment and installation costs were based on information supplied by a vendor specializing in CEMS equipment and installation. For engines that have a horsepower rating greater than or equal to 500 hp but less than 1,000 hp and are operating at a facility with an aggregate horsepower rating of 1,500 hp, these engines will be required under Rule 1110.2 to install a CEMS. Sharing of CEMS was not considered as part of this evaluation. Staff evaluated worst-case scenarios for individual CEMS installations, but there can be a cost savings by employing time-shared CEMS for groups of engines. Despite this, facilities based on their operational characteristics, can apply for permit conditions that limit usage and operation (e.g., backup engines or engines that are used sparingly or in rotation). For these engines, CEMS would not be required, per existing requirements in Rule 1110.2 subclause (f)(1)(A)(ii)(III).

In the calculation, staff assumed a uniformed series present worth factor (PWF) at a 4% interest rate and a 25-year equipment life expectancy.

$$PWV = TIC + (PWF \times AC)$$

PWV = present worth value ($)

[1] Reference EPA's 2016 SCR Cost Manual at the following website – https://www3.epa.gov/ttn/ecas/docs/SCRCostManualchapter7thEdition_2016.pdf

TIC = total installed cost ($)
AC = annual cost ($)
PWF = uniform series present worth factor (15.622)

Engines were separated into four categories: (1) lean-burn, two-stroke stationary engines, (2) lean-burn, four-stroke stationary engines, (3) rich-burn stationary engines, and (4) portable engines. Categories were selected based on past experience where technology and unique issues were identified and attributed to each. Although identified as a separate category, for purposes of this analysis, portable engines were not included. Portable engines are already required to comply with the State portable ATCM regulation, so cost effectiveness was not calculated for these engines.

Table 4-2 summarizes the results of the analysis. The overall cost-effectiveness was calculated to be $33,800 per ton of NOx reduced. The cost-effectiveness for the lean-burn sub-categories was calculated to be less than $50,000 per ton of NOx reduced. However, the cost-effectiveness for the rich-burn engine category is calculated to be greater than $50,000 per ton of NOx reduced.

For the rich-burn engine sub-category, the incremental amount of NOx reduced for this engine category is minimal at 3% compared to the other two categories. For rich-burn engines, it is anticipated that these engines will meet the NOx emission limit of 11 ppmvd with either minimal catalyst modifications or tuning of the air-to-fuel ratio controller. In many instances, rich-burn engines will incur costs associated with the installation of a CEMS. Under the RECLAIM program, any engine that had a horsepower rating less than 1,000 bhp did not have to have a CEMS. Under Rule 1110.2, however, an engine with a horsepower rating greater than or equal to 500 bhp and less than 1,000 bhp but that is operating at a facility with an aggregate horsepower rating of 1,500 bhp will be required under Rule 1110.2 to install a CEMS on each engine. The cost of installing CEMS on each engine is much greater compared to the cost of additional catalyst or tuning of the controller. These added monitoring costs are reflected in the resultant cost-effectiveness of $71,400 for this sub-category. If a CEMS is not installed on these engines, then the cost effectiveness for the rich-burn category is calculated to be approximately $19,000 per ton of NOx reduced. Because the effect of the rich-burn category on NOx reduction is not great compared to the other engine categories and if the CEMS requirement is not factored in, the overall cost effectiveness drops only from $33,800 per ton of NOx reduced to $32,200 per ton of NOx reduced.

Table 4-2 – Cost Effectiveness Analysis

Category	$/ton NOx
(a) 2-Stroke, Lean-Burn	28,100
(b) 4-Stroke, Lean-Burn	35,500
(c) Rich-Burn	71,400 *(19,000 without CEMS)*
Total	33,800 *(32,200 without CEMS)*

Although the cost-effectiveness analysis is based on the average cost-effectiveness for all affected equipment staff does assess outlier data to better understand why the cost-effectiveness is substantially higher for certain engines compared to the majority of the equipment category. A review of operational data for these outlier engines indicated that the engines did not operate more than 200 hours in the year. Due to the low engine use and the resulting small amount of emissions, the cost of additional controls leads to higher cost-effectiveness values.

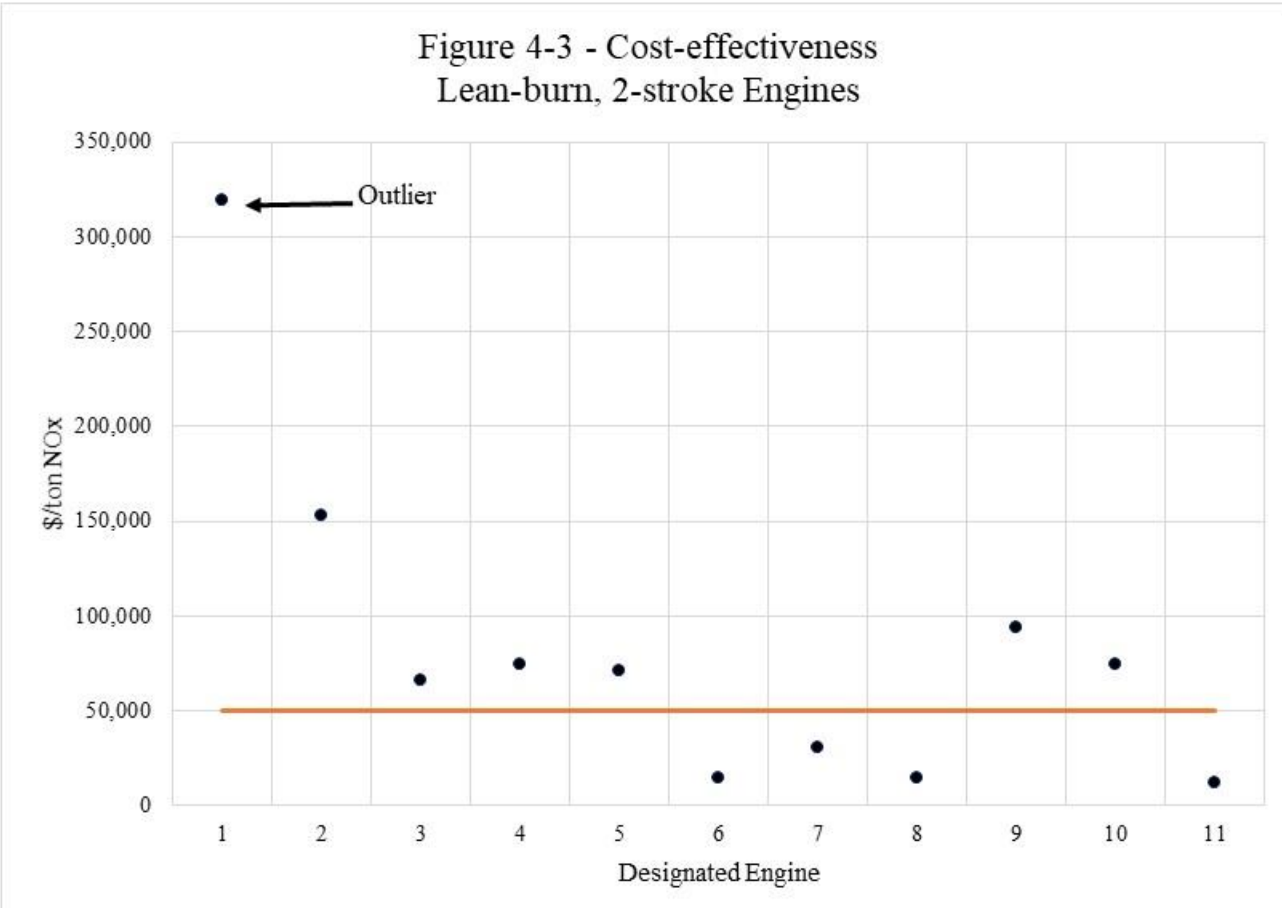


Figure 4-3 presents the distribution of cost-effectiveness for the eleven lean-burn, 2-stroke engines that were evaluated. The straight bar represents a value of $50,000. In this category, an outlier was determined to be a value greater than $213,050 per ton of NOx reduced. Engine No. 1 was identified as an outlier with a calculated value of $362,000 per ton of NOx reduced. Although not considered an outlier, Engine No. 2 also had a high cost-effectiveness. Both are diesel engines, rated at 450 hp and categorized as process units under RECLAIM. Each has a fixed emission factor of 469 lbs/1000 gallon. In 2016 and 2017, both engines operated less than 200 hours each year (one of those engines reported zero operating hours the last two compliance years). For these two engines, the low-use provision contained in Rule 1110.2 (d)(1)(B)(iii) would be applicable, should the facility decide to use it. If these engines exceed 500 hours of operation or use more than 1 x 10^9 British Thermal Units (Btus) per year (higher heating value) of fuel, then the emissions limits listed in Table II would apply.

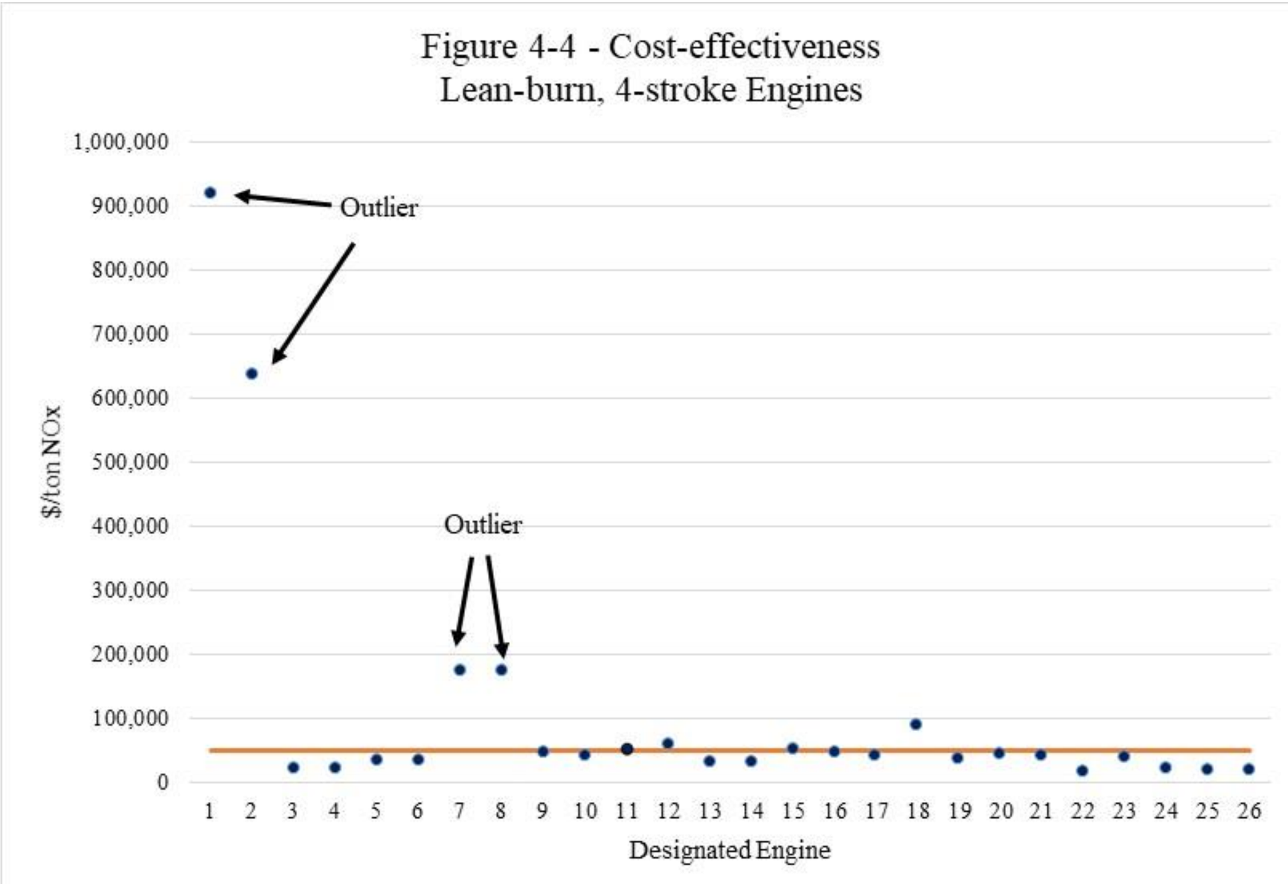


Figure 4-4 presents the distribution of cost-effectiveness for lean-burn, 4-stroke engines. The straight bar represents a value of $50,000. Twenty-six engines were evaluated. In this sub-category, an outlier was determined to be a value greater than $95,288 per ton of NOx reduced. Engine Nos. 1, 2, 7, and 8 were identified as outliers. All four engines are diesel engines rated at 131 hp, 450 hp, 853 hp, and 853 hp, respectively. Engine No.1 was categorized as a process unit under RECLAIM and Engines Nos. 2, 7, and 8 were categorized as RECLAIM large sources. Based on their past reported hours of operation, the low-use provision contained in Rule 1110.2 (d)(1)(B)(iii) would also be applicable, should the facility decide to use. If these engines exceed 500 hours of operation or use more than 1 x 10^9 British Thermal Units (Btus) per year (higher heating value) of fuel, then the emissions limits listed in Table II would apply.

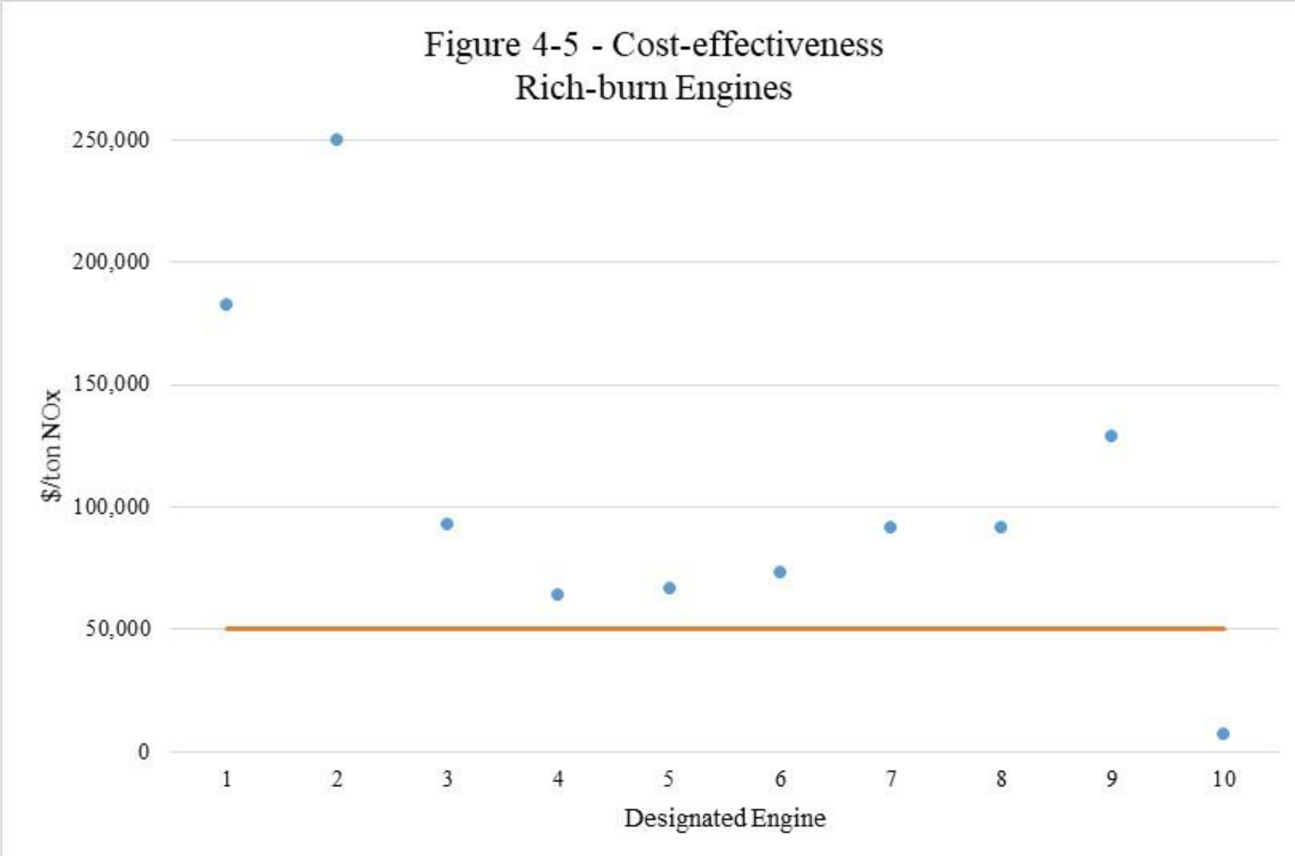


Figure 4-5 presents the distribution of cost-effectiveness for rich-burn engines. The straight bar represents a value of $50,000. Ten engines were evaluated. In this category, an outlier was determined to be a value greater than $256,900 per ton of NOx reduced. Although no engine was identified as an outlier, as a category, the engines had a high cost-effectiveness value relative to a $50,000 per ton of NOx reduced threshold. This was due in large part to CEMS costs that would be required per Rule 1110.2, specifically for those that would fall under the aggregate facility requirement for CEMS. These engines would be able to comply with the proposed emission limit easily with tuning and/or minor catalyst changes. The increased monitoring costs are the main driver for the increased cost effectiveness for this engine subcategory.

Although the cost-effectiveness for rich-burn engines had a high cost-effectiveness value relative to the $50,000 per ton of NOx reduced threshold, the overall cost-effectiveness for all engines affected by the transition from the RECLAIM program to a command-and-control regulatory structure is calculated to be $33,800 per ton of NOx reduced.

SOCIOECONOMIC ASSESSMENT

A Socioeconomic Impact Assessment has been prepared and released at least 30 days prior to the South Coast AQMD Governing Board Hearing on PAR 1110.2 and PAR 1100, which are set to be heard on November 1, 2019.

CALIFORNIA ENVIRONMENTAL QUALITY ACT ANALYSIS

Pursuant to the California Environmental Quality Act (CEQA) and South Coast AQMD's Certified Regulatory Program (Rule 110), the South Coast AQMD, as lead agency for the proposed project, has determined that PARs 1110.2 and 1100 are considered a "project" as defined by CEQA. South Coast AQMD staff has determined that the proposed project contains new information of substantial importance which was not known and could not have been known at the time the March 2017 Final Program Environmental Impact Report (EIR) was certified for the 2016 AQMP (referred to herein as March 2017 Final Program EIR). Because the proposed project may create new, potentially significant effects that were not analyzed in the March 2017 Final Program EIR, the South Coast AQMD has prepared a Subsequent Environmental Assessment (SEA) with significant impacts, which will tier off of the March 2017 Final Program EIR as allowed by CEQA Guidelines Sections 15168 and 15385. The March 2017 Final Program EIR, upon which the SEA will rely, is available from the South Coast AQMD's website at: http://www.aqmd.gov/home/research/documents-reports/lead-agency-South Coast AQMD-projects/South Coast AQMD-projects---year-2017. The SEA will allow public agencies and the public the opportunity to obtain, review, and comment on the environmental analysis.

In addition, since the proposed project could have statewide, regional or area wide significance, a CEQA scoping meeting is required to be held pursuant to Public Resources Code Section 21083.9(a)(2). The CEQA scoping meeting was held on July 31, 2019 in conjunction with the public workshop. A SEA has been released for a 45-day public review and comment period. Comments made at the public workshop/CEQA scoping meeting and responses to the comments have been included in the Final SEA.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings

California Health and Safety Code Section (H&SC) 40727 requires that prior to adopting, amending or repealing a rule or regulation, the South Coast AQMD 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 1110.2 and 1100 are needed for engines under the RECLAIM program that will be transitioning to a command-and-control regulatory structure to establish NOx emission limits for engines that are representative of BARCT, their time of transition, as well as monitoring, reporting, and recordkeeping requirements.

Authority

The South Coast AQMD obtains its authority to adopt, amend, or repeal rules and regulations pursuant to H&SC Sections 39002, 40000, 40001, 40440, 40702, 40725 through 40728, 40920.6, and 41508.

Clarity

PARs 1110.2 and 1100 are written or displayed so that their meaning can be easily understood by the persons directly affected by them.

Consistency

PARs 1110.2 and 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 1110.2 and 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 South Coast AQMD.

Reference

In amending these rules, the following statutes which the South Coast AQMD hereby implements, interprets or makes specific are referenced: H&SC Sections 39002, 40001, 40406, 40702, and 40440(a).

COMPARATIVE ANALYSIS

Under H&SC Section 40727.2, the South Coast AQMD 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 South Coast AQMD rules and air pollution control requirements and guidelines which are applicable to internal combustion engines. See Table 4-3 below.

Table 4-3: Comparative Analysis

Rule Element	PAR 1110.2	PR 1100	RECLAIM	Equivalent Federal Regulation Title 40, Part 60, Subpart JJJJ	Equivalent Federal Regulation Title 40, Part 60, Subpart IIII
Applicability	All stationary and portable engines over 50 rated brake horsepower (bhp) are subject to this rule	RECLAIM or post-RECLAIM facilities	Facilities regulated under the NOx RECLAIM program (SCAQMD Reg. XX)	Stationary spark ignition (SI) internal combustion engines	Stationary compression ignition internal combustion engines
Requirements* *All parts per million (ppm) emission limits are referenced at 15 percent gas oxygen on a dry basis averaged over a period of 15 consecutive minutes.	Non-emergency engines hp ≥ 50: **11 ppmvd**	•Schedule for meeting BARCT emission limits and MRR requirements	• Major Source **None** • Large Source **36 ppmvd** • Process Unit Natural gas **3400 lb/mmscf** LPG, propane, butane **139/mgal** Diesel **469 lb/mgal**	• Non-emergency, natural gas and LPG hp ≥ 100: **82 ppmvd** • Landfill/digester gas: **150 ppmvd**	For engines installed prior to January 1, 2012 • 12.7 g/hp-hr when max engine speed < than 130 rpm • 34 · $n^{-0.2}$ g/hp-hr) when 130 ≤ max engine speed < 2,000 rpm, where n is max engine speed; and • 7.3 g/hp-hr when max engine speed > 2,000 rpm For engines installed on or after January 1, 2012 and before January 1, 2016 • 10.7 g/hp-hr when max engine speed < 130 rpm; • 33 · $n^{-0.23}$ g/hp-hr) when 130 ≤ max engine speed < 2,000 rpm, where n is max engine speed; and • 5.7 g/hp-hr) when max engine speed > 2,000 rpm. For engines installed on or after January 1, 2016, • 2.5 g/hp-hr when max engine speed < 130 rpm; • 6.7 · $n^{-0.20}$ g/hp-hr) when 130 ≤ max engine speed < 2,000 rpm, where n is max engine speed; and • 1.5 g/hp-hr when max engine speed > 2,000 rpm.
Reporting	Report breakdowns subject to breakdown provisions	As specified in Rule 1110.2	• Daily electronic reporting for major sources • Monthly to quarterly reporting for large sources and process units	Annual report	Initial report

			• Quarterly Certification of Emissions Report and Annual Permit Emissions Program for all units		
Monitoring	• A continuous in-stack NOx monitor for units greater than or equal to 1000 bhp and operating 2 million bhp-hr per calendar year or for facilities with engines subject to paragraph (d)(1), having a combined rating of 1500 bhp or greater at the same location, and having a combined fuel usage of more than 16 x 109 Btus per year (higher heating value) • Non-resettable totalizing time meter	As specified in Rule 1110.2	• 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	Install a non-resettable hour meter	Install a non-resettable hour meter
Recordkeeping	• Monthly log • All data, logs, test reports and other information required by this rule shall be maintained for at least five years and made available for inspection by the Executive Officer	As specified in Rule 1110.2	• Quarterly log for process units • < 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)	• Maintain an operating log	• Maintain an operating log

INCREMENTAL COST EFFECTIVENESS

Health and Safety Code section 40920.6 requires an incremental cost-effectiveness analysis for Best Available Retrofit Control Technology (BARCT) rules or emission reduction strategies when there is more than one control option which would achieve the emission reduction objective of the proposed amendments relative to ozone, carbon monoxide, sulfur oxides, oxides of nitrogen, and their precursors. Incremental cost-effectiveness is the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control options as compared to the next less expensive control option.

Incremental cost-effectiveness is calculated as follows:

Incremental cost-effectiveness = $(C_{alt}–C_{proposed}) / (E_{alt}–E_{proposed})$

Where:

$C_{proposed}$ is the present worth value of the proposed control option;
$E_{proposed}$ are the emission reductions of the proposed control option;
C_{alt} is the present worth value of the alternative control option; and
E_{alt} are the emission reductions of the alternative control option

The proposed project would require retrofits of replacements of engines to meet 11 ppm NOx at 15% oxygen. The next progressively more stringent potential control option would be to require the engines to meet a 7 ppm NOx concentration limit. Lean-burn engines would require more significant SCR system changes that would include more catalyst layers as well as ammonia slip catalysts. Larger diesel engines with existing SCR would require a complete replacement of their emission control systems. Rich-burn engines would require installation of Tecogen retrofits that can achieve these emission levels, and smaller diesel engines would require replacement with Tier IV Final units to achieve 11 ppm. The present worth value of the proposed control option is $89,646,144 and the emission reductions are 2,649 tons over 25 years. The present worth value of the alternative control option is $269,894,022 and the emission reductions of the alternative control option is 2,881 tons over 25 years. The incremental cost-effectiveness for requiring retrofits to meet 7 ppm NOx as well replacement for smaller diesel engines to meet 11 ppm NOx is $69,500 per ton of NOx reduced as calculated below.

Incremental cost-effectiveness = ($221,257,192 – $89,646,144) / (2,881 – 2,649) = $566,389 per ton of NOx reduced

The incremental cost analysis presented above demonstrates that the alternative control option is not viable when compared to the control strategy of the proposed amendments.

APPENDIX A – LIST OF RECLAIM FACILITIES AFFECTED BY PAR 1110.2

Table A-1: RECLAIM Facilities Affected by PAR 1110.2

Facility ID	Facility Name
4242	San Diego Gas & Electric
5973	So Cal Gas Co/Honor Rancho Facility
8547	Quemetco Inc.
8582	So Cal Gas Co/Playa del Rey Facility
9755	United Airlines
18931	Tamco
43201	Snow Summit Inc.
61962	LA City, Harbor Dept
62548	The Newark Group, Inc.
68118	Tidelands Oil Production Company Etal
124723	Greka Oil & Gas
143740	DCOR LLC
143741	DCOR LLC
150201	Breitburn Operating LP
155877	Millercoors, LLC
166073	Beta Offshore
169754	So Cal Holding, LLC
173904	Lapeyre Industrial Sands, Inc.
174544	Breitburn Operating LP
800128	So Cal Gas Co/Aliso Canyon Facility
800189	Disneyland Resort

Table A-2: Equipment at RECLAIM Facilities Affected by PAR 1110.2

Engine	bhp	Fuel type	Current Controls	Current NOx Limit (ppm[1])	Proposed Limit (ppm[1])	Capital Cost ($)	Annual Cost ($)	Present Worth Value ($)	Estimated NOx Reduction (tpd)	CE ($/ton)
Lean-burn, 2-stroke engines										
1	450	Diesel	Oxi-cat	675	11	603,368	711,619	1,492,711	.000	318,900
2	450	Diesel	Oxi-cat	675	11	603,368	711,619	1,492,711	.001	152,900
3	995	Nat gas	Oxi-cat	150	11	947,181	1,221,826	2,169,007	.004	66,000
4	995	Nat gas	Oxi-cat	150	11	947,181	1,221,826	2,169,007	.003	74,300
5	995	Nat gas	Oxi-cat	150	11	947,181	1,221,826	2,169,007	.003	71,500
6	2000	Nat gas	Oxi-cat	225	11	1,683,747	1,607,860	3,291,607	.024	14,800
7	2000	Nat gas	Oxi-cat	225	11	1,683,747	1,607,860	3,291,607	.012	30,500
8	2000	Nat gas	Oxi-cat	225	11	1,683,747	1,607,860	3,291,607	.025	14,400
9	3000	Nat gas	Oxi-cat	116	11	1,380,480	1,605,864	2,986,344	.003	94,100
10	3000	Nat gas	Oxi-cat	116	11	1,380,480	1,605,864	2,986,344	.004	74,900
11	3200	Nat gas	Oxi-cat	116	11	1,441,430	1,659,134	3,100,564	.029	11,800
Lean-burn, 4-stroke engines										
12	131	Diesel	N/A	208	11	506,152	534,986	1,218,863	0.000	920,400
13	190	Compliant								
14	190									
15	190									

Engine	bhp	Fuel type	Current Controls	Current NOx Limit (ppm[1])	Proposed Limit (ppm[1])	Capital Cost ($)	Annual Cost ($)	Present Worth Value ($)	Estimated NOx Reduction (tpd)	CE ($/ton)
16	190									
17	190									
18	190									
19	190									
20	450	Diesel	N/A	344	11	603,368	647,641	1,251,008	0.000	637,800
21	853	Diesel	Oxi-cat	450	11	903,907	1,161,297	2,065,204	0.010	23,500
22	853	Diesel	Oxi-cat	450	11	903,907	1,161,297	2,065,204	0.010	23,500
23	853	Diesel	Oxi-cat	450	11	903,907	1,161,297	2,065,204	0.006	35,300
24	853	Diesel	Oxi-cat	450	11	903,907	1,161,297	2,065,204	0.006	35,300
25	853	Diesel	Oxi-cat	450	11	903,907	1,161,297	2,065,204	0.001	176,400
26	853	Diesel	Oxi-cat	450	11	903,907	1,161,297	2,065,204	0.001	176,400
27	881	Digester	Oxi-cat	36	11	912,440	1,173,350	2,085,790	0.005	49,800
28	881	Digester	Oxi-cat	36	11	912,440	1,173,350	2,085,790	0.005	43,900
29	1468	Compliant								
30	2000	Nat gas	Oxi-cat	23	11	1,075,730	1,295,420	2,371,150	0.005	54,600
31	2000	Nat gas	Oxi-cat	43	11	1,075,730	1,295,420	2,371,150	0.004	61,800
32	2000	Nat gas	Oxi-cat	30	11	1,075,730	1,295,420	2,371,150	0.008	33,300
33	2000	Nat gas	Oxi-cat	46	11	1,075,730	1,295,420	2,371,150	0.008	32,800
34	2000	Nat gas	Oxi-cat	24	11	1,075,730	1,295,420	2,371,150	0.005	54,600

Engine	bhp	Fuel type	Current Controls	Current NOx Limit (ppm[1])	Proposed Limit (ppm[1])	Capital Cost ($)	Annual Cost ($)	Present Worth Value ($)	Estimated NOx Reduction (tpd)	CE ($/ton)
35	3043	Diesel	SCR	50	11	214,408	423,617	638,024	0.001	49,300
36	3043	Diesel	SCR	50	11	214,408	423,617	638,024	0.002	42,500
37	3043	Diesel	SCR	50	11	214,408	423,617	638,024	0.001	90,200
38	3043	Diesel	SCR	50	11	214,408	423,617	638,024	0.002	37,400
39	3043	Diesel	SCR	50	11	214,408	423,617	638,024	0.001	46,800
40	3043	Diesel	SCR	50	11	214,408	423,617	638,024	0.002	42,600
41	5500	Nat gas	Oxi-cat	41	11	2,142,355	2,060,472	4,202,827	0.024	19,300
42	5500	Nat gas	Oxi-cat	54	11	2,142,355	2,060,472	4,202,827	0.011	41,600
43	5500	Nat gas	Oxi-cat	40	11	2,142,355	2,060,472	4,202,827	0.020	22,500
44	5500	Nat gas	Oxi-cat	54	11	2,142,355	2,060,472	4,202,827	0.022	20,600
45	5500	Nat gas	Oxi-cat	82	11	2,142,355	2,060,472	4,202,827	0.022	21,400
Rich-burn engines										
46	147	Compliant								
47	147									
48	189									
49	189									
50	268									
51	268									
52	268									

Engine	bhp	Fuel type	Current Controls	Current NOx Limit (ppm[1])	Proposed Limit (ppm[1])	Capital Cost ($)	Annual Cost ($)	Present Worth Value ($)	Estimated NOx Reduction (tpd)	CE ($/ton)
53	385									
54	738	Nat Gas	NSCR	20	11	177,725	462,713	640,438	0.000	182,200
55	738	Nat Gas	NSCR	20	11	177,725	462,713	640,438	0.000	250,000
56	790	Compliant								
57	790									
58	818	Nat Gas	NSCR	20	11	177,725	473,973	651,698	0.001	92,900
59	818	Nat Gas	NSCR	20	11	177,725	473,973	651,698	0.001	64,000
60	818	Nat Gas	NSCR	20	11	177,725	473,973	651,698	0.001	66,700
61	818	Nat Gas	NSCR	20	11	177,725	473,973	651,698	0.001	73,200
62	818	Nat Gas	NSCR	20	11	177,725	473,973	651,698	0.001	91,600
63	818	Nat Gas	NSCR	20	11	177,725	473,973	651,698	0.001	91,700
64	818	Nat Gas	NSCR	20	11	177,725	473,973	651,698	0.001	129,100
65	830	Compliant								
66	845	Nat Gas	NSCR	28	11	0	165,334	165,334	0.003	7,215
67	1150	Compliant								
68	2000									

Notes:

- Engines 9-11: The emission factor was based on the calculation used in the engineering evaluation at the time of permitting.

- Engines 14-19: Identical engines in the process of installation at a single facility. The engines were permitted at 12.3 ppmvd NOx; however, staff reviewed the respective permit file and determined that the engines are actually certified to emit less than 0.15 g/bhp-hr NOx. Staff also reviewed initial source test information and noted that the engines emit less than 11 ppm NOx. Although the individual permits list 12.3 ppmvd NOx emission limit, staff confirmed that the permit limit should have been set at 11 ppmvd. During the rule making process, questions on the validity of the source test and how the results were attained have come up. For this evaluation, however, staff assumed that no additional requirement is needed at this time.

- Engines 21-26: Identical engines installed at a single facility. Reviewing operational information for 2016 and 2017, staff noted that hours of operation varied for each engine; however, each engine can be used interchangeably. In its cost-effectiveness evaluation, staff therefore used 1,500 hours of operation for engines 21 and 22, 1,000 hours of operation for engines 23 and 24, and 200 hours of operation for engines 25 and 26 as a basis for its calculation. In addition, due to the aggregate facility horsepower greater than 1,500 hp, staff assumed that each engine would require a CEMS installation; no potential sharing of CEMS was considered at this time.

- Engines 30-34: Identical engines installed at a single facility. The emission factor for each engine was based on source test data found in the engineering evaluation file.

- Engines 41-45: Identical engines installed at a single facility. The emission factor for each engine was based on source test data found in the engineering evaluation file.

- Engines 56-57: Identical engines installed at a single facility. Although the aggregate horsepower at the facility is greater than 1,500 bhp, these engines operate well below 1,000 hours. It is assumed that these engines would not require a CEMS installation.

- Engines 58-64: Identical engines installed at a single facility. Since these engines are greater than 500 hp but less than 1,000 hp and the facility aggregate horsepower is greater than 1,500 hp, CEMS would be required on these engines.

- In general, for the rich-burn engine category, it is anticipated that lowering the emissions to 11 ppmvd will be accomplished through minimal catalyst modifications and/or retuning of the respective AFRC. However, engines, greater than or equal to 500 bhp but less than 1,000 bhp and where the aggregate horsepower for the facility is greater than 1,500 bhp, may be required to install a CEMS unit. The cost of adding CEMS and the low expected reduction in NOx is driving a high value for this category. Staff did not assume any potential sharing of CEMS equipment in its cost-effectiveness evaluation.

APPENDIX B – ANALYSIS OF NOX EMISSION LIMITS FOR OTHER AIR DISTRICTS

As part of the BARCT analysis, staff reviewed similar regulations related to internal combustion engines in other jurisdictions both within California and outside. In jurisdictions where limits were expressed in g/bhp-hr, conversion to ppmvd equivalent was based on a 33% thermal efficiency.

Antelope Valley

Staff reviewed Antelope Valley AQMD Rule 1110.2 – Emissions from Stationary, Non-road and Portable Internal Combustion Engines. The rule applies to all ICEs with a rated brake horsepower greater than 50 bhp. Per Rule 1110.2 (C)(1)(a)(iii), the owner or operator of any stationary ICE subject to this rule shall comply with the general emission limits of 36 ppm NOx, 250 ppm VOC, and 2000 ppm CO (corrected to 15% O2 on a dry basis, averaged over a 15-minute interval). The rule does not differentiate by fuel source whether the source is natural gas, diesel, biogas, or other hydrocarbon. The rule applicability also does not distinguish by engine type whether the engine is two-cycle, four-cycle, lean-burn, or rich-burn.

Bay Area

Staff reviewed Bay Area AQMD Regulation 9 – Inorganic Gaseous Pollutants, Rule 8 – Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines. Regulation 9, Rule 8 applies to stationary ICEs with an output rating greater than 50 bhp. The regulation sets different NOx emission limits based on fuel source whether fossil derived or waste derived and engine type whether spark-ignited or compression-ignited or whether lean-burn or rich-burn. The lowest NOx limit is set at 25 ppmvd (corrected to 15% O2 on a dry basis) for a spark-ignited, rich-burn engine powered by fossil derived fuels. CO emissions are limited to 2000 ppmvd (corrected to 15% O2 on a dry basis).

Mojave Desert

Staff reviewed Mojave Desert AQMD Rule 1160 – Internal Combustion Engines. Rule 1160 applies to any stationary, non-agricultural, ICE with a rated brake horsepower greater than 50 bhp. The regulation sets different NOx emission limits based on engine type whether spark-ignited or compression-ignited or whether lean-burn or rich-burn. The lowest NOx limit is set at 50 ppmvd (corrected to 15% O2 on a dry basis averaged over 15 minutes) for a spark-ignited, rich-burn engine. The VOC and CO compliance limits are established as 106 ppmvd and 4500 ppmvd respectively.

Santa Barbara

Staff reviewed Santa Barbara County APCD Rule 333 – Control of Emissions from Reciprocating Internal Combustion Engines. Rule 333 applies to any engine with a rated brake horsepower greater than 50 bhp. The regulation sets different NOx emission limits based on engine type whether spark-ignited or compression-ignited, whether cyclically or non-cyclically loaded, or whether lean-burn or rich-burn. The lowest NOx limit is set at 50 ppmvd (corrected to 15% O2 on a dry basis) for a spark-ignited, non-cyclically-loaded, rich-burn engine. The most stringent VOC and CO compliance limits are established as 250 ppmvd and 4500 ppmvd respectively.

San Diego

Staff reviewed San Diego County APCD Rule 69.4.1 – Stationary Reciprocating Internal Combustion Engines – Best Available Retrofit Control Technology. Rule 69.4.1 applies to all stationary ICEs with a horsepower rating greater than 50 bhp. The regulation sets different NOx emission limits based on fuel source whether fossil derived gaseous, gasoline, waste derived gaseous, diesel, or kerosene based and engine type whether lean-burn or rich-burn. The lowest NOx limit is set at 25 ppmvd (corrected to 15% O2 on a dry basis) for a rich-burn engine powered by either fossil derived fuels or gasoline. The VOC and CO compliance limits are established as 250 ppmvd and 4500 ppmvd respectively.

San Joaquin Valley

Staff reviewed San Joaquin Valley Unified APCD Rule 4702 – Internal Combustion Engines. Rule 4702 applies to engines rated at greater than 50 bhp. The regulation sets different NOx emission limits based on fuel source whether gaseous, waste derived, or field derived and engine type whether two-stroke or four-stroke, whether lean-burn or rich-burn, or whether spark-ignited or compression-ignited. The regulation also provides consideration for lean-burn engines used for gas compression and engines used in agricultural operations. The lowest NOx limit is set at 11 ppmvd (corrected to 15% O2 on a dry basis) for rich-burn or lean-burn engines not specifically exempted. The most stringent VOC and CO compliance limits are set as 250 ppmvd and 2000 ppmvd respectively.

San Luis Obispo

Staff reviewed San Luis Obispo County APCD Rule 431 – Stationary Internal Combustion. Rule 431 applies to any stationary ICE with a rated brake horsepower greater than 50 bhp. The regulation sets different NOx emission limits based on engine type whether lean-burn or rich-burn, or whether spark-ignited or compression-ignited. The regulation also provides consideration for engines used in agricultural operations. The lowest NOx limit is set at 50 ppmvd (corrected to 15% O2 on a dry basis) for a spark-ignited, rich-burn engine. CO emissions are limited to 4500 ppmvd (corrected to 15% O2 on a dry basis).

Ventura County

Staff reviewed Ventura County APCD Rule 74.9 – Stationary Internal Combustion Engines. Rule 74.9 applies to any stationary engine with a rated brake horsepower greater than 50 bhp. The regulation sets different NOx emission limits based on fuel source whether gaseous, diesel or waste derived and engine type whether spark-ignited or compression-ignited or whether lean-burn or rich-burn. The lowest NOx limit is set at 25 ppmvd (corrected to 15% O2 on a dry basis) for a general rich-burn engine. The most stringent VOC and CO compliance limits are established as 250 ppmvd and 4500 ppmvd respectively.

Pennsylvania

Staff reviewed the Commonwealth of Pennsylvania Code, Title 25 – Environmental Protection, Chapter 129 –Standards for Sources, subpart 129.97, subsection (g)(3). The code applies to any stationary internal combustion engine with a rated brake horsepower greater than or equal to 500 bhp. The regulation sets different NOx emission limits based on fuel source whether natural gas or liquid-fueled and engine type whether lean-burn or rich-burn. The lowest NOx limit is set at 2.0 g/bhp-hr or 155 ppmvd for a rich-burn engine fired on natural gas. VOC emissions are limited to 1.0 g/bhp-hr for engines fired on natural gas. The regulation established no CO compliance limit.

New Jersey

Staff reviewed the New Jersey State Department of Environmental Protection, New Jersey Administrative Code, Title 7, Chapter 27, Subchapter 19 – Control and Prohibition of Air Pollution from Oxides of Nitrogen, Section 7:27-19.8 – Stationary Reciprocating Engines. Section 7:27-19.8 applies to various rated engines beginning at approximately 50 bhp. The regulation sets different NOx emission limits based on engine rating, fuel source whether gaseous or liquid fueled and engine type whether lean-burn or rich-burn. The lowest NOx limit is set at 0.9 g/bhp-hr or 70 ppmvd for an engine with a rated brake horsepower greater than 50 bhp that started operation on or after March 7, 2007. The regulation established no VOC or CO compliance limit.

New York

Staff reviewed the New York Codes, Rules and Regulations, 6 CRR-NY 227-2.4, subpart (f) – Control Requirements for Stationary Internal Combustion Engines. The Code varies by engine size whether an engine is in a severe ozone nonattainment zone or not regulating engines greater than or equal to 200 bhp in severe ozone nonattainment zones or engines greater than or equal to 400 bhp in areas outside these zones. The regulation sets different NOx emission limits based on type of fuel used whether natural gas, landfill or digester gas, or diesel. The lowest NOx limit is set at 1.5 g/bhp-hr or 116 ppmvd for an internal combustion engine fired solely on natural gas. The regulation established no VOC or CO compliance limit.

Texas

Staff reviewed the Texas Administrative Code, Title 30, Part 1, Chapter 117, Subchapter D, Division 2, Rule 117.2110. The rule applies to stationary reciprocating internal combustion engines. The regulation sets different NOx emission limits based on fuel source whether gaseous, diesel or landfill gas and engine type whether spark-ignited or compression-ignited or whether lean-burn or rich-burn. The lowest NOx limit is set at 0.5 g/bhp-hr or 39 ppmvd for an engine fired on natural gas. CO emissions are limited to 400 ppmvd. The regulation established no VOC compliance limit.

References

Antelope Valley AQMD Source Specific Rules, Rule 1110.2 – Emissions from Stationary, Non-road and Portable Internal Combustion Engines, Website: https://avaqmd.ca.gov/regulation-xi-source-specific-standards.

Bay Area AQMD, Current Rules, Regulation 9 – Inorganic Gaseous Pollutants, Rule 8 – Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines, Website: http://www.baaqmd.gov/rules-and-compliance/current-rules.

Commonwealth of Pennsylvania Code, Title 25 – Environmental Protection, Chapter 129 – Standards for Sources, subpart 129.97, Website: https://www.pacode.com/secure/data/025/chapter129/s129.97.html.

Mojave Desert AQMD, Regulation XI – Source Specific Standards, Rule 1160 – Internal Combustion Engines, Website: http://mdaqmd.ca.gov/rules/rule-book/regulation-xi-source-specific-standards.

New Jersey State Department of Environmental Protection, New Jersey Administrative Code, Title 7, Chapter 27, Subchapter 19 – Control and Prohibition of Air Pollution from Oxides of Nitrogen, Section 7:27-19.8 – Stationary Reciprocating Engines, Website: https://www.nj.gov/dep/aqm/rules27.html

New York Codes, Rules and Regulations, 6 CRR-NY 227-2.4, subpart (f) – Control Requirements for Stationary Internal Combustion Engines, Website: https://govt.westlaw.com/nycrr/Document/I4e978e48cd1711dda432a117e6e0f345?contextData=(sc.Default)&transitionType=Default.

Santa Barbara County APCD, Current Rules and Regulations, Rule 333 – Control of Emissions from Reciprocating Internal Combustion Engines, Website: https://www.ourair.org/current-rules-and-regulations/.

San Diego County APCD, List of Current Rules, Rule 69.4.1 – Stationary Reciprocating Internal Combustion Engines – Best Available Retrofit Control Technology, Website: https://www.arb.ca.gov/drdb/sd/cur.htm.

San Joaquin Valley Unified APCD, Current District Rules and Regulations, Rule 4702 – Internal Combustion Engines, Website: https://www.valleyair.org/rules/1ruleslist.htm#reg4.

San Luis Obispo County APCD, List of Current Rules, Rule 431 – Stationary Internal Combustion Engines, Website: https://www.arb.ca.gov/drdb/slo/cur.htm.

Texas Administrative Code, Title 30, Part 1, Chapter 117, Subchapter D, Division 2, Rule 117.2110, Website: https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=117&rl=2110.

Ventura County APCD, List of Current Rules, Rule 74.9 – Stationary Internal Combustion Engines, Website: https://www.arb.ca.gov/drdb/ven/cur.htm.

APPENDIX C – ENGINE SURVEY

Rule 1110.2 Survey – October 2018

Facility ID: ________________ Company Name: ________________________

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Permit No.	Size (bhp)	Primary Fuel Type	2-stroke engine (Y/N)	Lean/ Rich Burn	Age of Engine (yrs)	Primary Engine Use	Type of Emission Control	Ammonia Slip (ppmv)	Ammonia Type	Type of Monitoring
1											
2											
3											
4											
5											
6											

	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
	Engine Portable (Y/N)	Tier Rating	Engine Efficiency (%)	Typical Load Factor	Any Retrofit (Y/N)	Fuel Usage Units	Annual Fuel Usage		Annual Operating Hours	
							CY 2016	CY 2017	CY 2016	CY 2017
1										
2										
3										
4										
5										
6										

Additional Comments:

Instructions:
- Please provide data (1) – (21) for each engine.
- Attach most recent emissions data for each engine (e.g. source test report, hand-held portable data, etc.)

Please return survey to:

South Coast Air Quality Management District
Attn: Kevin Orellana
21865 Copley Drive
Diamond Bar, California 91765-4178
Or via E-mail: korellana@aqmd.gov

Prepared by: ________________________

Contact Phone: ________________________

Email: ________________________

Page 1 of 2

Key

(1) Permit number per engine

(2) Size as rated in bhp

(3) Primary fuel type
1. NG – Natural Gas
2. Diesel
3. Digester
4. Other [Provide type]

(4) 2 Stroke Engine – Y/N

(5) Lean or Rich Burn engine

(6) Age of engine based on initial installation

(7) Primary engine use
1. Prime generator
2. Back-up generator
3. Pump
4. Compressor
5. Other: [Describe]

(8) Type of Emissions Control
1. Three-way catalyst with air/fuel ratio controller
2. Three-way catalyst without air/fuel controller
3. Selective catalyst reduction (SCR)
4. Pre-stratified charge combustion (PSC)
5. Combustion modifications
6. Other: [Provide type]

(9) Ammonia slip ppmv @ 15% O_2

(10) Ammonia type (if applicable)
1. Anhydrous
2. Aqueous
3. Urea
4. Other: [Provide type]

(11) Type of monitoring (if applicable)
1. Fuel meter
2. Timer
3. CEMS (list constituent: NOx, CO, O_2, stack flow, etc.)
4. Other: [Provide type]

(12) Is engine portable?

(13) Tier rating (if applicable)

(14) Engine efficiency based on higher heating value

(15) Typical load factor

(16) Has the unit been retrofitted? Please describe any retrofits made to engine. (e.g., catalytic controls, DPF, etc.) and indicate the year when retrofitted.

(17) Fuel usage units
1. MMSCFD
2. gal/day
3. Other: [Provide alternate type]

(18) – (19) Annual fuel usage for CY 2016 / CY 2017

(20) – (21) Annual operating hours for CY 2016 / CY 2017

Page 2 of 2

APPENDIX D – ASSESSMENT OF AIR POLLUTION CONTROL TECHNOLOGIES

The following assessment of pollution control technologies is derived from the November 2001 California Air Resources Board report, "Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Stationary Spark-Ignited Internal Combustion Engines – Appendix B". Focus is on post-combustion controls.

Post combustion controls generally consist of catalysts or filters that act on the engine exhaust to reduce emissions. Post combustion controls also include the introduction of agents or other substances that act on the exhaust to reduce emissions, with or without the assistance of catalysts or filters.

Oxidation Catalyst

Applicability: This control method is applicable to all engines. For stationary engines, oxidation catalysts have been used primarily on lean-burn engines. Rich-burn engines tend to use 3-way catalysts, which combine nonselective catalytic reduction (NSCR) for NOx control and an oxidation catalyst for control of CO and VOC. The oxidation catalyst has been used on lean-burn engines for nearly 30 years. Oxidation catalysts are used less frequently on stationary engines. In the United States, only about 500 stationary lean-burn engines have been fitted with oxidation catalysts.

Principle: An oxidation catalyst contains materials (generally precious metals such as platinum or palladium) that promote oxidation reactions between oxygen, CO, and VOC to produce carbon dioxide and water vapor. These reactions occur when exhaust at the proper temperature and containing sufficient oxygen passes through the catalyst. Depending on the catalyst formulation, an oxidation catalyst may obtain reductions at temperatures as low as 300 or 400 ºF, although minimum temperatures in the 600 to 700 ºF range are generally required to achieve maximum reductions. The catalyst will maintain adequate performance at temperatures typically as high as 1350 ºF before problems with physical degradation of the catalyst occur. In the case of rich-burn engines, where the exhaust does not contain enough oxygen to fully oxidize the CO and VOC in the exhaust, air can be injected into the exhaust upstream of the catalyst.

Typical Effectiveness: The effectiveness of an oxidation catalyst is a function of the exhaust temperature, oxygen content of the exhaust, amount of active material in the catalyst, exhaust flow rate through the catalyst, and other parameters. Catalysts can be designed to achieve almost any control efficiency desired. Reductions greater than 90 percent for both CO and VOC are typical. Reductions in VOC emissions can vary significantly and are a function of the fuel type and exhaust temperature.

Limitations: A sufficient amount of oxygen must be present in the exhaust for the catalyst to operate effectively. In addition, the effectiveness of an oxidation catalyst may be poor if the exhaust temperature is low, which is the case for an engine at idle. Oxidation catalysts, like other catalyst types, can be degraded by masking, thermal sintering, or chemical poisoning by sulfur or metals. If the engine is not in good condition, a complete engine overhaul may be needed to ensure proper catalyst performance.

Sulfur, which can be found in fuels and lubricating oils, is generally a temporary poison, and can be removed by operating the catalyst at sufficiently high temperatures. However, high temperatures can damage the substrate material. Other ways of dealing with sulfur poisoning include the use of low sulfur fuels or scrubbing of the fuel to remove the sulfur. Besides being a catalyst poison, sulfur can also be converted into sulfates by the catalyst before passing through the exhaust pipe. Catalysts can be specially formulated to minimize this conversion, but these special formulations must operate over a relatively narrow temperature range if they are to effectively reduce VOC and CO and also suppress the formation of sulfates. For engines operated over wide power ranges, where exhaust temperatures vary greatly, special catalyst formulations are not effective.

Metal poisoning is generally more permanent, and can result from the metals present in either the fuel or lubricating oil. Specially formulated oils with low metals content are generally specified to minimize poisoning, along with good engine maintenance practices. Metal poisoning can be reversed in some cases with special procedures. Many catalysts are now formulated to resist poisoning.

Masking refers to the covering and plugging of a catalyst's active material by solid contaminants in the exhaust. Cleaning of the catalyst can remove these contaminants, which usually restores catalytic activity. Masking is generally limited to engines using landfill gas, diesel fuel, or heavy liquid fuels, although sulfate ash from lubricating oil may also cause masking. Masking can be minimized by passing the exhaust through a particulate control device, such as a filter or trap, before this material encounters the catalyst. In the case of landfill gas, the particulate control device can act directly on the fuel before introduction into the engine.

Thermal sintering is caused by excessive heat and is not reversible. However, it can be avoided by incorporating over temperature control in the catalyst system. Many manufacturers recommend the use of over temperature monitoring and control for their catalyst systems. In addition, stabilizers such as CeO2 or La2O3 are often included in the catalyst formulation to minimize sintering. High temperature catalysts have been developed which can withstand temperatures exceeding 1800 ºF for some applications. This temperature is well above the highest IC engine exhaust temperature that would ever be encountered. Depending on the design and operation, peak exhaust temperatures for IC engines range from 550 to 1300 ºF.

Other recommendations to minimize catalyst problems include monitoring the pressure drop across the catalyst, the use of special lubricating oil to prevent poisoning, periodic washing of the catalyst, the monitoring of emissions, and the periodic laboratory analysis of a sample of catalyst material.

Other Effects: A catalyst will increase backpressure in the exhaust, resulting in a slight reduction in engine efficiency and maximum rated power. However, when conditions require an exhaust silencer, the catalyst can often be designed to do an acceptable job of noise suppression so that a separate muffler is not required. Under such circumstances, backpressure from the catalyst may not exceed that of a muffler, and no reduction in engine efficiency or power occur. Often, engine manufacturers rate their engines at a given backpressure, and as long as the catalyst does not exceed this backpressure, no reduction in the engine's maximum power rating will be experienced.

Nonselective Catalytic Reduction (NSCR)

Applicability: This control method is applicable to all rich-burn engines, and is probably the most popular control method for rich-burn engines. The first wide scale application of NSCR technology occurred in the mid- to late-1970s, when 3-way NSCR catalysts were applied to motor vehicles with gasoline engines. Since then, this control method has found widespread use on stationary engines. NSCR catalysts have been commercially available for stationary engines for over 15 years, and over 3,000 stationary engines in the U.S. are now equipped with NSCR controls. Improved NSCR catalysts, called 3-way catalysts because CO, VOC, and NOx are simultaneously controlled, have been commercially available for stationary engines for over 10 years. Over 1,000 stationary engines in the U.S. are now equipped with 3-way NSCR controls.

The dual bed NSCR catalyst is a variation of the 3-way catalyst. The dual bed contains a reducing bed to control NOx, followed by an oxidizing bed to control CO and VOC. Dual bed NSCR catalysts tend to be more effective than 3-way catalysts, but are also more expensive, and have not been applied to as many engines as 3-way catalysts. Improved 3-way catalysts can approach the control efficiencies of dual bed catalysts at a lower cost, and for this reason dual bed catalysts have lost popularity to 3-way catalysts.

Principle: The NSCR catalyst promotes the chemical reduction of NOx in the presence of CO and VOC to produce oxygen and nitrogen. The 3-way NSCR catalyst also contains materials that promote the oxidation of VOC and CO to form carbon dioxide and water vapor. To control NOx, CO, and VOC simultaneously, 3-way catalysts must operate in a narrow air/fuel ratio band (15.9 to 16.1 for natural gas-fired engines) that is close to stoichiometric. An electronic controller, which includes an oxygen sensor and feedback mechanism, is often necessary to maintain the air/fuel ratio in this narrow band. At this air/fuel ratio, the oxygen concentration in the exhaust is low, while concentrations of VOC and CO are not excessive.

For dual bed catalysts, the engine is run slightly richer than for a 3-way catalyst. The first catalyst bed in a dual bed system reduces NOx. The exhaust then passes into a region where air is injected before entering the second (oxidation) catalyst bed. NOx reduction is optimized in comparison to a 3-way catalyst due to the higher CO and VOC concentrations and lower oxygen concentrations present in the first (reduction) catalyst bed. In the second (oxidation) bed, CO and VOC reductions are optimized due to the relatively high oxygen concentration present. Although the air/fuel ratio is still critical in a dual bed catalyst, optimal NOx reductions are achievable without controlling the air/fuel ratio as closely as in a 3-way catalyst.

Typical Effectiveness: Removal efficiencies for a 3-way catalyst are greater than 90 percent for NOx, greater than 80 percent for CO, and greater than 50 percent for VOC. Greater efficiencies, below 10 parts per million NOx, are possible through use of an improved catalyst containing a greater concentration of active catalyst materials, use of a larger catalyst to increase residence time, or through use of a more precise air/fuel ratio controller.

For dual bed catalysts, reductions of 98 percent for both NOx and CO are typical.

The previously mentioned reduction efficiencies for catalysts are achievable as long as the exhaust gases are within the catalyst temperature window, which is typically 700 to 1200 ºF. For many engines, this temperature requirement is met at all times except during startup and idling.

The percentage reductions are essentially independent of other controls that reduce the NOx concentration upstream of the catalyst. Thus, a combination of combustion modifications and catalyst can achieve even greater reductions.

Limitations: As with oxidation catalysts, NSCR catalysts are subject to masking, thermal sintering, and chemical poisoning. In addition, NSCR is not effective in reducing NOx if the CO and VOC concentrations are too low. NSCR is also not effective in reducing NOx if significant concentrations of oxygen are present. In this latter case, the CO and VOC in the exhaust will preferentially react with the oxygen instead of the NOx. For this reason, NSCR is an effective NOx control method only for rich-burn engines.

When applying NSCR to an engine, care must be taken to ensure that the sulfur content of the fuel gas is not excessive. The sulfur content of pipeline-quality natural gas and LPG is very low, but some oil field gases and waste gases can contain high concentrations. Sulfur tends to collect on the catalyst, which causes deactivation. This is generally not a permanent condition, and can be reversed by introducing higher temperature exhaust into the catalyst or simply by heating the catalyst. Even if deactivation is not a problem, the water content of the fuel gas must be limited when significant amounts of sulfur are present to avoid deterioration and degradation of the catalyst from sulfuric acid vapor.

For dual bed catalysts, engine efficiency suffers slightly compared to a 3-way catalyst due to the richer operation of engines using dual bed catalysts.

In cases where an engine operates at idle for extended periods or is cyclically operated, attaining and maintaining the proper temperature may be difficult. In such cases, the catalyst system can be designed to maintain the proper temperature, or the catalyst can use materials that achieve high efficiencies at lower temperatures. For some cyclically operated engines, these design changes may be as simple as thermally insulating the exhaust pipe and catalyst.

Most of these limitations can be eliminated or minimized by proper design and maintenance. For example, if the sulfur content of the fuel is excessive, the fuel can be scrubbed to remove the sulfur, or the catalyst design or engine operation can be modified to minimize the deactivation effects of the sulfur. Poisoning from components in the lube oil can be eliminated by using specially formulated lube oils that do not contain such components. However, NSCR applications on landfill gas and digester gas have generally not been successful due to catalyst poisoning and plugging from impurities in the fuel.

Other Effects: A very low oxygen content in the exhaust must be present for NSCR to perform effectively. To achieve this low oxygen content generally requires richening of the mixture. This richening tends to increase CO and VOC emissions. However, use of a 3-way catalyst can reduce CO and VOC emissions to levels well below those associated with uncontrolled engines.

Another effect of NSCR is increased fuel consumption. This increase is very slight when compared to an uncontrolled rich-burn engine. However, when compared to a lean-burn engine, a rich-burn engine uses 5 to 12 percent more fuel for the same power output. If a rich-burn engine uses a dual bed catalyst, a further slight increase in fuel consumption is generally experienced.

Hybrid System

Applicability: This control method can be applied to all engines. This control method was conceived by Radian Corporation, and has been developed by AlliedSignal and Beaird Industries. There has been one field prototype demonstration in San Diego, and it appears that the system has been offered commercially. However, there are no commercial applications of this technique.

Principle: The hybrid system is a modification of the dual bed NSCR system. The hybrid system adds a burner in the engine exhaust between the engine and the dual bed catalysts. The burner is operated with an excess amount of fuel so that oxygen within the engine exhaust is almost completely consumed, and large amounts of CO are generated. The exhaust then passes through a heat exchanger to reduce temperatures before continuing on to a reducing catalyst. The NOx reduction efficiency of the reducing catalyst is extremely high due to the high CO concentration (the CO acts as a reducing agent to convert NOx into nitrogen gas. The exhaust next passes through another heat exchanger, and air is added before the exhaust passes through an oxidation catalyst. The oxidation catalyst is extremely efficient in reducing CO and VOC emissions due to the excess oxygen in the exhaust.

Typical Effectiveness: NOx concentrations as low as 3 to 4 ppm are achievable with this system. Concentrations of CO and VOC are typical of systems using oxidation catalysts.

Limitations: When the oxygen content of the engine's exhaust is high, such as for lean-burn engines, the burner must use a large amount of fuel to consume nearly all the oxygen and generate sufficient amounts of CO. Therefore, use of this method on lean-burn engines is only practical in cogeneration applications, where heat generated by the burner can be recovered and converted to useful energy.

Other Effects: For rich-burn engines, this method has a fuel penalty of about one to five percent. However, for lean-burn engines, the fuel penalty could be equal to the uncontrolled engine's fuel consumption.

Selective Catalytic Reduction (SCR)

Applicability: This method was patented in the U.S. in the 1950s, and there have been over 700 applications of SCR to combustion devices worldwide. Some of these applications include stationary IC engines. However, most of these applications are external combustion devices such as boilers. SCR systems for IC engines have been commercially available for a number of years, but there have only been a few dozen SCR retrofits of IC engines. SCR is applicable to all lean-burn engines, including diesel engines.

Principle: The exhaust of lean-burn engines contains high levels of oxygen and relatively low levels of VOC and CO, which would make an NSCR type of catalyst ineffective at reducing NOx. However, an SCR catalyst can be highly effective under these conditions. Oxygen is a necessary ingredient in the SCR NOx reduction equation, and SCR performs best when the oxygen level in the exhaust exceeds 2 to 3 percent.

Differing catalyst materials can be used in an SCR catalyst, depending on the exhaust gas temperature. Base metal catalysts are most effective at exhaust temperatures between 500 and 900 ºF. Base metal catalysts generally contain titanium dioxide and vanadium pentoxide, although other metals such as tungsten or molybdenum are sometimes used. Zeolite catalysts are most effective at temperatures between 675 to over 1100 ºF. Precious metal catalysts such as platinum and palladium are most effective at temperatures between 350 and 550 ºF.

In SCR, ammonia (or, in some cases, urea) is injected in the exhaust upstream of the catalyst. The catalyst promotes the reaction of ammonia with NOx and oxygen in the exhaust, converting the reactants to water vapor and nitrogen gas. Ammonia injection can be controlled by the use of a NOx monitor in the exhaust downstream of the catalyst. A feedback loop from the monitor to the ammonia injector controls the amount injected, so that NOx reductions are maximized while emissions of ammonia are minimized. To eliminate the use of a costly NOx monitor, some applications use an alternative system that measures several engine parameters. Values for these parameters are then electronically converted into estimated NOx concentrations.

Typical Effectiveness: The NOx removal efficiency of SCR is typically above 80 percent when within the catalyst temperature window.

Limitations: SCR can only be used on lean burn engines. Relatively high capital costs make this method too expensive for smaller or infrequently operated engines.

Some SCR catalysts are susceptible to poisoning from metals or silicon oxides that may be found in the fuel or lubricating oil. Poisoning problems can be minimized by using specially formulated lubricating oils that do not contain the problem metals, the use of fuels with low metals or silicon oxides content, or the use of zeolite catalysts which are not as susceptible to poisoning.

If platinum or palladium is used as an active catalyst material, the sulfur content of the exhaust must be minimized to avoid poisoning of the catalyst. In addition, for all types of SCR catalysts, high sulfur fuels will result in high sulfur oxides in the exhaust. These sulfur compounds will react with the ammonia in the exhaust to form particulate matter that will either mask the catalyst or be released into the atmosphere. These problems can be minimized by using low sulfur fuel, a metal-based SCR system specially designed to minimize formation of these particulate matter compounds, or a zeolite catalyst.

Ammonia gas has an objectionable odor, is considered an air pollutant at low concentrations, becomes a health hazard at higher concentrations, and is explosive at still higher concentrations. Safety hazards can occur if the ammonia is spilled or there are leaks from ammonia storage vessels. These safety hazards can be minimized by taking proper safety precautions in the design, operation, and maintenance of the SCR system. Safety hazards can be substantially reduced by using aqueous ammonia or urea instead of anhydrous ammonia. If a concentrated aqueous solution of urea is used, the urea tank must be heated to avoid recrystallization of the urea. In addition, if too much ammonia is injected into the exhaust, excessive ammonia emissions may result. These emissions can be reduced to acceptable levels by monitoring and controlling the amount of ammonia injected into the exhaust.

SCR may also result in a slight increase in fuel consumption if the backpressure generated by the catalyst exceeds manufacturer's limits.

Lean NOx Catalyst

Applicability: This control method can be used on any lean-burn engine, although development work has concentrated on diesel engines. This control method is still in the development stage and is not commercially available, but may be available in a few years.

Principle: A number of catalyst materials can be used in the formulation of lean NOx catalysts. The constituents are generally proprietary. NOx reductions are generally minimal unless a reducing agent (typically raw fuel) is injected upstream of the catalyst to increase catalyst performance to acceptable levels. Depending on the catalyst formulation, this method can reduce NOx, CO, and VOC simultaneously.

Typical Effectiveness: Claims for NOx control efficiencies have ranged from 25 to 50 percent. Steady state testing on a diesel-fueled engine yielded NOx reductions of 17 to 44 percent.
Limitations: Use of a reducing agent increases costs, complexity, and fuel consumption. The reducing agent injection system must be carefully designed to minimize excess injection rates. Otherwise, emissions of VOC and particulate matter can increase to unacceptable levels. Tests have shown that lean NOx catalysts produce significant amounts of nitrous oxide (N2O), and that this production increases with increasing NOx reduction efficiencies and reducing agent usage. This method is not commercially available, and is still in the development and demonstration stage.

Other Effects: None known.

Urea Injection

Applicability: This control method is applicable to all lean-burn engines and is also known as selective non-catalytic reduction. It has been used on several boilers to control NOx, but there have been no applications to internal combustion engines.

Principle: Urea injection is very similar to cyanuric acid injection, as both chemicals come in powder form, and both break down at similar temperatures to form compounds which react with nitric oxide. Differences are that a high temperature heating system is not required for urea injection. Instead, the urea is usually dissolved in water, and this solution is injected into the exhaust stream.

Typical Effectiveness: Unknown.

Limitations: The temperature window for urea is higher than the highest exhaust temperature of nearly all engines. Therefore, due to cost-effectiveness considerations, practical applications of urea injection are limited to engines in cogeneration applications. Specifically, these applications are limited to situations where supplemental firing is applied to the engine's exhaust to increase its temperature, and the exhaust heat is recovered and used.

Other Effects: Unknown

Replacement

Another method of reducing NOx is to replace the existing IC engine with an electric motor, or a new engine designed to emit lower NOx emissions. In some instances, the existing engine may be integral with a compressor or other gear, and replacement of the engine will require the replacement or modification of this other equipment as well.

Applicability: This control method is applicable to all engines.

Principle: Rather than applying controls to the existing engine, it is removed and replaced with either a new, low emissions engine or an electric motor.

Typical Effectiveness: New, low emissions engines can reduce NOx by a substantial amount over older, uncontrolled engines. Potential NOx reductions of over 60 percent can be realized by replacing existing SI engines with new certified low emission engines fueled by natural gas or propane.

Another approach is to replace an engine with an electric motor. An electric motor essentially eliminates NOx emissions associated with the removed engine, although there may be minor increases in power plant emissions to supply electricity to the electric motor.

Limitations: In remote locations or where electrical infrastructure is inadequate, the costs of electrical power transportation and conditioning may be excessive. Similarly, the cost of replacing an engine with a natural gas fired unit could be prohibitive if a natural gas pipeline is not in reasonably close proximity to the engine. In cases where the existing engine operates equipment integral to the engines (such as some engine/compressors that share a common crankshaft), both the engine and integral equipment would require replacement.

APPENDIX E – CEMS DATA ANALYSIS FOR AVERAGING TIME

Option to Average on an Hourly Basis for CEMS-equipped Engines

Staff reviewed concerns raised by stakeholders in the averaging of data for compliance purposes. In particular, one stakeholder operates three natural gas-fired, rich-burn internal combustion engines with each rated at greater than 2,000 bhp. The engines are used to drive cogeneration units that provide power to the facility. Each engine is equipped with a NSCR system and a CEMS unit. To determine compliance with its permitted limit, the facility calculates a rolling 15-minute average of CEMS 1-minute data.

At times, the engines experience transient operational shifts. These shifts may result from load demand variability, fuel compositional changes, or ambient weather fluctuations. Although the facility responds to these changes, they claim that the 15-minute averaging does not give them enough time to adequately address temporary phenomena before a permitted limit is exceeded. In 2017, the South Coast AQMD recorded forty-five notifications by the facility that were related to exceedances. In 2018, the facility made twenty-five similar notifications. About 90% of these calls describe exceedances due to transients.

In 2018, the South Coast AQMD issued a Notice of Violation to the facility for failure to operate their equipment in compliance to their permitted limits, referencing the volume of exceedances albeit transient as they may be. As a practice and to minimize the time of potential non-compliance, the facility now responds to 15-minute exceedances by shutting down an engine if and when a permitted limit is exceeded. The engine is then restarted and operation resumes.

Shutting down an engine and restarting it introduces several negative impacts. For example, upon a restart, it is anticipated that more emissions will be released into the atmosphere in comparison to if an engine were allowed to continue to operate during a transient. Staff evaluated 1-minute CEMS data from the facility that covers such instances. The following information presents findings from this analysis:

<u>Incident #1</u>

2/17/2018
NOx emissions rise as a transient: 0119 hrs – 0125 hrs (Duration – 7 minutes to go through the system)

Maximum Corrected NOx – 29.15 ppmvd @ 15% O_2
Maximum Raw NOx Value – 103 ppmvd

Unit shutdown at 0138 hrs

During the 7 minutes of the incident, excess emissions (above 11 ppmvd @ 15% O_2) are calculated to be 0.0724 lbs NOx

Subsequent Start-up
0245 – 0301 (Duration – 8 minutes to start up)
Maximum Corrected NOx – 34.42 ppmvd @ 15% O_2

Maximum Raw NOx Value – 121 ppmvd

During the 8 minutes of start-up, excess emissions (above 11 ppmvd @ 15% O_2) are estimated to be 0.1637 lbs NOx

The extra NOx emissions of undergoing a start-up is greater by 0.0913 lbs

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<u>Incident #2</u>

2/17/2018
NOx emissions rise as a transient: 0417 hrs – 0423 hrs (Duration – 7 minutes to go through the system)

Maximum Corrected NOx – 23.29 ppmvd @ 15% O_2
Maximum Raw NOx Value – 82 ppmvd

Unit shutdown at 0439 hrs

During the 7 minutes of the incident, excess emissions (above 11 ppmvd @ 15% O_2) are estimated to be 0.0394 lbs NOx

Subsequent Start-up
0620 – 0626 (Duration – 7 minutes)
Maximum Corrected NOx – 34.92 ppmvd@15% O_2
Maximum Raw NOx Value – 121 ppmvd

During the 7 minutes of start-up, excess emissions (above 11 ppmvd @ 15% O_2) are estimated to be 0.1409 lbs NOx

The extra NOx emissions of undergoing a start-up is greater by 0.1015 lbs.

As a result of this analysis, staff concluded that there can be an emissions benefit by having less frequent shutdowns and restarts. In addition to calculating additional NOx emissions due to start-up activity, staff considered two common 1-hour averaging methods versus a rolling 15-minute averaging procedure. The first method uses an averaging of four 15-minute quadrants in one hour on the hour patterned after the procedure used in Rule 2012. The second method extends the rolling averaging to one hour versus 15 minutes. Based on these alternative averaging methods, the facility would have been able to demonstrate compliance to its permitted limits during these transient events. Moreover, if the facility had been able to use a one-hour averaging procedure, it would have avoided the shutdown and subsequent startup of their engine and any corresponding net increase of emissions due to the startup.

Comparing the 1-hour Quadrant Averaging versus the 1-hour Rolling Averaging, staff notes a difference in the results. The 1-hour Quadrant procedure produces a slightly lower value than the 1-hour Rolling method. This may be attributed to what is considered a "double-smoothing" effect where 1-minute data is averaged first over a 15-minute period and then each period is averaged for the block hour. In terms of ease of calculation, the Quadrant Averaging procedure requires several steps to complete whereas the 1-hour Rolling method is simpler.

Table E-1: Averaging – Highest Peak Value (ppmvd @ 15% O_2)

Methodology	Incident #1	Incident #2
15-minute Rolling Averaging	29.15	23.29
1-hour Quadrant Averaging	9.59	8.82
1-hour Rolling Averaging	9.72	9.07

In analyzing the data, staff made the following observations and assumptions:

- The beginning of a transient incident was noted to occur when a raw NOx value exceeded the previous reading by 50% or more.
- The end of a transient incident was noted to occur when a previously high value returned to within 50% of the value before the start of the transient.
- In each transient incident, the 1-minute data would first show the occurrence of an event but then because of averaging, the rolling 15-minute would show the occurrence a short time later.
- The data suggests that each transient analyzed lasted approximately seven minutes.
- In response to an excess of a permit limit based on a 15-minute averaged value, the engine was shutdown. In these instances, the data showed that the transient had passed through the system prior to the shutdown.
- The beginning of a startup period was considered at which point the data showed either NOx emission values, stack flow rate, or oxygen readings.
- The end of a startup period was considered when emission levels were steady and in compliance to permit limits.
- Excess emissions were calculated as emissions greater than the permitted limit.
- It was noted upon start-up, several raw NOx values peaked and flat-lined at 121 ppmvd. To calculate emissions in these cases, the maximum reported value was used. There is a possibility that actual values were greater, but without additional information, staff used the maximum reported value in calculations.
- To calculate extended hour averaging after an engine was shutdown, staff assigned a value of 8 ppmvd NOx @ 15% O_2 to model the effect of the transient.

After evaluation of the issue and analysis of the emissions impact, staff recommends providing an option to average on a 1-hour, fixed-interval basis in accordance to the provisions in Rules 218 and 218.1. This would assure compliance with the existing emission limits, while also achieving emissions benefits from the reduction of shutdown and startup emissions.

APPENDIX F – RESPONSE TO PUBLIC COMMENTS

Public Comments
Table of Contents

Comment Letter No. 1 – Hoag Hospital, Newport Beach

Yorke
ENGINEERING, LLC
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August 2, 2019

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Planning, Rule Development, and Area Sources
South Coast Air Quality Management District
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Subject: Proposed Limit on Unplanned Emission-Related Shutdowns for Cogen Engines Subject to PAR 1110.2; Hoag Hospital

Dear Mr. Orellana:

Thank you for agreeing to accommodate Hoag Hospital's (Facility ID 11245) request to increase the emission averaging time from 15 to 60 minutes for their cogeneration engines by amending Rule 1110.2. On the morning of July 25, you called to inform us that you spoke with EPA about the proposed change and that EPA is agreeable. On July 31, Mike Morris spoke with Erik Lidecis and Duane Suby of Hoag Hospital and Yorke about the proposed rule amendments. 1-1

These changes are justified and will reduce real emissions by reducing the number of unplanned shutdowns and startups, during which emissions are uncontrolled, and allowing the engines to continue operating during load transients.

We reviewed Hoag's shutdown data for 2018 and the first half of 2019 and found as many as 7 shutdowns in a month for one engine due to potential emission exceedances of the 15-minute average limit. We believe that Hoag would agree to limit the number of unplanned shutdowns due to emission-related causes to no more than 5 per engine per month.

We propose the following rule language: 1-2

> *There shall be no more than five unplanned shutdowns per month due to emission-related causes. Planned shutdowns and shutdowns due to non-emission-related causes, including emergency reasons, shall not be subject to this limit. The operator shall maintain a log explaining the reason for each shutdown.*

We appreciate your assistance in addressing this matter.

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Mr. Kevin Orellana
August 2, 2019
Page 2 of 2

Sincerely,

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cc: Erik Lidecis, Hoag Hospital
Duane Suby, Hoag Hospital
Peter Moore, Yorke Engineering
Corina Chang, Yorke Engineering
Brian Yorke, Yorke Engineering

References:

1. Letter from Yorke to Mr. Kevin Orellana, dated October 26, 2018
2. Letter from Yorke to Mr. Kevin Orellana, dated May 29, 2019
3. Letter from Hoag to Ben Benoit of the Stationary Source Committee, dated July 23, 2019
4. Letter from Yorke to Mr. Kevin Orellana, dated July 26, 2019

Yorke Engineering, LLC

Hoag Hospital Reference Letter No. 1

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October 26, 2018

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Subject: Proposed Amended Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines;
Emissions Averaging Time for Hoag Hospital (Facility ID 11245) Based on June 3, 2016 Current Rule Language

Dear Mr. Orellana:

On behalf of Hoag Hospital (Facility ID 11245), Yorke Engineering, LLC is submitting this letter to request that the SCAQMD consider increasing the emissions averaging time for NO_x and CO in Rule 1110.2. We understand the rule is being amended to accommodate the sunset of the Regional Clean Air Incentives Market (RECLAIM) program.

FACILITY BACKGROUND

Hoag Hospital currently operates three (3) natural gas fired cogeneration engines to provide electricity and steam to the hospital. All three engines are Waukesha, model no. P9390GSI rated at 2080 brake horsepower (bhp). NO_x and CO emissions are monitored by a continuous emissions monitoring system (CEMS) subject to Rule 218. Hoag is a non-RECLAIM Title V facility.

EMISSIONS AVERAGING TIME

Based on current Rule 1110.2 Table I language dated June 3, 2016, the averaging time for NO_x, VOC, and CO emissions is 15 minutes. Rule 1110.2(B)(ii) currently allows for longer averaging times up to 6 hours for engines combusting non-pipeline-quality natural gas due to varying heating value of the gas. Current Rule 218(f)(2)(B) language dated May 14, 1999 does not state a specific averaging time but requires the averaging time for the CEMS to be consistent with the corresponding permit condition.

Hoag would like to request that the SCAQMD consider increasing the averaging period for NO_x and CO emissions to one hour for their natural gas engines to allow more time for the operators and control systems to accommodate unpredictable fluctuations in hospital electrical and thermal demands that result in minor deviations when averaged over 15 minutes. In 2018 the engines at Hoag have experienced approximately 20 events where NO_x and/or CO emissions slightly exceeded the 15-minute average emission limit. The magnitude of these exceedances is small with the yearly aggregate excess emissions adding up to less than half a pound for each NO_x and CO. Emissions calculated over a 1-hour average would most certainly be in compliance. In addition, a 1-hour averaging time would reduce the frequency of engine shut-downs and start-ups necessary to diagnose the engines. Each time the engine is restarted there is a period of time that engines are

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exempt from the emission limits and emissions are higher while the catalyst warms up (Facility Permit Condition 6).

This request to increase the compliance averaging time was suggested by SCAQMD Engineer Roy Olivares during permitting discussions. At his recommendation, we raised our concern about emissions averaging time at the September 27, 2018 Working Group Meeting. Mr. Olivares stated via email on October 5, 2018 that there may be multiple facilities with the same concern.

ACTIONS TAKEN BY HOAG

Hoag has made significant progress in mitigating emission exceedances for their cogen engines. In response to a variance in 2014 (Case No. 6005-1), Hoag agreed to install and maintain an alarm system that would notify the operator in the event emissions were going to exceed the 15-minute limits. The alarm system helped reduce the number of these exceedances but did not completely eliminate them. As such, Hoag has continued to tighten the alarm system trigger levels to give even earlier notice to the operators. For example, the alarm is currently configured to alert the operator when NO_x and CO emissions will exceed 10 ppm and 32 ppm, respectively. Current permit limits for NO_x and CO are 11 ppm and 33 ppm, respectively. To make the alarm system even more sensitive, it calculates emissions over a 5-minute averaging period. Even with this level of advanced notice, there are still incidents where the operators have insufficient time to adjust engine parameters or shut the engine down before the 15-minute average is exceeded.

In addition to maintaining the alarm system, Hoag also diligently maintains the engines per the manufacturer's specifications. Each engine is subject to a stringent maintenance schedule and is routinely overhauled so that it operates properly. Non-Selective Catalytic Reduction (NSCR) systems are also meticulously maintained. Hoag has continued to experiment with new cutting-edge NSCR technologies to minimize the small exceedances. The process of replacing the NSCR system is cumbersome and expensive. Hoag currently has a brand new NSCR system on standby awaiting installation during the next scheduled overhaul for one of the engines. Hoag has yet to find an NSCR system capable of completely eliminating these exceedances.

CONCLUSION

Hoag would like to request that the SCAQMD consider increasing the NO_x and CO emission averaging time in Rule 1110.2 for natural gas engines from 15 minutes to one hour to smooth out perturbations in the hospital energy demands and reduce the incidence of minor reportable exceedances. Since the overall emissions would not increase, there is no negative impact on the air quality. Hoag diligently maintains an alarm system, all three cogeneration engines, and the NSCR systems. Increasing the averaging period would reduce the number of minor deviations and the associated burden of reporting for both Hoag and the SCAQMD.

Mr. Kevin Orellana
October 26, 2018
Page 3 of 3

Should you have any questions or comments, please contact me at (949) 556-7074.

Sincerely,

Corey Luth
Engineer
Yorke Engineering, LLC
CLuth@YorkeEngr.com

cc: Erik Lidecis, Hoag
Duane Suby, Hoag
Peter Moore, Yorke Engineering
Corina Chang, Yorke Engineering

Yorke Engineering, LLC

Hoag Hospital Reference Letter No. 2

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May 29, 2019

Mr. Kevin Orellana
Program Supervisor
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765
Work: (909) 396-3492
E-mail: KOrellana@aqmd.gov

Subject: Request to Increase Emission Averaging Time to 60 Minutes; Proposed Amended Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines

Dear Mr. Orellana:

On behalf of Hoag Hospital (Facility ID 11245), Yorke Engineering, LLC (Yorke) is submitting this letter to the PAR1110.2 Working Group to request consideration for increasing the emissions averaging time to 60 minutes for NO_x and CO in Rule 1110.2. We previously submitted a letter[1] on this subject.

This letter includes specific examples of the benefit of 60-minute averaging versus 15-minute averaging for several incidents reported by Hoag. We are sharing this data with Rodolfo Chacon/SCAQMD, who contacted us on March 15, 2019.

FACILITY BACKGROUND

Hoag Hospital currently operates three (3) natural gas-fired cogeneration engines to provide electricity and steam to the hospital. All three engines are Waukesha, Model No. P9390GSI, rated at 2,080 brake horsepower (bhp). NO_x and CO emissions are monitored by a continuous emissions monitoring system (CEMS) subject to Rule 218. Hoag is a non-RECLAIM Title V facility.

EMISSIONS AVERAGING TIME

As stated in our email on May 15, 2019:

"We need your help increasing the averaging time for internal combustion engine emission limits from 15 minutes to 60 minutes. We sent you the attached letter in October 2018 and want to pursue this change in Rule 1110.2 in order to address compliance issues caused by load changes.

"During the 3rd WGM for PAR1110.2 on February 6, 2019, we were told that SCAQMD staff conducted an initial investigation into this and their preliminary thoughts were that increasing the averaging time may not solve all non-compliance issues, and may mask significant emissions in some cases. Variable load situations can create spikes, but increases in emissions may be minor (Hoag Hospital was discussed specifically). The operator response to minor exceedances has been to turn off the engine to stay below the 15 minute average. However, this actually results in higher overall emissions as startup and shutdown periods are exempt from emission standards. Therefore, we ask for consideration of increasing the averaging time for cases like Hoag, with

[1] Letter from Yorke to Mr. Kevin Orellana, dated October 26, 2018

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Mr. Kevin Orellana
May 29, 2019
Page 2 of 4

only small exceedances based on the 15-minute average. As stated in our October 2018 letter, "…the yearly [2018] aggregate excess emissions adding up to less than half a pound for each NO_x and CO." The concept of increasing averaging time should not be disregarded only because not all facilities would benefit. We were told that the rule developers would go back to AQMD staff and reconsider the averaging time.

"However, no mention was made about this concept at the 4th WGM for PAR1110.2 on April 24, 2019. On behalf of Hoag Hospital, we again submit a request for the SCAQMD to consider increasing the averaging time from 15 to 60 minutes for emission standards from reciprocating engines. As stated in our comment letter dated October 26, 2018, increasing the averaging time to one hour would allow more time for Hoag's operators and control systems to accommodate unpredictable fluctuations in hospital electrical and thermal demands that result in minor deviations when averaged over 15 minutes."

CEMS DATA EXAMPLES

In response to our email, Rodolfo Chacon/SCAQMD called us. He requested 1-minute raw CEMS data for the Hoag Cogen Engines for all of 2018 through 2019. He stated they would like to crunch the numbers to show if the 15-minute average versus the 60-minute average would make a difference with regards to number of excess emissions events. We explained to Rodolfo that the 1-minute CEMS data is not stored beyond a limited period of time per SCAQMD regulations. However, we worked with Hoag to obtain what was readily available.

We were able provide CEMS data with 15-minute and 60-minute averages for the exceedances that occurred on the dates noted in Table 1. Table 1 summarizes the 2018 NO_x exceedances reported for Internal Combustion Engine (ICE) No. 1. This unit was the one with the most incidents in 2018, and NO_x was the pollutant that most commonly exceeded the regulatory requirements (for NO_x, the limit is 11 ppm @ 15% O_2). Comparing the 15-minute averages to the 60-minute averages shows that the NO_x emissions are below the NO_x limit on those dates since short-term spikes in NO_x concentration are smoothed over the longer period.

Table 1: 2018 NO_x Emission 15-Minute vs. 1-Hour Averages for ICE 1

Date	Time of Incident	15-Min NO_x Average[1] (ppm)	1-Hr NO_x Average[2] (ppm)
2/17/2018	1:30	13.89	8.05
2/17/2018	2:30	12.44	7.59
2/22/2018	0:30	15.42	9.47
3/9/2018	2:15	11.04	2.76
3/14/2018	8:00	16.76	7.37
3/19/2018	19:00	12.05	8.77

[1] Reported for the 15-minute period prior to the time of incident listed, as measured consecutively from time 0:00.

[2] Reported for the 1-hour period including the time of incident listed, as measured consecutively from time 0:00.

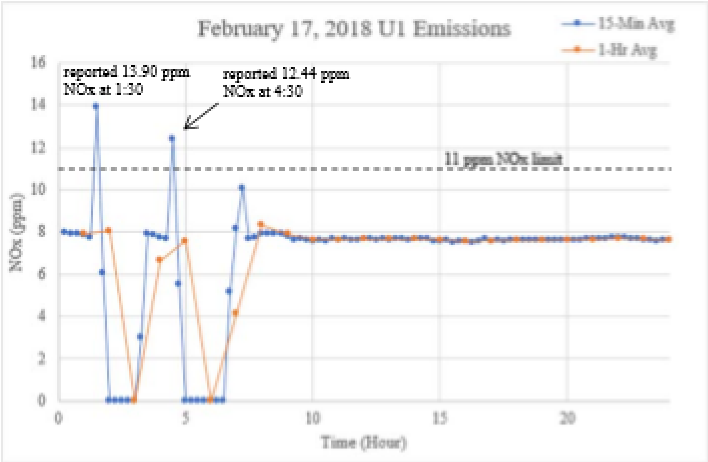
As shown in Figure 1, the operator typically responds to high emission alarms by shutting down the engine in an attempt to avoid exceeding the 15-minute average limit. Engine shut-downs create transients in otherwise stable operations. Following shut-down, the probable cause is diagnosed as quickly as possible and the engine restarted. Start-ups typically cause emission transients until the system reaches stable operation, during which time the emissions are exempt from meeting

Yorke Engineering, LLC

Mr. Kevin Orellana
May 29, 2019
Page 3 of 4

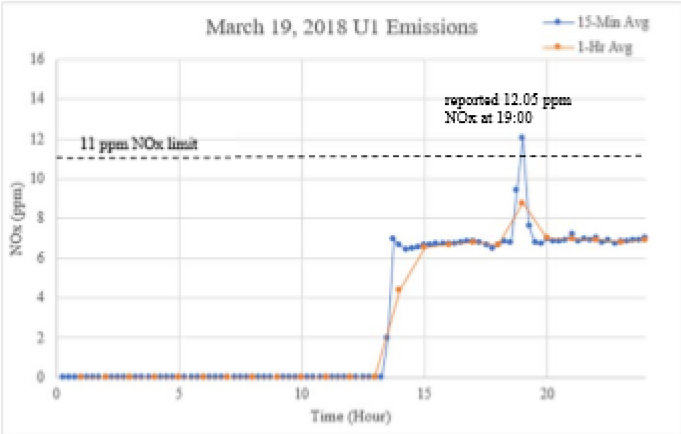
permit limits. The cycle of shutting down the engine and restarting results in more emissions in comparison to allowing the engine to remain operating.

Figure 1: NO_x Emissions for ICE 1 on February 17, 2018



In Figure 2 we see continuous operation past the exceedance, showing that this exceedance corresponds only to one 15-minute data point and is not sustained over an extended time period. Hourly NO_x emission averages would allow the system to continue operating past such short-term spikes such that it can re-stabilize without measures such as powering down, which may cause greater fluctuations in NO_x output.

Figure 2: NO_x Emissions for ICE 1 on March 19, 2018



Yorke Engineering, LLC

Mr. Kevin Orellana
May 29, 2019
Page 4 of 4

Table 2 summarizes the 2019 NO_x exceedances reported for ICE 1.

Table 2: 2019 NO_x Emission 15-Minute vs. 1-Hour Averages for ICE 1

Date	Time of Incident	15-Min NO_x Average[1] (ppm)	1-Hr NO_x Average[2] (ppm)
4/8/2019	17:00	12.06	8.68
4/30/2019	15:00	11.87	9.19
5/19/2019	0:30	19.37	8.65
5/19/2019	11:30	12.01	8.52

[1] Reported for the 15-minute period prior to the time of incident listed, as measured consecutively from time 0:00.
[2] Reported for the 1-hour period including the time of incident listed, as measured consecutively from time 0:00.

CONCLUSION

Hoag requests that the SCAQMD consider increasing the NO_x and CO emission averaging time in Rule 1110.2 for reciprocating internal combustion cogeneration engines to 60 minutes to allow more time for the engine control system to accommodate changes in the hospital energy demands and reduce the incidence of minor reportable exceedances.

The magnitude of mass emission exceedances is miniscule. Increasing emission averaging time would result in no overall emissions increase. In fact, by reducing the number of shutdown/startup cycles, the true air emissions would likely decrease.

Hoag diligently maintains all three cogeneration engines, the NSCR systems, CEMS, and an emissions alarm system. Increasing the averaging period will reduce the number of minor deviations and the associated burden of reporting for both Hoag and the SCAQMD.

Submitted with this letter is an Excel file with CEMS data for ICE 1 for the dates covered in this letter.

Should you have any questions or comments, please contact me at (949) 248-8490, x226.

Sincerely,

Corina Chang

Corina Chang
Senior Engineer
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CChang@YorkeEngr.com

cc: Erik Lidecis, Hoag
Duane Suby, Hoag
Peter Moore, Yorke Engineering
Corey Luth, Yorke Engineering
Brian Yorke, Yorke Engineering

Enclosure:
1. Attachment 1 – Excel File with CEMS Data (ICE 1)

Yorke Engineering, LLC

ATTACHMENT 1 – EXCEL FILE WITH CEMS DATA (ICE 1)

Yorke Engineering, LLC

Hoag Hospital Reference Letter No. 3

hoag

HOAG MEMORIAL HOSPITAL PRESBYTERIAN
One Hoag Drive, PO Box 6100
Newport Beach, CA 92658-6100

July 23, 2019

Council Member Ben Benoit
Chair, Stationary Source Committee
South Coast Air Quality Management District
21865 Copley Drive
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Subject: **Request to Increase Emission Averaging Time to 60 Minutes; Proposed Amended Rule 1110.2 (SSC Agenda Item 4)**

Chairperson Benoit:

Hoag Hospital in Newport Beach (SCAQMD Facility ID 11245) is a world class health care facility that serves Orange County and all of Southern California. Hoag requests consideration for proposed amendments to Rule 1110.2 which are being heard under Item 4 of the Stationary Source Committee (SSC) agenda for July 26, 2019. The amendment to increase the emission averaging time from 15 minutes to 60 minutes will increase Hoag's operational efficiency, improve compliance with air quality rules, reduce costs, and lower real air emissions from cogeneration engines.

Hoag's three cogeneration engines provide electricity and thermal energy to support hospital operations. SCAQMD permits for these engines impose emission limits that are monitored by Continuous Emissions Monitoring Systems (CEMS). Any small deviations from the emission limits are reported by Hoag as required under Title V. While Hoag meticulously maintains their equipment in good condition, hospital energy demand transients sometimes cause small emission exceedances, and often result in shutting-down the engines. Increasing the emission averaging time from 15 minutes to 60 minutes would allow time for the system to adjust to load transients and reduce the number of engine shutdowns. Emissions during startups and shutdowns are much higher than normal operations.

Hoag has been working with SCAQMD staff to amend Rule 1110.2 and allow up to one hour for emissions averaging time from cogen engines. Hoag met with SCAQMD staff on July 18 and presented detailed data to support this request. SSC agenda item 4 mentions Hoag's request under "Remaining Key Issues."

We appreciate the SSC's consideration of Hoag's request to increase the emission averaging time to 60 minutes.

Sincerely,

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Hoag Hospital Reference Letter No. 4

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July 26, 2019

Mr. Kevin Orellana
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Subject: Request to Increase Engine Emission Averaging Time to 60 Minutes for PAR 1110.2; Hoag Hospital

Dear Mr. Orellana:

Thank you for taking steps to accommodate Hoag Hospital's (Facility ID 11245) request to increase the emission averaging time from 15 to 60 minutes by proposing changes to Rule 1110.2. Yesterday morning you called to inform us that you spoke with EPA about the proposed change and that EPA is agreeable. EPA has requested that SCAQMD propose a cap on the number of unplanned shutdowns along with allowing 60-minute averaging of emissions. We understand that you will write justification for inclusion in the staff report. Yorke and Hoag will review data on shutdowns and propose a reasonable cap as soon as possible.

Thanks also to you and other SCAQMD staff that attended the July 18, 2019 conference call with representatives of Hoag and Yorke Engineering. The SCAQMD listened to Hoag's concerns and is considering increasing the emission averaging time from 15 to 60 minutes in PAR 1110.2.

Attachment 1 lists the meeting attendees for both conference calls.

Hoag has submitted a letter to the Stationary Source Committee (SSC) and will attend the meeting on July 26. Hoag and Yorke will support the PAR Public Workshop and CEQA Scoping Meeting on July 31. Reference is made to the letters previously submitted to SCAQMD on this topic.

We appreciate your assistance in addressing this matter.

Sincerely,

Corina Chang

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Mr. Kevin Orellana
July 26, 2019
Page 2 of 2

cc: Erik Lidecis, Hoag Hospital
Duane Suby, Hoag Hospital
Peter Moore, Yorke Engineering
Corey Luth, Yorke Engineering
Brian Yorke, Yorke Engineering

References:

1. Letter from Yorke to Mr. Kevin Orellana, dated October 26, 2018
2. Letter from Yorke to Mr. Kevin Orellana, dated May 29, 2019

Attachment:

1. Meeting Attendees

Yorke Engineering, LLC

MEETING ATTENDEES

Table 1: Conference Call, July 18, 2019

Kevin Orellana	SCAQMD
Rudy Chacon	SCAQMD
Melissa Gamoning	SCAQMD
Charlie Tupac	SCAQMD
Mike Wickson	SCAQMD
Dipankar Sarkar	SCAQMD
Mike Morris	SCAQMD
Erik Lidecis	Hoag Hospital
Duane Suby	Hoag Hospital
Kimban Sim	Hoag Hospital
Corina Chang	Yorke Engineering
Corey Luth	Yorke Engineering
Pete Moore	Yorke Engineering

Table 2: Conference Call, July 25, 2019

Kevin Orellana	SCAQMD
Rudy Chacon	SCAQMD
Mike Morris	SCAQMD
Duane Suby	Hoag Hospital
Kimban Sim	Hoag Hospital
Corina Chang	Yorke Engineering
Corey Luth	Yorke Engineering
Pete Moore	Yorke Engineering

Yorke Engineering, LLC

Response to Comment 1-1

South Coast AQMD appreciates your comments and agrees that a longer averaging time can result in less emissions. Regarding your request to increase the averaging time from 15 minutes to 60 minutes, PAR 1110.2 has been revised to allow a 1-hour averaging period for engines equipped with CEMS.

Response to Comment 1-2

Staff has reviewed your comment regarding limiting the number of emissions-related shutdowns. PAR 1110.2 allows a 1-hour averaging period which should address the transient load changes that were causing the need to excessively shutdown engines.

Comment Letter No. 2 – Snow Summit

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August 9, 2019

Mr. Michael Morris
Planning and Rule Manager
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91795

Subject: Rule 1110.2 Comments and BARCT Cost Effectiveness Analysis for Snow Summit, LLC (SCAQMD Facility ID No. 185353

Dear Mr. Morris:

On behalf of Snow Summit, LLC (Snow Summit), Yorke Engineering LLC (Yorke) is pleased to present this Rule 1110.2 Best Available Retrofit Control Technology (BARCT) cost effectiveness analysis for the proposed retrofit of the existing Selective Catalytic Reduction (SCR) systems on its six (6) diesel generator engines currently in operation at the ski area. In addition to the BARCT analysis, this letter also includes general comments pertaining to the proposed revisions to Rule 1110.2. 2-1

INTRODUCTION

Snow Summit has been working with the South Coast Air Quality Management District (SCAQMD) to determine if upgrades to the existing SCR systems on the generator engines would be cost effective based on SCAQMD criteria. The upgraded SCRs would enable the engines to meet the current Rule 1110.2 nitrogen oxide (NOx) emission standard of 11 parts per million (ppm). The engines are currently permitted to emit 50 ppm NOx.

Yorke evaluated the cost effectiveness using the following general assumptions: 2-2

- An annual operating limit of 1,000 hours per year;
- An interest rate (cost of money) of 5.5%;
- An operational life of a new SCR of 15 years; and
- A cost-effectiveness threshold of $50,000.

Yorke believes that these values are supportable and consistent with the guidance provided for the method.

Snow Summit is suggesting 1,000 hours per year be used as the BARCT threshold for their unique case. By accepting a permit condition limiting the operating hours of each engine to less than 1,000 per year, the engines would not be required to meet the NOx standard of 11 ppm @ 3% O_2. 2-3

The subsequent paragraphs provide more detail regarding our cost-effectiveness calculations and conclusions.

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Mr. Michael Morris
August 9, 2019
Page 2 of 6

FACILITY INFORMATION

The Snow Summit ski area was established in 1952 in the San Bernardino Mountains. It is located near Big Bear Lake along with its sister resort Bear Mountain. Snow Summit is one of the larger ski areas in Southern California and is considered to be one of the most popular ski and snowboard destinations in the Southern California area. Snow Summit is a mid-sized resort, with 1,209 feet vertical drop, and 240 acres of skiable terrain, all of it covered by snowmaking. Snow Summit's extensive snowmaking system draws water from Big Bear Lake. Snowmaking operations can cover all of the ski areas' marked terrain with skiable man-made snow when natural snow is insufficient and ambient conditions are amenable for snowmaking. Snow Summit is also one of the areas' largest and most important employers. During the ski season, Snow Summit typically employees approximately 1,800 employees. In addition, Snow Summit is very active in the local community and sponsors many local events. Snow Summit also works openly with the SCAQMD and fosters a positive working relationship. 2-4

BARCT ANALYSIS METHODOLOGY

The costs and estimating methodology are recommended by EPA in the Office of Air Quality Planning Service Air Pollution Cost Control Manual (referred to simply as "OAQPS" throughout the remainder of this document).

In brief, the methodology seeks to provide an annual cost of ownership which incorporates the direct operating costs (e.g., labor, utility, and maintenance costs) and an annualized capital cost. The annualized capital cost can be thought of like an annual lease payment for the equipment; it takes into account the installed equipment cost, equipment life, and the cost of money (i.e., the interest rate for borrowing). By adding the operating costs to the annualized capital cost, the cost of ownership is reduced to a numerical single value. This allows the comparison of different technologies on a common basis. For example, one technology may have high capital cost and low operating cost, and a different technology may have low capital cost and high operating cost. 2-5

This annualized cost of ownership is used by the SCAQMD to calculate a cost-effectiveness value in units of dollars per ton of emissions reduced/avoided. That cost-effectiveness value is compared to a standard that the SCAQMD has determined is appropriate for the pollutant. A more complete explanation of the methodology is provided in Attachment 1.

BARCT EMISSIONS

The premise of this analysis is that the upgraded SCR would reduce NOx emissions from the six diesel generator engines from 50 ppm to 11 ppm. Yorke calculated emissions based 1,000 hours per year, per engine. The change in emissions is summarized in Table 1. Emission calculations are provided in Attachment 2. 2-6

Yorke Engineering, LLC

Mr. Michael Morris
August 9, 2019
Page 3 of 6

Table 1: Net Change in NOx Emissions

Period	Emissions at 1,000 hours per year (ton/yr)
Pre-Project	12.7
Post-Project	2.8
Net Decrease	9.9

2-6 Cont.

BARCT DATA AND ASSUMPTIONS

The OAQPS methodology provides factors for estimating the costs associated with an air emissions control project. The factors are generally based on the cost of the air pollution control device itself (i.e., a percentage of the capital cost). While OAQPS provides a methodology for estimating the basic capital cost for an SCR, for this analysis, Yorke used the proposal for the upgraded SCR provided by [redacted] which is provided as Attachment 3.

In addition to the equipment provided by [redacted] for the project, Yorke assumed the following equipment would be required to execute the project, along with estimated costs: 2-7

- Urea Tank (one additional 5,000-gallon tank is assumed to be needed) ($20,000);
- Vaporizer (for urea vaporization)($45,000);
- Compressor (used to dilute urea to ensure better distribution) ($30,000);
- Structural Steel ($80,000); and
- Flex Couplings (to connect the SCR to the existing ducting/stack) ($36,000).

Yorke did not include the cost of new CEMS for the engines, but did include a cost of $25,000 per engine for instrumentation and process control. Whether the project would require modifications to the existing CEMS, or some other type of instrumentation to control urea feed has not been determined (and would depend on whether the SCAQMD provides a CEMS exemptions for limited use engines). 2-8

Yorke made the following assumptions:

- An equipment life of 15 years is assumed. Yorke reviewed several BACT analyses for SCR installations; the life expectancy for an SCR was reported as 10 years (SMAQMD and BAAQMD for BACT analyses), 10 years (ENSR/AECOM for Duke), 15 years (Onsite Sycom for DOE), and 25 years (SCAQMD for Rule 1110.2). The 25 year estimate used by the SCAQMD appears unreasonably long for several reasons:
    - Engine technology changes rapidly – in the last 25 years, diesel engines have gone from Tier 0 to Tier 4. 2-9
    - Rule 1110.2 has been amended nine times in the last 25 years (although not always to reduce NOx emission levels).
    - The State is making great strides to force replacement of older mobile and portable diesel engines by a mandatory phase-out of Tier 1, 2, and 3 engines by 2027.

Yorke Engineering, LLC

Mr. Michael Morris
August 9, 2019
Page 4 of 6

Given the rapid change of both technology and regulations, it is not reasonable to assume that Snow Summit could continue to operate these engines without further modification for 25 more years. For these reasons, Yorke selected 15 years as the life expectancy of the control equipment. 2-9 Cont.

- Yorke used an interest rate of 5.5% as the cost of money, as published by the Wall Street Journal, June 6, 2019. This is the rate at which banks would load money to their preferred customers. 2-10
- The operating and maintenance labor costs for the proposed SCR are assumed to be zero because Snow Summit already operates SCR on each of the six generator engines. The additional costs associated with the proposed new SCR are assumed to be negligible. 2-11
- The Miratech proposal includes new diesel particulate filters for the project. It is assumed that the particulate filters are required to protect the catalyst from fouling and, as such, are integral to the project. Thus, the cost of the particulate traps is included in the analysis. 2-12
- Catalyst replacement is assumed to be required after 24,000 hours of operation based on OAQPS guidance. Catalyst replacement cost is annualized based on the catalyst life, the cost of replacement catalyst, and the cost of money. 2-13
- The existing SCR will have to be demolished and removed prior to the installation of the proposed new SCR equipment. Demolition is estimated at $60,000. 2-14
- The proposed catalyst is assumed to have higher pressure drop than the existing SCR. The energy cost is estimated at 0.3% of the generator output based on OAQPS guidance. 2-15
- The additional cost for urea is estimated based on the urea required for the reduction from 50 ppm to 11 ppm only. The additional urea has to be vaporized for use; the heat required for vaporization is estimated assuming an electric heater. 2-16
- SCAQMD permitting costs have been included in the capital cost estimate. The cost estimate includes the SCAQMD application fees and an estimate of the cost for a consultant to prepare the applications. 2-17

The OAQPS cost factors that are used without adjustment are listed in Tables 1-1 and 1-2 in Attachment 1.

BARCT RESULTS

The total estimated capital and operating costs, along with the cost effectiveness values are summarized in Table 2. As noted, the operating costs only include the incremental costs that would be incurred if the proposed new SCR were to be installed. The operating costs exclude operating and maintenance labor and exclude the cost for supplies and utilities associated with the operation of the current SCR systems. 2-18

The SCAQMD published a cost-effectiveness threshold in conjunction with rule development activities for Rule 1110.2; the value is $28,957 per ton of NOx reduced for lean-burn, 4-stroke engines. In an e-mail from the SCAQMD, Kevin Orellana stated that the District would use $50,000 per ton as the cost-effectiveness threshold for their analysis of this project. Mr. Orellana did not indicate the basis for this value or why he is not using the value that was published for the Rule 1110.2 rule development. To ensure that this analysis is sufficiently conservative (i.e., 2-19

Yorke Engineering, LLC

Mr. Michael Morris
August 9, 2019
Page 5 of 6

protective of air quality), Yorke uses the $50,000 per ton value in our analysis. The cost-effectiveness calculations are provided in Attachment 4.

Table 2: Cost and Cost-effectiveness Summary

Category	Value
Operating Hours	1,000 Hrs/Yr
Total Capital Cost	$3,275,587
Annualized Capital Cost	$326,332
Annual Operating Cost	$40,355
Indirect Annual Cost	$139,933
Total Annualized Cost	$497,711
NOx Reduction	9.70 Tons/Yr
Cost Effectiveness	$51,332 per Ton
Cost Effectiveness Threshold	$50,000 per Ton
Cost Effective (Yes/No)?	No

2-19 Cont.

RULE 1110.2 BARCT CONCLUSIONS AND RECOMMENDATIONS

Yorke offers the following conclusions:

- The proposed new SCR systems are not cost effective based on 1,000 hours per year of operation per engine using 5.5% interest rate, 15-year equipment life, and a cost-effectiveness threshold of $50,000 per ton. 2-20
- A commercial interest rate of 4% used by SCAQMD in its analysis is unrealistic. While some assumptions are generally required in a cost-effectiveness analysis, the cost of money does not require assumption – it is a published value that is readily available. We encourage SCAQMD to use the current cost of money in its analysis. 2-21
- The SCR equipment life of 25-years assumed by the District in its analysis is very conservative. Snow Summit's operations are seasonal operations and the generator engines are more than 16 years old and near the end of their useful life. Engines such as these typically have a useful service life of 10,000 to 12,000 hours before a major engine overhaul or complete replacement is necessary. A more realistic SCR equipment life of 15 years is recommended. 2-22
- Using a cost-effectiveness threshold of $50,000 per ton is very conservative. This value does not appear to be based on EPA criteria or standards used by other California air districts for similar analyses. Given this, we suggest the SCAQMD uses its discretion when establishing a cost-effective threshold appropriate for Snow Summit. 2-23
- Snow Summit is suggesting 1,000 hours per year to be used as the BARCT threshold for its unique case. By accepting a permit condition limiting the operating time of each engine to less than 1,000 hours per year, the engines would not be required to meet the NOx standard of 11 ppm @ 3% O_2. 2-24

Yorke Engineering, LLC

Mr. Michael Morris
August 9, 2019
Page 6 of 6

GENERAL RULE 1110.2 COMMENTS

Yorke offers the following comments on draft Rule 1110.2:

- The rule should include provisions that specify emergency use, testing, and maintenance hours are not counted towards normal operations for any rule requirements such as CEMS requirements and NOx retrofit requirements. 2-25
- The averaging period for rule compliance for large lean-burn diesel engines such as these should be based on a 60-minute averaging period, which accounts for normal engine operating fluctuations such as air-to-fuel ratio time-lag, SCR stabilization, and load changes. 2-26
- We agree that engines with a permit condition that limits operating hours to less than 1,000 per year (not including emergency use, testing, and maintenance hours) should be exempt from CEMS requirements. 2-27

CLOSING

Should you have any questions or concerns, please contact me at (805) 293-7756, or John Furlong at (949) 248-8490 x 233.

Sincerely,

Russell Kingsley

Russell Kingsley
Principal Engineer
Yorke Engineering, LLC
RKingsley@YorkeEngr.com

cc: John Furlong, Yorke Engineering, LLC

Enclosures:

1. Attachment 1 – OAQPS Cost Analysis Methodology
2. Attachment 2 – Emission Calculations
3. [redacted] Proposal
4. Cost Effectiveness Calculations

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ATTACHMENT 1 – OAQPS COST ANALYSIS METHODOLOGY

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ATTACHMENT 1 – OAQPS COST ANALYSIS METHODOLOGY

Overview of Methodology

The costs and estimating methodology in this report are directed toward the "study" level estimate with a nominal accuracy of +/- 30 percent, which is consistent with the methodology recommended by EPA in the Office of Air Quality Planning Service Air Pollution Cost Control Manual (referred to simply as "OAQPS" throughout the remainder of this document). According to Perry's Chemical Engineer's Handbook, a study estimate is "… used to estimate the economic feasibility of a project before expending significant funds for piloting, marketing, land surveys, and acquisition … [However] it can be prepared at relatively low cost with minimum data." Specifically, to develop a study estimate, the following must be known:

- Location of the source within the plant;
- Rough sketch of the process flow sheet (i.e., the relative locations of the equipment in the system);
- Preliminary sizes of, and material specifications for, the system equipment items;
- Approximate sizes and types of construction of any buildings required to house the control system;
- Rough estimates of utility requirements (e.g., electricity);
- Preliminary flow sheet and specifications for ducts and piping;
- Approximate sizes of motors required.

(EPA, 2002)

Financial Evaluation

There are many ways of evaluating the cost of a project. Five common methods are:

- Cash Flow;
- Payback Period;
- Internal Rate of Return (IRR);
- Return on Investment (ROI); and
- Net Present Value (NPV).

While these can be used to evaluate projects, these five methods are better suited to projects with a positive cash flow – such as equipment used to make a product that is sold. Because pollution control projects generally have only negative cash flow for initial capital equipment purchase and annual operating expenses, these methods yield negative values, and evaluation is a comparison of negative numbers. While the comparison is possible, it can be hard to follow logically.

For this report, Yorke uses an alternative method described in OAQPS as "Annualization". This method determines a series of equal payments over a long period of time that fully funds a capital project and its operations and maintenance by multiplying the present value of those costs by a capital recovery factor. This method derives what can be described as the "annual cost of ownership". The initial capital investment is allocated over the life of the equipment, taking into account the time value of money, and added to the annual cost of operation (utilities, labor, etc.).

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This allows comparison of projects with differing capital costs, equipment life expectancy and operating costs on a common basis.

Annualization involves determining the NPV of each alternative equipment investment and then determining the equal (in nominal terms) payment that would have to be made at the end of each year to attain the same level of expenditure. In essence, annualization involves establishing an annual "payment" sufficient to finance the investment for its entire life.

The capital recovery cost (CRC) is calculated by multiplying the net present value (NPV) of the investment by the capital recovery factor (CRF):

$$CRC = NPV \ x \ CRF$$

Where CRF is defined according to the formula:

$$CRF = \left[\frac{i(1+i)^n}{(1+i)^n - 1}\right]$$

And where:

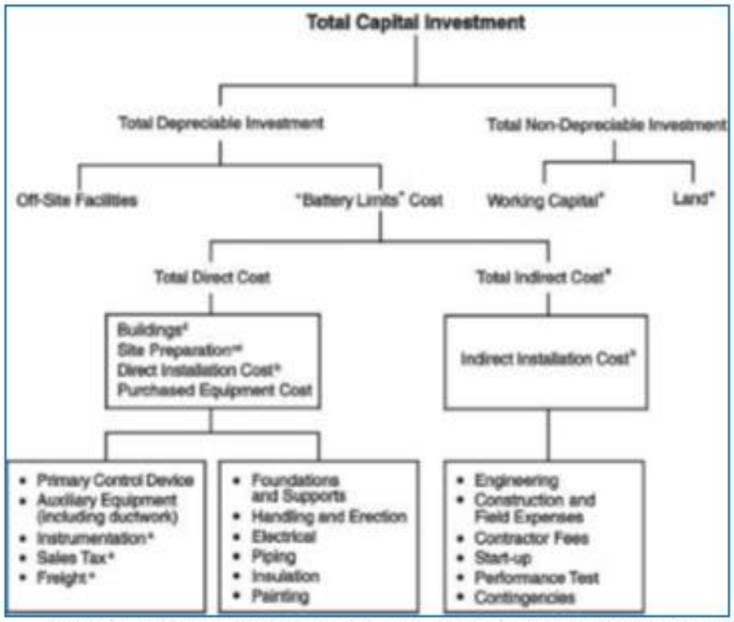
i is the interest rate, and

n is the number of years (usually the life of the equipment)

Capital Cost

Total capital investment (TCI) includes all costs required to purchase equipment needed for the control system (purchased equipment costs), the costs of labor and materials for installing that equipment (direct installation costs), costs for site preparation and buildings, and certain other costs (indirect installation costs). TCI also [typically] includes costs for land, working capital, and off-site facilities.

The sum of the purchased equipment cost, direct and indirect installation costs, site preparation, and buildings costs comprises the battery limits estimate. By definition, this is the total estimate for a specific job without regard to required supporting facilities which are assumed to already exist at the plant. This would mainly apply to control systems installed in existing plants, though it could also apply to those systems installed in new plants when no special facilities for supporting the control system (i.e., off-site facilities) would be required. Off-site facilities include units to produce steam, electricity, and treated water; laboratory buildings; and railroad spurs, roads, and other transportation infrastructure items. Pollution control systems do not generally have off-site capital units dedicated to them since pollution control devices rarely consume energy at that level (EPA, 2002). The elements of total capital investment are displayed in Figure 1-1.



a. Typically factored from the sum of the primary control device and auxiliary equipment costs.
b. Typically factored from the purchases equipment cost.
c. Usually required only at "grass roots" installations.
d. Unlike the other direct and indirect costs, costs for these items usually are not factored from the purchased equipment cost. Rather, they are sized and costed separately.
e. Normally not required with add-on control systems.

(Source: EPA, 2002)

Figure 1-1: Elements of Total Capital Investment

Operating Costs

Total Annual Cost (TAC) has three elements: direct costs (DC), indirect costs (IC), and recovery credits (RC). The basis of these costs is one year, as this period allows for seasonal variations in production (and emissions generation) and is directly usable in financial analyses. The various annual costs and their interrelationships are displayed in Figure 1-2.

Direct costs include costs for raw materials (reagents or adsorbers), utilities (steam, electricity, process and cooling water), waste treatment and disposal, maintenance materials (greases and other lubricants, gaskets, and seals), replacement parts, and operating, supervisory, and maintenance labor. Generally, raw materials, utilities, and waste treatment and disposal are variable costs, but there is no hard and fast rule concerning any of the direct cost components.

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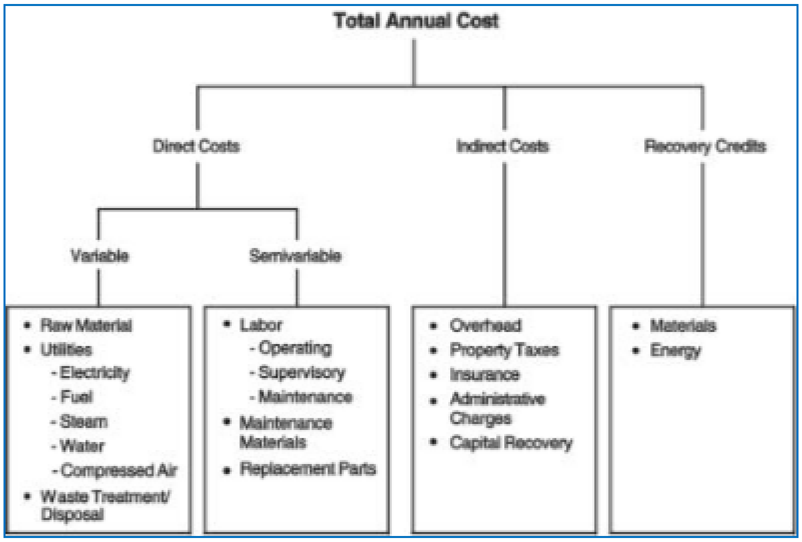

(Source: EPA, 2002)

Figure 1-2: Elements of Total Annual Cost

The control equipment is assumed to fully depreciate over the useful life, and no salvage value can be taken for the system equipment at the conclusion of its useful life. This is a reasonable assumption for add-on control systems, as most of the equipment, which is designed for a specific source, cannot be used elsewhere without modification. Even if it were reusable, the cost of disassembling the system into its components (i.e., "decommissioning cost") could be as high (or higher) than the salvage value.

Indirect, or "fixed", annual costs are independent of the level of production (or whatever unit of measure serves as the analytical metric) and, in fact, would be incurred even if the control system were shut down. Indirect costs include such categories as administrative charges, property taxes, insurance, and capital recovery.

Given the nature of the emission controls under consideration in this evaluation, recovery credits, taken for materials or energy recovered by the control system, which may be sold, recycled to the process, or reused elsewhere at the site are assumed to be negligible.

Capital Cost Factors

The basic cost of the control equipment is only one part of the overall control project cost. Other costs may include demolition, construction of foundations, structural steel, buildings, and installation of the equipment, including electrical, plumbing, ducting and painting. For this study, Yorke uses a combination of OAQPS factors, industry and regulatory references, and estimates based on our experience. The capital cost factors applicable to the proposed SCR project are summarized in Table 1-1.

Table 1-1: SCR Capital Cost Factors

Cost Category	Cost and/or Factor and Basis of Estimate
Direct Costs	
Purchased equipment costs:	
Equipment + auxiliary equipment	Vendor quote + estimates for auxiliary equipment
Instrumentation (CEMS)	BAAQMD BACT Example
Sales taxes	8% for San Bernardino County
Freight	Estimate
Purchased equipment cost (PEC)	Sum of above
Direct installation costs:	
Demolition	Estimate
Foundations and supports	0.08*PEC (OAQPS)
Handling and erection	0.14*PEC (OAQPS)
Electrical	0.04*PEC (OAQPS)
Piping	0.02*PEC (OAQPS)
Insulation for piping and duct work	0.01*PEC (OAQPS)
Painting	0.01*PEC (OAQPS)
Direct Installation Cost (DIC)	Sum of above
Total Direct Cost (TDC)	Sum of DIC and PEC
Indirect Costs	
Engineering	0.10*PEC (OAQPS)
Construction and field expenses	0.05*PEC (OAQPS)
Contractor fees	0.10*PEC (OAQPS)
Start-up	Incl. in vendor quote
Performance tests	Estimate
Permitting	SCAQMD Fee Schedule + Yorke estimate for consulting fees
Contingencies	0.03*PEC (OAQPS)
Total Indirect Cost (TIC)	Sum of above
Total Capital Investment (TCI)	**TCI = TDC + TIC**

Utilities and Administrative Costs

The costing assumptions and cost factors used in this evaluation for utilities and administrative overhead costs are shown in Table 1-2. OAQPS factors are used unless otherwise noted.

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Table 1-2: Cost Factors and Assumptions

Resource Category	Value	Reference
Electricity	$0.16466/kWh	http://www.pge.com/tariffs/electric.shtml# INDUSTRIAL
Compressed Air	$0.25 /1000 ft^3	OAQPS
Sales Tax	8.00%	San Bernardino County
Overhead	60% of labor and materials	OAQPS
Administrative	2% of Total Capital Investment	OAQPS
Property taxes	1% of Total Capital Investment	OAQPS
Insurance	1% of Total Capital Investment	OAQPS

Excluded Cost Items

For this study, Yorke did not take into account the following cost items:

- Operating or maintenance labor costs;
- Income tax; and
- The cost of buildings and land value.

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ATTACHMENT 2 – EMISSION CALCULATIONS

Information not included; business confidential.

ATTACHMENT 3 – [redacted] PROPOSAL

Information not included; business confidential.

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ATTACHMENT 4 – COST EFFECTIVENESS CALCULATIONS

Yorke Engineering, LLC

REFERENCES

Topic	Web Address
BAAQMD BACT Example	http://www.baaqmd.gov/~/media/files/engineering/bact-tbact-workshop/appendix/cost-effectiveness-calculations-nox.pdf
Catalyst and Urea Costs	EPA SCR Workbook: scr_cost_manual_spreadsheet_2016_vf.xls
Cost Analysis of NOx Control Alternatives for Stationary Gas Turbines (Onsite Sycom)	https://www.energy.gov/sites/prod/files/2013/11/f4/gas_turbines_nox_cost_analysis.pdf
Duke Auxiliary Boiler BACT Analysis (prepared by ENSR/AECOM)	https://files.nc.gov/ncdeq/Air%20Quality/permits/psd/docs/cliffside/Top-down_BACT_for_Auxiliary_Boiler_%25209-19-06.pdf
Interest Rate	https://www.bankrate.com/rates/interest-rates/wall-street-prime-rate.aspx
OAQPS	https://www3.epa.gov/ttncatc1/dir1/c_allchs.pdf
Proposed Amended Rule 1110.2 Presentation for WORKING GROUP MEETING NO. 5 Date – May 30, 2019	http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1110.2/rule-1110-2-working-group-meeting-5-final.pdf?sfvrsn=6
SMAQMD BACT Determinations #57 and #199	http://www.airquality.org/StationarySources/Documents/BACT%20Clearinghouse.pdf
Tank Cost Estimate	http://www.bvsde.paho.org/bvsacd/cd47/texas/cap6.pdf
Urea Reaction	http://eel.ecsdl.org/content/4/10/E5.full

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Response to Comment 2-1
The Final Staff Report includes a discussion of the cost-effectiveness for implementation of PAR 1110.2. Staff has reviewed the information provided on cost-effectiveness as discussed in more detail in the Response to Comment # 2-2.

Response to Comment 2-2
Some assumptions that are presented in your cost-effectiveness calculations of $51,467 per ton of NOx reduced differ from the ones used to evaluate cost-effectiveness for PAR 1110.2. For example, staff assumes a uniformed series present worth factor at a 4% interest rate and a 25-year equipment life expectancy, while your analysis is based on an interest rate of 5.5% with a useful life of 15 years. Staff assumptions for the cost-effectiveness analysis is consistent with other rulemakings such as Rule 1134 for turbines which was amended in March 2019 and Rule 1135 for electrical generating facilities which was amended in November 2018. The cost-effectiveness threshold of $50,000 per ton of NOx reduced is based on the 2016 Air Quality Management Plan cost-effectiveness threshold and is used as a guide for NOx rulemaking projects. This threshold is a guidance and is used to compare the average cost-effectiveness for implementation of a proposed or proposed amended rule. Compliance with the NOx emission limit may result in some units with a higher and some units with a lower cost-effectiveness than $50,000 per ton of NOx reduced. The average cost-effectiveness for 4-stroke ~~stronke~~lean burn engine category is $35,500 per ton of NOx reduced.

Response to Comment 2-3
Currently, limiting an engine that is rated at or greater than 1,000 bhp by permit conditions to 1,000 hours per year or a fuel usage of less than 8 x 10^9 Btus per year (higher heating value of all fuels used) may provide relief from equipping an engine with CEMS [Rule 1110.2 (f)(1)(A)(ii)(III)]. However, there is no similar provision for exempting an engine from meeting the NOx standard of 11 ppmvd @ 15% O_2 if the engine is limited by permit conditions to 1,000 hours per year or a fuel usage of less than 8 x 10^9 Btus per year (higher heating value of all fuels used). Under PAR 1110.2 engines that are operated less than 500 hours per year or use less than 1 x 10^9 Btus per year (higher heating value of all fuels used), the NOx, CO, and VOC emission limits are either Table II (Low-Use) or Table III-A (Low-Use) are applicable.

Response to Comment 2-4
Thank you for your comment.

Response to Comment 2-5
Thank you for your comment.

Response to Comment 2-6
Staff similarly calculated a reduction in NOx emissions by taking the difference in emission rates from a 50 ppmvd level to an 11 ppmvd level (@ 15% O_2) for each engine. Staff calculated emissions based on the previous year's operating information and source testing data as provided by Snow Summit.

Response to Comment 2-7
Thank you for providing estimates on your system upgrades. Appendix A includes capital and annual cost estimates used for the cost-effectiveness analysis. The Socioeconomic Analysis includes additional details of the cost assumptions.

Response to Comment 2-8
Staff recognizes that the CEMS for the engines are currently uncertified. It was conservatively assumed that the CEMS would be installed at a cost of $120,000 per unit with an annual cost of $10,000 per CEMS. Proposed Amended Rule 1110.2, clause (f)(1)(A)(i) does not require a NOx or CO CEMS for engines greater than 1,000 bhp that are operated less than 2 million bhp-hours per calendar year.

Response to Comment 2-9
A 25-year useful life for an SCR is consistent with the useful life used for other rule projects where SCR is used. The useful life covers the equipment and installation. The Tiered standards for engines apply to new engines and are not the same as retrofit emission limits in Rule 1110.2. In addition the references to state requirements are for mobile and portable diesel engines, and focuses on replacements, which is different than limits for existing stationary engines.

The last major amendment to the NOx emission standard was in 2008 which required the 11 ppmvd. During this rule development process, staff conducted another BARCT analysis and concluded that 11 ppmvd still represents BARCT, and the eleven year-old NOx limit will be retained. If the NOx emission limit for diesel engines is re-assessed in the future, staff would conduct a full BARCT analysis that includes an evaluation of the cost-effectiveness taking into consideration the useful life of the equipment. As a result, staff believes that a 25-year useful life for SCR is appropriate.

Response to Comment 2-10
Staff uses a 4% interest rate consistent with other similar rulemaking efforts and analysis.

Response to Comment 2-11
Staff recognized that the facility already operates an SCR on each of the six generator engines. The cost-effectiveness analysis used similar assumptions for operation and maintenance (O&M).

Response to Comment 2-12
The cost of particulate filters was not included in the cost-effectiveness analysis since PAR 1110.2 addresses NOx emissions, and the engines are already required to meet the CO and VOC concentration limits. Staff considers retrofits to control diesel particulate emissions outside the scope of PAR 1110.2 since PM emissions are not addressed in this rule or its proposed amendments. Rule 1470 addresses diesel PM from engines. There is no expected change to PM emissions from the retrofit of the SCR as the ammonia slip emission limits will remain the same or be lower.

Response to Comment 2-13
Staff used a 3-year operational expectancy for the catalyst life. The catalyst replacement cost is annualized based on a three-year cycle. Typically, the engines operated at the facility do not run for more than 1,000 hours per year. So, it is possible that the catalyst can be used well beyond the assumed three-year replacement cycle.

Response to Comment 2-14
It is unclear why the commenter assumes that the SCR will be demolished and removed. Staff assumed the continued use of existing infrastructure and equipment.

Response to Comment 2-15
Any additional pressure drop was considered negligible due to new catalyst designs and manufacture.

Response to Comment 2-16
Additional cost for an increase in urea usage was included, but staff assumed the continued use of existing infrastructure and equipment.

Response to Comment 2-17
Permitting costs were not included in the capital costs that were subsequently annualized but were considered as initial, one-time costs and with associated renewals.

Response to Comment 2-18
Thank you for your comment.

Response to Comment 2-19
Staff estimates that the average cost-effectiveness for the six engines is $51,467 per ton of NOx reduced which includes SCR and CEMS. In light of some differences in assumptions, the

calculated value of $51,332 per ton of NOx reduced provided in the comment letter is comparable. Please note that using a threshold of $50,000 per ton of NOx reduced is used as a guidance. As a whole for all affected engines, the transition of engines from the RECLAIM program over to a command-and-control regulatory structure is $35,500 which is below the $50,000 per ton of NOx reduced threshold. In cases where unique circumstances or exorbitant costs exists, provisions may be made to accommodate or to reduce negative impacts arising from these situations. Calculating the cost effectiveness at $51,332 per ton of NOx reduced does not appear to meet a situation of uniqueness or exorbitant costs relative to other affected engines.

Response to Comment 2-20

Based on staff's assumptions and calculations, the cost-effectiveness value calculated for the category of engines at this facility is $35,500 per ton of NOx reduced. It is expected that if the facility were to re-evaluate their data instead with a 4% interest rate and a 25-year equipment life expectancy, the cost-effectiveness for this category would remain below $50,000 per ton. Moreover, staff evaluated cost-effectiveness based on actual reported NOx emissions and on actual hours of operation. Staff did not conduct its evaluation based on 1,000 hours of operation or associated emission levels at this level of hours of operation. There do exist differences in what the facility considered as part of their potential retrofit and upgrade costs; but, with the facility's basis of a higher operational level (higher emission levels), the cost effectiveness calculations in the end were similar to what staff calculated.

Response to Comment 2-21

Thank you for your comment.

Response to Comment 2-22

The facility's operation is seasonal. Data for the past two compliance years shows that individual engines operated between 148 hours and 490 hours. Assuming that operation continues at about 500 hours per year, then if 10,000 hours to 12,000 hours is used as a milestone, then a theoretical operational life would be between 20 years to 24 years before a major engine overhaul or potential complete replacement would be necessary. With this consideration, then using a 25-year basis seems appropriate.

Response to Comment 2-23

As previously discussed, the cost-effectiveness threshold of $50,000 per ton of NOx reduced is based on the 2016 Air Quality Management Plan cost-effectiveness threshold and is used as a guide for NOx rulemaking projects. This threshold is a guidance and is used to compare the average cost-effectiveness for implementation of a proposed or proposed amended rule.

Response to Comment 2-24

Staff does not consider limiting operation to 1,000 hours as an option. At this time, an alternate option is to limit operation to less than 500 hours where the engines may meet the emission levels for a low-use engine. Table II sets a NOx emission level of 36 ppmvd for engines rated greater than 500 bhp. Taking this option would be at the discretion of the facility and should be incorporated into their operating permit.

Response to Comment 2-25

Currently, an engine may be permitted and operated as either a prime engine or an emergency engine. As an emergency engine, the provisions of subdivision (d) do not apply to the engine. If an engine is not subject to the provision of paragraph (d)(1), then no CEMS would be required. Rule 1110.2 currently limits emergency engines to operate no more than 200 hours per year. An example of an emergency would be in response to an unplanned power interruption where the safety of staff or the facility is of critical importance.

Response to Comment 2-26

Staff concurs that averaging over a longer period of time may allow a facility to account for transient load changes and other normal engine operating fluctuations. As such, staff is including an option in the rule to allow for a 1-hour averaging period with engines equipped with CEMS.

Response to Comment 2-27

Thank you for your comment.

Comment Letter No. 3 – Wärtsilä North America

WÄRTSILÄ

Wärtsilä North America Inc.

August 13, 2019

Mr. Rodolfo Chacon
Planning, Rule Development and Area Sources
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Subject: Proposed Amendments to Rule 1110.2

Dear Mr. Chacon:

Wärtsilä North America greatly appreciates the time and effort the District has spent in evaluating proposed changes to Rule 1110.2. As Wärtsilä discussed at a meeting with District staff in 2015, Wärtsilä has developed an advanced reciprocating engine control system that is capable of meeting the South Coast AQMD's stringent requirements for Best Available Control Technology, including the numerical limits contained in District Rule 1110.2. At that time (in 2015), we had proposed that the District revise the rule to provide additional flexibility in meeting the 15-minute average compliance requirement while preserving the operational flexibility that our clients need to operate in a modern electrical grid that includes a substantial input from intermittent renewable resources such as wind and solar. 3-1

As you know, Rule 1110.2, Section (d)(L) requires that all (non-emergency) electrical generators meet the emissions specified in Table IV.

TABLE IV EMISSION STANDARDS FOR NEW ELECTRICAL GENERATION ENGINES	
Pollutant	**Emission Standard (lbs/MW-hr)[1]**
NOx	0.070
CO	0.20
VOC	0.10[2]

1. The averaging time of the emission standards is 15 minutes for NOx and CO and the sampling time required by the test method for VOC, except as described in the following clause. 3-2
2. Mass emissions of VOC shall be calculated using a ratio of 16.04 pounds of VOC per lb-mole of carbon.

Since our meeting with District staff in 2015, Wärtsilä has confirmed its ability to comply with the rule as written, if necessary. However, Wärtsilä believes that the steps we need to take to meet these stringent limits on a 15-minute average basis will inhibit the ability of our customers to take full advantage of our technology's ability to respond to rapid fluctuations in demand in an electrical grid

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increasingly dominated by generation from intermittent resources. This 15-minute averaging period is relatively unique in District rules, and it is not tied to any ambient air quality standard. 3-2 Cont.

In the July 19, 2019 draft PAR 1110.2, the District has acknowledged the need for, and benefit of, providing additional operating flexibility for some classes of engines subject to the Rule. For example, Staff has proposed language allowing a 60-minute averaging period for the applicable NOx emission limit for certain engines subject to the requirements of Table II, and current rule 1110.2 allows up to 24-hour averaging for certain biogas engines subject to the requirements of Table III-B. The staff report for PAR 1110.2 indicate that these longer averaging periods are intended to facilitate compliance for certain two-stroke engines used for gas compression and which are equipped with post-combustion emission controls, and for certain engines using biogas (also when equipped with post-combustion controls). The challenges faced by the operators of these engines (transient operating loads and/or varying fuel composition) are similar to those faced by operators of Wärtsilä's engines for electric power generation with advanced emission controls in an environment in which the incremental demand for electricity can vary significantly within a matter of seconds due to changes in generation by wind and solar resources. Since the average emissions from our engines will be below the Table IV limits of 0.070 / 0.20 / 0.10 pounds per megawatt-hour on an hourly average basis regardless of whether compliance is assessed on a 15-minute or 60-minute average basis, no increase in emissions is associated with this proposed revision. 3-3

We therefore request that the footnote (1) to Table IV be modified as follows:

(1) The averaging time of the emission standards is 15 minutes for NOx and CO and the sampling time required by the test method for VOC, except as described in the following clause. For owners and operators of any new engine installation with catalytic controls, an averaging time of 60 minutes shall be used for demonstrating compliance with the NOx and CO requirements of Table IV. 3-4

We believe that this change provides an environmental benefit in that it will allow Wärtsilä's engines to provide even more flexibility to our customers as they integrate ever-larger fractions of renewable generation while delivering clean, flexible, efficient power to the grid.

Sincerely,

Matthew Fisher
Senior Sales Manager, Wärtsilä North America

Response to Comment 3-1

South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2. Staff has proposed options to provide additional flexibility in meeting the 15-minute average compliance requirement. Staff is recommending an averaging time of 1 hour for units equipped with CEMS.

Response to Comment 3-2

See Response 3-1.

Response to Comment 3-3

See Response 3-1.

Response to Comment 3-4

See Response 3-1.

Comment Letter No. 4 – Southern California Alliance of Publicly Owned Treatment Works

SCAP
SOUTHERN CALIFORNIA ALLIANCE OF PUBLICLY OWNED TREATMENT WORKS

August 14, 2019

Mr. Kevin Orellana, Program Supervisor
Planning, Rule Development & Area Sources
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Dear Mr. Orellana:

Re: Comments on Proposed Amended Rule 1110.2

The Southern California Alliance of Publicly Owned Treatment Works (SCAP) appreciates this opportunity to provide comments on Proposed Amended Rule 1110.2. SCAP represents 83 public agencies that provide essential water supply and wastewater treatment to nearly 19 million people in Los Angeles, Orange, San Diego, Santa Barbara, Riverside, San Bernardino and Ventura counties. SCAP's wastewater members provide environmentally sound, cost-effective management of more than two billion gallons of wastewater each day and, in the process, convert wastes into resources such as recycled water and biogas.

4-1

The purpose of this letter is to expand upon comments provided by our members at the July 31, 2019 Public Workshop. We greatly appreciate SCAQMD's acknowledgment that it is challenging for biogas engines to comply with Rule 1110.2. Due to the differences between natural gas and biogas, we believe that the biogas requirements contained in Rule 1110.2 should be moved to Proposed Rule 1179.1. Our specific comments on the July 2019 version of Proposed Amended Rule 1110.2 are outlined below.

Ammonia Limit (d)(1)(B)(vii)

This proposed provision establishes an ammonia limit of 5 ppmv, corrected to 15% O_2 and averaged over 60 minutes for any new or retrofit engine installation with selective catalytic reduction (SCR) pollution control equipment. While we appreciate this requirement would only apply to new installations with an SCR, the lower limit can be challenging for biogas engines to achieve. Biogas contains contaminants derived from waste discharged to the sanitary sewer system and tends to cause accelerated catalyst degradation. Accordingly, SCAP requests the ammonia limit for biogas engines with SCR be established at 10 ppmv, corrected to 15% O_2 and averaged over 60 minutes. 4-2

CEMS Applicability (e)(3)

One of our members elected to install an SCR system on their biogas engine at a minor source facility. 4-3

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Mr. Orellana August 14, 2019

The operation of the SCR and CEMS has proved to be more difficult and time-consuming than anticipated. Rather than shutting-down their engine and flaring biogas from the wastewater treatment process, this facility went the extra mile to beneficially use this waste gas. We would appreciate providing some relief for this facility, which happens to be the only biogas engine non-Title V facility with a CEMS. 4-3 cont.

CEMS Averaging Time (d)(1)(I)

Longer averaging period would be allowed by proposed provision (d)(1)(I), if the operator demonstrates through CEMS data that the engine meets 90% of the emission limits of Table III-B. Provisions (d)(1)(I) and (f)(1)(D)(i) require facilities with biogas engines using longer averaging period to submit an I&M plan even for those engines that are equipped with NOx and CO CEMS and include all items listed in Attachment 1. At the July 31st Public Workshop, Staff clarified that only Attachment 1, Item G is required for those engines with CEMS utilizing longer averaging period. In order to clarify that no other I&M requirements are triggered, we request that Item G in the Attachment 1 be moved to (d)(1)(I) or referenced as Attachment 2. 4-4

Source Testing (f)(1)(C)(i)

This proposed provision requires source testing at least once every two years (within the same calendar month of the previous source test), or every 8,760 operating hours, whichever occurs first. For those facilities with multiple engines, it is less burdensome to test the engines during one event rather than testing at different dates based on each engine's operating hours. Oftentimes the testing of multiple engines can take two months or more. The proposed wording "within the same calendar month of the previous source test" implies that each engine must be tested in the exact same month as the previous test and does not allow any flexibility to accommodate operational or scheduling limitations. We request the deletion of the proposed wording in this provision.

The same provision allows RATA required by Rule 218.1 or 40 CFR Part 75 Subpart E to satisfy the source test requirements for those pollutants monitored by CEMS. NOx and CO RATA is typically conducted at one load (e.g. maximum load) only whereas (f)(1)(C)(ii) requires source testing at three different loads – normal, max and min. Please confirm using one maximum load will satisfy both the RATA and source testing requirements. 4-5

Last, but not least, (f)(1)(C)(i) allows an extension of the source test deadline, if the engine has not been operated within three months of the source test due date. We request this provision not be limited to just a long-term shutdown of the engine, but any length of shutdown due to unforeseen maintenance or repair events.

Ammonia Testing (f)(1)(C)(iii)

This proposed provision requires quarterly ammonia source testing during first 12-months of operation of the SCR not utilizing certified ammonia CEMS and annually thereafter. It appears that this requirement applies only to the new or retrofit engine installation. However, during the July 31st Public Consultation meeting, Staff noted that this requirement also applies to the existing engine installation with SCR, if an engine does not pass the annual testing. Source testing engines is not only expensive, but laborious. Source testing requires extensive facility's operations and maintenance resources to execute without disrupting other critical operations. We respectfully 4-6

2

Mr. Orellana August 14, 2019

request to require ammonia testing concurrent with existing source test requirements. This is consistent with the statement in page 3-7 of the Preliminary Draft Staff Report which states that "the requirements for ammonia source testing would mirror those that exist and that are proposed for NOx, VOC, and CO (e.g., source testing deadline extension and the source testing interval between tests)". 4-6 cont.

In addition, biogas engines with NOx CEMS that utilize inlet ammonia analyzers to "estimate" ammonia slip should be not be required to perform additional source testing for ammonia.

Thank you for the opportunity to comment on Proposed Amended Rule 1110.2. If you have any questions regarding our concerns or recommendations, please do not hesitate to contact Mr. David Rothbart of the Los Angeles County Sanitation Districts, SCAP Air Quality Committee Chair at (562) 908-4288, extension 2412.

Sincerely,

Steve Jepsen, Executive Director

cc: Ms. Susan Nakamura, SCAQMD
Mr. Mike Morris, SCAQMD

3

Response to Comment 4-1
South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2. Staff is currently working on Proposed Rule 1179.1 and has not yet decided if engines at Public Owned Treatment Works (POTWs) should stay in Rule 1110.2 or be moved into Proposed Rule 1179.1. A provision has been added in PAR 1110.2 paragraph (i)(3) that states that “the provisions of this rule [Rule 1110.2] shall not apply to units located at landfills or publicly owned treatment works that are subject to a NOx concentration limit in a Regulation XI rule adopted or amended after *[Date of Amendment]*.” This provision will provide the South Coast AQMD staff the flexibility to move engines subject to POTWs in Proposed Rule 1179.1 if that is the decision.

Response to Comment 4-2
The initial proposed amended Rule 1110.2 contained a provision for an ammonia limit of 5 ppmvd @ 15% O2 for a new SCR installation or retrofit. However, staff has reviewed the addition of ammonia emission limits into the rule. The requirements for ammonia limits will be deferred to the permit evaluation process for new installations of SCRs. BACT may apply for any proposed increases in emissions. For existing retrofitted SCRs, ammonia limits may be specified in a permit to operate based on what is achieved in practice in similar installations.

Response to Comment 4-3
PAR 1110.2 includes a provision for Essential Public Service facilities that are operating a biogas engine that is between 1,000 and 1,200 bhp which allows an alternative compliance approach of conducing diagnostic emission checks weekly instead of using CEMS.

Response to Comment 4-4
PAR 1110.2 includes a provision for biogas engines equipped with CEMS that allows a 48-hour averaging period provided the engine can meet a NOx emission limit of 9.9 ppmvd and a CO emission limit of 225 ppmvd.

Response to Comment 4-5
Your concerns regarding when a source test is conducted and what happens if delays occur are noted. Staff has revised PAR 1110.2 to address your concerns. Under PAR 1110.2, conducting a source test should be timely and completed before any compliance due date. However, staff recognizes that operators may require flexibility on testing. To balance these interests, staff is proposing that a test be conducted no later than the month in which the previous testing was done. If the facility wants to do so before, then it can. However, the month when a subsequent test is done will be reset to that new month. Staff does not want to see situations where testing is somehow extended past the prescribed frequency of testing. The rule has also been revised to allow for unexpected shutdowns of equipment prior to a source test being conducted. If an owner or an operator however does shutdown an engine for operational considerations not due to unexpected

factors prior to a testing deadline, then the engine will be tested within a reasonable time once it returns to service.

Response to Comment 4-6

During the Public Workshop forum, staff may have miscommunicated the applicability for ammonia testing. The initial proposed rule had targeted new SCR installations or retrofits to existing equipment. However, staff has reviewed the addition of ammonia emission limits into the rule. The requirements for ammonia limits was removed from PAR 1110.2 and will be deferred to the permit process evaluation for new installations of SCRs. BACT will apply for any proposed increases in emissions.

Comment Letter No. 5 – Montrose Environmental

MONTROSE
ENVIRONMENTAL

August 14, 2019

Mr. Kevin Orellana
Program Supervisor
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Subject: **Proposed Amended Rule 1110.2 – Emissions from Gaseous and Liquid-fueled Engines Compliance Demonstration Averaging Period**

Dear Mr. Orellana:

During the July 31, 2019 Rule 1110.2 public workshop, SCAQMD indicated that at least one facility operator had expressed concern regarding the 15-minute averaging period that is used to demonstrate compliance with NOx and CO emission standards. Montrose works with many engine and emission control system manufacturers, data acquisition system (DAS) developers and facility operators. We agree that the 15-minute averaging period is inappropriate when demonstrating compliance with the distributed generation emission standards of Rule 1110.2.

Unlike most rules that specify emission concentration limits, Rule 1110.2 specifies mass emission limits that are normalized to generator power output. A Rule 1110.2 DAS must correlate emission concentrations with independent operating parameters to calculate a mass emission value. The DAS must then correlate the mass emission value with independent generator output data in order to determine compliance with a lb./MW-hr. standard. 5-1

The ability to manage load swings is a necessity as facility owners build hybrid systems that incorporate renewable energy sources to accommodate fluctuating demands. During abrupt engine operation shifts, however, changes in engine operations may not directly correlate with changes in generator output and the temporary data. The short-term inconsistencies can result in perceived excess NOx or CO emissions when measured as lb./MW-hr. during a 15-minute averaging period. These perceived noncompliance events occur even when emission concentrations are stable and within reasonable ranges.

Montrose suggests that amendments to Rule 1110.2 include a 60-minute averaging period when a CEMS is used to determine compliance with NOx and CO emission limits. The 60-minute averaging period also complements the way in which compliance is determined for gas turbine installations that are regulated pursuant to Rules 1134 and 1135. 5-2

Montrose welcomes the opportunity to discuss Rule 1110.2 averaging periods with SCAQMD and we are happy to engage other stakeholders as warranted. You can reach me at (714) 282-8240 if you would like to discuss this matter further. Otherwise, I look forward to the upcoming working group meeting.

Sincerely,
Montrose Environmental Solutions

Karl Lany
District Manager
Rule 1110.2 8-14-19

1631 St. Andrew Place
Santa Ana, CA 92705

T: 714.282.8240
F: 949.988.3514
info@montrose-env.com
www.montrose-env.com

Response to Comment 5-1

South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2. Staff concurs that averaging over a longer period of time may allow a facility to account for transient load changes and other normal engine operating fluctuations. As such, staff is including an option in the rule to allow for a 1-hour averaging period with engines equipped with CEMS.

Response to Comment 5-2

See Response 5-1.

Comment Letter No. 6 – Hoag Hospital, Newport Beach

hoag
HOAG MEMORIAL HOSPITAL PRESBYTERIAN
One Hoag Drive, PO Box 6100
Newport Beach, CA 92658-6100

August 19, 2019

Mr. Kevin Orellana
Program Supervisor
Planning, Rule Development, and Area Sources
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765
Work: (909) 396-3492
E-mail: KOrellana@aqmd.gov

Subject: **Proposed Rule Language to Allow Engines with CEMS to Average Emissions Over 60 Minutes; Proposed Amended Rule 1110.2 (August 2019)**

Dear Mr. Orellana:

We reviewed the updated version of Proposed Amended Rule 1110.2 dated August 2019 in preparation for Working Group Meeting #6.

Hoag Hospital supports the added language under paragraph (f)(1)(A)(x) which allows engines with CEMS to average emissions on an hourly basis. We appreciate the District's willingness to accommodate Hoag's request to increase the emission averaging time from 15 to 60 minutes for their cogeneration engines in Newport Beach. 6-1

However, we are concerned about the potential for confusion over the emission limit requirements since this language is proposed for Section (f) *Monitoring, Testing, Recordkeeping and Reporting*. One might interpret the requirements in Section (d), which establish emission limits with a 15-minute average, to also apply. It would be clearer to list an alternative emission standard in Section (d) for engines monitored by a CEMS, similar to the alternative requirements for other engine types:

- (d)(1)(B)(v) – 24 hours for engines combusting non-pipeline quality natural gas; and 6-2
- (d)(1)(B)(v) – 180 minutes for compressor gas lean-burn engines with SCR.

Another option may be to include this language under an exemption in Section (i).

We appreciate your assistance in addressing this matter.

Sincerely,

Erik Lidecis
Manager of Utilities/Operations
Hoag Hospital
(949) 764-6574

Hoag Hospital Newport Beach
One Hoag Drive
Newport Beach, CA 92663

Hoag Hospital Irvine
16200 Sand Canyon Avenue
Irvine, CA 92618

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HOAG MEMORIAL HOSPITAL PRESBYTERIAN
One Hoag Drive, PO Box 6100
Newport Beach, CA 92658-6100

cc: Duane Suby, Hoag Hospital
Corina Chang, Yorke Engineering
Peter Moore, Yorke Engineering
Corey Luth, Yorke Engineering
Brian Yorke, Yorke Engineering

Hoag Hospital Newport Beach
One Hoag Drive
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16200 Sand Canyon Avenue
Irvine, CA 92618

www.hoag.org

Response to Comment 6-1

South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2. Staff concurs that averaging over a longer period of time may allow a facility to account for transient load changes and other normal engine operating fluctuations. As such, staff is including an option in the rule to allow for a 1-hour averaging period with engines equipped with CEMS.

Response to Comment 6-2

Staff has amended the rule where the averaging provision is located. The proposed 1-hour averaging will be located in section (d).

Comment Letter No. 7 – City of Glendale

CITY OF GLENDALE, CALIFORNIA
Glendale Water & Power
Administration

141 N. Glendale Ave., Level 4
Glendale, CA 91206-4975
Tel. (818) 548-2107 Fax (818) 552-2852
glendaleca.gov

August 19, 2019

Mr. Kevin Orellana
Program Supervisor
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Subject: **Proposed Amended Rule 1110.2 – Emissions from Gaseous and Liquid-fueled Engines; Compliance Demonstration Averaging Period**

Dear Mr. Orellana:

The City of Glendale Department of Water and Power (GWP) is taking steps to modernize the Grayson Power Plant. Based upon many technical proposals that were evaluated in response to Glendale's 2018 Clean Energy Request for Proposals, GWP plans to develop a hybrid solution that integrates energy efficiency, distributed photovoltaic installations, and new demand reduction programs throughout the City, as well as 50-75 megawatts of battery storage, and approximately 95 MW of fossil-fueled power generation at the Grayson Power Plant.

The proposed new power generation system will be comprised of reciprocating internal combustion engine technology that will:

- provide a lower and flatter heat rate across the range of operating loads relative to gas turbine alternatives, and 7-1
- With a smaller individual unit size, provide a lower and more efficient minimum load than the gas turbine alternatives.

Taken together, the proposed reciprocating internal combustion engines and their ability to operate flexibly and efficiently is especially important due to their role in supporting GWP's proposed hybrid generation program and reliance upon the regional transmission of renewable and otherwise carbon-free electricity into the City of Glendale.

GWP's proposed engines would be subject to the distributed generation emission limits of SCAQMD Rule 1110.2 which are measured in lb./MW-hr. and averaged over a 15-minute period. GWP is concerned that the 15-minute averaging period, when combined with the complexity of simultaneously measuring mass emissions and power output, will complicate the effective management of the electricity system given the dynamics of the renewable energy sources, distributed generation, and a constrained electrical transmission system that GWP must rely upon. In this environment, the ability to effectively 7-2
manage fluctuations in both demand and generation is dependent upon the ability to quickly cycle engine load.

Based upon feedback from engine and emission control system vendors, correlating emission monitoring data with independent engine and generator operating parameters to obtain a lb./MW-hr. value within a

15-minute averaging period may lead to perceived excess emissions, even when emission concentration values are stable and within an expected range. Because of the way in which compliance is determined, the data acquisition handling system must corelate emission concentrations with independent operating parameters such as fuel flow rates, temperature, and moisture to obtain a mass emission value and then correlate that value with independent generator output data in order to determine compliance with Rule 1110.2.

During rapid engine load swings, short-term changes in engine and emissions data may not directly correlate with changes in generator output data. The temporary data inconsistencies can result in perceived excess NOx or CO emissions when measured as lb./MW-hr. during a 15-minute interval. Those inconsistencies, however, would be less prone to distort lb./MW-hr. emission rates when measured on a 60-minute basis. With a 60-minute averaging period, GWP would be able to more efficiently track load swings and accommodate the diverse energy portfolio that we are obligated to manage. 7-2 cont.

GWP requests SCAQMD to allow compliance with the Rule 1110.2 distributed generation emission limits to be determined based upon a 60-minute average when a CEMS is in use. GWP also reminds SCAQMD that the NOx emission limits of Rule 1110.2 were intended to closely reflect what can be achieved by a gas turbine and SCAQMD Rules 1134 and 1135 specify a 60-minute averaging period. In this respect, instituting a 60-minute averaging period for Rule 1110.2 distributed generation systems would be an equitable action. 7-3

GWP welcomes the opportunity to discuss Rule 1110.2 averaging periods with SCAQMD and we are also happy to engage engine, emission control system and emission monitoring system vendors in those discussions as warranted. You can reach me at (818) 548-2107 if you would like to arrange for a follow-up conversation.

Sincerely,

Stephen M. Zurn
General Manager, Glendale Water & Power

Response to Comment 7-1

South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2.

Response to Comment 7-2

Staff concurs that averaging over a longer period of time may allow a facility to account for transient load changes, other normal engine operating fluctuations, and temporary data inconsistencies. As such, staff is including an option in the rule to allow for a 1-hour averaging period with engines equipped with CEMS.

Response to Comment 7-3

See Response 7-2

Comment Letter No. 8 – Beta Offshore

Beta OFFSHORE

August 20, 2019

Kevin Orellana, Program Supervisor
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765-0830

Subject: Beta Offshore comments for PAR 1110.2 Emissions from Gaseous - and Liquid-Fueled Engines

Dear Mr. Orellana,

Beta Offshore attended Working Group #6 for Proposed Amended Rule (PAR) 1110.2 and would like to offer the following comments and recommendations for inclusion in the proposed Rule 1110.2 language update for Emissions from Gaseous and Liquid Fueled Engines. Beta maintains that the SCAQMD should include rule provisions which allow our newly installed Tier 4 crane engines operated on our platforms located 9 miles offshore in the Outer Continental Shelf (OCS) to comply with the PAR without the need for additional source testing beyond what is already required by permit to demonstrate compliance with Best Available Control Technology (BACT). The comments are summarized as follows: 8-1

1) Beta requests an exemption to the provisions of subdivision (d) for crane engines operating in the OCS provided that the facility operate engines certified by CARB to meet Tier 4 emissions standards and which are considered BACT. 8-2
2) Tier 4 engines that meet BACT have been used by the SCAQMD as a basis for demonstrating compliance with Rule 1110.2 as stated in existing exemptions for agricultural stationary engines. Beta requests this precedent extend similarly to crane engines operating in the OCS. R1110.2 (i)(1)(I)(ii) & (iii) 8-3
3) Source testing in accordance with subsection (f)(1)(C) will not apply to crane engines operating in the OCS because these engines will not be subject to the provisions of paragraph (d)(1). 8-4

Thank you for your cooperation and consideration of these requests for inclusion to Proposed Amended Rule 1110.2. If you have any questions, please don't hesitate to contact me via phone at 562-628-1529 or via e-mail at diana.lang@amplifyenergy.com .

Sincerely,

Diana Lang

Diana Lang
HSE Manager, Beta Offshore

Response to Comment 8-1
South Coast AQMD appreciates your comment letter submitted for the PAR 1110.2. Staff recognizes the challenges that source testing your equipment can involve~~; however, based on operational utilization, source testing may be required once every two or three years. Based on the NOx limit under Rule 1110.2, all new diesel engines must be Tier IV Final. It is important to note that the certification process is much different than the source testing requirement. The certification is a laboratory test where the engine is tested at a higher load than normal operating conditions. The certification process does not require that each engine be tested, but that an engine in the family be tested. Under PAR 1110.2, the purpose of the source test is to capture the emissions under normal operating conditions and to periodically verify that the engine is maintaining those emissions.~~ and consideration to this unique operation has been included in the rule as an exemption. As acknowledged in your comment letter dated October 23, 2018, you indicated that the source tests were conducted abnormally in conflict with the intent of Rule 1110.2 to conduct source testing under normal operating conditions (actual duty cycle). Since the initial source tests were conducted to comply with the 12.3 ppm NOx concentration limit on the permit, but were conducted under abnormal conditions, staff believes that this does not necessarily establish BACT.

Response to Comment 8-2
See response to Comment 8-1.~~Staff has considered your request for an exemption to the provisions of subdivision (d) for cranes operating in the Outer Continental Shelf (OCS) waters provided that the facility operate engines certified by CARB to meet Tier 4 emissions and which are considered BACT. Staff acknowledges that crane operations at an offshore platform have unique challenges. Staff has offered an alternative emission limit where the operator could conduct a source test to establish an emission factor specific to the duty cycle of the crane, with a concentration cap of 45 ppm which is four times the NOx concentration limit for most other engines. The facility's response to this proposal was a complete exemption and they declined staff's proposal. As a result, staff removed the proposed revision. Staff believes that a complete exemption from subdivision (d) is not appropriate and period source testing is needed to confirm the emissions from the engine on an ongoing basis.~~

Response to Comment 8-3
See response to Comment 8-1.~~Staff has reviewed the "agricultural" exemption contained in Rule 1110.2 (i)(1)(I). This exemption *does not* provide a complete absolution from any and all emission limits. These certified engines must still meet the Tier 4 emission standards of 40 CFR Part 1039, Section 1039.101, Table 1. For engines with a maximum engine power between 56 kW and 560 kW, Table 1 gives a NOx emission standard of 0.40 g/KW-hr which converts to approximately 22 ppmvd @ 15% O_2. In addition, the operator *may not* operate the Tier 4 engines in a manner that exceeds the not-to-exceed standards of 40 CFR Section 1039.101, Paragraph (e) as determined by the appropriate source test. The not-to-exceed NOx emission standard set by Paragraph (e) is calculated to be approximately 33 ppmvd @ 15% O_2.~~

Response to Comment 8-4

See response to Comment 8-1.~~Staff has reviewed your request to exempt engines operating in the OCS from source testing assuming that these engines are not subject to the provisions of paragraph (d)(1). At this time, staff is not considering an exemption from paragraph (d)(1) for engines operating in the OCS. Therefore, these engines would still be subject to source testing requirements. Moreover, if the "agricultural" exemption were to be adopted as suggested by Comment 8-3, some measure of compliance determination would still be required via source testing. Lastly, staff acknowledges that there exist concerns with source testing these engines related to personnel safety, undue equipment stress and what constitutes an operating cycle. With input from the South Coast AQMD's source testing group, a source testing protocol is being developed that should address these concerns.~~

Comment Letter No. 9 (received as an email) – Eastern Municipal Water District

Kevin Orellana

From: Torres, Alison <torresa@emwd.org>
Sent: Tuesday, August 20, 2019 11:22 AM
To: Kevin Orellana
Subject: Proposed Rule 1110.2 Comments-Ammonia Test Frequency

Good morning Kevin,

Thank you for the discussion at today working group meeting. I would like to reiterate the request to clarify that the added ammonia testing provisions in the proposed amended rule applies to new installations. We have an existing installation with extremely low ammonia concentrations. We are currently required to test ammonia concurrently with our Rule 1110.2 (NOx, CO, VOC) testing. It is burdensome to require more frequent testing for this installation, especially when our results are very low. The last ammonia test was required in 2018 with results <1 ppm. Based on the current proposed language, upon rule adoption, this installation would not meet the requirements of the rule due to the annual requirement. 9-1

13. THE AMMONIA SLIP SHALL BE TESTED CONCURRENTLY WITH THE REQUIRED RULE 1110.2 ENGINE TESTING, USING AQMD APPROVED TEST METHODS. RECORDS OF THE AMMONIA SLIP TESTS SHALL BE KEPT FOR AT LEAST FIVE YEARS AND BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

Please let me know if you need additional information.

Thank you,

Alison Torres
Senior Air Quality Compliance Analyst
Environmental & Regulatory Compliance Dept
Eastern Municipal Water District
(951) 928-3777, ext. 6345
torresa@emwd.org

Serving our community today and tomorrow

Response to Comment 9-1

South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2. Staff removed ammonia emission limits from PAR 1110.2. The requirements for ammonia limits will be deferred to the permit evaluation process for new installations of SCRs. BACT may apply for any proposed increases in emissions.

Comment Letter No. 10 – EtaGen

August 21, 2019

Mr. Michael Morris
Planning and Rules Manager
Planning, Rule Development, and Area Sources
South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765

Re: EtaGen Comments on Proposed Amended Rule 1110.2, Emissions from Gaseous- and Liquid-Fueled Engines

Dear Mr. Morris

EtaGen appreciates the opportunity to submit comments on Proposed Amended Rule 1110.2 (PAR 1110.2), Emissions from Gaseous- and Liquid-Fueled Engines. Driven by its mission to advance global access to low-carbon, dispatchable energy, EtaGen has developed a new category of power generation — the linear generator. EtaGen's linear generator has the ability to deliver on-site, fuel-flexible power at a lower cost than the electric grid due to its high efficiency.

EtaGen's linear generator uses a low-temperature reaction of air and fuel to drive magnets through copper coils to efficiently produce electricity. The patented design and adaptive control enable high efficiency, near-zero NOx emissions, full dispatchability, and seamless switching between renewable fuels such as biogas and natural gas or propane. Additional information on our technology is available on our website.[1]

10-1

Rule 1110.2 is a command-and-control "landing" rule which establishes Best Available Retrofit Control Technology (BARCT) requirements for facilities with internal combustion engines. Under California Health and Safety Code § 40406, BARCT is defined 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." [emphasis added]

10-2

[1] http://www.etagen.com/technology/

3601 Haven Avenue, Menlo Park, CA 94025 | info@etagen.com | www.etagen.com

EtaGen's linear generator technology is fundamentally different than the four engine categories currently addressed by current Rule 1110.2.[2] Attachment A presents a comparison of equipment features for various electrical generation technologies. It demonstrates that linear generators have very few features in common with traditional engines or microturbines. Because the linear generator technology has not been previously considered by the District under Rule 1110.2, EtaGen respectfully requests that a new category be added to Rule 1110.2 for linear generators. Consequently, we are also requesting a number of rule language clarifications and additions to ensure that linear generators have requirements available which are appropriate to the technology. 10-2 cont.

Our proposed language and comments are presented in the attached redline/strikeout version of PAR 1110.2 (August 20, 2019 version). We provide a brief description of these proposed language changes below:

Definitions – Subdivision (c)

- ENGINE: Add a language clarification to recognize the linear generator as a discrete category of equipment. 10-3
- LINEAR GENERATOR: New definition for the linear generator category.

Requirements – Subdivision (d)

- Section (d)(1)(L) et Seq.: Proposed amendments to specify new requirements for the new Linear Generator category. Proposed emissions standards for the linear generator category are technically feasible; a requirement of BARCT. 10-4

Compliance – Subdivision (e)

- Section (e)(5) et Seq.: Proposes language clarifications to explicitly exclude linear generators from consideration under sections applicable to other (non-linear generator) engine categories. Also proposes amendments specifying new compliance requirements for the new Linear Generator category. 10-5

Monitoring, Testing, Recordkeeping and Reporting – Subdivision (f)

- Section (f)(1)(C): Proposes language clarifications to explicitly exclude linear generators from consideration under sections applicable to other (non-linear generator) engine categories. Also proposes amendments specifying new compliance requirements for the new Linear Generator category. 10-6
- Section (f)(1)(D)(ii) et Seq.: Proposes amendments specifying new I&M requirements for the new Linear Generator category. Also makes language clarifications to explicitly exclude linear 10-7

[2] PAR 1110.2 currently groups engines in four categories based on the unique characteristics of each type of engine and the associated emissions controls available to each category: (1) Lean-Burn, 2 stroke, (2) Lean-Burn, 4 stroke, (3) Rich-Burn, and (4) Engines subject to the Air Toxics Control Measure. See Preliminary Draft Staff Report for PAR 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, July 2019.

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generators from consideration under sections applicable to other (non-linear generator) engine categories. 10-7 cont.

Attachment 1: I&M Plan Requirements

- Proposes amendments specifying new I&M requirements for the new Linear Generator category. Also makes language clarifications to explicitly exclude linear generators from consideration under sections applicable to other (non-linear generator) engine categories. 10-8

We believe these language changes would successfully resolve the issue with Rule 1110.2, which at present has not evaluated the linear generator technology and does not have suitable requirements. Adding this new class/category specific to linear generator technology would provide requirements which are appropriate for the technology, while establishing a BARCT standard which is technically feasible and cost effective. 10-9

EtaGen appreciates the District's consideration of these comments. Should you or your colleagues have any questions concerning the foregoing or need additional information, please contact me [adam.simpson@etagen.com or 610.721.5670] or our consultant, Scott Weaver at Ramboll [msweaver@ramboll.com or 213.943.6360] at your earliest convenience.

Yours sincerely,

Adam Simpson, PhD
CPO & Co-Founder
EtaGen

3601 Haven Avenue, Menlo Park, CA 94025 | info@etagen.com | www.etagen.com

Table 1. Comparison of Equipment Features for Various Electrical Generation Technologies EtaGen

Equipment feature	ICE (Lean Burn)	Microturbine (Capstone)	Microturbine (FlexEnergy)	Linear Generator (EtaGen)
Spark Plug	y			
Oil	y		y	
Flame Combustion	y	y	y	
Pistons	y			y
Cylinders	y			y
Valves	y			
Head	y			
Block	y			
Liquid Cooling	y	y	y	
Rotating Shaft	y	y	y	
Operable w/o Generator	y	y	y	
Oxidation Catalyst	y	y	y	y

Response to Comment 10-1
South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2. Thank you for your description on the EtaGen technology process.

Response to Comment 10-2
Staff has evaluated the linear generator process and has considered whether a new, separate category is warranted. At this time, staff does not propose to create a new class or category for this technology, but believes that this technology should be considered a compression-ignited combustion source.

Response to Comment 10-3
At this time, staff does not propose to recognize this technology as a discrete type of engine, but believes that this technology should be considered a combustion source.

Response to Comment 10-4
Concentration limits have been added in lieu of the emission standards for new electrical generating devices which are currently expressed as pounds of NOx per Mega-Watt Hour. The concentration limits were determined by converting the current standard using an assumed 40 percent engine efficiency. The basis for using a 40% thermal efficiency value is derived from information contained in a patent filing by a linear generator manufacturer. An expected thermal efficiency for a regular combustion engine is about 30%. In comparison, a linear generator has a theoretical increase in thermal efficiency to about 50%. However, to meet potential VOC requirements, this overall increase may not be realized in practice. Therefore, an average between 30% and 50% was used. So, for this rule development, 40% was used as the thermal efficiency value for this technology. In determining the equivalent emission limits, staff did not include any credit for recovered energy. The final determination of these values included a 10% rounding margin.

A manufacturer of linear generator technology has informed staff that due to the inherent low temperature of the exhaust, the oxidation catalyst cannot reach temperatures to completely oxidize VOC emissions, particularly propane emissions, to meet a VOC concentration limit of 10 ppmvd. The manufacturer has expressed that the company is working towards a solution to lower the VOC emissions. There are, however, several beneficial aspects with linear generators: low NOx emissions at start up and no ammonia emissions associated with SCR. With linear generators, the NOx concentration limit of 2.5 ppmvd can be achieved at start up with no after controls such as SCR. As a result there is no need for ammonia injection that would result in increased ammonia or PM emissions, and immediate compliance with NOx concentration limits. In other combustion technologies where SCR is used to achieve lower NOx emission limits, start-up emissions are uncontrolled until the SCR catalyst can reach optimum temperatures to control NOx emissions, which is generally 20 to 30 minutes. PAR 1110.2 includes a provision that allows engines that can achieve the NOx concentration limits at start-up with no ammonia emissions from SCR to meet an alternative VOC concentration limit of 25 ppmvd, until December 31, 2023. Any new installation after this date would be required to meet the lower VOC emission limit of 10 ppmvd in Table IV. Additionally, PAR 1110.2 includes a cap of 45 lbs of VOC per day that can be installed that are meeting the alternate VOC concentration limit of 25 ppmvd to ensure that the operational emissions would not exceed the VOC significance threshold under CEQA which is currently limited to 55 lbs of operational VOC per day.

Response to Comment 10-5
Linear generators would be required to meet the same monitoring, recordkeeping, and reporting requirements of other electrical generating engines.

Response to Comment 10-6
Linear generators would be required to meet the same monitoring, recordkeeping, and reporting requirements of other electrical generating engines.

Response to Comment 10-7
Staff advocates source testing under normal operating conditions which includes low load and high load situations. If a linear generator operates normally and exclusively at 100% of max generator net output, then testing should reflect this operation. However, if the generator operates at a lower output, then that consideration should be included in the analysis. It is possible that at a lower output, combustion is less complete which may lead to additional emissions in the engine exhaust.

Response to Comment 10-8
Diagnostic emission checks are conducted periodically as required by other engine categories. Although engines may be equipped with parametric monitoring capabilities, the diagnostic checks rely on actual emission measurements to determine performance and compliance. As such, staff advocates for the continued use of frequent and portable diagnostic testing. However, staff has proposed a provision in Attachment I that gives the operator of any type of engine the opportunity to argue their case that alternate monitoring or diagnostic tools may exhibit equivalency to requirements of this section.

Response to Comment 10-9
Thank you for your comment.

Comment Letter No. 11 (received as an email) – Orange County Sanitation District

From: Ahn, Terry
To: Michael Morris
Cc: Kevin Orellana; Rodolfo Chacon; "Rothbart, David"
Subject: Proposed Amended Rule 1110.2 August
Date: Friday, August 23, 2019 12:34:03 PM
Attachments: image001.jpg
image003.jpg

Hi Mike,

While OCSD supports SCAP's position that biogas engine requirements contained in Rule 1110.2 should be moved to Proposed Rule 1179.1, we are submitting following comments on the PAR 1110.2 August 2019 as you have requested at Tuesday's working group meeting: 11-1

(d)(1)(I) –Longer averaging time options for biogas engines

While we appreciate removal of the proposed I&M plan requirements for biogas engines using the longer averaging period, we are concerned about your proposal to remove the four-month averaging provision. When OCSD invested $30 million to retrofit eight engines with catalyst systems along with the digester gas cleaning systems, it was driven by our a long term commitment to provide a reliable power source to our two treatment plants and to ensure full compliance with Rule 1110.1 requirements long term. The four-month averaging provision has given us that assurance. Even though the retrofits have been operating without any major issues to date, we are continued to be challenged by variable siloxane, future uncertainties with food waste loadings in our influent stream, and aging of our equipment. We request that four-month averaging period provision remain for the existing biogas engines with SCRs. 11-2

(d)(1)(B)(vii) –Ammonia limit for new or retrofit SCRs

We would like to repeat SCAP's request that the ammonia limit for biogas engines with SCR be established at 10 ppmv, corrected to 15% O2 and averaged over 60 minutes. As NOx limit gets lower even the minimal increase in amount of NH3 injection can potentially cause NH3 slip to exceed the such low limit of 5 ppmv. It is especially challenging for biogas engines to meet both limits due to the contaminants in the biogas which can cause accelerated degradation of the catalysts. We request that NH3 limit for biogas engines with SCR be established at 10 ppmv, corrected to 15% O2 and averaged over 60 minutes. Furthermore, a longer averaging period for NH3 should be allowed for units with certified NH3 CEMS. 11-3

(f)(1)(C)(i) – Source Testing

As I have commented at the working group meeting, the provision that allows an extension of the source test deadline not be limited to just a long-term shutdown of the engine, but any length of shutdown due to unforeseen maintenance or repair events. 11-4

Thank you for the opportunity to comment and please let me know if you have any questions.

Terry Ahn
Orange County Sanitation District
Laboratory, Monitoring, and Compliance | Regulatory Specialist

Office: 714.593.7082
www.ocsd.com

Response to Comment 11-1
South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2. Staff is currently working on Proposed Rule 1179.1 and has not yet decided if engines at Public Owned Treatment Works (POTWs) should stay in Rule 1110.2 or be moved into Proposed Rule 1179.1. A provision has been added in PAR 1110.2 paragraph (i)(3) that states that "the provisions of this rule [Rule 1110.2] shall not apply to units located at landfills or publicly owned treatment works that are subject to a NOx concentration limit in a Regulation XI rule adopted or amended after *[Date of Amendment]*." This provision will provide the South Coast AQMD staff the flexibility to move engines subject to POTWs in Proposed Rule 1179.1 if that is the decision.

Response to Comment 11-2
Your interpretation of the four-month averaging option is incorrect. This option was an initial screening mechanism to allow for a 24-hour averaging to be used. Staff is clarifying this section to reinforce this requirement. In addition, PAR 1110.2 allows a 48-hour averaging time for biogas units that can meet a 9.9 ppmvd NOx concentration limit.

Response to Comment 11-3
The ammonia emission limit has been removed from PAR 1110.2. The SCR control equipment would then be subject to BACT at the time of permitting.

Response to Comment 11-4
Staff agrees with your comment and has proposed language to clarify this issue.

Comment Letter No. 12 – (received as an email) Ramboll (EtaGen)

From: Scott Weaver [mailto:MSWeaver@ramboll.com]
Sent: Friday, August 23, 2019 4:06 PM
To: Michael Morris <mmorris@aqmd.gov>
Cc: Adam Simpson <adam.simpson@etagen.com>; Scott Weaver <MSWeaver@ramboll.com>
Subject: RE: EtaGen Proposed Rule 1110.2 Comments

Hi Mike-

Following up our discussion yesterday concerning the form of a new Linear Generator standard, EtaGen would like to propose changing the emissions standards over to a concentration basis. The attached redline/strikeout file (Revision 1) reflects this change. The concentration form is similar to other rule categories and would eliminate EtaGen's concern over compliance assurance. 12-1

Should you have any questions or wish to discuss, please let us know. Happy to convene a call as needed to keep this moving.

Best regards,

Scott

M. Scott Weaver
Principal

D +1 (213) 9436360
M +1 (626) 7202015
msweaver@ramboll.com

Proposed EtaGen Changes for Linear Generators
Working Draft for Discussion Purposes

(Adopted August 3, 1990)(Amended September 7, 1990)(Amended August 12, 1994)
(Amended December 9, 1994)(Amended November 14, 1997)(Amended June 3, 2005)
(Amended February 1, 2008)(Amended July 9, 2010)(Amended September 7, 2012)
(Amended December 4, 2015)(Amended June 3, 2016)(PAR 1110.2 August 2019)

PROPOSED AMENDED RULE 1110.2 EMISSIONS FROM GASEOUS- AND LIQUID-FUELED ENGINES

(a) Purpose

The purpose of Rule 1110.2 is to reduce Oxides of Nitrogen (NO_x), Volatile Organic Compounds (VOCs), and Carbon Monoxide (CO) from engines.

(b) Applicability

All stationary and portable engines over 50 rated brake horsepower (bhp) are subject to this rule

(c) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) AGRICULTURAL STATIONARY ENGINE is a non-portable engine used for the growing and harvesting of crops of the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. An engine used for the processing or distribution of crops or fowl or animals is not an agricultural engine.

(2) APPROVED EMISSION CONTROL PLAN is a control plan, submitted on or before December 31, 1992, and approved by the Executive Officer prior to November 14, 1997, that was required by subdivision (d) of this rule as amended September 7, 1990.

(3) BREAKDOWN is a physical or mechanical failure or malfunction of an engine, air pollution control equipment, or related operating equipment that is not the result of operator error, neglect, improper operation or improper maintenance procedures, which leads to excess emissions beyond rule related emission limits or equipment permit conditions.

(4) CERTIFIED SPARK-IGNITION ENGINE means engines certified by California Air Resources Board (CARB) to meet emission standards in accordance with Title 13, Chapter 9, Article 4.5 of the California Code of Regulations (CCR).

(5) COMPRESSOR GAS LEAN-BURN ENGINE is a stationary gaseous-fueled two-stroke or four-stroke lean-burn engine used to compress natural

PAR 1110.2 - 1

Proposed Amended Rule 1110.2 (Cont.) **(Amended June 3, 2016)**

shall:

(i) Comply with the requirements of Best Available Control Technology in accordance with Regulation XIII if the engine requires a South Coast AQMD ~~District~~ permit; or

(ii) Not operate the engine in a manner that exceeds the emission concentration limits in Table I if the engine does not require a South Coast AQMD ~~District~~ permit.

(K) By February 1, 2009, the operator of a spark-ignited engine without a Rule 218-approved continuous emission monitoring system (CEMS) or a Regulation XX (RECLAIM)-approved CEMS shall equip and maintain the engine with an air-to-fuel ratio controller with an oxygen sensor and feedback control, or other equivalent technology approved by the Executive Officer, CARB and EPA.

(L) New Non-Emergency Electrical Generators

(i) All new non-emergency engines driving electrical-generators, excluding linear generators, shall comply with the following emission standards:

TABLE IV EMISSION STANDARDS FOR NEW ELECTRICAL GENERATION DEVICES	
Pollutant	**Emission Standard (lbs/MW-hr)[1]**
NOx	0.070
CO	0.20
VOC	0. 10[2]

1 The averaging time of the emission standards is 15 minutes for NOx and CO and the sampling time required by the test method for VOC, except as described in the following clause.

2 Mass emissionsofVOCshallbecalculatedusingaratioof 16.04 pounds of VOC per lb-mole of carbon.

(ii) Engines subject to this subparagraph that produce combined heat and electrical power may include one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered (MW_{th}-hr), in addition to each MW-hr of

PAR 1110.2 - 13

Proposed Amended Rule 1110.2 (Cont.) **(Amended June 3, 2016)**

(v) This subparagraph does not apply to: engines installed prior to February 1, 2008; engines issued a permit to construct prior to February 1, 2008 and installed within 12 months of the date of the permit to construct; engines for which an application is deemed complete by October 1, 2007; engines installed by an electric utility on Santa Catalina Island; engines installed at remote locations without access to natural gas and electric power; engines used to supply electrical power to ocean-going vessels while at berth, prior to January 1, 2014; or landfill or digester gas-fired engines that meet the requirements of subparagraph (d)(1)(C).

(XX) New Linear Generators

(i) All new linear generators shall comply with the following emission standards:

TABLE XX
CONCENTRATION LIMITS FOR NEW LINEAR GENERATORS

Pollutant	Concentration Limits (ppmvd @ 15% O_2)[1,2]
NOx	2.5
CO	10
VOC	30

1 The averaging time of the emission standards is 15 minutes for NOx and CO and the sampling time required by the test method for VOC

2 VOC parts per million by volume, measured as carbon, corrected to 15% oxygen on a dry basis and averaged over the sampling time required by the test method.

(2) Portable Engines:

(A) The operator of any portable engine generator subject to this rule shall not use the portable generator for:

(i) Power production into the electric grid, except to maintain grid stability during an emergency event or other unforeseen event that affects grid stability; or

Response to Comment 12-1

Concentration limits have been added for electrical generating engines. Based on staff's calculation, the following concentrations correspond to converting the values from mass emission standards in lbs/MW~~R~~-hr to concentrations in ppmvd.

TABLE IV
EMISSION STANDARDS FOR NEW ELECTRICAL GENERATION DEVICES

Pollutant	**Emission Standard (lbs/MW-hr)**	**Concentration Limit (ppmvd)**
NOx	0.070	2.5
CO	0.20	12
VOC	0.10	10

In your comment letter, a VOC concentration limit of 30 ppmvd was suggested. This is greater than what staff calculated. At this time, staff has proposed an alternative emission limit for the use of this technology. In addition, staff has included a ~~A~~ cap that limits VOC emissions to a maximum of 45 lbs of VOC emissions per day of combined installation from the PAR 1110.2 effective date up to January 1, 2024.

Comment Letter No. 13 – Southern California Gas Company

SoCalGas
A Sempra Energy utility

Deanna Haines
Director of Policy & Environmental Strategy

Southern California Gas Company
Strategy & Engagement
555 W. 5th St, GT21C5
Los Angeles, CA 90013

Tel: 213.244.3010
Mobile: 213.220.1121
DHaines@semprautilities.com

August 30, 2019

Susan Nakamura, Assistant Deputy Executive Officer
Planning, Rule Development & Area Sources
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765
Via Electronic Mail: SNakamura@aqmd.gov

RE: Comments on draft Proposed Amended Rules 1110.2 and 1100

Dear Ms. Nakamura:

Southern California Gas Company and San Diego Gas and Electric Company (referred to herein as "the Utilities") appreciate the opportunity to provide comments to the South Coast Air Quality Management District (AQMD) regarding AQMD Proposed Amended Rule (PAR) 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines and PAR 1100 – Implementation Schedule for NOx Facilities. 13-1

I. Background

The Utilities provide services to over 25 million customers in California and operate a complex natural gas distribution, transmission and storage system spanning thirteen counties in California. Within the South Coast Air Basin, the Utilities operate three gas storage facilities and one gas transmission station. These facilities play a key role in supplying energy services to our customers, ensuring a reliable and safe gas supply to residential, commercial and industrial facilities and operations, as well as supporting one of the most critical economic regions in the country.

An integral part of this distribution, transmission and storage system, are engine-driven gas compressors. These compressors, operating under highly variable and challenging conditions, ensure the availability of natural gas every day. 13-2

The Utilities are driven by our desire to be the cleanest in the country. As part of our forward-looking operational asset planning, we are evaluating electric-driven compression technologies and hydrogen production and blending, while studying how to meet our facilities' base electricity needs with fuel cell technology. These pathways are anticipated to reduce Oxides of Nitrogen (NOx) emissions and lower the net carbon footprint at our storage fields and compressor stations.

Page 2

Over the last year and a half, the Utilities have met with AQMD staff to highlight the operational significance and complexity of our facilities and compressors, including providing tours of each facility. During this time, the Utilities have provided extensive details regarding the unique nature of gas compressor engines, as well as operational and physical challenges that exist at each facility that affect these engines and the retrofit of emission controls. The Utilities have also provided and reviewed with staff, proposed emission control retrofit and replacement plans and associated time lines. 13-3

We appreciate staff's continued commitment to meet with our team and discuss our unique set of issues. The current version of the proposed amended rule reflects an understanding of the importance natural gas facility modernization projects can play in providing emission reduction benefits to the residents of the South Coast Air Basin.

II. Challenges Unique to the Utilities' Class and Category of Compressor Gas Engines

The utilities are encouraged to see that the current drafts of PARs 1110.2 and 1100 addressed many of our concerns regarding the infeasibility of previously proposed measures. As we've discussed with staff, many of the challenges associated with compressor gas engines have to do with the uniqueness of a certain type of compressor, e.g. an "integral" compressor. An integral compressor differs from other types of engines-driven equipment, in that they use a single crank shaft to drive both the engine and the compressor. This attribute contributes to many of the challenges that the Utilities' have noted. An attachment highlighting some of the characteristics of an integral compressor which impact the ability to control emissions is enclosed. 13-4

III. Comments on PARs 1110.2 & 1100 – Provisions and Suggested Changes
After reviewing these proposed draft rules, the Utilities have the following comments and recommended changes regarding specific sections in PARs 1110.2 and 1100.

Draft PAR 1110.2

<u>Section (e) – Compliance</u>

<u>Section (e)(3)(C)</u>
This section specifies the compliance milestones for installation of a new, or modification to an existing, Continuous Emissions Monitoring System (CEMS), specifically applicability of Table VII required actions and deadlines. These deadlines begin within 90 days of a Regional Clean Air Incentives Market (RECLAIM) facility becoming a "former RECLAIM facility." The date when this will happen is currently unknown but may take place sooner than required retrofit (with emission control systems) and/or replacement of engines under the schedules contained in PAR 1100. As currently written, PAR 1110.2 would require the installation or modification of existing CEMS to be constructed, made operational, and certified, prior to the rule-mandated engine emission control retrofits. 13-5

The Utilities request that this language and/or Table VII compliance actions and time frames, be modified to align with PAR 1100 compliance schedules, and preferably, be included in the Permits to Construct.

Page 3

Proposed Language:

Section (e)(3)(C)

The operator of any stationary engine that is located at a RECLAIM or former RECLAIM facility that is required to modify an existing CEMS or install a CEMS on an existing engine that is subject to ~~subdivision~~ paragraph (f)(1) shall comply with the compliance schedule in Table VII such that the operator shall submit to the Executive Officer applications for a new or modified CEMS within 90 days of becoming a former RECLAIM facility for engines not requiring retrofit emission controls and not scheduled for replacement. For existing engines requiring retrofit emission control system installations, the operator shall comply with the CEMS compliance milestones specified in the Permit to Construct issued for an existing engine's retrofit emission control system. For engines scheduled for replacement, CEMS will not be required as long as the engines designated for replacement are permanently shut-down and/or removed from service by the time frame specified in the replacement equipment's Permit to Construct. 13-5 cont.

Section (i) - Exemptions

Section (i)(1)(K)

Emission control systems [Non-Selective Catalytic Reduction (NSCR), Selective Catalytic Reduction (SCR), Air to Fuel Ratio Controller (AFRC), etc.] must be maintained, and on occasions, repaired. These systems are critical to successfully controlling emissions from an engine. Once a maintenance event, such as the replacement of a catalyst bed, has been completed, the engine/emission control system must be adjusted or "tuned" to the proper settings to attain required concentration limits specified in Rule 1110.2. Tuning these systems after a maintenance event is no different than the tuning that must occur when a new engine and/or emission control system is installed, taking anywhere from a few hours to several days. Currently, emission control system maintenance and/or repair events are not covered by existing exemptions in Rule 1110.2. Therefore, SoCalGas requests that emission control system maintenance and repair events be included in this exemption. 13-6

During recent discussions with the AQMD, staff noted that the maintenance of the emission control system is covered under the term "major repair" in the current rule language. The Utilities appreciate this clarification; however, we remain concerned about ambiguity in the current language. The subsection currently requires that a "major repair" include the removal of a cylinder head on the engine. Emission control system maintenance events do not require any specific maintenance to be done on the engine, especially the removal of an engine cylinder head.

Therefore, the Utilities recommend that the current language in Rule 1110.2 section (i)(1)(K), be modified to specifically cover emission control system maintenance and repair under this exemption. The Utilities have provided suggested language below.

Additionally, the Utilities are concerned that the current allowance of 4 hours is too short of a time frame to adjust exhaust emissions out of the catalyst into compliance with rule limits. This is especially true for SCR systems that not only require adjustments to the SCR system controls, but additional adjustments to the ammonia injection control system as well, such as when an ammonia injection grid must be tuned, or a combination of engine and SCR control systems tuning is required. Therefore, the Utilities recommend that the AQMD extend the existing 4-hour exemption time frame to a minimum of 36 hours. 13-6 cont.

Proposed Language:

Section (i)(1)(K)
"An engine start-up, after an engine overhaul or major repair requiring removal of a cylinder head, or an emission control system maintenance or repair event, for a period not to exceed ~~four~~ 36 operating hours."

Draft PAR 1100

Section (d) – Rule 1110.2 Implementation Schedule

Section (d)(5)(B)
Section (d)(5)(B) allows the AQMD to consider the establishment of a case-by-case NOx emission limit, upon notification and a demonstration submitted by the Utilities, that an engine cannot achieve the limits established in Rule 1110.2 section (d)(1). An additional requirement [section (d)(5)(A)] requires the submittal of various data to support the AQMD's consideration of this request. This data submittal not only includes NOx emission data, but also ammonia (NH_3) and Volatile Organic Compound (VOC) data.

The Utilities have provided substantial technical information regarding the infeasibility of attaining low NOx and VOC limits while maintaining a maximum allowable NH_3 slip limit of 5 parts per million (ppm). The physical and chemical challenges discussed with AQMD staff over the last 18 months include: the challenging compressor loading (hourly, daily, seasonal) conditions, the unique characteristics of integral gas compressors themselves, and the difficulty NH_3 injection controls will have in keeping up with the quickly changing NOx concentrations from the engine. Additionally, the Utilities are including a letter from Environex detailing the challenges in meeting both the 11 ppm NOx and 5 ppm NH_3 limits. 13-7

Engine geometry and load control strategies unique to integral compressor units create power cylinder-to-power cylinder, and combustion cycle-to-combustion cycled differences that create variability in engine emissions (see enclosed engine compressor diagram). Note that challenges related to loading would also apply to brand new engines driving a separate compressor. Moreover, unlike generators connected to the electric grid, compressor engine load cannot be reduced to achieve compliance over the averaging period. Gas compression engines must remain at load to assure delivery of natural gas.

Page 5

Since control of emissions from integral gas compressor engines, to the levels required in section (d)(1) of Rule 1110.2 have never been achieved anywhere in the country, the current AQMD proposal, allowing only for the consideration of a technologically achievable case-by-case NOx limit, will make it inherently difficult to maintain a 5 ppm NH_3 limit, without a significant give on NOx and/or possible exceedances of the VOC limit. The Utilities strongly urge AQMD to provide an option to develop technically achievable case-by-case NOx and/or NH_3 limits. We suggest that AQMD not limit a facility's ability to apply for alternate emission limits just to NOx. Rather, by providing an additional option for the Executive Officer to approve alternate NH_3 limits, AQMD will provide itself with more flexibility to evaluate the most feasible emissions after collecting numerous months of operational data. The best pathway to minimize emissions overall may be one with alternate limits for NOx and NH_3.

The Utilities propose the following language that would provide the Executive Officer with the discretion to establish a case-by-case NOx limit, either separately, or in conjunction with, a case-by-case NH_3 limit.

Proposed Language:

13-7 cont.

PAR 1100 (d)(5)(A)(v)
"Provide detailed information steps that have been taken to
meet the NOx and NH_3 emission limits specified in Rule 1110.2 paragraph (d)(1), why
the NOx and/or NH_3 emission limits cannot be met,
the number of occurrences that the NOx and/or NH_3 emission limits ~~was~~ were
exceeded, and the duration and concentrations of NOx and NH_3 ~~concentrations~~ that
exceeded Rule 1110.2 paragraph (d)(1)."

PAR 1100 (d)(5)(B)
"The Executive Officer will review the information provided pursuant to subparagraph (d)(5)(A) and either require that the NOx and/or NH_3 emission limits in Rule 1110.2 paragraph (d)(1) be met or establish technologically achievable case-by-case emission limits."

[NOTE: another option to amending the sections above, would be to delete the term NOx from these sections and let the section simply specify "the emission limits in Rule 1110.2 paragraph (d)(1).]

IV. Conclusion

The Utilities appreciate the effort of AQMD staff over the last 18 months in working with us to understand issues unique to our facilities and operations. We have also come to understand the complex and challenging nature of this transition out of RECLAIM. The Utilities are pleased to see that the current drafts of the rules provide us with compliance pathways. However, we are still recommending changes to a few rule provisions in order to achieve a reliable emissions control strategy that will allow us to transition our lean-burn compressor gas engines from RECLAIM to the Regulation XI rules. 13-8

Page 6

The Utilities appreciate your consideration of our comments and recommendations. Should you wish to discuss the above comments, or have any questions, please contact Daniel McGivney of my staff at 951-225-2958 or at dmcgivney@socalgas.com.

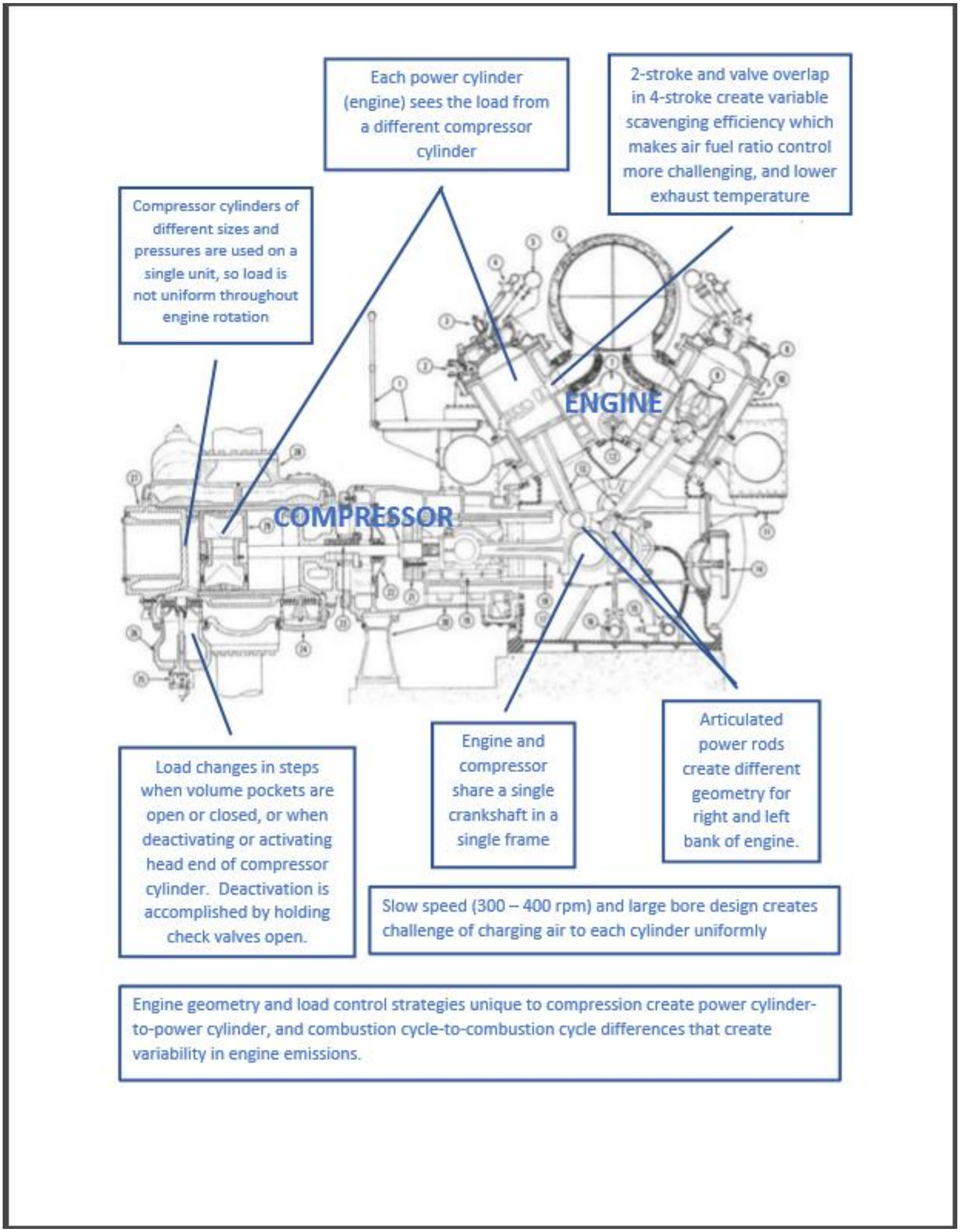
Sincerely,

Daniel R. McGivney
for

Deanna Haines
Director, Environmental Policy
Southern California Gas Company

cc:
Phil Fine, SCAQMD
Michael Morris, SCAQMD

ATTACHMENTS


Each power cylinder (engine) sees the load from a different compressor cylinder
2-stroke and valve overlap in 4-stroke create variable scavenging efficiency which makes air fuel ratio control more challenging, and lower exhaust temperature
Compressor cylinders of different sizes and pressures are used on a single unit, so load is not uniform throughout engine rotation
ENGINE
COMPRESSOR
Load changes in steps when volume pockets are open or closed, or when deactivating or activating head end of compressor cylinder. Deactivation is accomplished by holding check valves open.
Engine and compressor share a single crankshaft in a single frame
Articulated power rods create different geometry for right and left bank of engine.
Slow speed (300 – 400 rpm) and large bore design creates challenge of charging air to each cylinder uniformly
Engine geometry and load control strategies unique to compression create power cylinder-to-power cylinder, and combustion cycle-to-combustion cycle differences that create variability in engine emissions.

ENVIRONEX

August 28, 2019

Gregg Arney
Gas Engineering
SoCalGas
555 West 5th St.
Los Angeles, California 90071

Rule 1110.2 - NOx and Ammonia Limits for 2 and 4 Stroke Compressors

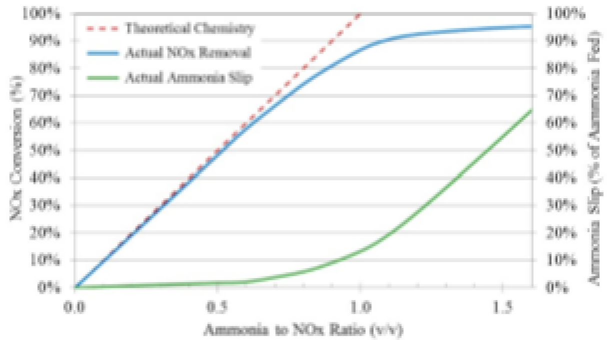
Gregg,

Environex has reviewed proposed Rules 1100 and 1110.2. We have specific concerns regarding the viability of the proposed 11 ppmvdc NOx and 5 ppmvdc ammonia slip limits for the 2 and 4 stroke gas compressors.

The concern is that the SCR technology being applied to these compressors has practical limitations that must be considered when setting the limits to provide reliable performance. All SCR systems operate on the principle of providing a target percent NOx removal for a percent ammonia slip. As an illustration, Figure 1 below shows the SCR characteristic curve for an SCR system with an inlet ammonia-to-NOx distribution of 10% RMS; a well designed, state-of-the-art system and the most widely accepted design basis for gas fired SCR applications. In this design, to achieve 90% NOx reduction 20% excess (above stoichiometric) ammonia is needed. This 20% excess ammonia exits the reactor as ammonia slip. If the system has an inlet NOx of 25 ppmvdc NOx and 90% removal is achieved, the stack NOx is 2.5 ppmvdc and the ammonia slip is 5 ppmvdc. If, however, the inlet NOx is 100 ppmvdc then the stack NOx would be 10 ppmvdc and the ammonia slip would be 20 ppmvdc.

1 Great Valley Parkway, Suite 4
Malvern, PA 19355
Tel (484) 320-8608
Fax (484) 320-8639

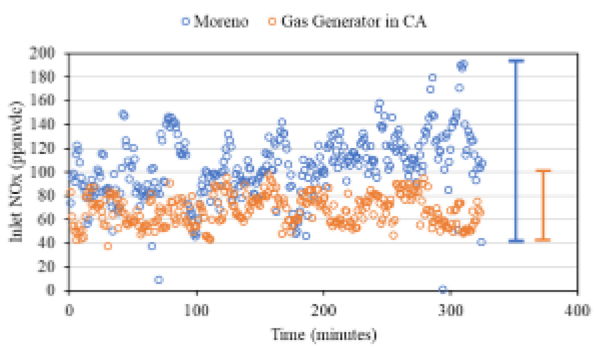
Figure 1 – SCR Characteristic Curve



The SoCal Gas compressors have an engine exit NOx of 100 to 150 ppmvdc. At 150 ppmvdc NOx and 11 ppm Stack NOx, 92.7% NOx removal is required. However, for 92.7% NOx removal 25% excess ammonia is needed and ammonia slip would be 37.5 ppmvdc. Some engines may have the capability to adjust combustion ratios and reduce NOx, but only at the expense of increasing VOCs.

Further, unique to the operation of the compressors is wide and sudden variation in engine exit NOx. Figure 2 illustrates this point by comparing actual operating data between a typical lean-burn IC engine gas generator and the Moreno engines. The variation in engine exit NOx at Moreno is more than twice that of a gas fired generator.

Figure 2 – Engine Exit NOx Moreno Compressor vs IC Engine Generator



Conventional ammonia flow control systems have a lag in response time as an artifact of the feed forward and/or feedback control signals from the CEMS. When wide variations occur, the control system is consistently lagging and the result is over or under injection of ammonia and increased variation on stack NOx and ammonia slip. This would typically be allowed for by longer averaging periods of 12 to 24 hours. In lieu of that, increased NOx and ammonia slip limits are necessary to compensate for these variations. It is also worth noting that the gas generator used in this illustration is located in California and is permitted with a 3-hr rolling NOx averaging period.

Due to the above challenges, we conclude that the gas compressors are a unique class of engine. We further recommend that the proposed NOx and ammonia slip limits of 11 ppmvdc NOx and 5 ppmvdc ammonia slip are not practical to achieve. For a stack NOx of 11 ppm the acheiveable ammonia slip limit is 20 to 30 ppmvdc. We recommend SoCal Gas request the AQMD revisit the basis for the limits in the proposed Rule 1110.2 and make allowance for some variance for those engines that demonstrate practical limitations to SCR technology.

Regards,

Daniel Ott
President

Response to Comment 13-1

South Coast AQMD appreciates your comment email submitted for the proposed amendments to Rule 1110.2.

Response to Comment 13-2

Thank you for your comment. Staff recognizes the important role that the distribution, transmission and storage of natural gas has on the residents of the South Coast AQMD. We appreciate your efforts to be the cleanest utility in the country.

Response to Comment 13-3

Thank you for your comment. Having the opportunity to tour the affected facilities has provided key insights on potential community impacts. Staff appreciates your hospitality. In addition, your participation has been a key part of the rule making process.

Response to Comment 13-4

Thank you for your comment.

Response to Comment 13-5

Your concern over the installation of a CEMS is duly noted and the proposed rule language will be modified to incorporate this concern.

Response to Comment 13-6

Staff has reviewed your proposal to include an emission control system maintenance or repair event as subject to provision to section (i)(1)(K). Staff agrees that the installation or the repair of catalytic emission control equipment should be included in this provision. However, staff believes that extending the exemption period from 4 hours to 36 hours is not warranted. Staff has not received feedback from other stakeholders suggesting that the additional time is needed. Further, tuning an engine's control system should be and is addressed in section (i)(1)(J).

Response to Comment 13-7

Staff recognizes that NOx, ammonia, and VOC are all air contaminants that may and/or will vary throughout your requested demonstration period. Within these parameters, we are asking you to balance a three-legged emissions stool with the NOx emissions representing the one parameter that is allowed to range up to 45 ppmvd @ 15% O_2 which is still an emission reduction from current operational limits. After staff's review and feedback from stakeholders, an ammonia emission limit will not be included in this rule amendment at this time but a limit may be applied to new SCR installations that show an emission increase. The SCR control equipment would be subject to BACT at the time of permitting. As such, under your particular circumstances, it may be beneficial to limit ammonia emissions to a level consistent with the installation of an SCR.

Response to Comment 13-8

Thank you for your comment.

Comment Letter No. 14 (received as an email) – Eastern Municipal Water District

Rodolfo Chacon

Subject: FW: Proposed Rule 1110.2 Comments-Ammonia Test Frequency

From: Torres, Alison [mailto:torresa@emwd.org]
Sent: Tuesday, September 17, 2019 9:30 AM
To: Kevin Orellana <korellana@aqmd.gov>
Cc: Michael Morris <mmorris@aqmd.gov>; Rodolfo Chacon <rchacon@aqmd.gov>
Subject: RE: Proposed Rule 1110.2 Comments-Ammonia Test Frequency

Good morning Kevin,

I wanted to reach out again regarding my concerns with the ammonia-testing requirement proposed in PAR 1110.2. I reviewed the latest language (8/20/19) and I did not see added clarifications regarding the applicability of the quarterly and annual ammonia testing to new installations only. 14-1

As I expressed previously, upon rule adoption, if the language is unchanged, our existing installation would immediately be considered "late" for ammonia testing since we are not currently subject to quarterly or annual ammonia testing. In addition, we would be required to test more frequently during a special test mobilization, even though our historical ammonia test results are extremely low. 14-2

We don't believe there is a need to require differing test frequencies for ammonia and request that staff consider adjusting the test frequency so it is consistent with the NOx, CO and VOC testing. Requiring annual testing for ammonia would require a separate test mobilization by a certified tester. The test frequency for NOx, CO and VOC testing occurs approximately every 1-3 years depending on engine operation. If an engine runs continuously, ammonia testing would be triggered at the desired annual frequency, along with the testing for other constituents. However, if the engine is not operating 24/7, testing would be in line with the frequencies outlined for NOx, CO and VOC (every 1-3 years). 14-3

I ask that you consider requiring the quarterly testing for the first 12 months of operation for **new installations** only, and adjust the language to reflect future testing to occur in line with the NOx, CO, VOC testing (rather than annually). 14-4

Please let me know if there are planned modifications to the proposed rule language. I would be happy to propose wording and/or provide additional information if needed.

Thank you,

Alison Torres
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Environmental & Regulatory Compliance Dept
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Serving our community today and tomorrow

Response to Comment 14-1
South Coast AQMD appreciates your comment email submitted for the proposed amendments to Rule 1110.2. PAR 1110.2 has been revised to remove an ammonia concentration limit and associated source testing provisions.

Response to Comment 14-2
PAR 1110.2 had been revised to remove ammonia limits. Ammonia limits and source testing will be addressed during permitting of new installations of SCRs.

Response to Comment 14-3
Source testing requirements for ammonia have been removed from PAR 1110.2.

Response to Comment 14-4
At this time, the provisions related to ammonia testing have not been included in the PAR 1110.2.

Comment Letter No. 15 (received as an email) – Ramboll (EtaGen)

Rodolfo Chacon

Subject: Revised Draft Rule Language - PAR 1110.2/1100 - EtaGen comment on I&M Plans for Linear Generators (or equivalent)

From: Scott Weaver [mailto:MSWeaver@ramboll.com]
Sent: Tuesday, September 24, 2019 7:05 PM
To: Michael Morris <mmorris@aqmd.gov>; Susan Nakamura <SNakamura@aqmd.gov>; Kevin Orellana <korellana@aqmd.gov>
Cc: Adam Simpson <adam.simpson@etagen.com>
Subject: [BULK] Revised Draft Rule Language - PAR 1110.2/1100 - EtaGen comment on I&M Plans for Linear Generators (or equivalent)

Susan, Mike & Kevin:

Thank you again for your time today to discuss EtaGen comments on the revised PAR1110.2 language. Wanted to provide a little more information on the I&M Plan topic that we discussed. 15-1

Background: The power output from EtaGen's linear generator is primarily controlled using controllers on air flow, fuel flow, and oscillator motion (called apex control). The linear generators are equipped with a real-time onboard diagnostic system that monitors fuel flow, air flow, apex control, power output (DC and AC), and efficiency (DC and AC) to ensure that the unit is continuously operating within emissions specification. This onboard diagnostics system is analogous to what is used in automobiles for engine emissions compliance. Today, when a car is smog checked, they don't even measure emissions. Rather they check that the onboard diagnostics are working and that there were no errors thrown. The EtaGen system can be used to ensure emissions compliance to a much higher degree than occasional portable analyzer checks, which are not well suited to the linear generator technology. As we discussed, the Permits team had reached that conclusion and had actually excluded the portable analyzer stuff in the most recent draft permit. Of course all of this will be backstopped by the source testing. 15-2

Proposed I&M Approach: As we discussed, EtaGen would like an option added to the rule for an alternative I&M Plan that could (if approved by the Executive Officer) leverage the onboard diagnostic system for emissions compliance assurance. Our proposed language would be something like: 15-3

> Proposed Section (i)(4) language: The provisions of paragraph (e)(5), (f)(D)(i) and (f)(D)(ii) shall not apply to a new non-emergency generator subject to paragraph (d)(L)(1) provided the owner/operator submits an alternative I&M Plan using real-time, onboard diagnostic monitoring and such a plan is approved by the Executive Officer.

As noted, this would be much better suited to the assuring emissions compliance for this technology. And obviously, since this would be subject to AQMD approval it presents zero risk to include it. If the AQMD does not get comfortable with the alternative I&M Plan approach, the owner/operator would be left defaulting to the standard I&M provisions. 15-4

Should you have any questions, please let us know. Thanks again for your consideration.

Best regards,

Scott

M. Scott Weaver
Principal

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M +1 (626) 7202015
msweaver@ramboll.com

Response to Comment 15-1
South Coast AQMD appreciates your comment email submitted for the proposed amendments to Rule 1110.2.

Response to Comment 15-2
The initial permit was to be an experimental permit that would allow the use of the onboard diagnostics backstopped with source testing. Over several years of operation the source testing could be reviewed to determine if the onboard diagnostics would be acceptable in lieu of portable analyzer testing. However, once the manufacturer opted to pursue a permit to operate rather and forego the experimental permitting process, the existing conditions and requirements of Rule 1110.2 were applicable. The analogy of smog checking a car and validating emissions through diagnostic measures is inaccurate because diagnostic evaluation for cars has been developed over years of testing and data comparison over a wide range of automobile types. The manufacturer has not provided similar data showing the data comparison of the onboard diagnostics to portable analyzer checks. Subclause (f)(1)(D)(i)(I) has been included in the rule that allows the manufacturer to demonstrate that such a system is equivalent to current monitoring requirements eventually allowing the onboard diagnostics to be used in some situations in lieu of the portable analyzer checks.

Response to Comment 15-3
See Response 15-2.

Response to Comment 15-4
See Response 15-2.

Comment Letter No. 16 (received as an email) – Southern California Gas Company

Rodolfo Chacon

Subject: SoCalGas comments regarding September 20 draft PARs 1110.2 & 1100

From: McGivney, Daniel [mailto:DMcGivney@socalgas.com]
Sent: Tuesday, September 24, 2019 7:17 PM
To: Michael Morris <mmorris@aqmd.gov>
Cc: Nevitt, Lauren B <LNevitt@socalgas.com>
Subject: SoCalGas comments regarding September 20 draft PARs 1110.2 & 1100

Mike, please find below, SoCalGas comments on the September 20 draft PARs 1110.2 and 1100. Please let me know if you have any questions, and certainly, any comments. We are available to meet this week on these items. We would like at least a confirmation of the items where the District would agree to our requests and those the District disagrees with. We very much would like to get all these items settled as quickly as possible. Thank you. 16-1

NH_3 Flexibility

Originally, the District proposed a 5 ppm NH_3 slip limit in PAR 1110.2 and an interim NH_3 limit of 20 ppm in PAR 1100 (during the time extension period). However, the PAR 1100 language only allowed for a final case-by-case limit for NOx, keeping the final NH_3 limit at 5 ppm. At our last in-person meeting (September 12), we inquired again about additional flexibility by allowing the potential for a higher NH_3 slip limit. District staff stated that it was looking at what might be possible and said it would continue its internal discussion and see what they could do. In the recently released (Sept. 20) draft rules, the District has removed NH_3 slip limits from the rules completely, thereby establishing the permitting process as the vehicle to negotiate NH_3 slip limits. 16-2

- SoCalGas is concerned that negotiating two separate NH_3 slip limits up front in the permitting process (e.g. a limit to go with the Rule 1110.2 Table II limits, and a second "interim:" limit which would apply during the time extension period in PAR 1100) is unpredictable and creates additional, unnecessary uncertainty. 16-3
- SoCalGas, as noted at our last meeting (and other preceding meetings) is concerned that there is no allowance for the development and approval of a possible final case-by-case ~~NH3~~ slip limit. As discussed in previous meetings, the best case scenario would be that SoCalGas has the option to identify the best NOx and/or NH3 limits that would achieve the greatest NOx emissions reduction (with the NOx goal being 11 ppm). SoCalGas believes having the ability to possibly reach and maintain a NOx limit of 11 ppm with a higher NH3 limit would be the best outcome for all. 16-4
- SoCalGas recommends leaving the previously proposed interim NH_3 limit of 20 ppm in PAR 1100 (d)(4)(C). 16-5
- SoCalGas recommends amending PAR 1100 Sections (4) and (5) to allow for a final case-by-case NH_3 slip limit. 16-6

NOx Interim Limit

PAR 1100 Section (d)(4)(C)(i) establishes the interim NOx limit that must be met as required by an Executive Officer approved compliance plan granting a time extension. SoCalGas previously understood that this NOx limit (and other applicable limits at the time, e.g. the 20 ppm NH_3 slip limit) would be the 45 ppm NOx concentration limit noted in the proposed rule. However, in a conversation with District staff, it appears that the interim limits would be based upon data collected during the 24 months following the issuance of a Permit to Construct, and would likely be less than, in the case of NOx, the 45 ppm limit cited in the rule. 16-7

- This would defeat the purpose of operating under interim limits while SoCalGas staff works the engines to determine first, whether the engines can achieve the Rule 1110.2 Table II limits, and if not, what NOx (and NH3) concentration can be achieved with variations in pipeline conditions through a year of operation. Lowering the interim limit would put the compliance of the engine operations in jeopardy while trying to operate the engine as it makes various load step changes. This could lead to future non- 16-8 compliant events, should the final limits be artificially and inaccurately based upon a limited set of operating conditions. 16-8 cont.

- SoCalGas requests that the 45 ppm NOx interim limit (and the 20 ppm NH_3 interim limit addressed above) be established in Rule 1100 as hard limits for the interim time extension, which would be no longer than 24 months. 16-9

<u>NOx Averaging Period</u>

The District has language in both PARs 1110.2 and 1100 regarding NOx emissions averaging. In PAR 1110.2 Section (d)(1)(B)(v), the draft rule requires compressor gas engines to utilize a "fixed-interval averaging time of three hours" to demonstrate compliance with the NOx emission concentration limit. PAR 1100 Section (d)(4)(C)(i) requires that NOx emissions data be "averaged over 180 minutes." 16-10

- SoCalGas seeks definition and clarification of these proposed NOx averaging periods, why they are different, how they would be calculated, and how they align/comply with Rules 218 and 218.1 (i.e. do the averaging requirements in Rules 1110.2 and 1100 supersede the requirements of Rules 218 and 218.1?).

<u>Alternative VOC Limit for 2-Stroke Lean Burn Engines</u>

Current Rule 1110.2 Section (d)(1)(B)(ii) allows for the demonstration that a 2-stroke, lean-burn engine cannot meet the Table II 30 ppm VOC limit, and request a case-by-case limit. The latest changes appear to eliminate that option, while grandfathering previously approved case-by-case limits . 16-11

- SoCalGas would appreciate it if the District could confirm this interpretation and discuss why this provision is being removed.

<u>Source Test Frequency</u>

The District is amending PAR 1110.2 Section (f)(1)(C)(i) regarding the frequency of source tests. SoCalGas is having trouble interpreting the following sentences in this section: "The <u>above</u> source test frequency may be reduced to once every three years if the engine has operated less than 2,000 hours since the last source test. If the engine has not been operated before ~~within three months of~~ the date a source test is ~~required~~ <u>due</u>, the source test shall be conducted <u>by the end of</u> ~~when the engine resumes operation for a period longer than either~~ seven consecutive days or 15 cumulative days of <u>resumed</u> operation." 16-12

- SoCalGas would appreciate it, if the District could clarify the above requirement.

<u>PAR 1100 Quarterly Reports</u>

PAR 1100 Section (d)(3)(C) requires the submittal of quarterly reports during the 24 month period following issuance of a Permit to Construct for compressor gas engines. One of the requirements of this section specifies that the report include the "identification of applicable engine and control equipment parameters necessary to maintain pollutant concentrations within the rule and permit limits." The section additionally includes the requirement that "the parameters as well as any corrective actions shall include, but not be limited to, those specified in Attachment 1 of Rule 1110.2." Attachment 1 of Rule 1110.2 describes data elements that must be included in an Inspection and Monitoring plan per Rule 1110.2 (f)(1)(D)(i)(I), which is required for engines without NOx/CO CEMS. SoCalGas' compressor gas engines will all have CEMS. 16-13

- SoCalGas would like clarification as to the applicability of Attachment 1 to compressor gas engines, and more importantly, identification of the specific data elements applicable to compressor gas engines.

<u>Engines affected by Other Regulation XI Rules</u>

PAR 1100 Section (d)(3)(D) addresses engines that may be replaced by another Regulation XI rule. Currently, this section stipulates that engines that will be replaced by equipment under a different Regulation XI rule must be permanently removed from service within 24 months after issuance of the new equipment's Permit to Construct or by December 31, 2023, whichever is later. Under Rule 1134, compressor gas turbines can obtain 36 months (versus 24 months) to construct and meet compliance with applicable rule limits if the operator files the permit applications early, and additionally has the option to request up to an additional 36 months to meet the ammonia limit. 16-14

- SoCalGas has compressor gas engines that will be replaced by equipment regulated under Rule 1134. Hence we request that PAR 1100 (d)(3)(D) be amended to reflect these Rule 1134 compliance time frames, as SoCalGas cannot remove the existing compressor gas engines until the new equipment is operational and in compliance with all operational and regulatory requirements. Removing these engines early, would jeopardize SoCalGas' and SDG&E's gas system reliability. 16-15
- SCAQMD had expressed their understanding of this concern, but the proposed rule language does not address the compliance date gap between the two rules. Allowing 24 months to replace the engines does not harmonize the two rules. 16-16

Compliance Gap

PAR 1100 Section (d)(5) establishes requirements that must be met to request and obtain a final case-by-case emission limit. At the end of the time extension provided in Section (d)(4), SoCalGas may submit a demonstration that engines cannot achieve the emission limits in Rule 1110.2 (d)(1)(B) Table II. Upon review and approval by the Executive Officer, case-by-case emission limits can be determined and approved. Section (d)(5)(C)(i) stipulates that the operator must comply with the standards approved by the Executive Officer within 30 days of notification. In review of the language in Section (d)(5), it appears that there exists the possibility that there could be a compliance gap between the end of the time extension granted under (d)(4) and the notification sent to the operator in (d)(5). 16-17

- SoCalGas is concerned with this potential time gap and therefore requests that the District add language to Section (d)(5) that would require the operator to maintain compliance with the interim limits until a notification regarding the final limits is received by the operator. This would ensure that there is no compliance gap while the Executive Officer is reviewing the request submittal, the determination of final limits, and the subsequent notification to the operator.

Daniel McGivney
Environmental Affairs Program Manager
Southern California Gas Company
951-225-2958
dmcgivney@socalgas.com

Response to Comment 16-1
South Coast AQMD appreciates your comment email submitted for the proposed amendments to Rule 1110.2.

Response to Comment 16-2
PAR 1110.2 was revised to remove the ammonia emission limit that was initially proposed because the establishment of any ammonia limits along with monitoring requirements ~~is~~ will be determined during the permitting process.

Response to Comment 16-3
PAR 1100 allows for flexibility with the NOx concentration limit and specifically focuses on efforts to achieve the final NOx concentration limit without adjustment to any permitted ammonia limit.

Response to Comment 16-4
As noted in Comment 16-3, the facility will have flexibility with the NOx emission limit as well as with the averaging time. The limit on ammonia slip will be determined based on BACT standards for the installation of affected control equipment.

Response to Comment 16-5
Any ammonia slip limits will be determined through the permitting process. See also Comments 16-3 and 16-4.

Response to Comment 16-6
See response to Comment 16-5.

Response to Comment 16-7
It is expected that the facility should make good faith efforts to achieve 11 ppm NOx upon commissioning. The proposed rule provides flexibility through the extension period and staff will work with the facility to establish a technologically-achievable NOx limit that is based on all supporting data, if necessary. This NOx limit may be greater than 11 ppm and the rule provides for a backstop of 45 ppm.

Response to Comment 16-8
The proposed rule provides sufficient time after commissioning to operate the unit under various operating conditions with flexibility for the NOx limit. The objective of providing time extensions is to give the facility sufficient flexibility to determine what can be achievable. In addition, the proposed rule provisions allow for averaging over an extended period of time which gives additional flexibility to account for any load changes.

Response to Comment 16-9
See the responses to Comments 16-4 through 16-7.

Response to Comment 16-10
Please refer to the staff report under *Clarification of Rule Language in Subparagraph (d)(1)(B)* for examples of fixed-interval averaging. Staff acknowledges the disparity in the language between PAR 1110.2 and PAR 1100 regarding the 3-hour averaging. The two rules have been harmonized to include a fixed-interval 3-hour averaging requirement. Although Rules 218 and 218.1 will be amended in the near future to address elements pertaining to averaging, any requirements in the source-specific rules that are considered more stringent than in Rules 218 and 218.1 should be adhered to.

Response to Comment 16-11
Thank you for your comment. It is not the intent to remove VOC limits that had been previously established on a case-by-case basis. As also explained in response to Comment 16-3, any future flexibility with emission limits would be limited to NOx. The rule has been updated to clarify this issue.

Response to Comment 16-12
Staff has contacted the commenter and has discussed the intent for the revision to the source testing requirements. Refer to the staff report discussion under *Clarified Language Regarding Source Testing Deadlines*.

Response to Comment 16-13
Reference to Attachment I is made as an example of the types of parameters that the facility may be required to report to the Executive Officer. Depending on what information is required for the data evaluation, a data acquisition process will be agreed to by the facility and the South Coast AQMD. PAR 1100 provides a listing of information that includes, but is not limited to, any applicable operating parameter under Attachment 1. This is not a requirement to submit an Inspection & Monitoring plan.

Response to Comment 16-14
The differences between Rule 1134 and PAR 1110.2 are noted and staff has added proposed rule language that will address the compliance dates.

Response to Comment 16-15
Staff has clarified these requirements in new proposed paragraph (d)(4) in Rule 1100 to address engines that will be subject to replacement with compressor gas turbines under Rule 1134. The

proposed provision would require submittal of a retirement plan that would outline the expected dates of engine removal or replacement. Through the permitting process for the replacement equipment, permit conditions will specify an appropriate time overlap that would ensure that the new equipment can operate reliably before the existing compressor gas lean-burn engines are removed from service.

Response to Comment 16-16

See response to Comment 16-15.

Response to Comment 16-17

Staff agrees and has revised the rule to address any compliance gap.

Comment Letter No. 17 (received as an email) – Orange County Sanitation District

Rodolfo Chacon

Subject: FW: EXTERNAL: **Announcement ** Proposed Amended Rules 1110.2/1100

From: Ahn, Terry [mailto:tahn@ocsd.com]
Sent: Thursday, October 3, 2019 10:34 AM
To: Kevin Orellana <korellana@aqmd.gov>
Cc: Michael Morris <mmorris@aqmd.gov>; Frigo, Lisa <LFrigo@ocsd.com>
Subject: RE: EXTERNAL: **Announcement ** Proposed Amended Rules 1110.2/1100

Hi Kevin,

We have following questions and comment on the final PAR 1110.2:

1) Is the 48-hour averaging allowed only if it's specified in the permit? It could take several months before the permits can be revised. Which averaging period do we use between the rule effective date and the permit revision? 17-1

(I) A n operator of a biogas engine with a CEMS shall meet:

(i) The NOx and CO limits of Table III-B, averaged pursuant to the specified averaging provisions in subparagraph (d)(1)(B); or

(ii) The emission limits at or below 9.9 ppmvd for NOx and 225 ppmvd for CO (if CO is selected for averaging), each corrected to 15% O2 and averaged over a 48 hour fixed interval, with the emission limits and averaging time specified as a condition in the engine's permit to operate.

2) Having the word "or" rather than "and" would be more useful in following provision (i)(1)(J). Tuning of the engine and emission control equipment may not always occur concurrently. 17-2

(J) An engine start-up, until sufficient operating temperatures are reached for proper operation of the emission control equipment or for the tuning of the engine ~~and~~ or emission control equipment, and an engine shutdown period.

Thank you in advance for your response.

Terry Ahn
Orange County Sanitation District
Laboratory, Monitoring, and Compliance | Senior Regulatory Specialist
Office: 714.593.7082
www.ocsd.com

Response to Comment 17-1

South Coast AQMD appreciates your comment submitted for the proposed amendments to Rule 1110.2. To address the concern raised regarding which averaging period should be used between the date of amendment and a permit revision, staff has revised the proposed rule to allow facilities that currently use 24-hour averaging to keep this as an option for the interim period. This would be to average emissions over a fixed-interval, 24-hour average where NOx and CO emissions would be limited to 11 ppmvd and 250 ppmvd, respectively, until a new permit is issued with new conditions for complying with 9.9 ppm NOx and 225 ppm CO, averaged over 48 hours.

If, after rule amendment, the facility opts to average data over a fixed-interval, 48-hour period, the facility would be required to apply for this option. Under a 48-hour averaging allowance, NOx and CO emissions would now be limited to 9.9 ppmvd and 225 ppmvd, respectively. If a facility opts for the longer 48 hour averaging, then it would have to meet a 10% reduction in NOx and CO emissions.

To codify which method is selected, the option would be specifically identified in the permit as one of its conditions. For those existing units that do not currently have a specific 24-hour averaging condition in their permit, staff will be re-issuing permits to include this condition before the date of amendment, to reflect the previous emissions requirements for biogas engines. Once the rule is amended, the facility can apply to change the limit.

Staff believes that the averaging condition should be explicitly stated on the permit so the standard as to what the facility will be held to is clear. By placing the averaging provision as a condition on the permit, it would avoid potential change over by the operator from one averaging method to the other. Because the averaging periods have different limits, changing over from one method to the other may be considered circumvention. For example, a facility that has selected a 48-hour averaging option may experience a sustained period of engine operation where NOx emissions averaged 10.5 ppmvd per day over a 4 day window. In this example, the engine would not comply with a 9.9 ppmvd NOx limit, but would have potentially met a 24-hour averaging limit of 11 ppmvd. The proposed rule makes certain that if a facility desires to have the flexibility to average over a longer period of time, the expectation is that it will meet the 10% emission reduction target at all times.

Response to Comment 17-2

Staff agrees with the comment and has included language to distinguish that tuning may be done on an engine *and/or* its associated emission control equipment.

Comment Letter No. 18 – Southern California Gas Company

Deanna Haines
Director
Policy & Environmental Strategy
Tel: 213-244-3010
dhaines@socalgas.com

October 11, 2019

Susan Nakamura, Assistant Deputy Executive Officer
Planning, Rule Development & Area Sources
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

RE: Comments on draft Proposed Amended Rules 1110.2 and 1100

Dear Ms. Nakamura:

Southern California Gas Company and San Diego Gas and Electric Company (referred to herein as "the Utilities") appreciate the opportunity to provide comments to the South Coast Air Quality Management District (AQMD) regarding AQMD Proposed Amended Rule (PAR) 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines and PAR 1100 – Implementation Schedule for NOx Facilities. 18-1

Background
The Utilities provide energy services to over 25 million customers in California and operate a complex natural gas distribution, transmission and storage system in California. This infrastructure plays a key role in ensuring reliable energy, including electric services, to millions of customers.

An integral part of this distribution, transmission and storage system, are engine-driven gas compressors. These compressors, operating under highly variable and challenging conditions, ensure the availability of natural gas every day. 18-2

The Utilities have provided extensive details regarding the unique nature of lean-burn engines in gas compression service to the AQMD, as well as operational and physical challenges that exist at each facility that affect these engines, including the retrofit of emission controls, and the challenges in simultaneously achieving and maintaining rule emission limits for Oxides of Nitrogen (NOx),Volatile Organic Compounds (VOCs), at all operating conditions, while subject to a low ammonia (NH_3) slip limit.

Page 2

Managing Competing Contaminants

The Utilities appreciate the AQMD's acknowledgement of the need for emission limit flexibility in PAR 1100, where upon demonstration, allows for the establishment of a final case-by-case emission limit. 18-3

Throughout this rulemaking, the Utilities have provided details regarding the inherent chemical, physical, and operational difficulties that lean-burn engines face to achieve simultaneously low NOx and NH_3 levels while maintaining VOC limits established in Rule 1110.2. This is especially significant as the NH_3 slip needed to meet the final NOx limit (11 parts per million) has yet to be achieved by the class and category of lean-burn engines used in our application. In the August 20 version of PAR 1100, AQMD had provided for interim limits for both NOx and NH_3. The Utilities appreciated the certainty of these interim limits, and further requested the flexibility to establish a case-by-case final limit for NH_3. As we have explained previously, a low NH_3 limit coupled with low NOx and VOC limits jeopardizes the Utilities' ability to control emissions under variable operating conditions. 18-4

However, the version of the proposed amended rule that was set for hearing on October 4 removed the NH_3 slip limits entirely. The Utilities will work with permitting staff regarding our need for flexibility to establish a final NH_3 slip concentration that supports meeting the NOx rule limit. If this is not the AQMD's intent, we would request that the interim NH_3 slip limit remain in the rule. 18-5 Additionally, AQMD's rulemaking staff have acknowledged the importance of setting an interim NOx limit at <u>45 parts per million</u> and providing a <u>24-month time extension</u>.[1] This interim flexibility is critical for the Utilities to design and test engine emissions in our effort to achieve final emission limits. 18-6

The Utilities continue to recommend that AQMD provide a pathway to determine final emission limits that both allow our engines to operate in compliance under all operating conditions, while achieving substantial NOx reductions. Again, as noted in earlier comments, the Utilities' believe that the best pathway to minimize emissions overall, especially NOx emissions, may be one with alternate final limits for NOx and/or NH_3. 18-7

Tuning Period for SCR Equipped Engines

The Utilities have recently consulted with a catalyst service vendor specifically about tuning ammonia injection grids on Selective Catalytic Reduction (SCR) systems. While we understand the District wishes to maintain the current time limitations contained in Rule 1110.2 sections (i)(1)(J) and (K), the Utilities wish to once more raise our concern that these time frames may not be adequate. 18-8

There is a fundamental difference between engine and catalyst system normal startup and shutdown, and periodic maintenance of emission control systems, including NH_3 tuning. The two have very different requirements and cannot be combined. During normal startup and shutdown, temperature parameters in the NH_3 system designed to protect the catalyst from damage, control the time required to start ammonia flow at startup and when it should be stopped during shutdown. For startup and shutdown [section (i)(1)(J)] 30 minutes is typically a reasonable period with some exceptions requiring up to 60 minutes. 18-9

[1] October 4, 2019 conversation between D. McGivney, G. Arney, M. Morris, and K. Orellana.

Page 3

Other tuning events, such as periodic ammonia injection system tuning, requires stack testing in combination with manual adjustment of the ammonia system to optimize NOx removal and minimize ammonia slip. This is done once or twice each year and takes 1 to 2 days to complete. During the tuning, periodic spikes in NOx and ammonia slip are possible. This is normal maintenance for any SCR system in any application and should be addressed in the rule language. 18-10

During tuning the Utilities recommend a longer averaging period for NOx and ammonia to allow for the periodic spikes, which may occur during the tuning process. The recommended averaging period is 6 hours for up to 4 days per year during tuning. The Utilities believe this would provide a reasonable approach to tuning events which are a necessary element of catalytic emission control, while limiting the number and length of these tuning events. 18-11

Conclusion
The Utilities' appreciate the effort of AQMD in working with the Utilities' to understand issues unique to our facilities and operations, and to craft regulatory requirements that provide a path forward in our effort to achieve cleaner air. Thank you for the consideration of our comments. Should you wish to discuss the above comments, or have any questions, please contact Daniel McGivney of my staff at 951-225-2958 or at dmcgivney@socalgas.com. 18-12

Sincerely,

Daniel R McGivney for

Deanna Haines
Director, Policy & Environmental Strategy
Southern California Gas Company & SDG&E

cc:
Phil Fine, SCAQMD
Michael Morris, SCAQMD

Response to Comment 18-1

South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2.

Response to Comment 18-2

Thank you for your comment. The South Coast AQMD recognizes the important role that the Utilities serve in the transmission and storage of natural gas for residents of Southern California, and acknowledges the challenges in achieving compliance with NOx, VOC, and ammonia limits. PARs 1110.2 and 1100 provide a pathway for compliance, while providing the opportunity and flexibility to achieve the required emission limits.

Response to Comment 18-3

Thank you for your comment. See response to Comment 18-2.

Response to Comment 18-4

PARs 1110.2 and 1100 have been revised and has removed the ammonia limit. See Responses to comments 16-3 and 16-4.

Response to Comment 18-5

See response to Comment 18-4. Ammonia limits will be established through the permitting process, consistent with BACT.

Response to Comment 18-6

It is expected that the facility should make good faith efforts to achieve 11 ppm NOx upon commissioning. The proposed rule provides flexibility through the extension period, if necessary, and staff will work with the facility to establish a technologically-achievable NOx limit that is based on all supporting data. This NOx limit may be greater than 11 ppm and the rule provides for a backstop of 45 ppm, in addition to flexibility with the averaging time.

Response to Comment 18-7

The flexibility that is provided with the NOx limit as well as with the averaging time would achieve provide the pathway towards compliance under all operating conditions. See response to Comment 18-6.

Response to Comment 18-8

Staff has also consulted with catalyst vendors specifically about tuning ammonia injection systems and disagrees with the commenter. PAR 1110.2 has been revised to allow for more flexibility regarding tuning. Please note that PAR 1110.2 subparagraph (i)(1)(J) allows for a facility to apply for a longer period of time not exceeding two hours as a condition of their permit.

Response to Comment 18-9

Staff agrees with the comment and PAR 1110.2 subparagraph (i)(1)(J) provides consideration for an engine start-up until sufficient operating temperatures are reached for proper operation of the emission control equipment, that would now also include the time for tuning. An allowance is given for 30 minutes, and an operator can apply for a longer time period not to exceed 2 hours.

Response to Comment 18-10

For tuning events outside of startup, it is expected that the engine would still maintain compliance during periods where there is a drift in the NOx and/or ammonia emissions. A longer NOx averaging time that is provided for compressor gas lean-burn engines is one benefit that other engines that are required to comply with 15 minute averaging do not have. Furthermore, there are engines in the South Coast AQMD jurisdiction that are required to comply with much more stringent distributed generation emission limits, which also require the same type of tuning that the commenter describes.

Response to Comment 18-11

If during the tuning process, emissions qualify for exemption pursuant to Rule 1110.2 subparagraphs (i)(1)(J) or (i)(1)(K), then these emissions should not be used for the averaging. Moreover, the rule has been revised to provide a fixed-interval averaging option of three hours for compressor gas lean-burn engines equipped with selective catalytic reduction pollution control equipment and a CEMS to allow flexibility for tuning during periods beyond the startup period.

Response to Comment 18-12

Thank you for your comment.

Comment Letter No. 19 – Beveridge & Diamond

Beveridge & Diamond

David C. Weber
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Seattle, WA 98101
+1.206.315.4811
dweber@bdlaw.com

October 22, 2019

VIA EMAIL

Governing Board
C/O Clerk of the Board
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178
cob@aqmd.gov

Re: Comments on Proposed Amendments to Rule 1100 and Rule 1110.2

Dear Governing Board:

I am writing on behalf of Beveridge & Diamond, P.C. ("B&D") in response to the South Coast Air Quality Management District's ("District's") solicitation of comments on its proposed amendments to Rule 1100 (Implementation Schedule for NOx Facilities) and Rule 1110.2 (Emissions from Gaseous- and Liquid-Fueled Engines). B&D regularly comments on federal and state regulatory developments that may affect its clients, and appreciates this opportunity to present its views concerning the proposed rules.[1] B&D reserves the right to raise any additional regulatory, legal, or other issues at a later date.

Brief Background on RECLAIM. The District intends to bring the RECLAIM program to an end. The District is creating and/or amending command-and-control "landing rules" that will control emissions from sources now subject to RECLAIM. Landing rules must be developed for all RECLAIM sources at a RECLAIM facility before the facility can exit the program. 19-1

Proposed Amended Rule ("PAR") 1110.2 is intended to be the landing rule for "stationary and portable engines over 50 rated brake horsepower." PAR 1110.2(b). PAR 1100 is the "transition rule," which establishes timeframes by which former RECLAIM sources must

[1] B&D is a U.S. law firm focusing on environmental and natural resource law, litigation, and dispute resolution. B&D is not making representations on behalf of its clients, though, this comment letter raises issues that affect many regulated entities in the District.

Austin, TX Baltimore, MD Boston, MA
New York, NY San Francisco, CA Seattle, WA Washington, DC

Beveridge & Diamond

October 22, 2019
Page 2

comply with specific landing rules, though, it also imposes certain compliance obligations as well. 19-1 cont

Impacts to portable engines should be considered. The District's primary focus during the development of PAR 1110.2 and PAR 1100 has been stationary engines. However, the proposed rules also impact the regulation of portable engines that the District has included in the RECLAIM program. The proposed rules will result in unnecessarily complicated and redundant requirements for many portable engines following the end of RECLAIM. 19-2

State regulations for portable engines provide adequate landing rules. We respectfully request the District to adopt modest changes to the proposed rules that would streamline compliance requirements while maintaining the same environmental benefit. <u>In short, we encourage the District to adopt the California Air Resource Board's ("CARB's") regulatory framework for portable engines without imposing additional District-specific requirements</u>. This is particularly important for portable engines registered in CARB's Portable Equipment Registration Program ("PERP"). PERP was intended to minimize compliance burdens for equipment which, by nature, moves around and between facilities and often moves from air district to air district. 19-3

The District has acknowledged implicitly that CARB's regulatory framework is sufficient by requiring in PAR 1110.2(d)(2) that portable engines subject to the rule comply with the Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater and the Large Spark-ignition Engine Fleet Requirements Regulation, as applicable. Further, PAR 1110.2(i)(1)(F) and (G) exempt portable engines registered in PERP and nonroad engines from the emissions limits in PAR 1110.2(d)(2). Notably, CARB's PERP regulation requires PERP-registered engines to comply with the same emissions standards as portable engines covered by the District's proposed landing rule. *Compare* 13 Cal. Code of Regs. § 2456(f) ("Engines rated equal to, or greater than 50 bhp registered under this article shall … meet all applicable requirements in title 17, Cal. Code Regs., sections 93116 through 93116.5 ….") *with* PAR 1110.2(d)(2)(B) ("The operator of any portable diesel engine shall comply with the applicable requirements of the Subchapter 7.5 Airborne Toxic Control Measures for diesel particulate matter in Chapter 1, Division 3, Title 17 of the California Code of Regulations."). 19-4

The District has attempted, in the main, to harmonize federal, state, and District requirements for portable engines since at least 1997, when Rule 1110.2 was amended to accommodate state PERP and federal nonroad engine regulations.[2] 19-5

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[2] *See generally* South Coast Air Quality Management District, Draft Staff Report for Proposed Amended Rule 1110.2 – Emissions from Gaseous & Liquid-Fueled Internal Combustion Engines (July 24,

Beveridge & Diamond

October 22, 2019
Page 3

Together, PAR 1100 and PAR 1110.2 impose requirements that are inconsistent with CARB's regulatory framework for portable engines, that are unnecessary, and that are confusing. Rather than simplifying compliance, PAR 1100 and PAR 1110.2 perpetuate challenges with managing portable engines. The complexity generates no environmental benefit, and is unnecessary for ensuring compliance with applicable emissions standards.

As an example, pursuant to PAR 1110.2(i)(1)(F), equipment registered in PERP is exempt from the emission standards under PAR 1110.2(d)(2). Yet, registered engines appear to be subject to a monthly (or quarterly) recordkeeping requirement under PAR 1110.2(f)(2). The monthly (or quarterly) recordkeeping requirements are unnecessary to assure compliance with the emission standards for portable engines. Indeed, CARB's PERP regulation already requires the owners and operator of PERP-registered engines to keep operational and use records and submit an annual report to CARB. *See* 13 Cal. Code of Regs. § 2458. 19-6

As another example, PAR 1100(f)(1) requires Title V facilities to continue to comply with the monitoring, reporting, and recordkeeping requirements specified in Rule 2012 even after the Title V facility exits RECLAIM. Yet, the Rule 2012 monitoring, reporting, and recordkeeping requirements are unnecessary to assure compliance with the emissions standards for portable engines subject to PAR 1110.2 or to the PERP regulation – whether or not they are at a Title V facility. 19-7

As noted above, removing these District-specific requirements would be consistent with the District's amendments to PAR 1110.2 in 1997 in response to federal and state activity regulating portable engines.[3]

In addition, as the District is aware, when developing the Regulation for the Reporting of Criteria Air Pollutants and Toxic Air Contaminants, CARB recently declined to impose specific reporting requirements for portable engines in response to concerns raised in stakeholder comments about the impracticability of additional reporting requirements.[4] 19-8

1997) (describing rule changes to address "federal and state preemptions on regulating portable engines at the local district level").

[3] In the 1997 version of Rule 1110.2, for example, PERP-registered engines were exempt from Rule 1110.2's recordkeeping requirements as well as from the rule's emission standards. These recordkeeping requirements were placed on PERP-registered equipment in the 2005 amendments to Rule 1110.2.

[4] *See* CARB, Final Statement of Reasons – Proposed Regulation for the Reporting of Criteria Air Pollutants & Toxic Air Contaminants, at pp. 156-160 (Oct. 2019).

Beveridge & Diamond

October 22, 2019
Page 4

Finally, the District has sufficient tools to regulate potential air quality impacts from portable engines without imposing District-specific requirements. The District has an array of tools to regulate portable engines in addition to PAR 1110.2. For example, CARB recently revised its PERP regulation to eliminate the possibility that portable engines operating in the District without a permit would contribute to an exceedance of an ambient air quality standard. *See* 13 Cal. Code of Regs. § 2455(a) (permitting an ambient air quality impact analysis for large "onshore projects" in "districts designated as extreme non-attainment for ozone" and allowing registrations to be invalidated if analysis shows an ambient air quality standard exceedance). 19-9

B&D appreciates your consideration of these comments. If the District has questions or requires additional information concerning the issues raised in this letter, please feel free to contact me at (206) 315-4811 or by e-mail at dweber@bdlaw.com.

Sincerely yours,

David C. Weber

cc: Kevin Orellana, Program Supervisor, korellena@aqmd.gov
Rudy Chacon, Air Quality Specialist, rchacon@aqmd.gov
Michael Morris, Planning and Rules Manager, mmorris@aqmd.gov

Response to Comment 19-1

South Coast AQMD appreciates your comment letter submitted for the proposed amendments to Rule 1110.2 and Rule 1100.

Response to Comment 19-2

Rule 1110.2 currently applies to portable engines. The proposed amendments would require portable units in RECLAIM to comply with the same requirements for non-RECLAIM portable units once they exit RECLAIM. South Coast AQMD staff is not recommending any changes to the existing provisions for portable engines.

Response to Comment 19-3

The portable engine requirements in Rule 1110.2 have been in effect since November 14, 1997. It is not uncommon for local rules and regulations to have more stringent requirements than in State or Federal regulations.

Response to Comment 19-4

Staff agrees that portable engines are required to comply with the applicable State emission requirements pursuant to Rule 1110.2 (d)(2).

Response to Comment 19-5

Staff agrees with the commenter's statement that South Coast AQMD has harmonized local, State, and Federal requirements, but as stated in response to Comment 19-3, local requirements can be more stringent.

Response to Comment 19-6

Although portable engines are subject to the State emission standards that CARB's Portable Equipment Registration Program (PERP) also refers to, there are more stringent requirements that apply to portable engines operated within the South Coast AQMD jurisdiction. It should be noted that a facility is allowed to comply with CARB's PERP regulation recordkeeping requirements as long as a portable engine does not remain more than 12 months at a single location. In this situation, the portable engine operator would not be required to comply with the portable engine recordkeeping requirements under Rule 1110.2. This provides the flexibility for an owner or operator to move the engine across various locations, inside or outside South Coast AQMD's jurisdiction. However, if a portable engine resides at a location for more than 12 consecutive months, it must comply with the portable engine recordkeeping requirements in Rule 1110.2 and would also require a South Coast AQMD permit to operate.

Response to Comment 19-7

Portable engines that are in RECLAIM (as well as those that are also in Title V and RECLAIM) must still comply with the RECLAIM monitoring, reporting, and recordkeeping (MRR) requirements while still in RECLAIM. Based on discussions with U.S. EPA, no facilities will be allowed to exit RECLAIM until all landing rules, RECLAIM rules, and Regulation XIII New Source Review rules are approved into the State Implementation Plan. As a result, all RECLAIM facilities will be subject to Rule 2012 until they exit RECLAIM. As long as any facility is in RECLAIM, it must still report all emissions from all devices from the facility and reconcile these emissions with RECLAIM trading credits (RTCs). However, once a facility exits RECLAIM, the facility will comply with Rule 1110.2 for MRR requirements, but would no longer be required to report mass emissions or reconcile emissions with RTCs.

Response to Comment 19-8

Please see the response to Comment 19-7 and 19-3.

Response to Comment 19-9

Staff, in moving forward with the RECLAIM transition, is requiring portable engines in RECLAIM to comply with the same requirements that all non-RECLAIM portable engines have been required to comply with for many years. Particularly some of these older portable engines are also subject to the phase out schedule in the State Air Toxics Control Measure.

ATTACHMENT J

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Socioeconomic Impact Assessment of Proposed Amended Rule 1110.2 – Emissions from Gaseous and Liquid-fueled Engines and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities

November 2019

Executive Officer
Wayne Nastri

Deputy Executive Officer
Planning, Rule Development & Area Sources
Philip Fine, Ph.D.

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Reviewed By:	Shah Dabirian, Ph.D., Program Supervisor William Wong, Principal Deputy District Counsel Mike Morris, Planning and Rules Manager

EXECUTIVE SUMMARY

Elements of Proposed Amendments	South Coast AQMD 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 1110.2 – Emissions from Gaseous and Liquid-fueled Engines; and PAR 1100 – Implementation Schedule for NOx Facilities, will be amended to transition equipment from the NOx RECLAIM program to a command-and-control regulatory structure while achieving Best Available Retrofit Control Technology (BARCT). The substantive provisions of PAR 1110.2 are: 1) expand the applicability to include internal combustion engines operated at RECLAIM and former-RECLAIM facilities not previously required to comply with BARCT limits in Rule 1110.2; and 2) require engines operated at RECLAIM and former RECLAIM facilities to comply with BARCT in accordance with existing Rule 1110.2 NOx limits. There are other minor and administrative changes that are also proposed for clarity and consistency throughout the rule. Implementation of the proposed project is estimated to reduce NOx emissions by 0.29 tons per day after implementation of BARCT limits. PAR 1100 would: 1) expand the applicability to include owner and operator of RECLAIM or former RECLAIM facility that owns or operates equipment subject to Rule 1110.2; 2) add definitions for additional clarity; and 3) establish the implementation schedule for RECLAIM engines subject to PAR 1110.2.
Affected Facilities and Industries	There are 21 RECLAIM facilities with 76 internal combustion engines that will be subject to PAR 1110.2. Twenty-one of these engines already meet the proposed NOx limit of 11 ppm. Eight portable engines at three facilities will be phased out. ~~Approximately~~ Staff expects that 47 engines across the remaining 10 facilities would need to be replaced, repowered, or retrofitted with air pollution controls in order to meet the NOx limits in PAR 1110.2. <table><tr><th>Total Engines Subject to PAR 1110.2</th><th>76</th></tr><tr><td>Already Compliant to 11 ppmv</td><td>21</td></tr><tr><td>Will be phased out</td><td>8</td></tr><tr><td>Remaining Engines with Compliance Costs</td><td>47</td></tr></table> Cost impacts for PAR 1110.2 were estimated for five facilities in Los Angeles County, three in Orange County, and one each in Riverside and San Bernardino Counties. The composition of affected engine equipment by county is 25 engines in Los Angeles County, 10 in Orange County, and six each in Riverside and San Bernardino Counties. <table><tr><th>County</th><th>Number of Engines</th><th>Facilities</th></tr><tr><td>Los Angeles</td><td>25</td><td>5</td></tr><tr><td>Orange</td><td>10</td><td>3</td></tr><tr><td>San Bernardino</td><td>6</td><td>1</td></tr><tr><td>Riverside</td><td>6</td><td>1</td></tr><tr><td>Total</td><td>47</td><td>10</td></tr></table>

Cost Assumptions	The Final Socioeconomic Report for the 2005 RECLAIM amendment fully analyzed the socioeconomic impacts of installing selective catalytic reduction (SCR) units at RECLAIM facilities that are currently proposed under PAR 1110.2. However, few of the RECLAIM facilities actually installed the control equipment while in RECLAIM, instead obtaining RTCs in lieu of any required emission reductions. Thus, for many of these RECLAIM facilities, they will actually undertake these costs of installation for the first time. Some of the PAR 1110.2 RECLAIM facilities impacted by the 2016 NOx RTC shave would seek emission controls rather than RTCs to achieve NOx emission limits. Moreover, the PAR 2001 Staff Report of July 2019 finds that "*even after Rule 2001 is amended, RECLAIM facilities will still enjoy a significant advantage over other facilities in their ability to use RECLAIM NSR provisions, especially the 1 to 1 offset ratio and the ability to use RTCs rather than the scarcer ERCs. On an overall basis, RECLAIM facilities are not disproportionately impacted*." Socioeconomic conditions have changed since the 2005 RECLAIM amendment's analysis of SCR equipment and installation costs. As a result, staff ~~conservatively analyzed~~ updated these socioeconomic impacts using, to the extent data is available, current costs under the current socioeconomic conditions. For facilities with engines requiring retrofit or replacement to meet the BARCT limit of 11 ppm defined in PAR 1110.2, the following cost assumptions were conservatively applied: **SCR Retrofits and New Installation Costs** The cost of SCR equipment varies partially on the size (horsepower) of the engine intended for the emission controls, and the range of engines in the PAR 1110.2 universe is from 131 hp to 5,500 hp. Accordingly, the range of SCR costs assumed for PAR 1110.2 is from $304,000 to $857,000 (rounded to the nearest thousand) across 37 engines (10 rich-burn engines will achieve required emission limits with existing NSCR equipment and tuning of engines and emission controls). The average SCR cost across all facilities/engines is $382,000, and the SCR equipment life is assumed to be 25 years. **CEMS Equipment and Installation Costs** For control equipment requiring continuous emission monitoring systems (CEMS), approximately $178,000 per system was assumed including equipment and installation. **Catalyst Replacement Costs** For the cost analysis in PAR 1110.2, the catalyst replacement interval assumed was 3 years, and the annual replacement costs range from approximately $28,000 to $231,000, with an average annual cost of $129,000 among 47 engines. **Total Engine Replacement Costs** The proposed emission limits of PAR 1110.2 are achievable with SCR additions and retrofits to existing control equipment. Due to the high cost of total engine replacement, it is assumed that a facility would meet compliance with PAR 1110.2

through the use of available emission control technologies rather than engine replacement. However, for ~~certain~~ an estimated three smaller and older diesel Tier 0 and Tier I engines, which are certified to a default emission factor of 600 to 800 ppm, retrofits are not feasible ~~because it would not achieve the PAR 1110.2 emission limits~~. ~~, and~~ Therefore engine replacement would be the preferred ~~control~~ compliance option.

Operations & Maintenance Costs
The operations and maintenance (O&M) costs in PAR 1110.2 range between $1,207 and $4,285 annually. The majority of the O&M costs come from electricity required to operate the SCR, and the remaining costs are periodic maintenance of the control equipment. Electrical demand increases as a function of the size of the SCR, which is scaled to the rate of emissions based on engine size.

CEMS Retrofit and New Installation Costs
Some facilities subject to PAR 1110.2 require continuous emission monitoring systems (CEMS) as new installations and/or permit modifications or re-certifications for the existing CEMS equipment. PAR 1110.2 assumes CEMS equipment and installations range between $124,000 and $178,000 for 23 engines, and the associated re-certification and permit modification costs estimated at approximately $4,000. Annual O&M costs of the CEMS equipment range between $10,000 and $20,000, respectively.

Compliance Costs

PAR 1110.2 Industry-Wide Compliance Costs (2021-2046)

Real interest rate scenario	Total cost if all expenses made in 2019	Annualized cost
High-rate scenario (4% interest rate)	**$87,682,000**	**$5,404,000**
Low-rate scenario (1% interest rate)	**$113,125,000**	**$4,690,000**

Note: A higher real interest rate means future expenses have lower current value. The real interest rate corrects for inflation, and is closely approximated by the nominal interest rate minus inflation.

The majority of compliance costs (61%) for PAR 1110.2 impact Pipeline Transportation (NAICS 4862), where engines are used by utility gas suppliers maintain pipeline systems for distribution of natural gas consumers. Smaller portions of the total costs impact Oil & Gas Extraction (NAICS 2111), Natural Gas Distribution (NAICS 2212), Beverage Manufacturing (NAICS 3121), and Amusement, Gambling and Recreation Industries (NAICS 7139) with 20%, 11%, 5%, and 3%, respectively.

The majority of the one-time costs come from the required purchase and installation of SCR controls or the retrofit of existing SCR equipment. The total cost of SCRs including installation is approximately $33.8 million or approximately $2.1 million average annual cost across the 10 affected facilities. The largest recurring cost is the replacement of catalyst, which totals almost $30.6 million or $1.88 million average annual cost across the 10 affected facilities.

Cost-Effectiveness

The cost-effectiveness of the PAR 1110.2 series is estimated to range from $32,000 to $41,000 per ton of NOx reduced based on the Discount Cash Flow (DCF) method, depending on discount and real interest rate (1% or 4%). The rich-burn engine category ~~shows a higher~~ is less cost-effective~~ness~~ figure because PAR 1110.2 requirements affect mainly CEMS equipment for the same catalytic controls. Although this category is subject to emission reductions, the cost is higher as a function of tons of NOx reduced.

	4% discount and real interest rate DCF cost-effectiveness ($/ton of NOx reduced)	**1% discount and real interest rate DCF cost-effectiveness ($/ton of NOx reduced)**
Lean-burn engines - 2 Stroke	$28,000	$36,000
Lean-burn engines - 4 Stroke	$34,000	$45,000
Rich-Burn Engines	$72,000	$80,000
Average (all types)	**$32,000**	**$41,000**

Jobs and Other Socioeconomic Impacts

Compliance costs for PAR 1110.2 are expected to result in 76 to 175 jobs foregone annually, on average, between 2021 and 2046. The projected job loss represents about 0.001% of total employment in the four-county region. The Pipeline Transportation industry, which bears more than half of the total expected compliance cost, would have an average of 8 to 13 jobs foregone annually. The industry with the largest job impacts is Construction, where an estimated 12 to 31 jobs would be foregone annually on average.

Competitiveness

On any given year during the period between 2021 and 2046, ~~The~~ the compliance costs of 1110.2 are expected to ~~impact~~ increase the relative costs of production at most ~~on any given year during the period of 2021 to 2046~~ in the following ranges by low-rate (1%) and high rate (4%) scenarios, respectively:

- Oil & Gas Extraction: 0.075-0.081%
- Natural Gas Distribution:0.026-0.014%
- Beverage Manufacturing: 0.005-0.006%
- Pipeline Transportation: 2.01-2.21%
- Amusement, Gambling, and Recreation Industries: ~~0.002~~ 0.002%

Over the same period, ~~The~~ the same industries are anticipated to experience an increase in relative delivered price in any given year in the following ranges ~~from 2021 to 2046 of at most by low-rate and high-rate scenarios, respectively~~:

- Oil & Gas Extraction: 0.009-0.01%
- Natural Gas Distribution: 0.027-0.015%
- Beverage Manufacturing: 0.006-0.006%
- Pipeline Transportation: 0.481-0.521%
- Amusement, Gambling, and Recreation Industries: 0.002-0.002%

Impacts of CEQA Alternatives	There are four CEQA alternatives associated with PAR 1110.2. Alternative A, the no project alternative, would mean that the current version of Rule 1110.2 would remain in effect. Alternative B (more stringent with distributed generation limits) sets emission limits for non-emergency engines driving electrical generators, with 0.070 lbs/MW-hr NOx, 0.20 lbs/MW-hr CO, and 0.10 lbs/MW-hr VOC. Alternative C (more stringent) sets emission limits for NOx at 7 ppmv (at 15% O_2) and a 5 ppmv ammonia slip limit. Alternative D (less stringent) delays the compliance date for compressor gas two-stroke or four-stroke engines to 2031 instead of the proposed project's 2023 date.

	Average Annual, 2021-2046		
Alternatives	**Cost**	**Job Impacts**	**DCF Cost-Effectiveness, 4%; $ per ton NOx**
Proposed Amendments	$5,464,000	-175	$32,000
Alternative A - No Project	-	-	-
Alternative B – More Stringent, Total Engine Replacement	$23,541,000	-722	$136,000
Alternative C – More Stringent	$13,464,000	-410	$78,000
Alternative D – Less Stringent	$4,237,000	-118	$22,000

INTRODUCTION

The South Coast AQMD's 2016 Air Quality Management Plan established Control Measure CMB-05 – Further NOx Reductions from RECLAIM Assessment, committed to an additional five ton NOx reduction per day to occur by 2025. The South Coast AQMD Governing Board directed staff to implement an orderly sunset of the RECLAIM program and transition to a command-and-control regulatory structure to achieve the additional five ton per day NOx reductions. California State Assembly Bill (AB) 617 also promulgated an expedited schedule for Best Available Retrofit Control Technology (BARCT). A programmatic analysis of ~~the~~ RECLAIM concluded that command-and-control rules would need to be adopted and/or amended reflecting current BARCT and provided implementation timeframes for achieving BARCT.[1] South Coast AQMD staff concluded that RECLAIM facilities should not exit the program unless their equipment is subject to an adopted BARCT rule. Since 2018, South Coast AQMD has amended or adopted Rule 1135, Rule 1146, Rule 1146.1, Rule 1146.2, Rule 1118.1, and Rule 1134 with BARCT requirements for facilities exiting RECLAIM. So far only two facilities have exited RECLAIM, and due to EPA concerns about early exiting, South Coast AQMD has stopped allowing facilities to exit RECLAIM with the July 12, 2019 amendment to Rule 2001.

Proposed Amended Rule 1110.2 - Emissions from Gaseous and Liquid-fueled Engines, and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities would set new emission limits for Oxides of Nitrogen (NOx), Volatile Organic Compounds (VOCs), and Carbon Monoxide (CO) from all stationary and portable engines over 50 rated brake horsepower (bhp). Implementation of the proposed amendment is estimated to reduce NOx emissions by 0.29 tons per day after implementation of BARCT limits.

The substantive provisions of PAR 1110.2 are:

1) Expand the applicability to include internal combustion engines operated at RECLAIM and former-RECLAIM facilities not previously required to comply with BARCT limits in Rule 1110.2; and
2) Require engines operated at RECLAIM and former RECLAIM facilities to comply with BARCT in accordance with existing Rule 1110.2 NOx limits

PAR 1100 would:

1) Expand the applicability to include owners and operators of a RECLAIM or former RECLAIM facility that owns or operates equipment subject to Rule 1110.2; and
2) Add definitions for additional clarity

LEGISLATIVE MANDATES

The legal mandates directly related to the assessment of the proposed amended rule include South Coast AQMD Governing Board resolutions and various sections of the California Health & Safety Code.

[1] South Coast AQMD, *Report on Feasible Target Dates for Sunsetting the RECLAIM Program*, Governing Board Meeting: May 5, 2017. Available: http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2017/2017-may5-026.pdf?

South Coast AQMD Governing Board Resolutions

On March 17, 1989 the South Coast AQMD 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. Health and Safety Code sections 40440.8(a) and (b), which became effective on January 1, 1991, require 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

Health and Safety Code section 40728.5, which became effective on January 1, 1992, requires the South Coast AQMD 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 impact 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, Health and Safety Code section 40920.6, which became effective on January 1, 1996, requires 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 1110.2 was adopted in August 1990, requiring additional reductions for NOx and VOCs from gaseous-fueled combustion engines rated greater than 50-bhp, extending from emission controls for NOx and CO that were previously required in Rule 1110.1, adopted in October 1984.

Administrative changes and clarifications for the rule amendments were adopted in August 1994 and December 1994, with no socioeconomic impacts. In November 1997 requirements for portable engines were revised to be consistent with federal and state regulations. In addition, the continuous emission monitoring requirements for CO were removed and source testing was reduced from annually to every three years.

In June 2005 stationary agricultural engines were required to comply with the rule by replacing their engines with a controlled spark ignition engine and non-selective catalytic reduction system (NSCR) or an electric motor, or adding an NSCR to an existing spark ignition engine. The total annual cost of PAR 1110.2 was estimated at $316,000 per year (2005 dollars), but with the available state funding, the cost to agricultural facilities was reduced to $40,000 per year.

The adoption of the February 2008 amendment to 1110.2 lowered NOx, VOC, and CO emission limits for stationary, non-emergency engines. It also established lower emission standards for new, non-emergency electrical generation engines. The amendment also increased monitoring requirements to include more frequent emissions testing and the development of Inspection and Monitoring (I&M) plans. This amendment affected 859 engines at 405 facilities. Overall, costs for all the affected industries ranged from $10.76 million in 2008 to $27.24 million in 2012, with an average annual cost of $22.39 million between 2008 and 2020. 169 jobs were projected to be forgone annually, on average, between 2008 and 2020 in the local economy.

In September 2012, Rule 1110.2 was amended to establish emission limits for biogas/natural gas engines. Included in the amendment was a technology assessment for biogas engine control technology. In December 2015, the compliance deadline for biogas engines was extended by one year. The amendment also addressed concerns raised by the United States Environmental Protection Agency related to State Implementation Plan (SIP) approval issues contained in the rule language regarding excess emissions from startup, shutdown, and malfunction (SSM).

In June 2016, Rule 1110.2 was amended to extend the compliance deadline for one landfill gas facility due to economic concerns related to its power purchase agreement. The facility is required to retire its engines subject to the rule by October 1, 2022.

AFFECTED EQUIPMENT AND FACILTIES

PAR 1110.2 applies to gaseous- and liquid-fueled stationary and portable engines over 50 bhp. There are 21 RECLAIM facilities with 76 internal combustion engines that will be subject to PAR

1110.2. Twenty-one of these engines already meet the proposed NOx limit of 11 ppm. Eight portable engines at three facilities will be phased out. There are two engines that are limited to 499 operating hours per year that are not required to meet the 11 ppm NOx limit. Approximately 47 engines across the remaining 10 facilities would need to be replaced, repowered, or retrofitted with air pollution controls in order to meet the NOx limits in PAR 1110.2.

Table 1:
PAR 1110.2 Affected Equipment and Facilities by Industry Category

NAICS	Industry Description	Number of Engines	Facilities
312120	Breweries	2	1
211111	Crude Petroleum and Natural Gas Extraction	11	4
221210	Natural Gas Distribution	3	2
486210	Pipeline Transportation of Natural Gas	25	2
713920	Skiing Facilities	6	1
Total		**47**	**10**

Cost impacts for PAR 1110.2 were estimated for four facilities in Los Angeles County, three in Orange County, and one each in Riverside and San Bernardino Counties. The composition of affected engine equipment by county is 25 engines in Los Angeles County, 10 in Orange County, and six each in Riverside and San Bernardino Counties.

Table 2:
PAR 1110.2 Affected Equipment and Facilities by County

County	Number of Engines	Facilities
Los Angeles	25	5
Orange	10	3
San Bernardino	6	1
Riverside	6	1
Total	**47**	**10**

Small Business

South Coast AQMD defines a "small business" in Rule 102 as one which employs 10 or fewer persons and which earns less than $500,000 in gross annual receipts. South Coast AQMD also defines “small business” for the purpose of qualifying for access to services from the South Coast AQMD’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 SCAQMD's 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 CAAA 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 $7.0 million in average annual receipts for most nonmanufacturing industries.[2]

Revenue and employee data was available for 5 of the 10 affected facilities in PAR 1110.2 in the Dun and Bradstreet Enterprise Database.[3] Under South Coast AQMD's definition of a small business (Small Business Assistance Office), there are no businesses with available data potentially affected by the requirements of PAR 1110.2 that meet the criteria for a small business. Using the sector-specific SBA definitions, two of the facilities are classified as small businesses. Under the CAAA definition of small business, none of the facilities are considered small businesses.

COMPLIANCE COSTS

Analysis Timeframe

The cost estimate for PAR 1110.2 assumes the first year of costs would be incurred by facilities in 2021, when equipment would be required to meet emission limits defined in the rule. The primary emission control for most engines subject to PAR 1110.2 is selective catalytic reduction (SCR) units, for which the equipment life is assumed to be 25 years before replacement or retrofit is needed. The horizon of the analysis timeline is 2046, which is 25 years after the initial implementation of required controls and emission reductions.

One-time and Recurring Costs

Compliance costs associated with PAR 1110.2 include one-time (capital) costs and recurring costs. The one-time costs include SCR equipment and installation costs, continuous emission monitoring systems (CEMS) equipment and installation costs, as well as one-time permitting fees with South Coast AQMD for SCRs and CEMS with modifications. Recurring costs include annual permit renewal fees for SCR units, operating and maintenance (O&M) costs, triennial catalyst replacement costs, urea usage, annual maintenance and certification for CEMS equipment, and electricity to run SCR equipment.[4] One-time and recurring costs estimates exclude operating costs for existing emission control installations, so the cost estimates account for PAR 1110.2 compliance costs above a facility's current operational baseline.

[2] The latest SBA definition of small businesses by industry can be found at http://www.sba.gov/content/table-smallbusiness-size-standards.

[3] Dun & Bradstreet Enterprise Database, 2019.

[4] For one facility that operates six engines subject to PAR 1110.2, due to the specific nature of the SCR equipment, the catalyst replacement interval is assumed to be 10 years instead of three based on current practice.

One-time Costs

Staff has used the U.S. EPA Air Pollution Control Cost Manual to estimate costs of capital, installation, and operating and maintenance of SCRs.[5] Required modifications (and associated costs) to facilities in order to meet the updated BARCT NOx concentration limits in PAR 1110.2 are detailed below.

Total one-time capital costs for an SCR retrofit include direct and indirect costs associated with purchasing and installing SCR equipment. These costs include the equipment cost for the SCR system itself, the cost of auxiliary equipment, direct and indirect installation costs, and additional costs due to installation such as asbestos removal. The cost of SCR equipment varies partially on the size (horsepower) of the engine intended for the emission controls, and the range of engines in the PAR 1110.2 universe is from 131 hp to 5,500 hp. Accordingly, the range of SCR costs assumed for PAR 1110.2 is from $304,000 to $857,000 (rounded to the nearest thousand) across 37 engines.[6] The average SCR equipment plus installation cost across all facilities/engines is $0.96 million. For the 37 engines across 10 facilities potentially affected by PAR 1110.2, the total capital costs associated with SCR equipment or retrofit of existing equipment, including installation, are approximately $33.8 - $36 million. Per unit equipment costs for SCRs and retrofits range from $0.09 - $0.86 million, and per unit installation costs range from $0.36 - $1.29 million. A smaller subset with 10 engines, rich-burn engines, which require non-selective catalytic reduction (NSCR, also known as 3-way catalyst), are already close to the 11 ppm NOx limit. Compliance with PAR 1110.2 limits for rich-burn engines would likely be achieved through tuning or NSCR retrofit, which have ~~significantly lower~~ minimal costs for modifications to existing equipment ~~than a SCR retrofit~~. One-time permitting fees would apply to 31 of the 47 engines subject to PAR 1110.2, requiring a permit modification at a cost per unit is assumed of $4,659.

Some facilities subject to PAR 1110.2 require continuous emission monitoring systems (CEMS) as new installations and/or permit modifications or re-certifications for the existing CEMS equipment. PAR 1110.2 assumes CEMS equipment and installations range between $124,000 and $178,000 for 23 engines, and the associated re-certification and permit modification costs estimated at approximately $4,000.

Recurring Costs

The largest recurring cost for affected PAR 1110.2 facilities is catalyst replacement. Consumption of catalyst is a function of SCR size and emission reduction requirements, but staff assumed a replacement interval of three years for most SCRs with the exception of one facility whose six engines and SCRs would need catalyst replacement every 10 years.[7] The range of triennial catalyst replacement costs is from $28,000 - $231,000 per SCR unit (average cost per unit is $129,000), while one facility with a 10 year catalyst replacement interval for six engines is $50,000 per unit. Urea costs associated with the operation of each SCRs range from $18,000 to $35,000 annually, and O&M (not including electricity) costs range from $1,207 to $4,285 per unit. Electrical costs

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[5] U.S. EPA Air Pollution Control Cost Manual, Selective Catalytic Reduction available at: https://www.epa.gov/sites/production/files/201712/documents/scrcostmanualchapter7thedition_2016revisions2017.pdf

[6] 10 engines subject to PAR 1110.2 categorized as rich-burn engines, will meet rule requirements through modification or installation of CEMS, and thus do not require retrofit or replacement to existing SCR equipment.

[7] Catalyst replacement intervals are based on typical vendor guarantees, but may be longer in actual practice.

per unit is estimated at $1,395 annually. Recurring costs associated with CEMS units include annual service and maintenance. These costs are expected to range from $10,000 - $20,000 annually.

The proposed emission limits of PAR 1110.2 are achievable with SCR additions and retrofits to existing control equipment. Due to the high cost of total engine replacement, it is assumed that a facility would meet compliance with PAR 1110.2 through the use of available emission control technologies rather than engine replacement. However, ~~some~~ an estimated three smaller and older diesel engines would require engine replacement with Tier IV final engines because retrofitting with SCR controls is not feasible.[8]

The average annual cost of PAR 1110.2 is estimated to be $4.7 – 5.5 million (in 2019 dollars) between 2021 and 2046, for the 1% and 4% real interest rate scenarios, respectively.[9] Table 3 shows a breakdown of both in present worth value of total costs and annualized total costs by industry.

Table 3:
Annual Estimated Costs of PAR 1110.2 by Industry

Industry Description	Number of Facilities	Present Worth Value (2019)		Average Annual Costs (2021-2046)	
		1% Discount Rate	4% Discount Rate	1% Discount Rate	4% Discount Rate
Oil and gas extraction (2111)	4	$22,895,000	$17,386,000	$950,000	$1,084,000
Natural gas distribution (2212)	2	$12,415,000	$9,652,000	$515,000	$603,000
Beverage manufacturing (3121)	1	$5,433,000	$4,120,000	$225,000	$257,000
Pipeline transportation (486)	2	$68,469,000	$53,533,000	$2,839,000	$3,336,000
Amusement, gambling, and recreation industries (7139)	1	$3,914,000	$2,992,000	$162,000	$184,000
Total	**10**	**$113,125,000**	**$87,682,000**	**$4,690,000**	**$5,464,000**

Note: Cost totals shown across all facilities, and costs by category are not evenly distributed among facilities.

Figure 1 illustrates that Pipeline Transportation (NAICS 4862) is expected to incur the largest portion of overall compliance cost with 61%, Oil and Gas Extraction (2111) 21%, Natural Gas

[8] For the Tier 0 and Tier I engines in which certified default emission factors range from 600 to 800 ppm, retrofits would not achieve the required NOx limits of PAR 1110.2.
[9] SCAQMD uses both 1% and 4% real interest rates to provide a range of potential compliance cost estimates for the proposed amendments.

Distribution (221210) 11%, Beverage Manufacturing (3121) 5%, and Amusement, Gambling and Recreation Industries (7139) 3%.

Figure 1:
Portion of Estimated Annual Compliance Costs by Industry, 2021-2046

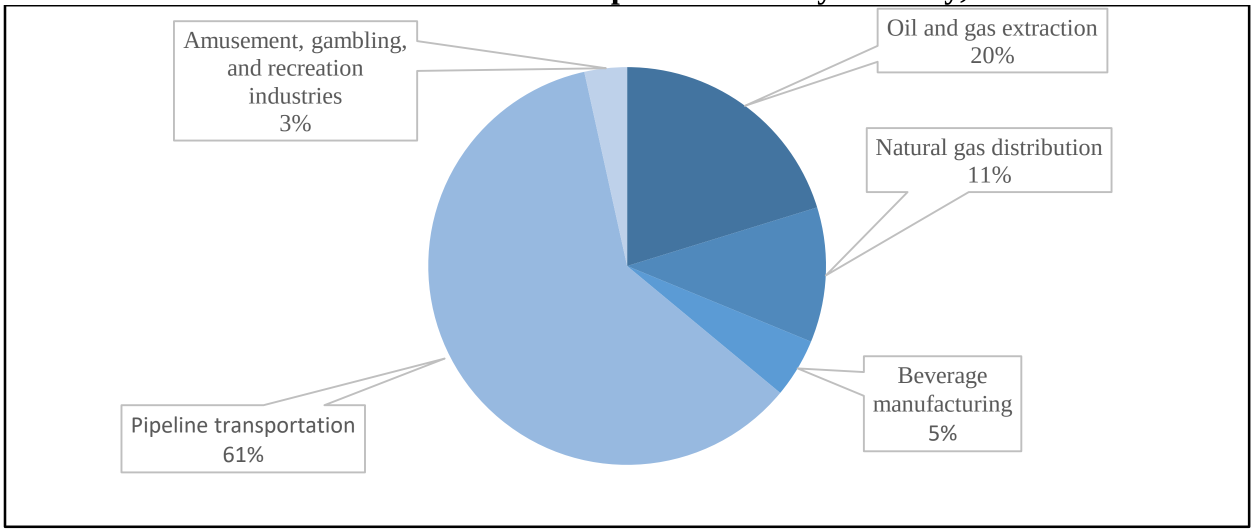


Table 4 shows the distribution of compliance costs by selected cost categories. The majority of capital costs ($2.1 million annually or 39%) are expected to occur from the purchase, installation and/or retrofit of SCR equipment. The remaining one-time costs of CEMS equipment and installation, and permitting total approximately $295,000 annually or 6%.

The largest source of costs is from the recurring cost catalyst replacement, also shown in Table 4, which totals almost $1.9 million annually or 35% across the 47 engines in the PAR 1110.2 universe. Urea consumption accounts for $495,000 (9%) in annual costs of PAR 1110.2, and CEMS service and maintenance costs are approximately $483,000 (9%) annually. Other recurring costs of electricity ($61,000), annual SCR permit renewal ($52,000), and SCR O&M costs ($66,000) each total about 1% each of the annual costs from PAR 1110.2.

Table 4:
Annual Estimated Costs of PAR 1110.2 by Cost Categories

	Present Worth Value (2019)		Annual Average (2021-2046)	
Cost Categories	**1% Discount Rate**	**4% Discount Rate**	**1% Real Interest Rate**	**4% Real Interest Rate**
One-Time Cost				
SCR	$14,336,000	$13,364,000	$596,000	$840,000
SCR (install)	$21,991,000	$20,501,000	$914,000	$1,288,000
SCR (initial permitting fees)	$147,000	$137,000	$6,000	$9,000
CEMS (Equipment/Install)	$3,319,000	$4,607,000	$138,000	$289,000
CEMS (Certification/Modification Fees)	$82,000	$76,000	$3,000	$5,000
One-Time Cost Subtotal	$39,875,000	$38,685,000	$1,657,000	$2,431,000
Recurring Cost				
CEMS Annual Svc. Cost	$11,620,000	$7,684,000	$483,000	$483,000
SCR (permit renewal)	$1,247,000	$824,000	$52,000	$52,000
O&M	$1,579,000	$1,044,000	$66,000	$66,000
Catalyst	$45,438,000	$30,606,000	$1,878,000	$1,878,000
Increased Urea	$11,902,000	$7,870,000	$495,000	$495,000
SCR (electricity)	$1,465,000	$969,000	$61,000	$61,000
Recurring Cost Subtotal	$73,251,000	$48,997,000	$3,035,000	$3,035,000
Total	**$113,125,000**	**$87,682,000**	**$4,690,000**	**$5,464,000**

PAR 1100
Proposed Amended Rule 1100 (PAR 1100) establishes the implementation schedule for PAR 1110.2 for RECLAIM and former RECLAIM facilities. PAR 1100 includes engines regulated under PAR 1110.2 in its applicability for owners or operators of RECLAIM or former RECLAIM facilities. PAR 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.

COST-EFFECTIVENESS

Table 5 shows the cost-effectiveness of the PAR 1110.2 series is estimated to range from $32,000 to $41,000 per ton of NOx reduced based on the Discount Cash Flow (DCF) method, depending on real interest rate used (1% or 4%). 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 rich-burn engine category shows a higher cost-effectiveness figure because PAR 1110.2 requirements affect mainly CEMS equipment. Although this category is subject to emission reductions, the cost reduced is higher as a function of the smaller amount of tons of NOx reduced.

Table 5:
PAR 1110.2 Cost-Effectiveness[10]

	4% discount and real interest rate DCF cost-effectiveness	1% discount and real interest rate DCF cost-effectiveness
Lean-burn engines - 2 Stroke	$28,000	$36,000
Lean-burn engines - 4 Stroke	$34,000	$45,000
Rich-Burn Engines	$72,000	$80,000
Average (all types)	**$32,000**	**$41,000**

Note: A higher real interest rate means future expenses have lower current value. The real interest rate corrects for inflation, and is closely approximated by the nominal interest rate minus inflation.

JOBS AND SOCIOECONOMIC IMPACTS

The REMI model (PI+ v2.3.1) was used to assess the total socioeconomic impacts of a regulatory change (i.e., the proposed rule).[11] 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.[12]

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 regulatory scenario under which the affected facilities would incur an average annual compliance costs totaling $4.7 - $5.5 million. 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 actors in the four-county economy on an annual basis and across a user-defined horizon (2021 - 2046). 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.

[10] ~~The cost-effectiveness values presented in this analysis differ slightly from that of the SCAQMD Staff report for PAR 1110.2. 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)*

[11] Regional Economic Modeling Inc. (REMI). Policy Insight® for the South Coast Area (160 sector model). Version 2.3.1, 2019.

[12] 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.)

While compliance expenditures may increase the cost of doing business for affected facilities, the purchase and installation of additional equipment combined with spending on operating and maintenance, may increase sales in other sectors. Table 4 lists the industry sectors modeled in REMI that would either incur a cost or benefit from the compliance expenditures.
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 at a regional scale. The most recent regional analysis was conducted for the 2016 Air Quality Management Plan (AQMP) which found significant health benefits if federal air quality standards are met.

On average, PAR 1110.2 is expected to result in approximately 76 - 175 jobs forgone annually, between 2021 and 2046, depending on the real interest rate assumed (1% - 4%). The projected job loss impacts represent about 0.00065% - 0.0015% of the total employment in the four-county region. Table 7 presents the job impacts across multiple sectors of the regional economy for selected years in the planning horizon.

Table 6:
Industries Incurring vs. Benefitting from Compliance Costs/Spending

Source of Compliance Cost	**REMI Industries Incurring Compliance Costs (NAICS)**	**REMI Industries Benefitting from Compliance Spending (NAICS)**
SCR	Oil and gas extraction (211) Natural Gas Extraction (2212) Beverage Manufacturing (3121) Pipeline Transportation (486) Amusement, Gambling, and Recreation Industries (713)	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing (3334)
SCR (installation)		
SCR (initial permitting fees)		Construction (23)
CEMS (Equipment + Install)		State and Local Government (92)
CEMS (Certification/Modification Fees)		Management, scientific, and technical consulting services (5416)

Table 7:
Job Impacts of PAR 1110.2

Industry (NAICS)	2021	2024	2029	2035	2040	2046	Average annual jobs change	Baseline annual jobs (2021-2046)	% Change from average baseline (2021-2046)
Construction (23)	71	-106	-27	-10	-13	-10	-31	496,308	-0.0063%
Retail trade (44-45)	-4	-28	-11	-11	-12	-12	-15	1,015,185	-0.0015%
State and Local Government (92)	-1	-19	-15	-13	-13	-11	-14	902,552	-0.0015%
Pipeline Transportation (486)	-30	-28	-9	-8	-7	-6	-13	957	-1.3994%
Local Government (N/A)	0	-17	-13	-11	-11	-10	-12	755,529	-0.0016%
Management, scientific, and technical consulting services (5415)	-2	-7	-9	-11	-12	-12	-10	212,901	-0.0046%
Food services and drinking places (722)	-1	-13	-8	-8	-8	-8	-9	789,531	-0.0011%
Real Estate (531)	-2	-11	-4	-4	-4	-5	-6	588,763	-0.0010%
Wholesale Trade (42)	1	-10	-4	-4	-4	-4	-5	456,804	-0.0011%
Oil and Gas Extraction (211)	-7	-8	-4	-3	-3	-3	-5	20,161	-0.0230%
Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing (3334)	10	0	0	0	0	0	0	2,117	0.0141%
All Other Industries	1	-122	-50	-51	-57	-58	-68	7,155,021	-0.0009%
Total	**27**	**-351**	**-141**	**-122**	**-133**	**-129**	**-175**	**11,638,182**	**-0.0015%**

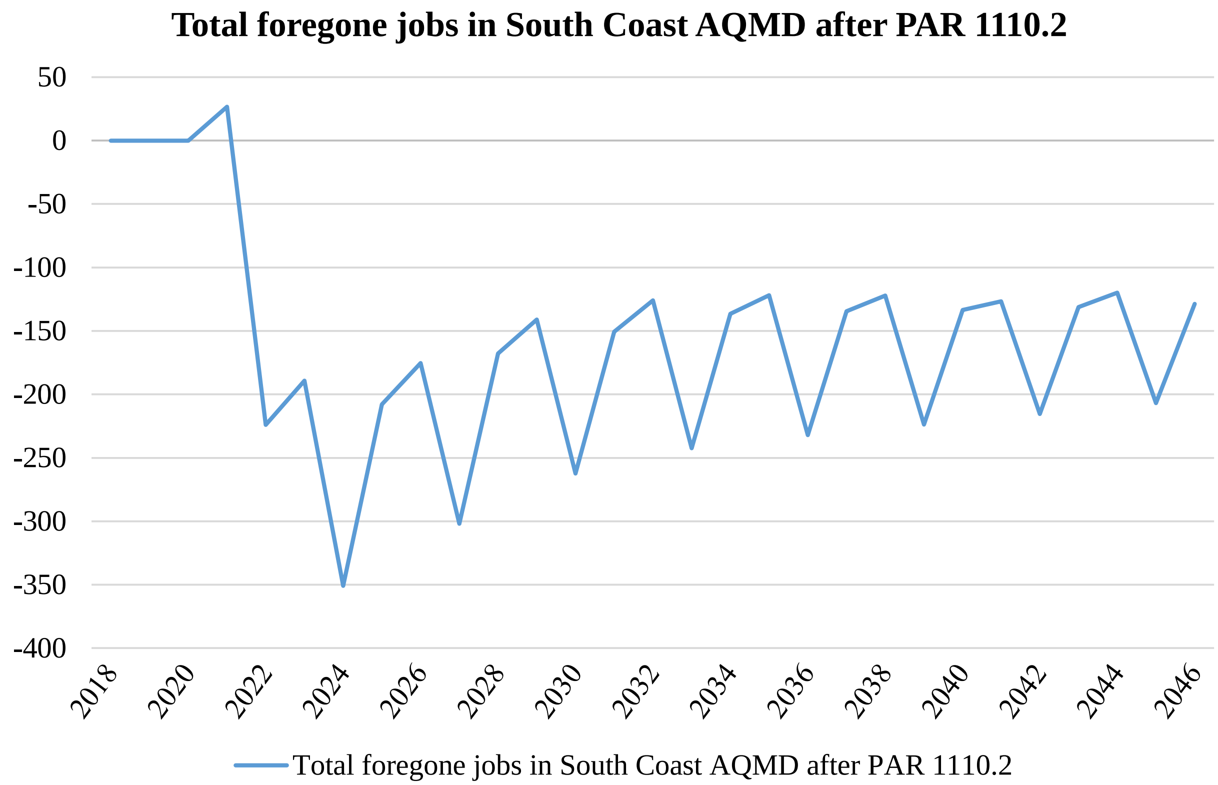
*Assumes a 4% real interest rate

In earlier years of the regional simulation 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. Construction (NAICS 23) is projected to gain 71 jobs in 2021 from additional demand for equipment installation from the affected facilities on average. Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing (NAICS 3334) also benefits from installations from SCR retrofits and installations in 2021, netting 10 additional jobs in the first year of implementation. Across all industries, the net effect of PAR 1110.2 is a gain of 27 jobs in 2021.

Subsequent years net a decrease in jobs across all industries as a result of direct costs of compliance. Table 7 ranks the most negatively impacted industries over the timeline of the analysis.[13] 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. The reduction in disposable income would dampen the demand for goods and services in the local economy, thus resulting in a relatively large number of jobs forgone projected in sectors such as construction (NAICS 23), retail trade (NAICS 44 - 45), and State and Local Government (NAICS 92). Cyclical job impacts relating to catalyst replacement on a triennial interval are the source of recurring fluctuations in the total job market. Such fluctuations reach a maximum short-term change of 176 jobs foregone in the period from 2024 to 2046, but vary less over time do to predictable market adjustments in demand.

[13] NAICS 3334 is included in Table 4 as an industry benefitting from compliance costs as a result of installations to affected facilities, but does not rank in the top 10 overall from jobs foregone across all industries in the four-county region.

Figure 2:
Projected Regional Job Impact, 2021 – 2046



COMPETITIVENESS

The additional cost brought on by PAR 1110.2 would increase the cost of services rendered by the affected industries in the region. The magnitude of the impact depends on the size, diversification, 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 from elsewhere.

It is projected that the Pipeline Transportation sector (NAICS 486), which affects 25 engines across four facilities, would experience a rise in its relative cost of production of 1.88% in 2024 for the 4% real interest rate scenario, and on average is projected to see an increase of 2.21% over the period from 2021 to 2046. Oil and Gas Extraction (NAICS 211) is expected to see an increase in its delivered price of 0.07% in 2024, with an overall increase of 0.08% on average over 2021 to 2046.

Table 8:
PAR 1110.2 Projected Relative Cost of Production

Industry	NAICS	1%	4%
Oil and gas extraction	2111	0.0750%	0.0810%
Natural gas distribution	2212	0.0260%	0.0140%
Beverage manufacturing	3121	0.0050%	0.0060%
Pipeline transportation	4862	2.0110%	2.2070%
Amusement, gambling, and recreation industries	7139	0.0020%	0.0020%

Delivered prices that a facility may charge for specific goods or services may increase at a greater rate than predicted, allowing incurred costs to be passed through to downstream industries and end-users. The remaining sectors are likely to experience increases in the relative cost of production and relative delivered price with respect to their counterparts in the rest of the U.S. The natural gas distribution sector (NAICS 2212) is expected to experience an increase in its delivered price by 0.01% in 2024 for the 4% real interest rate scenario, and on average will increase by 0.014% over 2021 to 2046. Smaller impacts to relative cost of production are projected for Amusement, Gambling and Recreation industries (NAICS 713), and Beverage Manufacturing (NAICS 3121), with no estimated increase by 2024 for both, and over time an increase of 0.002% and 0.006%, respectively, over 2021 to 2046.

Table 9:
PAR 1110.2 Projected Relative Delivered Price

Industry	NAICS	1%	4%
Oil and gas extraction	2111	0.0090%	0.0100%
Natural gas distribution	2212	0.0270%	0.0150%
Beverage manufacturing	3121	0.0060%	0.0060%
Pipeline transportation	4862	0.4810%	0.5210%
Amusement, gambling, and recreation industries	7139	0.0020%	0.0020%

CEQA ALTERNATIVES

There are four CEQA alternatives associated with PAR 1110.2. Alternative A, the "no project" alternative, means that the current version of Rule 1110.2 would remain in effect. Alternative B, with distributed generation limits would impose a 0.07 lbs./MW-hr NOx limit, presumed to be achievable in most applications only with a total engine replacement. Alternative C would impose stricter emission limits than the proposed project, with a limit of 7 ppmv NOx at 15% O_2, achieved with greater SCR reductions using additional ammonia and catalyst. Alternative D, the phased-in compliance date, assumes the same reductions as the proposed project but with a later date of required compliance.

Assuming a 4% interest rate, average annual compliance costs for the CEQA alternatives range from \$4.2 - \$23.5 million between 2021 and 2046, as shown in Table ~~8~~10. Jobs forgone for the

CEQA alternatives range from 118 to 722 between 2021 and 2046. Alternative B, which aims for more stringent reductions to 2.5 ppmv NOx, could most reasonably be achieved through total engine replacement of a significant number of facilities subject to PAR 1110.2. As explained earlier in the compliance costs section, total engine replacement was seen as a costly path to reductions, and therefore most of the limits proposed in PAR 1110.2 are based on achievable reductions with SCR retrofits and replacements. Cost-effectiveness accordingly increases to $136,000 per ton of NOx reduced for Alternative B. Alternative C, which sets more stringent emission limits for NOx to 7 ppmv (proposed amendments are 11 ppmv NOx), would achieve the reductions with SCR enhancements and additional catalyst layers. The additional capital costs of SCR enhancements as well as the increased recurring cost of catalyst consumption puts Alternative C at a cost-effectiveness level of $78,000 per ton of NOx reduced. Alternative D, which maintains the same emission limits as the proposed amendments, but with a delayed implementation for compressor gas 2-stroke and 4-stroke lean-burn engines (to comply by December 31, 2027).[14]

Table ~~8~~10:
CEQA Alternatives Comparison to Proposed Amendments

	Average Annual, 2021-2046		
Alternatives	**Cost**	**Job Impacts**	**DCF Cost-Effectiveness, 4%; $ per ton NOx**
Proposed Amendments	$5,464,000	-175	$32,000
Alternative A - No Project	-	-	-
Alternative B – More Stringent, Total Engine Replacement	$23,541,000	-722	$136,000
Alternative C – More Stringent	$13,464,000	-410	$78,000
Alternative D – Less Stringent	$4,237,000	-118	$22,000

[14] The current PAR 1100 provides an extension to the compliance schedule for the compressor gas lean-burn engines. The first compliance deadline is 2023 for retrofits, and facilities can get an extension through a compliance plan for two years from the issuance of a permit to construct. For example, if a facility owner or operator applies by 7/1/2021 and the permit to construct is issued one year later (typical time it takes for South Coast AQMD to process), the first compliance deadline could be 7/1/2024. Proposed rule provisions would allow an additional 2 year extension, so the compliance deadline can be up to 7/1/2026. For replacements, an application received by 7/1/2022 that receives a permit to construct by 7/1/2023, would have 36 months or until 7/1/2026. Another extension of 3 additional years may be requested, with a final compliance date of 7/1/2029.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Subsequent Environmental Assessment for Proposed Amended Rule 1110.2 - Emissions from Gaseous-and Liquid-Fueled Engines and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities

October 2019

South Coast AQMD No. 07252019TT
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PREFACE

This document constitutes the Final Subsequent Environmental Assessment (SEA) for Proposed Amended Rule (PAR) 1110.2 - Emissions from Gaseous-and Liquid-Fueled Engines, and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities. A Draft SEA was circulated for a 46-day public review and comment period from Friday, July 26, 2019 to Tuesday, September 10, 2019 and five comment letters were received. The comment letters and responses relative to the Draft SEA have been included in Appendix G of this Final SEA.

Analysis of PARs 1110.2 and 1100 in the 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].

In addition, subsequent to the release of the Draft SEA for public review and comment, minor modifications were made to PARs 1110.2 and 1100. The minor modifications to PAR 1110.2 include the following: 1) adding, revising, and removing various definitions for clarification; 2) rewording and renumbering of rule language; 3) adding an exemption for engines which are used to power cranes operated in either the Southern California Coastal Waters or Outer Continental Shelf Waters; and 4) establishing an interim VOC limit for electric generating units, also referred to as linear generator engines, that: a) do not have ammonia emissions from add-on control equipment; b) meet the NOx limit of Rule 1110.2 Table IV; and c) were installed prior to January 1, 2024. The minor modifications to PAR 1100 include the following: 1) adding, revising, and removing various definitions for clarification; 2) rewording and renumbering of rule language; 3) extending compliance date for achieving the emission limits specified in the rule and adding interim emission limits for compressor gas lean-burn engines if the owners or operators submit a request for a time extension; 4) adding alternative emission limits for compressor gas lean-burn engines; 5) extending the compliance date for achieving the emission limits for compressor gas lean-burn engines undergoing a facility-wide engine modernization; 6) adding a requirement for permit applications to be submitted by July 1, 2021; and 7) adding low-use criteria for diesel engines operated at ski resorts. To facilitate identification of the changes between the Draft SEA and the Final SEA, modifications to the document are included as underlined text and text removed from the document is indicated by ~~strikethrough~~. To avoid confusion, minor formatting changes are not shown in underline or strikethrough.

South Coast AQMD staff has reviewed the modifications to PARs 1110.2 and 1100 after the release of the Draft SEA for public review and comment period 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 Draft SEA. In addition, revisions to the proposed project and analysis 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 Draft SEA pursuant to CEQA Guidelines Sections 15073.5 and 15088.5. Therefore, the Draft SEA has been revised to include the aforementioned modifications such that it is now the Final SEA for PARs 1110.2 and 1100.

TABLE OF CONTENTS

CHAPTER 5 – ALTERNATIVES

APPENDICES

Page No.

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

EXECUTIVE SUMMARY

INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (South Coast AQMD) 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 South Coast AQMD 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 California Environmental Quality Act (CEQA) Guidelines[2] 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 South Coast AQMD 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 South Coast AQMD[3]. Furthermore, the South Coast AQMD must adopt rules and regulations that carry out the AQMP[4]. The AQMP is a regional blueprint for how the South Coast AQMD will achieve air quality standards and healthful air and the 2016 AQMP[5] 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 oxides of nitrogen (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 South Coast AQMD Governing Board adopted Regulation XX – Regional Clean Air Incentives Market (RECLAIM) to reduce NOx and oxides of sulfur (SOx) emissions

1 The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., Ch. 324 (codified at Health and Safety Code Section 40400-40540).
2 The CEQA Guidelines are codified at Title 14 California Code of Regulations Section 15000 *et seq.*
3 Health and Safety Code Section 40460(a).
4 Health and Safety Code Section 40440(a).
5 South Coast AQMD, Final 2016 Air Quality Management Plan, March 2017. https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp

from high emitting 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 emission 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 smaller 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 to additional NOx emission reductions of five tons per day to occur by 2025. Also, the South Coast AQMD Governing Board directed staff to implement an orderly sunset of the RECLAIM program to achieve the additional five tons per day. Thus, CMB-05 committed to a process of transitioning NOx RECLAIM facilities to a command-and-control regulatory structure and ensure that the applicable equipment will meet Best Available Retrofit Control Technology (BARCT) level equivalency as soon as practicable.

On July 26, 2017, California State Assembly Bill (AB) 617 was approved by the Governor, which addresses community monitoring and non-vehicular air pollution (criteria pollutants and toxic air contaminants). AB 398, a companion to AB 617, was also approved, and extends California's cap-and-trade program for reducing greenhouse gas (GHG) emissions from stationary sources. AB 617 also contains an expedited schedule for implementing BARCT for cap-and-trade facilities. Industrial source RECLAIM facilities that are in the cap-and-trade program are subject to the requirements of AB 617. Under AB 617, Districts are required to develop by January 1, 2019, an expedited schedule for the implementation of BARCT no later than December 31, 2023, with the highest priority given to older, higher-polluting units that will need retrofit controls installed.

As a result of control measure CMB-05 from the 2016 AQMP as well as ABs 617 and 398, South Coast AQMD staff has been directed by the Governing Board to begin the process of transitioning the current regulatory structure for NOx RECLAIM facility emissions to an equipment-based command-and-control regulatory structure per South Coast AQMD Regulation XI – Source Specific Standards. Thus, South Coast AQMD staff conducted a programmatic analysis of the RECLAIM equipment at each facility to determine if there are appropriate and up-to-date BARCT NOx limits within existing South Coast AQMD 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, South Coast AQMD staff determined that RECLAIM facilities should not exit unless their NOx emitting equipment is subject to an adopted future BARCT rule.

As such, South Coast AQMD staff is proposing amendments to Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines, to facilitate the transition of affected equipment subject to the NOx RECLAIM program to a command-and-control regulatory structure and to implement Control Measure CMB-05. Proposed Amended Rule (PAR) 1110.2 applies to all stationary and portable gaseous- and liquid-fueled engines with a rating greater than 50 brake horsepower (bhp) operated at RECLAIM and non-RECLAIM facilities. PAR 1110.2 is proposing to: 1) include internal combustion engines operated at current and former RECLAIM facilities which were not previously subject to Rule 1110.2 and require them to comply with BARCT ; ~~2) establish ammonia~~

~~slip limits and require ammonia emissions monitoring;~~ and ~~3~~2) exempt non-emergency engines operated at remote two-way radio transmission towers. Additionally, staff is proposing to add definitions for additional clarity, add language to help facilitate the transition from RECLAIM, and revise exemptions to remove provisions that are obsolete. To address concerns from stakeholders, changes were made to PAR 1110.2 after the release of the Draft SEA, which include establishing an interim VOC limit of 25 ppmvd for electric generating units, also referred to as linear generator engines, that: 1) do not have ammonia emissions from add-on control equipment; 2) meet the NOx limit of Rule 1110.2 Table IV; and 3) were installed before January 1, 2024. Additionally, staff has added an exemption for Tier 4 – Final diesel engines which are used to power cranes operated in the Southern California Coastal Waters or Outer Continental Shelf. Implementation of the proposed project is estimated to reduce NOx emissions by 0.29 ton per day, and is expected to be achieved by retrofitting existing internal combustion engines with air pollution control equipment (e.g., selective catalytic reduction (SCR) technology/systems, or by repowering or replacing existing internal combustion engines.

South Coast AQMD staff is also proposing amendments to Rule 1100 – Implementation Schedule for NOx Facilities, to require: 1) two- and four-stroke lean-burn compressor gas engines to comply with the NOx emission limits in PAR 1110.2 within 24 months after a permit to construct is issued~~,~~ ~~or 36 months after a permit to construct is issued if~~ and require the permit application ~~is~~ to be submitted by July 1, 2021; and 2) all other qualifying engines to meet the NOx emission limits by December 31, 2023. Further, to address comments from stakeholders, staff has included the following changes to PAR 1100 since the release of the Draft SEA: 1) extending compliance date for achieving the emission limits specified in the rule and adding interim emission limits for compressor gas lean-burn engines if the owners or operators submit a request for a time extension; 2) adding alternative emission limits for compressor gas lean-burn engines; 3) extending the compliance date for achieving the emission limits for compressor gas lean-burn engines undergoing a facility-wide engine modernization; 4) adding a requirement for permit applications to be submitted by July 1, 2021; and 5) adding low-use criteria for diesel engines operated at ski resorts. Staff will also add definitions to PAR 1100 for clarity.

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 South Coast AQMD 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 §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 South Coast AQMD's regulatory program was certified by the secretary of resources agency on March 1, 1989 [CEQA Guidelines Section 15251(l)]. In addition, the South Coast AQMD adopted Rule 110 – Rule Adoption Procedures to Assure Protection and Enhancement of the Environment, which implements the South Coast AQMD's certified regulatory program. Under the certified regulatory program, the South Coast AQMD typically prepares an Environmental Assessment (EA) to evaluate the environmental impacts for rule projects proposed for adoption or amendment.

The proposed amendments to Rule 1110.2 and Rule 1100 are considered a "project" as defined by CEQA. PAR 1110.2 will transition affected stationary and portable internal combustion engines at NOx RECLAIM facilities to a command-and-control regulatory structure. NOx RECLAIM facilities with equipment subject to PAR 1110.2 will be required to meet the NOx emission limits as specified in PAR 1110.2, unless those facilities qualify for an exemption. The decision to transition from NOx RECLAIM into a source-specific command-and-control regulatory structure was approved by the South Coast AQMD Governing Board as a 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[6].

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 in 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 selective catalytic reduction (SCR) or selective non-catalytic reduction (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 in the March 2017 Final Program EIR concluded that significant and unavoidable adverse environmental impacts were 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-related 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.

The currently proposed project primarily implements current BARCT. BARCT is statutorily required in California Health and Safety Code Section 40406 to be based on "environmental, energy, and economic impacts." A BARCT analysis was conducted and completed as part of the rule development process for PAR 1110.2[7]. Based on the BARCT analysis, the current limit of 11 parts per million, by volume (ppmv) NOx of PAR 1110.2 is BARCT. PAR 1110.2 is proposing to: 1) include internal combustion engines operated at current and former RECLAIM facilities which

[6] South Coast AQMD, 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

[7] South Coast AQMD's rule development webpage for PAR 1110.2 contains all of the documentation relied upon for the BARCT analysis and can be found here: http://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules#1110.2

were not previously subject to Rule 1110.2 and require them to comply with BARCT; and ~~2) establish ammonia slip limits and require ammonia emissions monitoring; 3~~2) exempt non-emergency engines operated at remote two-way radio transmission towers. Additionally, staff is proposing to add definitions for additional clarity, add language to help facilitate the transition from RECLAIM, and revise exemptions to remove provisions that are obsolete. To address concerns from stakeholders, changes were made to PAR 1110.2 after the release of the Draft SEA, which include establishing an interim VOC limit of 25 ppmvd for electric generating units, also referred to as linear generator engines, that: 1) do not have ammonia emissions from add-on control equipment; 2) meet the NOx limit of Rule 1110.2 Table IV; and 3) were installed prior to January 1, 2024. Additionally, PAR 1110.2 proposes to exempt Tier 4 – Final diesel engines which are used to power cranes operated in the Southern California Coastal Waters or Outer Continental Shelf. As explained in Chapter 2 (pp. 2-6 and 2-8 to 2-9) and analyzed in Chapter 4 (pp. 4-19 to 4-21) of this Final SEA, the total accumulated daily VOC emissions cap of 45 pounds per day from the operation of linear generator engines in addition to the VOC emissions estimated to occur during overlapping construction and operation activities will not exceed any South Coast AQMD air quality significance thresholds. Further, the exemption of Tier 4 – Final diesel crane engines will not change the quantities of NOx emissions generated from this equipment relative to baseline conditions because the existing diesel crane engines at the affected facilities are certified by CARB to meet the Tier 4 – Final emission standards. As such, the changes to PAR 1110.2 after the release of the Draft SEA will not change the conclusions for the topic areas of air quality and hazards and hazardous materials.

PAR 1110.2 is estimated to reduce NOx emissions by 0.29 ton per day after implementation of BARCT limits and will provide an overall environmental benefit to air quality. While reducing emissions of NOx will create an environmental benefit, activities that facility operators may undertake to comply with PAR 1110.2 may also create secondary adverse environmental impacts in the topic area of hazards and hazardous materials.

In addition, amendments are proposed to Rule 1100 that would establish the compliance schedule qualifying stationary engines. PAR 1100 proposes to require: 1) two- and four-stroke lean-burn compressor gas engines to comply with the NOx emission limits in PAR 1110.2 within 24 months after a permit to construct is issued~~, or 36 months after a permit to construct is issued if~~ and require the permit application ~~is~~ to be submitted by July 1, 2021; and 2) all other qualifying engines to meet the NOx emission limits by December 31, 2023. Further, to address comments from stakeholders, staff has included the following changes to PAR 1100 since the release of the Draft SEA: 1) extending compliance date for achieving the emission limits specified in the rule and adding interim emission limits for compressor gas lean-burn engines if the owners or operators submit a request for a time extension; 2) adding alternative emission limits for compressor gas lean-burn engines; 3) extending the compliance date for achieving the emission limits for compressor gas lean-burn engines undergoing a facility-wide engine modernization; 4) adding a requirement for permit applications to be submitted by July 1, 2021; and 5) adding low-use criteria for diesel engines operated at ski resorts. As discussed Chapter 2 (pp. 2-10 to 2-12) and based on the analysis in Chapter 4 (pp. 4-14 to 4-17 and 4-21), the proposed revisions since the release of the Draft SEA will not result in additional environmental impacts. As such, the changes to PAR 1100 after the release of the Draft SEA will not change the conclusions for the topic areas of air quality and hazards and hazardous materials. ~~However, PAR 1100 contains administrative changes that would not require any physical modifications to occur at affected facilities; thus, no environmental impacts are expected to occur.~~

In analyzing the potential environmental impacts of the current proposed project, South Coast AQMD staff has determined that the proposed project contains new information of substantial importance which was not known and could not have been known at the time 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).

More specifically, the proposed project is expected to have: 1) significant effects that were not discussed in the March 2017 Final Program EIR (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 March 2017 Final Program EIR (CEQA Guidelines Section 15162(a)(3)(B)).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, which tiers off of the March 2017 Final Program EIR as allowed by CEQA Guidelines Sections 15168 and 15385. The SEA is a substitute CEQA document prepared in lieu of a Subsequent EIR with significant impacts (CEQA Guidelines Section 15162), pursuant to the South Coast AQMD's Certified Regulatory Program (CEQA Guidelines Section 15251(1); codified in South Coast AQMD 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 new potentially significant adverse effects to hazards and hazardous materials that may result from implementing PAR 1110.2 was not analyzed at the project level in the March 2017 Final Program EIR for the 2016 AQMP, and because PARs 1110.2 and 1100 contain new information that was not previously considered, the South Coast AQMD, as lead agency for the proposed project has prepared this SEA with significant impacts pursuant to its Certified Regulatory Program. Because the proposed project may have statewide, regional, or areawide significance, a CEQA scoping meeting ~~is~~ was required pursuant to Public Resources Code §21083.9(a)(2) and ~~will be~~ was held at the South Coast AQMD's Headquarters in conjunction with the Public Workshop on July 31, 2019. ~~Any~~No CEQA-related comments were made at the Public Workshop/CEQA scoping meeting relative to PARs 1110.2 and 1100~~ and responses to comments will be included in the 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 Draft SEA ~~is~~was ~~being~~ released and circulated for a 46-day public review and comment period from Friday, July 26, 2019 to Tuesday, September 10, 2019. Five comment letters were received relative to the Draft SEA. Responses to ~~Any~~ comments on the analysis presented in th~~is~~e Draft SEA received during the public comment period are ~~will be responded to and~~ included in Appendix G of this Final SEA.

The March 2017 Final Program EIR for the 2016 AQMP, upon which this Final SEA relies, is available from the South Coast AQMD's website at: http://www.aqmd.gov/home/research/documents-reports/lead-agency-South Coast AQMD-projects/South Coast AQMD-projects---year-2017. This document may also be obtained by visiting the Public Information Center at South Coast AQMD Headquarters located at 21865 Copley Drive, Diamond Bar, CA 91765; or by contacting Fabian Wesson, Public Advisor by phone at (909) 396-2001 or by email at PICrequests@aqmd.gov.

South Coast AQMD staff has reviewed the modifications made to PARs 1110.2 and 1100 after the release of the Draft SEA for public review and comment 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 Draft SEA. In addition, revisions to the proposed project and analysis 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 Draft SEA pursuant to CEQA Guidelines Sections 15073.5 and 15088.5. Therefore, the Draft SEA has been revised to include the aforementioned modifications such that it is now the Final SEA for PARs 1110.2 and 1100.

Prior to making a decision on the adoption of PARs 1110.2 and 1100, the South Coast AQMD 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 PARs 1110.2 and 1100.

PREVIOUS CEQA DOCUMENTATION

The Draft SEA is a comprehensive environmental document that analyzes potential environmental impacts from the proposed project. South Coast AQMD 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.). The following summarizes the contents of the CEQA documents prepared for previous versions of Rule 1110.2 (which includes the March 2017 Final Program EIR for 2016 AQMP, upon which this SEA for PAR 1110.2 relies) and Rule 1100, in reverse chronological order and are included for informational purposes. For CEQA documents that were prepared after January 1, 2000, a link for downloading files from the South Coast AQMD'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 South Coast AQMD's Public Records Unit.

Rule 1110.2

Rule 1110.2 was adopted in August 1990 and amended in September 1990, August 1994, December 1994, November 1997, June 2005, February 2008, July 2010, September 2012, December 2015, and June 2016. Several previous environmental analyses have been prepared that analyzed the past amendments to Rule 1110.2. Also, the 2016 AQMP was adopted in March 2017 and an environmental analysis for the entire 2016 AQMP, including control measure CMB-05 which applies to Rule 1110.2 equipment, was addressed in the March 2017 Final Program EIR.

Final Program Environmental Impact Report for the 2016 Air Quality Management Plan; March 2017 (SCH No. 2016071006): The 2016 AQMP identified 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 micrograms per cubic meter ($\mu g/m^3$)) 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 South Coast AQMD'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 adopted. The South Coast AQMD Governing Board certified the Final Program EIR and approved the project on March 3, 2017. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2016/2016aqmpfpeir.pdf.

Final SEA for Proposed Amended Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines; June 2016: Rule 1110.2 was amended in June 2016 to provide relief for one facility that had a power purchase agreement (PPA) due to expire on October 1, 2022. Due to the constraints of the PPA, the facility was unable to economically meet the January 1, 2017 compliance deadline. As such, Rule 1110.2 was amended to exempt the facility from the emission requirements of the rule, contingent upon the facility submitting a retirement plan for the permanent shutdown of all equipment subject to Rule 1110.2 by the expiration date of the PPA. The project would result in a delay in achieving reductions of NOx, VOC, and CO emissions from the facility until 2022 instead of 2017, as previously analyzed in the December 2015 SEA. As a result, the quantity of peak daily NOx emission reductions foregone exceeded the South Coast AQMD's air quality significance threshold for operation. Since significant adverse significant operational air quality impacts were identified, an alternatives analysis was required and included. The June 2016 Final SEA concluded that the project would have significant and unavoidable adverse operational air quality impacts and there were no feasible mitigation measures identified at the time that would reduce or eliminate the expected delays in emission reductions. Findings were made and a Statement of Overriding Considerations was adopted. The South Coast AQMD Governing Board certified the Final SEA and approved the project on June 3, 2016. This document can be obtained by visiting the following website: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2016/par-1110_2-final-sea-combined.pdf

Final SEA for Proposed Amended Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines; December 2015: In December 2015, the South Coast AQMD amended Rule

1110.2 to delay implementation of NOx, VOC, and CO emission limits compliance dates for biogas engines because some emission control technologies were not available at the time. The quantity of delayed emission reductions for NOx, VOC, and CO was greater than the South Coast AQMD's air quality significance thresholds, thus the air quality impacts were considered significant. However, all of the delayed emission reductions were temporary because they will be recaptured over time such that the adverse air quality impacts would not be permanent. Limits were also adopted on the number of breakdowns and excess emissions during breakdown events in order to be consistent with the EPA's breakdown provisions and to allow the rule to be included in the SIP. The December 2015 Final SEA concluded that the project would have significant and unavoidable adverse operational air quality impacts and there were no feasible mitigation measures identified at the time that would reduce or eliminate the expected delays in emission reductions. Findings were made and a Statement of Overriding Considerations was adopted. The South Coast AQMD Governing Board certified the Final SEA and approved the project on June 4, 2015. This document can be obtained by visiting the following website: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/par-1110_2-final-sea.pdf

Addendum to the 2007 Final EA for Proposed Amended Rule 1110.2 – Emissions from Gaseous - and Liquid-Fueled Engines; September 2012: The 2012 amendments to Rule 1110.2corrected the effective dates of new exhaust emission concentration limits for landfill and digester gas-fired engines that were originally scheduled to take effect July 1, 2012 as part of the February 2008 amendments to Rule 1110.2. Implementation of the new exhaust emission concentration limits for landfill and digester gas-fired engines was contingent upon completion of a technology assessment by July 2010. Except for CO, the emission standards would be equivalent to the current best available control technology (BACT) for NOx and VOC for new internal combustion engines (ICE). Among the engines affected by the 2012 amendments were approximately 55 engines that are fired by landfill or digester gas (biogas), located at 13 public and private landfills and wastewater treatment plants. The analysis concluded that the 2012 amendments would not change the environmental analysis or conclusions in the previously certified December 2007 Final EA. As such, an Addendum was prepared for the project. Pursuant to CEQA Guidelines Section 15164(c), circulation of the Addendum for public review was not required. The South Coast AQMD Governing Board certified the Addendum to the 2007 Final EA and approved the project on September 7, 2012. This document can be obtained by visiting the following website at: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2012/addendum-to-the-2007-final-environmental-assessment-for-proposed-amended-rule-1110-2.pdf

Final SEA for Proposed Amended Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines; July 2010: The County of Riverside planned to rebuild and update the communications equipment an existing public safety communications site which is located at a remote location at a high altitude with heavy snowpack during the winter with no access to commercial power. The existing engines at this site were not sufficient to provide power to the upgraded equipment and the replacement engines had a rating greater than 50 bhp which would be subject to Rule 1110.2. The use of propane-fired engines was found to be not feasible as delivery of propane during winter would be difficult. Additionally, to comply with the limits of Rule 1110.2, the new engines would need to be equipped with SCR control technology which would require the transportation, storage and use of ammonia. As such, Rule 1110.2 was amended to exempt the County of Riverside's project from the requirements of the rule. The analysis concluded that less than significant impacts to the environmental topic areas of air quality and greenhouse gas emissions and energy would occur. The South Coast AQMD Governing Board certified the Final SEA and approved the project on July 9, 2010. This document can be obtained by visiting the following website: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2010/final-subsequent-environmental-assessment-for-proposed-amended-rule-1110-2.pdf

Final EA for Proposed Amended Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines; February 2008: Rule 1110.2 was amended to further reduce NOx, VOC and CO emissions from gaseous- and liquid-fueled ICEs. Amended Rule 1110.2 partially implemented the 2007 AQMP Control Measure MCS-01 – Facility Modernization, which prescribed facilities to retrofit or replace their equipment to achieve emission levels equivalent to BACT. The amendments were applicable to stationary, non-emergency engines and increased monitoring requirements; reduced the emission standards equivalent to the current BACT; required new electrical generating engines to meet the same requirements as large central power plants; and clarified portable engine requirements. The analysis identified potential adverse environmental impacts for the topic areas of air quality, hazards and hazardous materials, and solid and hazardous wastes. Since significant adverse impacts were identified, mitigation measures and an alternatives analysis were required and included. Some, but not all of the significant adverse impacts were mitigated to less than significant and a Mitigation, Monitoring, and Reporting Plan was adopted. Findings were made and a Statement of Overriding Considerations was adopted. The South Coast AQMD Governing Board certified the Final EA and approved the project on February 1, 2008. This document can be obtained by visiting the following website: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2008/rule-1110.2/finalea.pdf

Final EA for Proposed Amended Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines and Rescission of Rule 1110.1 – Emissions from Stationary Internal Combustion Engines, June 2005: Rule 1110.2 was amended to: remove an exemption for all agricultural engines, except emergency standby engines and engines powering orchard wind machines; add more recordkeeping requirements; prohibit the use of portable engine generators to supply power to the grid or to a building, facility, stationary source or stationary equipment except in an emergency affecting grid stability; and remove outdated rule language. Rule 1110.1 was rescinded because it was superseded by the requirements in amended Rule 1110.2. The analysis concluded that no significant impacts to any environmental topic area would occur. The South Coast AQMD Governing Board certified the Final EA and approved the project on June 3, 2005. This document can be obtained by visiting the following website: http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2005/fea_1110.doc

Final SEA for the Proposed Amended Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines; November 1997: Rule 1110.2 was amended to: revise the requirements for portable engines to be consistent with federal and state regulations (i.e. CARB's Statewide Portable Engine and Equipment Registration Regulation); delete CO continuous emission monitoring system (CEMS) requirements; revise source testing requirements for all stationary engines; specify CEMs meet federal regulations; allow an alternative to CEMS, and authorize alternative emission limits equivalent to electrification. Further, the exemption for snow manufacture and ski lift operations was amended and exemptions were added for engines operated by the U.S. Navy on San Clemente Island, U.S. EPA non-road engines, engines registered by CARB. . The Final SEA concluded that the project would have significant and unavoidable adverse operational air quality impacts and there were no feasible mitigation measures or project alternatives identified at the time that would reduce or eliminate the expected delays in emission reductions. Findings were made and a Statement of Overriding Considerations was adopted. The South Coast AQMD Governing Board certified the Final SEA and approved the project on November 14, 1997.

Notice of Exemption for Proposed Amended Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines; December 1994: Rule 1110.2 was amended to clarify the meaning of the term "originally installed" for the purpose of determining compliance with the rule. The amendments were administrative in nature and had no significant adverse impacts on the environment. Therefore, staff determined that it could be seen with certainty that the project would not result in a significant adverse effect on the environment. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project on December 9, 1994. A Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Notice of Exemption for the Proposed Amended Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines; August 1994: Rule 1110.2 was amended to: clarify that the original intent that continuous in-stack CO monitoring system would not be required if a continuous in-stack NOx monitoring system is also not required; and harmonize monitoring requirements in Rule 1110.2 with RECLAIM. The amendments were concluded to be administrative in nature and would not increase emissions. Therefore, staff determined that it could be seen with certainty that the project would not result in a significant adverse effect on the environment. The South Coast AQMD Governing Board determined that the project was exempt from CEQA and approved the project on August 12, 1994. A Notice of Exemption was filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties.

Final EA for Proposed Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines; September 1990: The South Coast AQMD Governing Board directed staff to examine issues raised during the August 1990 public hearing for the adoption of Rule 1110.2 and provide recommendations. Rule 1110.2 was amended to: clarify that monitoring and periodic emission testing for NOx and CO was added for engines with a rating greater than 1,000 bhp; add a limited exemption for up-slope units at winter resort facilities that are operated less than 700 hours per year; and allow oil field-produced-gas-fueled engines to operate in any oil field service and not be limited to oil pumping engines. Since the circumstances of the original project analyzed in the August 1990 Final EA and the September 1900 modifications were essentially identical, staff determined that the September 1990 amendments did not constitute substantial changes to the August 1990 project requiring revisions to the environmental analyses. As such, no additional CEQA document was required. The South Coast AQMD Governing Board recertified the previously prepared August 1990 Final EA for Proposed Rule 1110.2 and approved the project on September 7, 1990.

Final EA for Proposed Rule 1110.2 - Emissions from Gaseous - and Liquid-Fueled Engines; August 1990: Rule 1110.2 was developed based on Control Measure C-2 of the March 1989 AQMP. The adopted rule required all stationary power-generating internal combustion (IC) engines with a rating greater than 50 bhp and all portable IC engines with a rating greater than 100 bhp to comply with NOx emission limits or electrify their processes by December 31, 1994. The Final EA identified potentially significant impacts and mitigation measures for the environmental topic areas of water quality, risk of upset, transportation, energy, solid waste disposal, and human health. Significant adverse impacts were mitigated to less than significant levels through the application of mitigation measures pursuant to a Mitigation, Monitoring, and Reporting Plan.

Findings were made and a Statement of Overriding Considerations was adopted. The Governing Board approved the project and certified the Final EA on August 3, 1990.

Rule 1100

The decision to transition from NOx RECLAIM into a source-specific command-and-control regulatory structure was approved by the South Coast AQMD 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 March 2017 Final Program EIR. Rule 1100 is an administrative rule that was developed and adopted on December 7, 2018 to establish a compliance schedule for transitioning affected units NOx RECLAIM facilities to a command-and-control regulatory structure in accordance with the direction in CMB-05. NOx RECLAIM facilities with equipment subject to PAR 1110.2 will be required to meet the NOx emission limits in this rule in accordance with the implementation schedule outlined in PAR 1100.

Final 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; and Proposed Rule 1100 – Implementation Schedule for NOx Facilities: Rules 1146, 1146.1, and 1146.2 were amended to achieve additional NOx emission reductions and to transition the RECLAIM program to a command-and-control regulatory structure, as soon as practicable, as directed by the Control Measure CMB-05 of the 2016 AQMP. Rule 1100 developed to establish the compliance schedule for RECLAIM facilities with Rule 1146 and/or 1146.1 units. Rule 1100 is an administrative rule that would not require any physical modifications to occur at affected facilities and thus, and would not cause any environmental impacts are expected to occur. However, Rules 1146 and 1146.1 included updated NOx emission limits for boilers, heaters, and steam generators and Rule 1146.2 updated the NOx emission limits for larger water heaters and small boilers and process heaters that would require activities such as installation of air pollution control systems which could create potentially significant adverse environmental impacts. The Final SEA concluded that although a reduction of NOx emissions are expected to create an environmental benefit and protect public health, the activities that the affected facilities may undertake to comply with the applicable NOx emission limits may also create potentially significant adverse environmental impacts for the topic of hazards and hazardous materials due to the storage and use of aqueous ammonia needed for the operation of SCR systems. As such, mitigation measures were required and crafted to reduce the severity of the effects of the potentially significant adverse hazards and hazardous materials impacts and these mitigation measures were made a condition of approval of this project; however, the impacts could not be mitigated to less than significant levels. Since significant adverse environmental impacts were identified, an alternatives analysis was required and included in the Final SEA. No other environmental topic areas were identified as having potentially significant adverse environmental impacts. Thus, a Mitigation, Monitoring, and Reporting Plan was required and adopted for this project. Findings were made and a Statement of Overriding Considerations was adopted. The South Coast AQMD Governing Board certified the Final SEA and approved the project on December 7, 2018. This document can be obtained by visiting the following website at: https://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2018/pars-1146-series---final-sea---full-merge-113018.pdf

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 SEA is intended to: a) provide the South Coast AQMD Governing Board and the public with information on the environmental effects of the proposed project; and b) be used as a tool by the South Coast AQMD 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 South Coast AQMD's Governing Board which will consider the SEA for the proposed project in their decision-making, the California Air Resources Board (CARB), a state agency, and the U.S. EPA, a federal agency, will be reviewing PARs 1110.2 and 1100 and all supporting documents, including the SEA, as part of the process for considering the inclusion of PARs 1110.2 and 1100 into the SIP. Moreover, PARs 1110.2 and 1100 are 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 1110.2 and 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 PAR 1110.2 in accordance with the compliance schedule in PAR 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, there were some concerns regarding PAR 1110.2 and 1100 that were expressed by representatives of industry and environmental groups, either in public meetings or in written comments. However, the issues raised were facility-specific and have been addressed and incorporated into the rule language. ~~No concerns were raised relative to PAR 1100.~~

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 1110.2 and 1100 have been evaluated in Chapter 4 of this SEA. No direct or indirect physical changes resulting from economic or social effects have been identified as a result of implementing PARs 1110.2 and 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 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 South Coast AQMD 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

South Coast AQMD 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 South Coast AQMD Regulation XX – RECLAIM for NOx to instead be subject to an equipment-based command-and-control regulatory structure per South Coast AQMD Regulation XI – Source Specific Standards. To date, several rules have been amended in accordance with the Governing Board's direction. Currently, South Coast AQMD staff is continuing this transition process by proposing amendments to Rule 1110.2 and Rule 1100. PAR 1110.2 reflects the proposed project which is a culmination of recommendations made throughout the public engagement process including five working group meetings held at South Coast AQMD headquarters in Diamond Bar on June 28, 2018, September 27, 2018, February 6, 2019, April 24, 2019, ~~and~~ May 30, 2019, August 20, 2019. 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 1110.2 and 1100 at the RECLAIM working group meetings held on November 8, 2017, January 11, 2018, June 14, 2018, July 12, 2018, November 8, 2018, December 13, 2018, January 11, 2019, February 14, 2019, ~~and~~ April 11, 2019, and September 12, 2019. A Public Workshop and CEQA Scoping Meeting ~~will be~~ was held on July 31, 2019.

PAR 1110.2 will transition affected engines at NOx RECLAIM facilities to a command-and-control regulatory structure. Staff is proposing to amend PAR 1110.2 to: 1) include internal combustion engines operated at current and former RECLAIM facilities which were not previously subject to Rule 1110.2 and require them to comply with BARCT; and ~~2) establish ammonia slip limits and require ammonia emissions monitoring; 3~~2) exempt non-emergency engines operated at remote two-way radio transmission towers. Additionally, staff is proposing to add definitions for additional clarity, add language to help facilitate the transition from RECLAIM, and revise exemptions to remove provisions that are obsolete. To address concerns from stakeholders, changes were made to PAR 1110.2 after the release of the Draft SEA which include establishing an interim VOC limit of 25 ppmvd for electric generating units, also referred to as linear generator engines, that: 1) do not have ammonia emissions from add-on control equipment; 2) meet the NOx limit of Rule 1110.2 Table IV; and 3) were installed before January 1, 2024. Additionally, staff has added an exemption for Tier 4 – Final diesel engines which are used to power cranes operated in the Southern California Coastal Waters or Outer Continental Shelf. ~~1) expand its applicability to include internal combustion engines operated at RECLAIM and former RECLAIM facilities which were not previously required to comply with Rule 1110.2; 2) require engines operated at RECLAIM and former RECLAIM facilities to comply with BARCT in accordance with existing Rule 1110.2 NOx limits; 3) establish ammonia slip limits and require ammonia emissions monitoring; 4) add definitions for additional clarity; 5) add language help facilitate the transition from RECLAIM such as removing references to Regulation XX; 6) revise exemptions to remove provisions that are obsolete; and 7) add an exemption for non-emergency engines operated at remote two-way radio transmission towers. Other minor changes are also proposed for clarity and consistency throughout the rule.~~

The proposed project is estimated to reduce NOx emissions by 0.29 ton per day after implementation of BARCT limits and will provide an overall environmental benefit to air quality. While reducing emissions of NOx and other contaminants will create an environmental benefit, activities that facility operators may undertake to comply with PAR 1110.2 may also create secondary potentially significant adverse environmental impacts the topic area of hazards and hazardous materials for the storage and use of aqueous ammonia.

In addition, amendments are proposed to Rule 1100 that would establish the compliance schedule qualifying stationary engines. PAR 1100 proposes to require: 1) two- and four-stroke lean-burn compressor gas engines to comply with the NOx emission limits in PAR 1110.2 within 24 months after a permit to construct is issued~~, or 36 months after a permit to construct is issued~~ if the application is submitted by July 1, 2021; and 2) all other qualifying engines to meet the NOx emission limits by December 31, 2023. Further, to address comments from stakeholders, staff has included the following changes to PAR 1100 since the release of the Draft SEA: 1) extending compliance date for achieving the emission limits specified in the rule and adding interim emission limits for compressor gas lean-burn engines if the owners or operators submit a request for a time extension; 2) adding alternative emission limits for compressor gas lean-burn engines; 3) extending the compliance date for achieving the emission limits for compressor gas lean-burn engines undergoing a facility-wide engine modernization; 4) adding a requirement for permit applications to be submitted by July 1, 2021; and 5) adding low-use criteria for diesel engines operated at ski resorts. ~~However, PAR 1100 contains administrative changes that would not require any physical modifications to occur at affected facilities; thus, no environmental impacts are expected to occur.~~

A copy of PARs 1110.2 and 1100 can be found in Appendix A of this ~~Draft~~ Final SEA.

Summary of Chapter 3 – Existing Setting

Pursuant to CEQA Guidelines Section 15125, Chapter 3 – Existing Setting includes a description of the environmental topic areas that are potentially adversely affected by the proposed project. The analysis of the proposed project indicated that additional potentially significant adverse hazards and hazardous material impacts will occur; thus, the focus of the analysis in this SEA is limited to the environmental topic of hazards and hazardous materials. However, because physical modifications are expected to occur that may cause adverse, but less than significant, air quality impacts as a result of implementing PAR 1110.2, this chapter also addresses the topic of air quality.

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 South Coast AQMD'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 South Coast AQMD's jurisdiction is in attainment with the NAAQS only 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

Hazards and hazardous materials is the only environmental topic area that has been identified in this SEA as having potentially significant adverse impacts if the proposed project is implemented. In addition, because physical modifications are expected to occur that may cause adverse, but less than significant, air quality impacts as a result of implementing PAR 1110.2, this chapter also analyzes the topic of air quality. PAR 1100 is an administrative rule that is not expected to require any physical modifications that would cause any adverse air quality impacts.

Potential Environmental Impacts Found Not To Be Significant

Because this SEA is a subsequent CEQA document to the March 2017 Final Program EIR for the 2016 AQMP, this SEA relies on the conclusions reached in this document as evidence for environmental areas where impacts were found not to be significant. The previous CEQA document reviewed approximately 17 environmental topic areas and analyzed whether the respective projects would create potentially significant adverse impacts.

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 the currently proposed project. Please see Chapter 4, Table 4-22, 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.

The proposed project is expected to have: 1) significant effects that were not discussed in the previous 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 may be substantially more severe than what was discussed in the March 2017 Final Program EIR for the 2016 AQMP (CEQA Guidelines Section 15162(a)(3)(B)).

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 the proposed project, no other environmental topic areas have been evaluated in this SEA. Thus, the conclusions reached in this SEA are consistent with the conclusions reached in the previously certified CEQA document (e.g., the March 2017 Final Program EIR for the 2016 AQMP) that aside from the topic of 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
- 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 March 2017 Final Program EIR for the 2016 AQMP can be found using the link 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. Three alternatives to the proposed project are summarized in Table 1-1: 1) Alternative A – No Project; 2) Alternative B – Distributed Generation Limits; 3) Alternative C – Stricter Limits; and 4) Phased In Compliance Dates. 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 project's potentially adverse impacts, but less than significant air quality impacts and the potentially significant adverse hazards and hazardous materials impacts to each of the project alternatives for the individual rule components that comprise the proposed project is provided in Table 1-2. Aside from potentially significant adverse impacts to 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. The proposed project is considered to provide the best balance between achieving requisite BARCT NOx emission reductions and the secondary adverse environmental impacts that may occur due to activities associated with the storage of hazardous materials associated with operating air pollution control equipment (e.g., SCRs) while achieving the overall objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

Table 1-1
Summary of the Proposed Project and Alternatives

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Emissions Limit[1]	11 ppmv NOx @ 15% O2	No emission limits except for existing permit limits	Meet NOx, CO, and VOC limits listed in Table IV of existing Rule 1110.2 for new non-emergency engines driving electrical generators 0.070 lbs/MW-hr NOx (2.5 ppmv @ 15% O2) 0.20 lbs/MW-hr CO (12 ppmv @ 15% O2)0.10 lbs/MW-hr VOC (10 ppmv @ 15% O2)	7 ppmv NOx @ 15% O2	11 ppmv NOx @ 15% O2
Interim Emissions Limit[2] (Compressor Gas Lean-burn Engines at RECLAIM and Former RECLAIM Facilities)	45 ppmv NOx @ 15% O2 250 ppmv CO @ 15% O2 30 ppm VOC @15% O2	Same as above	Same as above	Same as above	Same as above
Emissions Limit[3] (Linear Generators)	2.5 ppmv NOx @ 15% O2 12 ppmv CO @ 15% O2 25 ppm VOC @15% O2	Existing Rule 1110.2 limits: 2.5 ppmv NOx @ 15% O2 12 ppmv CO @ 15% O2 10 ppm VOC @15% O2	Same as Alternative A	Same as Alternative A	Same as Alternative A

1. Existing engines operated at RECLAIM and former RECLAIM facilities are already in compliance with the CO and VOC emission limits of Rule 1110.2.
2. ~~Compressor gas two-stroke or four-stroke lean-burn engines have up to 24 months after a permit to construct is issued or up to 36 months if the application for permit to construct is submitted by July 1, 2021. Facility may request extensions pursuant to PAR 1100.~~Compressor gas lean-burn engines shall comply with the CO and VOC emission limits of Rule 1110.2 (d)(2) or a previously established alternate emission limit as listed in their operating permit if they are granted a time extension pursuant to PAR 1100.
3. At the time of publishing this Final SEA, no linear generators were permitted within the South Coast AQMD jurisdiction but now would be subject to the specific emission limits rather than generally applicable ones. Linear generators permitted and installed prior to January 1, 2024 will be required to comply with a VOC emission limit of 25 ppmv @ 15% O2. Linear generators installed on or after January 1, 2024 will be required to meet the DG limits listed in Table IV in existing Rule 1110.2 including the VOC limit of 10 ppmv @ 15% O2.

Table 1-1
Summary of the Proposed Project and Alternatives (concluded)

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
~~**Ammonia SlipLimit**~~	~~5 ppm @ 15% O2~~	~~No emission limits except for existing permit limits~~	~~10 ppm @ 15% O2~~	~~5 ppm @ 15% O2~~	~~5 ppm @ 15% O2~~
Compliance Date[5]	Submit permit application by July 1, 2021; meet limits by December 31, 2023	N/A	December 31, 2023	December 31, 2023	December 31, 2023~~,~~ ~~except for compressor gas two-stroke or four-stroke lean-burn engines which will have a compliance date of December 31, 2027~~
Compliance Date (Compressor Gas Lean-burn Engines)	Submit application by July 1, 2021; meet emission limits no later than 24 months after issuance of the Permit to Construct	N/A	December 31, 2023	December 31, 2023	December 31, 2031
Control Technology to Meet Project Objectives	*Lean-burn engines*: SCR with ammonia injection *Rich-burn engines*: 3-way catalyst (NSCR)	N/A	*Lean-burn engines*: SCR with ammonia injection *Rich-burn engines*: 3-way catalyst (NSCR)	*Lean-burn engines*: SCR with ammonia injection *Rich-burn engines*: 3-way catalyst (NSCR)	*Lean-burn engines*: SCR with ammonia injection *Rich-burn engines*: 3-way catalyst (NSCR)

4. For new SCRs, current Best Available Control Technology (BACT) for ammonia emissions is 5 ppmv. This limit is not specified in PAR 1110.2; however, BACT will be evaluated under Regulation XIII – New Source Review by Engineering and Permitting staff during permitting of any engine with a new SCR.
5. Under the proposed project, with the exception of compressor gas lean-burn engines, affected engines must comply with the emission limits by December 31, 2023. Additionally, permit applications must be submitted by July 1, 2021. Under Alternatives B, C, and D, permit applications are not required to be submitted by a specific date.
6. Under the proposed project, permit applications for compressor gas lean-burn engines must be submitted by July 1, 2021. Compressor gas lean-burn engines must comply with the emission limits no later than 24 months after issuance of the Permit to Construct. Under Alternatives B, C, and D, permit applications are not required to be submitted by a specific date. Gas compressor lean-burn engines may also qualify for a time extension provided that a compliance plan is submitted and approved pursuant to PAR 1100. Additional time may be granted for facilities that undergo facility-wide engine modernization to comply with PAR 1110.2 limits provided that a compliance plan is submitted and approved pursuant to PAR 1100.

Table 1-2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Air Quality	Expected to result in NOx emission reductions of 0.29 ton per day. Engines at affect RECLAIM and former RECLAIM facilities will transition to a command-and-control regulatory structure. The affected lean burn engines are expected to be retrofitted with SCR technology, replaced, or retrofitted. Affected lean burn engines equipped with existing SCR systems are expected to modify their air pollution control system. The affected rich burn engines are equipped with NSCR systems and are expected to modify or replace their air-to-fuel ratio controller and catalyst. Upon project implementation, all affected engines at RECLAIM and non-RECLAIM facilities will achieve BARCT equivalency for NOx. <u>Expected to result in a fixed increase in VOC emissions of up to 45 pounds per day from the operation of linear generators engines installed before January 1, 2024.[2]</u>	No NOx emission reductions will occur because RECLAIM facilities would not transition to a command-and-control regulatory structure such that their engines will not be retrofitted with air pollution control equipment, repowered, or replaced.	Expected to meet project objectives of BARCT for NOx ~~but there would be a higher ammonia slip limit~~. In addition to NOx reductions, there will also be CO and VOC emission reductions.[1] Additional NOx reductions beyond the expected 0.29 ton of NOx per day of the proposed project but would expand the project scope to include non-RECLAIM facilities. Therefore, more facilities are expected to undergo construction on a peak day leading to potentially higher peak day emissions and subsequently significant impacts for air quality. ~~Moreover, ammonia slip limit will be higher which will result in more ammonia emissions than the proposed project.~~	Expected to meet project objectives of BARCT for NOx ~~and ammonia slip~~. Additional NOx reductions beyond the expected 0.29 ton of NOx per day of the proposed project but would expand the project scope to include non-RECLAIM facilities. More facilities are expected to undergo construction on a peak day leading to potentially higher peak day emissions and subsequently significant impacts for air quality.	Expected to meet project object of meeting BARCT emission limits for NOx ~~and ammonia slip~~. NOx emission reductions will be delayed; however, there will be less impacts from construction emissions since engines used for natural gas compression and pipeline transmission have an additional ~~4~~<u>7</u> years to comply. As such, less facilities are expected to undergo construction on a peak day and therefore would result in lower peak day emissions.

1. The CO and VOC limits listed in Table IV of Rule 1110.2 are more stringent than the current limits for existing engines. Although the emission reductions are not quantified, the requirement to meet the lower CO and VOC limits of Table IV would result in CO and VOC emission reductions.
2. <u>Linear generator engines are pre-fabricated, stand-alone units. Therefore, no additional impacts from construction is expected from the installation of these units.</u>

Table 1-2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (continued)

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Significance of Air Quality Impacts	**Less than Significant:** No exceedances of the South Coast AQMD's air quality significance thresholds for any pollutant are expected to occur either during construction, during construction with overlapping operational impacts, or during operation after all construction is completed. As facilities implement modifications to retrofit existing stationary engines with air pollution control equipment (e.g., SCR technology/systems installation), or repower or replace existing stationary engines, emissions from construction are expected to occur. As affected RECLAIM and former RECLAIM facilities transition their existing engines to achieve BARCT emission levels over the 4-year compliance period, some facilities will have completed construction, which will create incremental NOx emission reductions, an air quality benefit (see Appendix F). Compressor gas lean-burn engines could qualify for a time extension which would result in less overlapping construction impacts on a peak day. Upon completion of construction at all affected facilities, an overall benefit to operational air quality will occur due to the project's overall NOx emission reductions.	**Not Significant:** Alternative A would not result in an exceedance of any South Coast AQMD air quality significance thresholds during construction or operation because no physical modifications would be expected to occur that would create construction emissions or reduce overall NOx emissions from the affected equipment. The South Coast AQMD will not achieve any emission reductions of NOx (a pre-cursor to the formation of ozone); thus, progress towards attainment for the South Coast AQMD for ozone is unlikely to occur.	**Significant:** Due to lower emissions limits, the construction schedules of the affected facilities under Alternative B would be expected to occur over a shorter period time such that more facilities would be expected to undergo construction on a peak day since both RECLAIM and non-RECLAIM facilities would be affected. As such, an exceedance of the South Coast AQMD's air quality significance threshold for NOx is expected to occur during overlapping construction of more SCR systems and more retrofit, repower or replacement of stationary engines on a peak day, than the proposed project. As facilities transition their existing stationary engines to achieve BARCT emission levels over the 4-year compliance period, some facilities will have completed construction, which will create incremental NOx emission reductions, an air quality benefit. Upon completion of construction at all affected facilities, an overall benefit to operational air quality will occur sooner due to the project's overall NOx emission reductions.	**Significant:** Due to lower emissions limits, the construction schedules of the affected facilities under Alternative B would be expected to occur over a shorter period time such that more facilities would be expected to undergo construction on a peak day since both RECLAIM and non-RECLAIM facilities would be affected. As such, an exceedance of the South Coast AQMD's air quality significance threshold for NOx is expected to occur during overlapping construction of more SCR systems and more retrofit, repower or replacement of stationary engines on a peak day, than the proposed project. As facilities transition their existing stationary engines to achieve BARCT emission levels over the 4-year compliance period, some facilities will have completed construction, which will create incremental NOx emission reductions, an air quality benefit. Upon completion of construction at all affected facilities, an overall benefit to operational air quality will occur sooner due to the project's overall NOx emission reductions.	**Less than Significant:** Due to the delayed compliance date for engines used for natural gas compression and pipeline transmission, the construction schedules of the affected facilities would be expected to occur over a longer period of time such that fewer facilities would be expected to undergo construction on a peak day. As such, exceedances of the South Coast AQMD's air quality significance thresholds are not expected to occur and there will likely be less overlapping construction of SCR systems and/or retrofit, repower or replacement of engines on a peak day than the proposed project. As facilities transition their existing engines to achieve BARCT emission levels over the 4-year compliance period for engines not used for natural gas compression or distribution, and over the additional ~~3~~8-year compliance period for the remaining engines, some facilities will have completed construction, which will create incremental NOx emission reductions, an air quality benefit. Although there will be a delay in NOx emission reductions, upon completion of construction at all affected facilities, an overall benefit to air quality will occur due to the project's overall NOx emission reductions.

Table 1- 2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (continued)

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Hazards and Hazardous Materials	Some of the affected engines are expected to be retrofitted with SCR technology, which requires ammonia for operation. Thus, the analysis assumes that one new ammonia storage tank will be needed for each SCR system installed at each facility. Further, there are new ammonia delivery trips for facilities operating new SCR systems and one facility operating an existing SCR system will need additional urea deliveries. Ammonia is considered to be a hazardous material. <u>Linear generator engines do not require SCR technology to meet NOx emission limits; therefore, no ammonia usage is required for these types of engines.</u>	None of the affected facilities will be required to achieve BARCT level equivalency through compliance with the proposed project. As such, no engines will be retrofitted with SCR technology. Thus, no new ammonia storage tanks will be needed.	Some of the affected engines are expected to be retrofitted with SCR technology, which requires ammonia for operation. Thus, the analysis assumes that one new ammonia storage tank will be needed for each SCR system installed at each facility. Further, there are new ammonia delivery trips for facilities operating new SCR systems and facilities operating an existing SCR system will use more ammonia or urea to meet the emission limits and subsequently, need additional ammonia/urea deliveries. Facilities are also expected to use more ammonia to achieve the NOx emission ~~limits and with a higher ammonia slip limit~~. Ammonia is considered to be a hazardous material.	Some of the affected engines are expected to be retrofitted with SCR technology, which requires ammonia for operation. Thus, the analysis assumes that one new ammonia storage tank will be needed for each SCR system installed at each facility. Further, there are new ammonia delivery trips for facilities operating new SCR systems and facilities operating an existing SCR system will use more ammonia or urea to meet the emission limits and subsequently, need additional ammonia/urea deliveries. Ammonia is considered to be a hazardous material.	Some of the affected stationary engines are expected to be retrofitted with SCR technology, which requires ammonia for operation. Thus, the analysis assumes that one new ammonia storage tank will be needed for each SCR system installed at each facility. Ammonia is considered to be a hazardous material.

Table 1- 2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (concluded)

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Significance of Hazards and Hazardous Materials Impacts	**Significant:** Based on the analysis, using U.S. EPA RMP*Comp, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors could result in significant impacts for any facility that installs a new ammonia storage tank, depending on the location of where the storage tank is installed, relative to the location of the offsite receptor. If the toxic endpoint is outside of a facility's boundaries, mitigation measures will be required. Since linear generator engines do not utilize SCR technology, use of ammonia is not required. Therefore, adverse impacts to hazard and hazardous materials from the installation and operation of linear generator engines are not expected.	**Not Significant:** The construction of SCR systems would not be necessary; thus, there would be no need to use ammonia or build new ammonia storage tanks. No significant hazards or hazardous materials impacts would be expected to occur.	**Significant:** Based on the analysis, using U.S. EPA RMP*Comp, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors could result in significant impacts for any facility that installs a new ammonia storage tank, depending on the location of where the storage tank is installed, relative to the location of the offsite receptor. If the toxic endpoint is outside of a facility's boundaries, mitigation measures will be required. There would be more affected facilities than the proposed project. The level of significance in Alternative B would be greater than the proposed project.	**Significant:** Based on the analysis, using U.S. EPA RMP*Comp, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors could result in significant impacts for any facility that installs a new ammonia storage tank, depending on the location of where the storage tank is installed, relative to the location of the offsite receptor. If the toxic endpoint is outside of a facility's boundaries, mitigation measures will be required. There would be more affected facilities than the proposed project. The level of significance in Alternative C would be greater than the proposed project but less than Alternative B.	**Significant:** Based on the analysis, using U.S. EPA RMP*Comp, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors could result in significant impacts for any facility that installs a new ammonia storage tank, depending on the location of where the storage tank is installed, relative to the location of the offsite receptor. If the toxic endpoint is outside of a facility's boundaries, mitigation measures will be required. The number of affected facilities would be the same as the proposed project. The level of significance in Alternative D would be equivalent to the amount in the proposed project.

CHAPTER 2

PROJECT DESCRIPTION

PROJECT LOCATION

The proposed project applies to all stationary and portable gaseous- and liquid-fueled engines with a rating greater than 50 bhp operated at RECLAIM and non-RECLAIM facilities. The South Coast AQMD 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 South Coast AQMD'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).

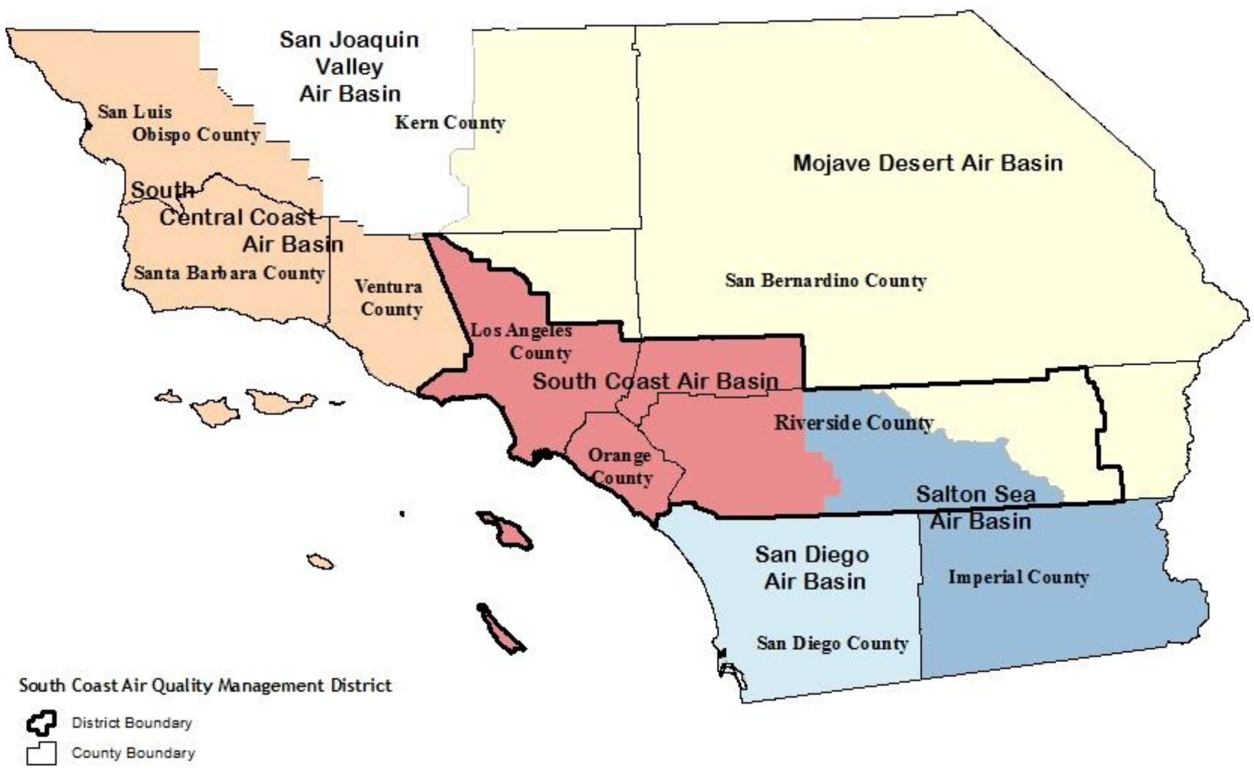


Figure 2-1
Southern California Air Basins

PROJECT BACKGROUND

Rule 1110.2 – Emissions from Gaseous- and Liquid-Fired Engines was adopted by the AQMD Governing Board on August 3, 1990 which required that either: 1) reductions of NOx emissions by over 90 percent via one out of two compliance limits specified in the rule; or 2) permanent removal of engines from service or replacement with electric motors. Rule 1110.2 was amended: 1) in September 1990 to clarify rule language; and 2) in August 1994 and December 1994 to modify the CO monitoring requirements and to clarify rule language. The November 1997 amendments to Rule 1110.2 eliminated the requirement for continuous monitoring of CO, reduced the source testing requirement from once every year to once every three years, and exempted non-road engines, including portable engines, from most requirements. The June 2005 amendments to Rule 1110.2 removed an exemption for agricultural engines so that they would subject to the rule.

To address widespread non-compliance with stationary IC engines, the February 2008 amendments to Rule 1110.2: augmented the source testing, continuous monitoring, inspection and maintenance (I&M), and reporting requirements of the rule to improve compliance; and required stationary, non-emergency engines to meet emission standards equivalent to current BACT for NOx and VOC and almost to BACT for CO to partially implement the 2007 AQMP control measure for Facility Modernization (MCS-001). Additionally, the February 2008 amendments to Rule 1110.2: required new electric generating engines to limit emissions to levels nearly equivalent to large central power plants, achieving standards that are at or near the CARB 2007 Distributed Generation Emissions Standards; clarified the status for portable engines; and set emissions standards for biogas engines to become effective on July 1, 2012 if the July 2010 Technology Assessment confirmed that the rule limits could be achieved.

The resolution for the adoption of the February 2008 amendments to Rule 1110.2 included commitments directing staff to conduct a Technology Assessment to address the availability, feasibility, cost-effectiveness, compliance schedule, and global warming impacts of biogas engine control technologies and report back to the Governing Board no later than July 2010. Additionally, the Governing Board directed that the July 2012 biogas emission limits would not be incorporated into the SIP unless the July 2010 Technology Assessment found that the proposed limits are achievable and cost-effective.

At the July 2010 Governing Board meeting, staff presented an Interim Technology Assessment to address the commitments contained in the resolution for the adoption of the February 2008 amendments to Rule 1110.2. The Interim Technology Assessment summarized the biogas engine control technologies to date and the status of on-going demonstration projects. Due to delays caused by the permit moratorium in 2009, the release of a subsequent report was recommended upon the completion of these projects. The Interim Technology Assessment concluded that feasible, cost-effective technology should be available that can support the feasibility of the July 2012 emission limits, but that the delay in the demonstration projects would likely necessitate an adjustment to the July 1, 2012 compliance date in Rule 1110.2.

Amendments to Rule 1110.2 in July 2010 added an exemption to the rule affecting a remote public safety communications site at Santa Rosa Peak in Riverside County which has limited accessibility in the wintertime.

The September 2012 amendments to Rule 1110.2 established a compliance date of January 1, 2016 for biogas engines. A compliance option was also provided so that operators requiring additional time would be given up to two years beyond the compliance date with the submittal of a compliance plan and payment of a compliance flexibility fee. In addition, South Coast AQMD staff presented an Assessment of Available Technology for Control of NOx, CO, and VOC Emissions from Biogas-Fueled Engines that detailed the different available technologies and demonstration projects for biogas engines, along with costs.

Due to the fact that some control technologies were not available, in December 2015, Rule 1110.2 was amended to delay implementation of NOx, VOC, and CO emission limits compliance dates for biogas engines. However, all delayed emission reductions will be recaptured over time, so the emissions foregone are not permanent. Limits were also adopted on the number of breakdowns and excess emissions during breakdown events in order to be consistent with the U.S. EPA's breakdown provisions and to allow the rule to be incorporated into the SIP.

Rule 1110.2 was amended in July 2016 to provide relief to a biogas facility from emission requirements specified in Table III-B of the rule provided the facility has submitted a detailed retirement plan, approved by the Executive Officer, for the permanent shutdown of all equipment subject to Rule 1110.2 by October 1, 2022.

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, South Coast AQMD staff was 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 South Coast AQMD Regulation XI – Source Specific Standards. South Coast AQMD staff has proposed amendments to Rule 1110.2 to transition equipment from the NOx RECLAIM program to a command-and-control regulatory structure, while achieving BARCT. PAR 1110.2 will assist in the transition of 21 facilities out of the RECLAIM program. Further, Rule 1100 is an administrative rule that was developed and adopted on December 7, 2018 to establish a compliance schedule for transitioning affected units NOx RECLAIM facilities to a command-and-control regulatory structure in accordance with the direction in CMB-05. NOx RECLAIM facilities with equipment subject to PAR 1110.2 will be required to meet the NOx emission limits in this rule in accordance with the implementation schedule outlined in PAR 1100.

PROJECT OBJECTIVES

The main objectives of the proposed project are to: 1) reduce NOx emissions from internal combustion engines and transition these equipment that are currently permitted under the NOx RECLAIM program to a command-and-control regulatory structure; and 2) implement Control Measure CMB-05 by requiring stationary internal combustion engines operating at RECLAIM or former RECLAIM facilities to comply with current BARCT in accordance with a implementation schedule for transitioning affected units NOx RECLAIM facilities to a command-and-control regulatory structure; ~~3) establish new ammonia (NH3) slip limits and require ammonia emissions monitoring;~~ and ~~4~~3) add clarification to its applicability to engines operated at remote radio transmission towers.

PROJECT DESCRIPTION

If adopted, PAR 1110.2 would: 1) include internal combustion engines operated at current and former RECLAIM facilities which were not previously subject to Rule 1110.2 and require them to comply with BARCT; ~~2) establish ammonia slip limits and require ammonia emissions monitoring;~~ ~~3~~2) exempt non-emergency engines operated at remote two-way radio transmission towers. Additionally, staff is proposing to add definitions for additional clarity, add language to help facilitate the transition from RECLAIM, and revise exemptions to remove provisions that are obsolete. To address concerns from stakeholders, changes were made to PAR 1110.2 after the release of the Draft SEA, which include establishing an interim VOC limit of 25 ppmvd for electric generating units, also referred to as linear generator engines, that: 1) do not have ammonia emissions from add-on control equipment; 2) meet the NOx limit of Rule 1110.2 Table IV; and 3) were installed before January 1, 2024. Additionally, staff has added an exemption for Tier 4 – Final diesel engines which are used to power cranes operated in the Southern California Coastal Waters or Outer Continental Shelf. Implementation of the proposed project is estimated to reduce NOx emissions by 0.29 ton per day, and is expected to be achieved by retrofitting existing internal combustion engines with air pollution control equipment (e.g., selective catalytic reduction (SCR) technology/systems, or by repowering or replacing existing internal combustion engines.

PAR 1100 would require: 1) two- and four-stroke lean-burn compressor gas engines to comply with the NOx emission limits in PAR 1110.2 within 24 months after a permit to construct is issued~~,~~ ~~or 36 months after a permit to construct is issued if~~ and require the permit application ~~is~~ to be submitted by July 1, 2021; and 2) all other qualifying engines to meet the NOx emission limits by December 31, 2023. Further, to address comments from stakeholders, staff has included the following changes to PAR 1100 since the release of the Draft SEA: 1) extending compliance date for achieving the emission limits specified in the rule and adding interim emission limits for compressor gas lean-burn engines if the owners or operators submit a request for a time extension; 2) adding alternative emission limits for compressor gas lean-burn engines; 3) extending the compliance date for achieving the emission limits for compressor gas lean-burn engines undergoing a facility-wide engine modernization; 4) adding a requirement for permit applications to be submitted by July 1, 2021; and 5) adding low-use criteria for diesel engines operated at ski resorts. Staff will also add definitions to PAR 1100 for clarity.

The following is a detailed summary of key elements contained in PARs 1110.2 and 1100. A copy of PARs 1110.2 and 1100 can be found in Appendix A.

PAR 1110.2

Definitions – Subdivision (c)
Staff proposes to add the following new definitions to clarify and explain key concepts:

- Compressor Gas Lean-Burn Engine
- Essential Public Service
- Former RECLAIM Facility
- Non-RECLAIM Facility
- RECLAIM Facility

Requirements – Subdivision (d)
Staff is proposing to modify clause (d)(1)(L)(iv) to remove the reference to Regulation XX and specify that the subparagraph is applicable to both RECLAIM and former RECLAIM facilities.

Due to some concerns over the operational variability of certain engines, the averaging time of 15 minutes previously noted in Tables I, II, III-A, III-B, and IV have been removed. Clause (d)(1)(B)(ii) will be modified to specify the averaging time period of 15 minutes unless allowed under clauses (d)(1)(B)(iii) through (d)(1)(B)(v). Also, there are three clauses that follow clause (d)(1)(B)(ii) which are not currently delineated with a separate designation. Staff is proposing to designate those clauses as (d)(1)(B)(iii), (vi), and (vii) ~~(d)(1)(B)(iii)-(v)~~ and update rule language for additional clarity as follows:

- (d)(B)(1)(iii): Use an averaging time approved by the Executive Officer for an engine that uses non-pipeline quality natural gas that has demonstrated that due to the varying heating value of the gas a longer averaging time was necessary. The fixed-interval averaging time shall not exceed six hours for any of the concentration limits of Table II, unless an existing engine has a longer averaging time as a permit condition. Non-pipeline quality natural gas is a gas that does not meet the gas specifications of the local gas utility and is not supplied to the local gas utility.

- (d)(1)(B)(~~ii~~vi): Comply with the ~~T~~the concentration limits in Table II for Low-Use Engines ~~effective~~ before ~~on and after July 1, 2010 shall not apply to~~ if the engines ~~that~~ operate less than 500 hours per year or uses less than 1 x 10^9 British Thermal Units (Btus) per year (higher heating value) of fuel.

- (d)(1)(B)(~~i~~vii): Comply with any technologically achievable case-by-case CO and VOC limits that were approved by the Executive Officer in lieu of the concentration limits in Table II, effective on and after July 1, 2010 for a ~~If the operator of a~~ two-stroke engine equipped with an oxidation catalyst and insulated exhaust ducts and catalyst housing ~~demonstrates~~ that has demonstrated that the CO and VOC limits effective on and after July 1, 2010 ~~are~~were not achievable, then the Executive Officer may, with U. S. EPA approval, establish technologically achievable. ~~case-by-case CO and VOC limits in place of the concentration limits effective on and after July 1, 2010.~~ The case-by-case limits shall not exceed 250 ppmvd[8] VOC and 2000 ppmvd CO.

- ~~(d)(1)(B)(viii): If the operator of an engine that uses non-pipeline quality natural gas demonstrates that due to the varying heating value of the gas a longer averaging time is necessary, the Executive Officer may establish for the engine a longer averaging time, not to exceed 24 hours, for any of the concentration limits of Table II. Non-pipeline quality natural gas is a gas that does not meet the gas specifications of the local gas utility and is not supplied to the local gas utility.~~

Clauses (d)(1)(B)(iii) through (v) allows facilities to use an averaging time other than 15 minutes to demonstrate compliance. The change in averaging times is not expected to have an adverse environmental impact as facilities will still be required to meet an emission limit of 11 ppmv NOx.

One affected RECLAIM facility will be subject to clause (d)(1)(B)(~~v~~iii) upon approval of PAR 1110.2. The facility operates a produced gas-fired engine that was permitted to meet 6 ppm NOx averaged over a 24-hour period as well as a 24 ppm NOx limit averaged over a one hour period. The fuel of this engine does not meet pipeline quality natural gas specifications. The proposed language would extend the six-hour averaging time maximum to 24 hours. Since the stationary

8 Parts per million by volume on a dry basis

engine is currently permitted to meet six ppm NOx averaged over 24 hours, this change is not expected to result in any adverse environmental impacts.

Several ~~two-stroke natural gas-fired~~ compressor gas lean-burn engines will be affected by PAR 1110.2, which are utilized for natural gas compression and pipeline distribution. Two-stroke engines have unique characteristics that can present some challenges in complying with the 11 ppm NOx limit. To address concerns for these specific engines, staff is proposing to include the following language:

- (d)(1)(B)(v~~i~~): Use a fixed-interval averaging time of three hours f~~F~~or ~~owners and operators of two-stroke engines~~ compressor gas lean-burn engines equipped with selective catalytic reduction pollution control equipment and a CEMS~~, an averaging time of 60 minutes shall be used for~~ to demonstrate~~ing~~ compliance with the NOx ~~requirements~~ concentration limit of Table II.

To meet current BARCT, operators are expected to install post-combustion emission controls. Lean-burn engines will likely need to be retrofitted with SCR systems which use ammonia. However, there is a possibility of ammonia emissions due to unreacted ammonia. The unreacted ammonia is referred to as ammonia slip. Current BACT for ammonia from new SCR systems is five ppmv and Engineering and Permitting will evaluate for BACT under Regulation XIII – New Source Review (NSR), Rule 1303 during permitting of any engine with new SCR control technology. ~~To minimize ammonia slip emissions, staff is proposing to add clause (d)(1)(B)(vii) to limit ammonia emissions to five ppmv (referenced at 15 percent oxygen on a dry basis, averaged over a period of 60 consecutive minutes). This limit will apply to the installation of new SCR systems or modification of existing SCR systems upon approval of PAR 1110.2.~~

Staff was approached by a manufacturer of electrical generating devices using linear generator technology to provide concentration limits in addition to the listed emission standards for new electrical generating devices as currently expressed as pounds of NOx per megawatt-hour (MW-hr). Staff has updated Table IV in PAR 1110.2, which contains the requirements for new electrical generators to reflect the conversion from a mass-based emission standard to a concentration limit. The manufacturer also requested that the rule allow for engines that can achieve the NOx concentration limits at start-up with no SCR and in turn, no ammonia emissions to meet a VOC concentration limit above the current Rule 1110.2 limit of 10 ppmvd. While there would be a potential increase in VOC emissions due to an increase in VOC concentration limits, this technology is capable of meeting low NOx emission levels without emitting any ammonia slip, a precursor to PM2.5 emissions. Therefore, staff is proposing to allow engines that can achieve the NOx concentration limits at start-up with no ammonia emissions from an SCR to meet a VOC concentration limit of 25 ppmv for units installed prior to January 1, 2024. However, linear generator engines installed on or after January 1, 2024 will be required to meet the 10 ppmv VOC limit. To minimize the potential increase in VOC from linear generator engines installed prior to January 1, 2024, clause (d)(1)(L)(vii) has been added to PAR 1110.2 to limit the total VOC emissions from all linear generator engines permitted during this window to no more than 45 pounds per day, which is based on the accumulated daily VOC emissions in excess of the concentration limits of Table IV based on the permitted VOC limits from each engine. Further, South Coast AQMD Engineering and Permitting staff will evaluate any potential increase in VOC emissions, as well as other criteria pollutants including NOx, from linear generator engines pursuant to Regulation XIII – New Source Review, which may require the permit applicant to provide emission offsets.

Compliance – Subdivision (e)
Staff is proposing to add subparagraph (e)(3)(C) to require operators of stationary engines located at a RECLAIM or former RECLAIM facility that are required to modify or install CEMS to submit applications for the new or modified CEMS within 90 days of exiting from the RECLAIM program.

Staff is also proposing to add paragraph (e)(10) which specifies that engines at RECLAIM or former RECLAIM facilities will be required to meet the applicable NOx limits in Table II of Rule 1110.2 in accordance to the schedule established in Rule 1100.

Monitoring, Testing, Recordkeeping and Reporting – Subdivision (f)
Staff is proposing to remove references to Regulation XX from this subdivision as part of the transition to a command-and-control structure. Facilities will also be required to: comply with subparagraph (f)(1)(E) or paragraph (f)(2) once they exit from the RECLAIM program; and keep a monthly engine operating log for stationary and portable engines instead of quarterly logs.

~~Additionally, staff is proposing to add clause (f)(1)(A)(iii) which requires owners and operators of each stationary engine with SCR to either conduct source testing pursuant to clause (f)(1)(C)(iii) or to use an approved ammonia CEMS to demonstrate compliance with ammonia emission limits.~~

~~Staff is also proposing to add the following source testing requirements to clause (f)(1)(C)(iii) and modify Table IX to include Test Method South Coast Air Quality Management District Method 207.1 for Ammonia:~~

- ~~The owner or operator of each stationary engine with selective catalytic reduction pollution control equipment not utilizing a certified ammonia CEMS shall conduct source tests quarterly to demonstrate compliance during the first 12 months of operation of the pollution control equipment and every calendar year thereafter (within the same calendar month of the previous source test) after four consecutive sources tests demonstrate compliance with the ammonia emission limit. If the engine has not been operated within three months of the date a source test is required, the operator may utilize the provisions for extension of the source testing deadlines contained under clause (f)(1)(C)(i).~~

Staff is proposing an alternative to CEMS requirements for engines operated by Essential Public Service or a contractor for an Essential Public Service under clause (f)(1)(A)(ix). However, if the engine is found to exceed the applicable emissions limits by a source test of South Coast AQMD testing using a portable analyzer on at least three occasions in any 12-month period, clause (f)(1)(A)(x) requires the operator to comply with the CEMS requirements of clause (f)(1)(A)(i).

Exemptions – Subdivision (i)
Staff is proposing to add subparagraph (i)(1)(M) to exempt stationary engines used exclusively for electrical generation at remote two-way transmissions towers where no utility, electricity, or natural gas is available within a 0.5 mile radius. The engines must also have a manufacturer's rating of 100 bhp or less, and be fired exclusively on diesel #2, compressed natural gas (CNG), or liquefied petroleum gas (LPG). South Coast AQMD Rule 219 was amended in May 2013 to exempt engines used exclusively for electrical generation at remove two-way radio transmission towers where no utility, electricity or natural gas is available within one half mile radius, with a rating of 100 bhp or less. Impacts associated with this exemption were analyzed in the May 2013

Final EA for PARs 219 and 222[9]. In addition to the exemption from Rule 219, staff had also intended to exempt the engines from Rule 1110.2. The analysis in the May 2013 Final EA for PARs 219 and 222 took into account the NOx emission reductions foregone as a result of these engines being exempted from Rules 219 and 1110.2.

The exemption was further expanded to include engines fired on LPG and CNG in the May 2017 amendment of Rule 219. Based on the Final Staff Report which was included in the May 5, 2017 Governing Board Package[10], NOx and PM emissions from combustion of LPG- and CNG-fired engines would be less than emissions from diesel-fired engines. Also, since the engines are operated at remote locations, operation of these engines are unlikely to result in any health risks above one in million. The project was determined to be exempt from CEQA and the project was approved by the Governing Board. Therefore, no additional impacts are expected from exempting engines used exclusively for electrical generation at remove two-way radio transmission towers where no utility, electricity or natural gas is available within one half mile radius, with a rating of 100 bhp or less from the requirements of Rule 1110.2.

Rule 1110.2 previously exempted engines operated by the County of Riverside for the purpose of public safety communication at Santa Rosa Peak under subparagraph (i)(1)(H). The site was located at a high elevation with no access to electric power or natural gas. The engines operated by the County of Riverside at Santa Rosa Peaks qualify for the newly proposed exemption from Rule 1110.2 under subparagraph (i)(1)(M). Therefore, subparagraph (i)(1)(H) will be amended to remove language specifically exempting those engines.

~~For additional clarity,~~ South Coast AQMD staff is currently developing other rules for equipment operated at landfills or publicly owned treatment works. Staff is proposing to add subparagraph ~~(i)(3)~~(i)(1)(N) to exempt any engine 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. Additionally, staff is proposing to exempt engines operated at landfills or a publicly owned treatment works that are subject to a NOx emission limit in a Regulation XI rule adopted or amended after approval of PAR 1110.2 under paragraph (i)(3).

Further, concerns over the ability to source test engines which are used to power cranes operated in the Southern California Coastal Waters or OCS were brought to the attention of staff during rule development. The currently installed engines for powering cranes on off-shore oil platforms are certified to meet Tier 4 – Final emission standards. Ordinarily, Tier 4 – Final diesel engines are source-tested to determine if they can meet the NOx emission limit of 11 ppmvd. However, cranes on off-shore oil platforms operate intermittently. Because a source test needs to be conducted on an engine running for a longer period of time than what actually occurs for cranes operating on off-shore oil platforms, staff is proposing to add an exemption for these engines under subparagraph (i)(1)(O) provided that they meet the following criteria:

(i) The engine is used to power a crane;

[9] South Coast AQMD, Final Environmental Assessment for: Proposed Amended Rule 219 – Equipment Not Requiring a Written Permit Pursuant to Regulation II, Proposed Amended Rule 222 – Filing Requirements for Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II, certified May 2017, http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2013/219and222finalea.pdf

[10] South Coast AQMD, Governing Board Package for Public Hearing to Amend Rule 219 – Equipment Not Requiring a Written Permit Pursuant to Regulation II and Amend Rule 222 – Filing Requirements for Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II, May 2017, http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2017/2017-may5-027.pdf

(ii) The engine is certified by CARB to meet the Tier 4 – Final emission standards of 40 CFR Part 1039 Section 1039.101 Table 1;
(iii) The engine is operated per the specifications of the engine manufacturer; and
(iv) The operator submits an I&M Plan to the Executive Officer for approval and implementation, pursuant to the requirements of paragraph (e)(6).

With this exemption, operators are still required to install and operate CARB certified Tier 4 – Final engines but no longer will be required to conduct a source test. Since engines powering cranes are required to meet Tier 4 – Final emission standards and will continue to be required to meet Tier 4 – Final emission standards, there will be no increase in NOx emissions relative to baseline conditions (existing setting) such that no change to the CEQA analysis is required.

Averaging Time Provisions for Biogas Facilities

Staff is proposing to clarify the averaging time provisions for biogas engines in subparagraph (d)(1)(I). Biogas engines are currently allowed to have longer averaging times if the operator can demonstrate that NOx emissions are at least 10 percent below the 11 ppm limit over a four-month period. However, it was not clear whether initial four-month period would occur immediately upon start up. Therefore, staff is proposing the following language for subparagraph (d)(1)(I):

- An operator of a biogas engine equipped with CEMS shall meet:

  (i) The NOx and CO limits of Table III-B, averaged pursuant to the specified averaging provisions in subparagraph (d)(1)(B);

  (ii) The emission limits at or below 11 ppmvd for NOx and 250 ppmvd for CO (if CO is selected for averaging), each corrected to 15% O2 and averaged over a 24-hour fixed interval, with the emission limits and averaging time specified as a condition in the engine's permit to operate on or before the [*Date of Amendment*]; or

  (iii) The emission limits at or below 9.9 ppmvd for NOx and 225 ppmvd for CO (if CO is selected for averaging), each corrected to 15% O2 and averaged over a 48-hour fixed interval, with the emission limits and averaging time specified as a condition in the engine's permit to operate.

- ~~Upon startup of a new engine installation that is equipped with catalytic controls or retrofitted with catalytic controls for an existing engine, for determining compliance with the NOx and/or CO limits of Table III-B, an operator of a biogas engine with CEMS may utilize a monthly fixed interval averaging time for the first four months after startup. After the initial four-month startup period, an operator of a biogas engine may determine compliance by utilizing a 24-hour averaging time, provided the operator demonstrates through CEMS data that the engine is achieving a concentration at or below 9.9 ppmv for NOx and/or 225 ppmv for CO (if CO is selected for averaging), each corrected to 15 percent oxygen (O2), over a four-month rolling time period. If during any four-month period, the engine is not achieving the emissions criteria contained in this subparagraph, the engine shall revert to 15-minute averaging, but can resume 24-hour averaging if the engine can demonstrate the aforementioned emissions criteria over a four-month period. Procedures for demonstrating the emissions criteria contained in this subparagraph, for demonstrating compliance with 24-hour averaging, and for reverting to 15-minute averaging shall be contained in the facility's Inspection and Monitoring plan, as specified~~

~~in subparagraph (f)(1)(D). Exceedances of the emissions criteria contained in this subparagraph shall be reported, pursuant to the requirements in clause (f)(1)(H)(iii).~~

The existing conditions for determining compliance using either a monthly or 24-hour averaging time through CEMS were previously contained in clauses (d)(1)(I)(i) through (iv). Staff is proposing to <u>remove these provisions from the rule.</u> ~~to move these requirements to subclauses (d)(1)(I)(i)(I) through (IV) to further clarify that the requirements are specific to demonstrating compliance with subparagraph (d)(1)(I).~~

~~To assist tracking the ongoing requirements, staff is proposing to add language under subclause (f)(1)(D)(i)(I) to require facilities with biogas engines using longer averaging times and utilizing CEMS for compliance to submit a Implementation and Monitoring (I&M) Plan. Staff is proposing to include the following I&M Plan requirements for biogas engines:~~

- ~~For biogas engines using NOx and/or CO CEMS to demonstrate compliance by using a longer averaging time:~~
  - ~~procedures for demonstrating that the NOx and/or CO emissions are at or below 9.9 ppmv for NOx and 225 ppmv for CO (if CO is selected for averaging) over a four-month period.~~
  - ~~procedures for demonstrating ongoing compliance with a 24-hour fixed interval averaging time, if the requirements in paragraph F.1 are met.~~
  - ~~procedures for reverting back to a 15-minute averaging time in the event that the NOx and/or CO emissions are not at or below 9.9 ppmv for NOx and 225 ppmv for CO (if CO is selected for averaging).~~

PAR 1100

Applicability – Subdivision (b)
Staff is proposing expand the applicability of the rule by adding Rule 1110.2 – Emissions from Gaseous- and Liquid- Fueled Engines to this subdivision.

Definitions – Subdivision (c)
Staff proposes to add the following new definitions to clarify and explain key concepts:

- Compressor gas <u>lean-burn</u> engine
- Engine
- <u>Lean-burn Engine</u>
- Location
- Portable Engine
- <u>Rule 1110.2 Unit</u>
- <u>South Coast AQMD</u>
- Stationary Engine

Rule 1110.2 Implementation Schedule – Subdivision (d)
Staff is proposing to add the following implementation schedule for engines operated at RECLAIM or former RECLAIM facilities:

(1) An owner or operator of a RECLAIM or former RECLAIM facility ~~with any stationary engine(s)~~ subject to ~~and not exempt by~~ Rule 1110.2 <u>that does not currently meet the NOx concentration limit specified</u> ~~shall meet the emission limits listed~~ in Rule 1110.2 paragraph (d)(1) <u>shall:</u>

(A) On or before July 1, 2021, submit a permit application for each stationary engine that does not meet the NOx concentration limit specified in Rule 1110.2; and
(B) On or before December 31, 2023, meet the emission limits specified in Rule 1110.2 paragraph (d)(1).

(2) An owner or operator of a RECLAIM or former RECLAIM facility with any portable engine(s) subject to Rule 1110.2 shall meet the conditions listed in Rule 1110.2 paragraph (d)(2).

(3) An owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1110.2 with a compressor gas lean-burn engine that currently does not meet the NOx concentration limit specified in Rule 1110.2 paragraph (d)(1) shall:
(A) On or before July 1, 2021, submit a permit application for each compressor gas lean-burn engine
(B) On or before 24 months after a Permit to Construct is issued by the Executive Officer, meet the emission limits specified in Rule 1110.2 paragraph (d)(1).

An owner or operator of a RECLAIM or former RECLAIM facility subject to Rule 1110.2 with a compressor gas lean-burn engine that currently does not meet the NOx concentration limit specified in Rule 1110.2 will also be required to submit quarterly reports as specified under subparagraph (d)(3)(C). Further, under subparagraph (d)(4)(D), any compressor gas lean-burn engines that will not be retrofitted and instead, will be replaced, must be permanently removed from service by December 31, 2023, or 24 months after a permit to construct is issued for the replacement equipment, whichever is later.

Due to the specialized operation of compressor gas lean-burn engines used for natural gas compression and distribution, staff is proposing to provide some flexibility in meeting the emissions limits of PAR 1110.2 under paragraph (d)(4). To qualify for an extension up to 24 months, an owner or operator of a compressor gas lean-burn engine operating at a RECLAIM or former RECLAIM facility must submit a compliance plan, provide justification for the requested extension, and have provided all quarterly reports since the startup of the retrofitted equipment, pursuant to subparagraph (d)(3)(C). If the compliance plan is approved and the extension is granted, the compressor gas lean-burn engines will be subject to the interim emission limits of subparagraph (d)(4)(C). If an extension is not granted, an owner or operator of a compressor gas lean-burn engine operating at a RECLAIM or former RECLAIM facility will be notified of the Executive Officer’s decision and the engines will be required to meet the emission limits in Rule 1110.2 paragraph (d)(1) within 30 days after notification.

Further, an owner or operator of RECLAIM or former RECLAIM facility subject to Rule 1110.2 with a compressor gas lean-burn engine can request to comply with alternative emission limits under the proposed provisions in paragraph (d)(5). To qualify, the owner or operator must meet the requirements of subparagraph (d)(5)(A) which include notifying the Executive Officer no later than four months prior to the compliance dates specified in subparagraphs (d)(3)(B) and (d)(4)(C), and the facility must demonstrate through CEMS data and source testing from the past two years that the compressor gas lean-burn engines cannot achieve the emissions limits in paragraph (d)(1) of Rule 1110.2. The Executive Officer will review the request and supporting information and notify the owner or operator of the applicable emissions limits.

Under proposed subparagraph (d)(5)(C), the owner or operator will be required to meet the alternative emission limits within 30 days after being notified of the alternative emission limits and be required to pay a mitigation fee of $100,000 per calendar year for the duration of the extension. Alternatively, the owner or operator can replace any compressor gas lean-burn engines that do not meet the emission limits of Rule 1110.2 paragraph (d)(1) within 12 months of notification from the Executive Officer.

Additionally, staff has included requirements for a Facility-wide Engine Modernization Compliance Plan under paragraph (d)(6). Facilities planning to undergo a facility-wide engine modernization must submit a compliance plan that meets the requirements of clause (d)(6)(A)(i) and subparagraph (d)(6)(B) by January 1, 2021. Permit applications for engines identified in the Compliance Plan must be submitted by January 1, 2022 and must be removed from service or replaced within 36 months after the Permit to Construct is issued. Similar to the requirements in paragraph (d)(5), extensions may be granted to facilities with an approved Facility-wide Engine Modernization Compliance Plan provided that the facility complies with the requirements in subparagraph (d)(6)(C).

RECLAIM or former RECLAIM facilities operating compressor gas lean-burn engines that are granted extensions pursuant to PAR 1100 paragraph (d)(4) and subparagraph (d)(6)(C), a mitigation fee of $100,000 will be required per facility per calendar year beginning 30 days from the approval of the extension for the duration of the extension. The mitigation fees will be used to fund future studies and projects designed to reduce criteria pollutants and toxic air contaminant emissions. The amount for the mitigation fee is approximately the amount that a facility would otherwise have to pay in order to go through the variance process with the South Coast AQMD Hearing Board, including excess emissions fees, notification fees, and other procedural fees.

The aforementioned revisions subsequent to the release of the Draft SEA is not expected to result in any additional environmental impacts. The proposed provisions for qualifying compression gas lean-burn engines, included those undergoing a facility-wide engine modernization, would result in less overlapping construction activities and subsequently lower peak daily emissions. Further, emission from retrofitted engines that are required to meet the interim NOx emission limit in subparagraph (d)(4)(A) or the alternative emissions limits established pursuant to paragraph (d)(5) would be lower than baseline emissions from existing engines. Therefore, additional environmental impacts are not expected and further CEQA analysis is not required.

Finally, to address concerns of a RECLAIM facility operating diesel-fired engines with meeting the 11 ppmv NOx limit, staff is proposing to add a low-use emission limit for in-use units at ski resorts. To qualify, each engine will have a condition added in its South Coast AQMD Permit to Operate which limits the operating hours to no more than 500 hours per year or uses less than 1×10^9 Btu of fuel per year. Engines under the low-use provision will retain the NOx and ammonia limits as well as the monitoring and source testing requirements specified on the South Coast AQMD Permit to Operate in effect at the date of rule adoption. In order for an engine to qualify for the low-use provision, the owner or operator will need to apply for a permit by July 1, 2021. If the engine exceeds the annual hours and fuel use requirements listed in the Permit to Operate, the owner or operator will be required to submit an application to repower or retrofit the engines within six months from the reported exceedance. This provision would allow the facility to continue operating the engines at baseline emission levels and therefore does not result in additional impacts or further CEQA analysis.

SUMMARY OF AFFECTED EQUIPMENT

Among the facilities subject to PAR 1110.2, 76 internal combustion engines at 21 RECLAIM facilities are expected to be affected by PAR 1110.2. Of these engines, 21 currently meet the proposed NOx emission limit of 11 ppmv and eight portable engines at three facilities are expected to be phased out. Additionally, two engines that are limited to operating 499 hours per year do not have to meet the 11 ppmv NOx emission limit. Among the remaining 10 facilities affected by PAR 1110.2, approximately 45 engines would need to be replaced, repowered, or retrofitted with air pollution control equipment in order to comply with the NOx limits in PAR 1110.2. Upon full implementation of BARCT, PAR 1110.2 is estimated to reduce NOx emissions by approximately 0.29 ton per day. Table 2-1 identifies the industry sectors, as classified by the North American Industry Classification System (NAICS) code, and the number of respective internal combustion engines at facilities that would be subject to the requirements in PAR 1110.2.

Table 2-1
Affected Industries Subject to PAR 1110.2

NAICS Codes	Description of Industry	Number of Facilities	Number of Units
713110	Amusement and Theme Parks	1	1
312120	Breweries	1	4
211111	Crude Petroleum and Natural Gas Extraction	8	23
212322	Industrial Sand Mining	1	1
331110	Iron and Steel Mills and Ferroalloy Manufacturing	1	1
~~221210~~	~~Natural Gas Distribution~~	~~2~~	~~17~~
322130	Paperboard Mills	1	1
486210	Pipeline Transportation of Natural Gas	~~2~~4	~~16~~33
88310	Port and Harbor Operations	1	2
481111	Scheduled Passenger Air Transportation	1	3
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	1	1
713920	Skiing Facilities	1	6
	Total	21	76

Table 2-2 identifies the number of internal combustion engines that would require modifications[11] to comply with BARCT for the 10 affected facilities. The following list describes internal combustion engines that would require modifications in order to meet the updated BARCT NOx and ammonia concentration limits in PAR 1110.2:

1) Engines with existing SCR or NSCR systems: There are six lean burn engines with existing SCR systems that may need modifications in order to comply with PAR 1110.2, if they

[11] Modification in this Final SEA does not necessarily imply an event that would be subject to South Coast AQMD Regulation XIII – New Source Review. Instead, modification is a general term used to describe potential changes that may occur as a result of complying with PARs 1110.2 and 1100.

continue operating. PAR 1100 allows for these units to continue operation without meeting the 11 ppmv NOx limit provided that they take a low-use permit limit of 500 hours per year or 1 x 10^9 Btu per year of fuel. However, the analysis assumes that these engines will need to comply with the 11 ppmv NOx limit. Compliance with PAR 1110.2 would require modifications to the existing SCR systems or additional ammonia deliveries. There are currently ten engines equipped with NSCR systems. Since low NOx emissions can be achieved with this technology, minimal modifications such as replacing or tuning the air-to-fuel ratio controller and/or replacing the catalysts are expected. Since replacing the existing catalyst will require more construction, for this analysis, it is assumed that 16 SCR or NSCR systems will need to have catalyst replacements.

2) Lean burn engines without SCR: There are currently 15 lean burn engines that are operated at RECLAIM facilities which are not equipped with SCR and are expected to need to retrofit the existing engines with new SCR system and would also include installation of an ammonia or urea tank. Subsequently, ammonia or urea deliveries would also be required once the SCR system is operational.

3) Lean burn engines without SCR to be repowered: There are eight lean burn engines at two facilities currently used to drive gas compressors that will be repowered. In lieu of retrofitting the engine with SCR, the engines will be replaced with natural gas-fired stationary gas turbines equipped with SCR. The stationary gas turbines, once constructed and operational, will be subject to the requirements of South Coast AQMD Rule 1134 - Emissions of Oxides of Nitrogen from Stationary Gas Turbines. Although three of the turbines were included in the analysis in the Final SEA for Rule 1134 which was certified on April 5, 2019[12], for the purposes of this CEQA analysis, the repowering of all eight lean burn engines with eight stationary gas turbines with SCR will be evaluated.

4) Stationary engines located in the Outer Continental Shelf (OCS): There are six lean burn engines located in the OCS that may need modifications in order to comply with PAR 1110.2 if they continue operating. The most effective NOx emission control technology for lean burn engines typically entails installing an SCR system as the primary post-combustion technology for NOx reduction. Some engines located in the OCS are equipped with SCR which utilizes urea injection. However, those engines have ratings at less than 200 bhp each. The six lean-burn engines are much larger (853 bhp) and would require a substantial quantity of aqueous ammonia or urea to comply with the proposed emission limits. Since there is no way to safely deliver and store aqueous ammonia or urea located in the OCS due to space constraints on the platforms and risk of exposure during catastrophic failure of an ammonia tank to workers, replacement or repowering of the existing stationary engines with equipment utilizing NSCR technology such as three-way catalyst is the most likely scenario to ensure OCS stationary engines meet BARCT for NOx.

12 South Coast AQMD, Final Subsequent Environmental Assessment for Proposed Amended Rule 1134 – Emissions of Oxides of Nitrogen from Stationary Gas Turbines, certified April 2019, http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2019/par-1134---final-sea_with_appdx.pdf

Table 2-2
Summary of Stationary Engines and Expected Modifications

Description of Modifications	Total
Existing SCR or NSCR expected to be modified	16
Engines expected to be retrofitted with new SCR	15
Engines expected to be repowered with new stationary gas turbines and new SCR	8
Engines expected to be replaced and with new NSCR catalyst (OCS facility)	6
Total Number of Affected Stationary Engines	45

The total NOx inventory for the RECLAIM units affected by PAR 1110.2 is estimated to be 0.37 ton per day and is summarized in Table 2-3.

Table 2-3
2017 NOx Emissions Inventory

Engine Type	Emissions (ton per day)
Two-Stroke Lean Burn	0.12
Four-Stroke Lean Burn	0.23
Rich Burn	0.02
Total	**0.37**

TECHNOLOGY OVERVIEW

Combustion is a high temperature chemical reaction resulting from burning a gas, liquid, or solid fuel (e.g., natural gas, diesel, fuel oil, gasoline, propane, and coal) in the presence of air (oxygen and nitrogen) to produce: 1) heat energy; and 2) water vapor or steam. An ideal combustion reaction is when the entire amount of fuel needed is completely combusted in the presence of air so that only carbon dioxide (CO2) and water are produced as by-products. However, since fuel contains other components such as nitrogen and sulfur plus the amount of air mixed with the fuel can vary, in practice, the combustion of fuel is not a “perfect” reaction. As such, uncombusted fuel plus smog-forming by-products such as NOx, SOx, CO, and soot (solid carbon) can be discharged into the atmosphere.

Of the total NOx emissions that can be generated, there are two types of NOx formed during combustion: 1) thermal NOx; and 2) fuel NOx. Thermal NOx is produced from the reaction between the nitrogen and oxygen in the combustion air at high temperatures while fuel NOx is formed from a reaction between the nitrogen already present in the fuel and the available oxygen in the combustion air. The amount of fuel NOx generated is dependent on fuel type and boilers, engines, and gas turbines all generate thermal NOx as a combustion by-product. The following provides a brief description of the various types of existing combustion equipment that may be affected by PAR 1110.2 and subsequently retrofitted with NOx control equipment.

Gaseous and Liquid Fuel Powered Internal Combustion Engines: Internal combustion engines create power by mixing fuel in a cylinder controlled by valves in a timed cycle. The cylinder contains a piston which compresses the fuel igniting it by either a spark (spark ignition) or until the fuel ignites from pressure (compression ignition). The expansive force created by the ignited fuel is transferred by the piston through a connecting rod to a crankshaft which transfers the resulting power to useable work. The power created can generate electricity or by an external shaft for propulsion. The extreme heat created by the combustion of the fuel exits the engine through the exhaust system at a temperature sufficient to create many undesirable compounds such as NOx and the formation of other greenhouse gases. The emissions are often controlled by complex catalyst systems for compression ignition engines and a single simple catalyst for spark ignited engines. For the purpose of the analysis in this SEA, controlling NOx emissions from diesel fueled internal combustion engines is assumed to be accomplished with SCR technology.

One portion of the BARCT assessment for PAR 1110.2 evaluated technologically feasible NOx emissions control technologies specific to engines. The BARCT assessment identified the following technologies that could be employed to achieve BARCT compliance in the event that a facility operator chooses to install new or modify their existing air pollution control equipment to reduce NOx emissions from engines: 1) SCR for lean-burn engines; and 2) NSCR for rich-burn engines. An emissions control system developed by Tecogen was identified as an alternative to these two technologies. The Tecogen technology utilizes two non-selective catalysts in series with a heat exchanger as well as air injection to achieve low NOx and CO emissions. However, this technology is only effective for certain rich burn, natural gas engines. Additionally, this technology has only been used to retrofit smaller engines. As such, it will not likely be used to retrofit any rich burn engines operated at affected RECLAIM facilities until the technology can be demonstrated that it can achieve BARCT emission levels when used on larger engines.

<u>Staff also reviewed a technology developed by EtaGen which has designed and constructed a "linear generator." The linear generator produces electricity with magnets that are driven linearly through copper coils to directly produce electricity without rotating motion and without conventional crankshaft mechanical work. This type of technology operates using a thermodynamic gas cycle similar to that of the Otto cycle, where the fuel/air mixture is compressed until a reaction occurs at near constant volume and combustion products are generated. At this time, no engine equipped with the EtaGen system has been permitted within the South Coast AQMD jurisdiction. However, this type of engine is expected to meet the low DG emission limits for all pollutants in Rule 1110.2, except VOC. Because linear generators rely upon a low temperature reaction, temperature of the exhaust gas is not hot enough for an oxidation catalyst to control VOC emissions to meet the 10 ppmv DG limit for VOC. However, since this technology is able to meet the 0.070 lbs/MW-hr (2.5 ppmv equivalent) NOx limit in Table IV of Rule 1110.2 without the use of SCR and without emitting ammonia slip, a precursor for generating PM2.5 emissions, staff is proposing to include an interim limit of 25 ppmv VOC provided that the engine can achieve 2.5 ppmv NOx emission levels at start-up. This 25 ppmv VOC emission limit is only applicable for units installed prior to January 1, 2024. Units installed on or after January 1, 2024 will be required to meet the existing VOC limit of 10 ppmv. PAR 1110.2 will limit the total VOC emissions from all linear generator engines permitted during this window to no more than 45 pounds per. Further, South Coast AQMD Engineering and Permitting staff will evaluate any potential increase in VOC emissions, as well as other criteria pollutants including NOx, from linear generator engines pursuant to Regulation XIII – New Source Review which may require the permit applicant to provide emission offsets. Further, the associated VOC emissions increase will only occur after a Permit to Construct the linear generator is granted and the equipment is installed and operating.</u>

PAR 1110.2 is expected to result in 21 facilities either installing new or modifying existing air pollution control equipment in order to meet BARCT and reduce NOx emissions. The type of air pollution control equipment that is used at a facility to reduce NOx emissions is dependent upon a variety of factors but is mainly dependent on whether an engine is designed for lean-burn~~ing~~ or rich-burn~~ing~~. Operational and space constraints such as the engines operated at facilities located at the OCS are also contributing factors. Facilities may choose to electrify their engines or use other zero-emission technologies, if available. However, based on information available to staff at the time of writing this SEA, the analysis assumes that facilities will mainly use post-combustion technology to comply with PAR 1110.2. The following summarizes the technology assessment of post-combustion technologies that were analyzed as part of the BARCT assessment for PAR 1110.2.

Selective Catalytic Reduction

Selective catalytic reduction (SCR) is a post-combustion control technology that is considered to be BACT for new equipment and BARCT for existing equipment. SCR can be used, if cost-effective, for NOx control of combustion sources like engines, boilers, process heaters, and gas turbines and it is capable of reducing NOx emissions by as much as 90 percent or higher. A typical SCR system design consists of an ammonia or urea reductant storage tank, ammonia vaporization and injection equipment, an SCR reactor with catalyst, an exhaust stack plus ancillary electronic instrumentation and operations control equipment. The way an SCR system reduces NOx is by a matrix of nozzles injecting a mixture of reductant and air into the flue gas exhaust stream from the combustion equipment. As this mixture flows into the SCR reactor with catalyst, the catalyst, reductant, and oxygen in the flue gas exhaust react primarily (i.e., selectively) with NO and NO_2 to form nitrogen and water. The amount of reductant introduced into the SCR system is approximately a one-to-one molar ratio of reductant to NOx for optimum control efficiency, though the ratio may vary based on equipment-specific NOx reduction requirements. There are two main types of catalyst structures: the first type is one in which the catalyst is coated onto a metal structure and the second type is one with a ceramic-based catalyst onto which the catalyst components are calcified. Commercial catalysts used in SCRs are available in two forms: 1) solid, block configurations or 2) modules, plate or honeycomb type. Catalysts are comprised of a base material of titanium dioxide (TiO_2) that is coated with either tungsten trioxide (WO_3), molybdic anhydride (MoO_3), vanadium pentoxide (V_2O_5), or iron oxide (Fe_2O_3). These materials are used for SCRs because of their high activity, insensitivity to sulfur in the exhaust, and useful life span of approximately five years. Ultimately, the material composition of the catalyst is dependent upon the application and flue gas conditions including but not limited to gas composition and temperature.

For conventional SCRs, the minimum temperature for NOx reduction is 500 degrees Fahrenheit (^{o}F) and the maximum operating temperature for the catalyst is 800 ^{o}F. Zeolite SCR catalysts have a higher temperature operating range. 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 ^{o}F and 750 ^{o}F to limit the occurrence of several undesirable side reactions at certain conditions. One of the major concerns associated with SCRs is the oxidation of sulfur dioxide (SO_2) in the exhaust gas to sulfur trioxide (SO_3) and the subsequent reaction between SO_3 and ammonia to form secondary particulates such as ammonium bisulfate or ammonium sulfate. The formation of either ammonium bisulfate or ammonium sulfate depends on the amount of SO_3 and ammonia present in the flue gas and can cause equipment plugging downstream of the catalyst. The presence of particulates, heavy metals and silica in the flue gas exhaust can also limit catalyst performance. The production of secondary particulates can be substantially minimized by reducing the quantity of injected ammonia, maintaining the exhaust temperature within a predetermined range, and maintaining a precise NOx to ammonia molar ratio to minimize the production of unreacted ammonia which is commonly referred to as ammonia slip.

Depending on the type of combustion equipment utilizing SCR technology, the typical amount of ammonia slip is typically zero to five ppmv.

Lean-burn engines can use SCR to control NOx. All lean-burn, non-biogas engines are controlled with the exception of RECLAIM engines, which are exempt from the NOx limits in Rule 1110.2.

Oxidation Catalyst

Oxidation catalysts have two simultaneous tasks: 1) oxidation of carbon monoxide to carbon dioxide ($2CO + O_2 \rightarrow 2CO_2$) and 2) oxidation of unburned hydrocarbons (unburned and partially-burned fuel) to carbon dioxide and water ($2C_xH_y + (2x+y/2)O_2 \rightarrow 2xCO_2 + yH_2O$). An oxidation catalyst contains materials (generally precious metals such as platinum or palladium) that promote oxidation reactions between oxygen, CO, and VOC to produce carbon dioxide and water vapor. These reactions occur when exhaust at the proper temperature and containing sufficient oxygen passes through the catalyst. Depending on the catalyst formulation, an oxidation catalyst may obtain reductions at temperatures as low as 300 or 400^{o}F, although minimum temperatures in the 600 ^{o}F to 700 ^{o}F range are generally required to achieve maximum reductions. The catalyst will maintain adequate performance at temperatures typically as high as 1350 ^{o}F before problems with physical degradation of the catalyst occur. In the case of rich-burn engines, where the exhaust does not contain enough oxygen to fully oxidize the CO and VOC in the exhaust, air can be injected into the exhaust upstream of the catalyst.

This type of catalytic converter is widely used on lean-burn engines to reduce hydrocarbon and carbon monoxide emissions. The oxidation catalyst is a corrugated base metal substrate with an alumina wash coat loaded with precious metals such as platinum. The alumina is porous allowing for large surface areas to promote oxidation of any unreacted CO and hydrocarbons with oxygen remaining in the exhaust gas. Most oxidation catalysts can be retrofitted onto the engine without disruption of the existing design configuration.

Non-Selective Catalytic Reduction

Non-selective catalytic reduction such as three-way catalysts reduce NOx in addition to oxidizing carbon monoxide and unburned hydrocarbons. The oxidation process is described above under the subheading oxidation catalysts. Reduction of NOx emissions requires an additional step. Platinum catalysis can be used to reduce NOx emissions. The NSCR catalyst promotes the chemical reduction of NOx in the presence of CO and VOC to produce oxygen and nitrogen. The three-way NSCR catalyst also contains materials that promote the oxidation of VOC and CO to form carbon dioxide and water vapor. To control NOx, CO, and VOC simultaneously, NSCR catalysts must operate in a narrow air/fuel ratio band (15.9 to 16.1 for natural gas-fired engines) that is close to stoichiometric. An electronic controller, which includes an oxygen sensor and feedback mechanism, is often necessary to maintain the air/fuel ratio in this narrow band. At this air/fuel ratio, the oxygen concentration in the exhaust is low, while concentrations of VOC and CO are not excessive.

CHAPTER 3

EXISTING SETTING

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 §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., PAR 1110.2) 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 South Coast AQMD's Public Information Center at South Coast AQMD 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 SETTING

In general, Rule 1110.2, was developed to reduce NOx emissions from stationary and portable internal combustion engines with a rating greater than 50 bhp. Rule 1100 was developed to establish the implementation schedule for RECLAIM and former-RECLAIM facilities as they transition to a command-and-control regulatory structure. 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 versions of Rules 1110.2 and 1100.

CMB-05 - Further NOx Reductions from RECLAIM Assessment

The 2016 AQMP identifies 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 South Coast AQMD'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 emission reductions.

Rule 1110.2
Rule 1110.2 was adopted in 1990 and applies to stationary and portable internal combustion engines with a rating greater than 50 bhp. Rule 1110.2 was originally developed based on control measure CM-2 from the 1989 AQMP to regulate NOx, CO, and VOC emissions. Rule 1110.2 has been amended 10 times since it was first adopted.

Rule 1100
Rule 1100 was adopted in December 2018 and established the implementation schedule for RECLAIM and former RECLAIM facilities that are transitioning to a command-and-control regulatory structure. Rule 1100 has not been amended since it was first adopted.

AIR QUALITY

It is the responsibility of South Coast AQMD 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 3-1. South Coast AQMD monitors levels of various criteria pollutants at 38 monitoring stations. The 2017 air quality data (the latest data available) from South Coast AQMD's monitoring stations are presented in Table 3-2.

Table 3-1
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 3-1 (concluded)
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard[a]	Federal Primary Standard[b]	Most Relevant Effects
Nitrogen Dioxide (NO_2)	1-Hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)	(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/m^3)	0.053 ppm (100 μg/m^3)	
Sulfur Dioxide (SO_2)	1-Hour	0.25 ppm (655 μg/m^3)	75 ppb (196 μg/m^3)	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/m^3)	No Federal Standard	
Sulfates	24-Hour	25 μg/m^3	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 (H_2S)	1-Hour	0.03 ppm (42 μg/m^3)	No Federal Standard	Odor annoyance.
Lead (Pb)	30-Day Average	1.5 μg/m^3	No Federal Standard	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction.
	Calendar Quarter	No State Standard	1.5 μg/m^3	
	Rolling 3-Month Average	No State Standard	0.15 μg/m^3	
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/m^3)	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 O_3 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 3-2
2017 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	365	1.9	1.6
2	Northwest Coastal Los Angeles County	227*	2.0	1.2
3	Southwest Coastal Los Angeles County	361	2.1	1.6
4	South Coastal Los Angeles County 1	--	--	--
4	South Coastal Los Angeles County 2	--	--	--
4	South Coastal Los Angeles County 3	357	3.9	2.6
4	I-710 Near Road##	--	--	--
6	West San Fernando Valley	365	3.0	2.5
8	West San Gabriel Valley	365	2.2	1.7
9	East San Gabriel Valley 1	365	1.8	0.9
9	East San Gabriel Valley 2	365	0.8	0.6
10	Pomona/Walnut Valley	365	2.0	1.6
11	South San Gabriel Valley	357	2.5	2.2
12	South Central Los Angeles County	365	6.1	4.6
13	Santa Clarita Valley	354	1.3	0.8
ORANGE COUNTY				
16	North Orange County	365	3.8	1.7
17	Central Orange County	365	2.5	2.1
17	I-5 Near Road##	364	8.4	2.6
18	North Coastal Orange County	181*	1.7	1.4
19	Saddleback Valley	340	1.4	0.9
RIVERSIDE COUNTY				
22	Corona/Norco Area	--	--	--
23	Metropolitan Riverside County 1	365	1.9	1.7
23	Metropolitan Riverside County 3	365	2.2	2.0
24	Perris Valley	--	--	--
25	Elsinore Valley	365	1.2	0.8
26	Temecula Valley	--	--	--
29	San Gorgonio Pass	--	--	--
30	Coachella Valley 1**	365	1.0	0.5
30	Coachella Valley 2**	--	--	--
30	Coachella Valley 3**	--	--	--
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	365	1.9	1.4
33	I-10 Near Road##	359	4.2	1.3
33	CA-60 Near Road##	--	--	--
34	Central San Bernardino Valley 1	365	1.6	1.3
34	Central San Bernardino Valley 2	357	2.5	2.3
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
DISTRICT MAXIMUM			**8.4**	**4.6**
South Coast AIR BASIN			**8.4**	**4.6**

ppm = parts per million
-- Pollutant not monitored
*Incomplete Data
**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.

[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 3-2 (Continued)
2017 Air Quality Data – South Coast Air Quality Management District

OZONE (O3)										
						No. Days Standard Exceeded				
						Federal			State	
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	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	0.116	0.086	0.080	0	14	9	6	14
2	Northwest Coastal LA County	228*	0.099	0.077	0.069	0	3	1	1	3
3	Southwest Coastal LA County	364	0.086	0.070	0.064	0	0	0	0	0
4	South Coastal LA County 1	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 2	--	--	--	--	--	--	--	--	--
4	South Coastal LA County 3	362	0.082	0.068	0.062	0	0	0	0	0
4	I-710 Near Road##	--	--	--	--	--	--	--	--	--
6	West San Fernando Valley	365	0.140	0.114	0.095	4	64	44	26	64
8	West San Gabriel Valley	365	0.139	0.100	0.092	2	36	25	18	36
9	East San Gabriel Valley 1	365	0.152	0.114	0.107	7	62	43	38	62
9	East San Gabriel Valley 2	365	0.157	0.121	0.111	9	60	48	45	60
10	Pomona/Walnut Valley	360	0.147	0.114	0.106	5	35	20	18	35
11	South San Gabriel Valley	354	0.118	0.086	0.079	0	9	4	7	9
12	South Central LA County	352	0.092	0.076	0.072	0	5	1	0	5
13	Santa Clarita Valley	365	0.151	0.128	0.104	5	73	53	45	73
ORANGE COUNTY										
16	North Orange County	357	0.113	0.086	0.082	0	12	8	5	12
17	Central Orange County	365	0.090	0.076	0.073	0	4	2	0	4
17	I-5 Near Road##	--	--	--	--	--	--	--	--	--
18	North Coastal Orange County	181*	0.088	0.080	0.073	0	4	1	0	4
19	Saddleback Valley	365	0.103	0.083	0.082	0	25	14	3	25
RIVERSIDE COUNTY										
22	Corona/Norco Area	--	--	--	--	--	--	--	--	--
23	Metropolitan Riverside County 1	365	0.145	0.118	0.102	2	81	58	47	81
23	Metropolitan Riverside County 3	362	0.144	0.111	0.102	2	64	48	41	64
24	Perris Valley	365	0.120	0.105	0.094	0	80	52	33	80
25	Elsinore Valley	365	0.121	0.098	0.093	0	54	35	23	54
26	Temecula Valley	365	0.104	0.088	0.086	0	47	26	4	47
29	San Gorgonio Pass	365	0.128	0.105	0.101	2	82	64	50	82
30	Coachella Valley 1**	365	0.113	0.097	0.093	0	57	36	18	57
30	Coachella Valley 2**	365	0.107	0.093	0.087	0	44	27	8	44
30	Coachella Valley 3**	--	--	--	--	--	--	--	--	--
SAN BERNARDINO COUNTY										
32	Northwest San Bernardino Valley	365	0.150	0.127	0.112	9	87	72	66	87
33	I-10 Near Road##	--	--	--	--	--	--	--	--	--
33	CA-60 Near Road##	--	--	--	--	--	--	--	--	--
34	Central San Bernardino Valley 1	361	0.137	0.118	0.095	2	49	38	33	49
34	Central San Bernardino Valley 2	365	0.158	0.136	0.114	14	112	88	81	112
35	East San Bernardino Valley	363	0.156	0.135	0.109	9	114	89	79	114
37	Central San Bernardino Mountains	359	0.146	0.121	0.114	11	110	90	76	110
38	East San Bernardino Mountains	--	--	--	--	--	--	--	--	--
DISTRICT MAXIMUM			**0.158**	**0.136**	**0.114**	**14**	**114**	**63**	**81**	**114**
South Coast AIR BASIN			**0.158**	**0.136**	**0.114**	**26**	**145**	**82**	**109**	**145**

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.
*Incomplete data
**Salton Sea Air Basin

Table 3-2 (Continued)
2017 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	Max. Conc. in ppb 1-hour	98th Percentile Conc. in ppb 1-hour	Annual Average AAM Conc. ppb
LOS ANGELES COUNTY					
1	Central LA	364	80.6	61.7	20.5
2	Northwest Coastal LA County	229*	55.7	46.2	10.2
3	Southwest Coastal LA County	324	72.2	54.8	9.3
4	South Coastal LA County 1	--	--	--	--
4	South Coastal LA County 2	--	--	--	--
4	South Coastal LA County 3	358	89.5	72.9	17.9
4	I-710 Near Road##	364	115.5	82.5	25.4
6	West San Fernando Valley	337	62.5	54.2	12.9
8	West San Gabriel Valley	361	72.3	59.3	15.3
9	East San Gabriel Valley 1	365	65.6	51.1	15.8
9	East San Gabriel Valley 2	365	55.5	44.5	10.0
10	Pomona/Walnut Valley	360	81.2	62.9	20.5
11	South San Gabriel Valley	357	75.0	63.7	19.6
12	South Central LA County	365	99.1	66.8	16.1
13	Santa Clarita Valley	354	57.6	38.3	10.5
ORANGE COUNTY					
16	North Orange County	365	76.2	61.3	14.5
17	Central Orange County	353	81.2	63.5	14.2
17	I-5 Near Road##	365	86.4	64.1	22.5
18	North Coastal Orange County	181*	45.3	42.2	7.9
19	Saddleback Valley	--	--	--	--
RIVERSIDE COUNTY					
22	Corona/Norco Area	--	--	--	--
23	Metropolitan Riverside County 1	365	63.0	57.9	15.0
23	Metropolitan Riverside County 3	365	65.1	51.9	13.2
24	Perris Valley	--	--	--	--
25	Elsinore Valley	365	49.0	38.3	8.2
26	Temecula Valley	--	--	--	--
29	San Gorgonio Pass	359	56.3	46.0	8.0
30	Coachella Valley 1**	362	42.5	37.7	6.5
30	Coachella Valley 2**	--	--	--	--
30	Coachella Valley 3**	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	365	64.1	48.7	15.3
33	I-10 Near Road##	362	86.0	77.3	28.8
33	CA-60 Near Road##	358	93.2	76.3	32.1
34	Central San Bernardino Valley 1	345	69.2	58.4	18.3
34	Central San Bernardino Valley 2	365	65.8	56.5	15.9
35	East San Bernardino Valley	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM			**115.5**	**82.5**	**32.1**
South Coast AIR BASIN			**115.5**	**82.5**	**32.1**

ppb = parts per billion
AAM = Annual Arithmetic Mean
-- Pollutant not monitored
*Incomplete data
**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 NO_2 federal 1-hour standard is 100 ppb and the annual standard is annual arithmetic mean NO_2 > 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 3-2 (Continued)
2017 Air Quality Data – South Coast Air Quality Management District

SULFUR DIOXIDE (SO_2)[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	356	5.7	2.6
2	Northwest Coastal LA County	--	--	--
3	Southwest Coastal LA County	365	9.5	6.6
4	South Coastal LA County 1	--	--	--
4	South Coastal LA County 2	--	--	--
4	South Coastal LA County 3	361	19.7	14.3
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	181*	1.9	1.7
19	Saddleback Valley	--	--	--
RIVERSIDE COUNTY				
22	Corona/Norco Area	--	--	--
23	Metropolitan Riverside County 1	365	2.5	1.9
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	365	3.9	2.1
34	Central San Bernardino Valley 2	--	--	--
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
DISTRICT MAXIMUM			**19.7**	**14.3**
South Coast AIR BASIN			**19.7**	**14.3**

ppb = parts per billion
-- = 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.
*Incomplete data
** Salton Sea Air Basin

[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 3-2 (Continued)
2017 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/m³, 24-hour	No. (%) Samples Exceeding Standard		Annual Average AAM Conc.[e] µg/m³
				Federal > 150 µg/m³, 24-hour	State > 50 µg/m³, 24-hour	
LOS ANGELES COUNTY						
1	Central LA	340	96	0	41 (12%)	34.4
2	Northwest Coastal LA County	--	--	--	--	--
3	Southwest Coastal LA County	57	46	0	0	19.8
4	South Coastal LA County 1	--	--	--	--	--
4	South Coastal LA County 2	34*	70	0	2 (6%)	27.3
4	South Coastal LA County 3	57	79	0	9 (16%)	33.3
4	I-710 Near Road##	--	--	--	--	--
6	West San Fernando Valley	--	--	--	--	--
8	West San Gabriel Valley	--	--	--	--	--
9	East San Gabriel Valley 1	55	83	0	6 (11%)	31.4
9	East San Gabriel Valley 2	347	140	0	36 (10%)	31.7
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	--	--	--	--	--
12	South Central LA County	--	--	--	--	--
13	Santa Clarita Valley	54*	66	0	2 (4%)	23.6
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	332	128	0	17 (5%)	26.3
17	I-5 Near Road##	--	--	--	--	--
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	57	58	0	1 (2%)	18.4
RIVERSIDE COUNTY						
22	Corona/Norco Area	56	85	0	7 (13%)	31.2
23	Metropolitan Riverside County 1	365	138	0	103 (28%)	41.6
23	Metropolitan Riverside County 3	359	144	0	194 (54%)	54.4
24	Perris Valley	59	75	0	11 (19%)	32.2
25	Elsinore Valley	364	133	0	9 (2%)	22.5
26	Temecula Valley	--	--	--	--	--
29	San Gorgonio Pass	59	97	0	1 (2%)	22.4
30	Coachella Valley 1**	363	93	0	7 (2%)	21.0
30	Coachella Valley 2**	363	128	0	43 (12%)	34.0
30	Coachella Valley 3**	317	150	0	76 (24%)	42.0
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	320	106	0	26 (8%)	31.5
33	I-10 Near Road##	--	--	--	--	--
33	CA-60 Near Road##	--	--	--	--	--
34	Central San Bernardino Valley 1	43*	75	0	7 (16%)	39.3
34	Central San Bernardino Valley 2	356	86	0	35 (10%)	30.9
35	East San Bernardino Valley	59	77	0	2 (3%)	25.8
37	Central San Bernardino Mountains	55	56	0	2 (4%)	17.6
38	East San Bernardino Mountains	--	--	--	--	--
DISTRICT MAXIMUM			**150**	**0**	**194**	**54.4**
South Coast AIR BASIN			**144**	**0**	**207**	**54.4**

µg/m³ = micrograms per cubic meter of air
AAM = Annual Arithmetic Mean
-- Pollutant not monitored
*Incomplete Data
**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.
\+ 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.

[d] PM10 statistics listed above are based on combined Federal Reference Method (FRM) and Federal Equivalent Method (FEM) data.

[e] State annual average (AAM) PM10 standard is > 20 µg/m³. Federal annual PM10 standard (AAM > 50 µg/m³) was revoked in 2006.

Table 3-2 (Continued)
2017 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	358	49.20	27.80	5 (1.4%)	11.94
2	Northwest Coastal LA County	--	--	--	--	--
3	Southwest Coastal LA County	--	--	--	--	--
4	South Coastal LA County 1	348	55.30	32.30	4 (1.1%)	10.90
4	South Coastal LA County 2	356	56.30	31.10	5 (1.4%)	11.02
4	South Coastal LA County 3	--	--	--	--	--
4	I-710 Near Road##	365	85.40	35.60	8 (2.2%)	12.90
6	West San Fernando Valley	109	35.20	20.70	0	9.70
8	West San Gabriel Valley	121	22.80	18.80	0	9.68
9	East San Gabriel Valley 1	115	24.90	21.20	0	10.42
9	East San Gabriel Valley 2	--	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	119	49.50	29.50	1 (0.8%)	12.23
12	South Central LA County	119	66.70	41.30	4 (3.4%)	12.92
13	Santa Clarita Valley	--	--	--	--	--
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	305*	53.90	31.20	6 (2%)	11.39
17	I-5 Near Road##	--	--	--	--	--
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	113	19.50	15.00	0	8.11
RIVERSIDE COUNTY						
22	Corona/Norco Area	--	--	--	--	--
23	Metropolitan Riverside County 1	353	50.30	29.50	6 (1.7%)	12.18
23	Metropolitan Riverside County 3	358	62.20	39.80	9 (2.5%)	13.40
24	Perris Valley	--	--	--	--	--
25	Elsinore Valley	--	--	--	--	--
26	Temecula Valley	--	--	--	--	--
29	San Gorgonio Pass	--	--	--	--	--
30	Coachella Valley 1**	114	14.50	12.80	0	6.05
30	Coachella Valley 2**	110	18.80	14.70	0	8.10
30	Coachella Valley 3**	--	--	--	--	--
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	--	--	--	--	--
33	I-10 Near Road##	--	--	--	--	--
33	CA-60 Near Road##	359	44.80	34.50	7 (1.9%)	14.43
34	Central San Bernardino Valley 1	120	39.20	26.50	1 (0.8%)	12.04
34	Central San Bernardino Valley 2	116	38.20	25.60	1 (0.9%)	11.43
35	East San Bernardino Valley	--	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--	--
38	East San Bernardino Mountains	49	23.50	23.50	0	5.85
DISTRICT MAXIMUM			**85.40**	**41.3**	**9**	**14.43**
South Coast AIR BASIN			**85.40**	**41.3**	**15**	**14.43**

µg/m³ = micrograms per cubic meter of air
AAM = Annual Arithmetic Mean
-- Pollutant not monitored
*Incomplete Data
**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
+ 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 statistics listed above are for the FRM data only. FEM PM2.5 continuous monitoring instruments were operated at some of the above locations for real-time alerts and forecasting only.

g Both Federal and State standards are annual average (AAM) > 12.0 µg/m³.

Table 3-2 (Concluded)
2016 Air Quality Data – South Coast Air Quality Management District

		LEAD[h]		SULFATES (SOx)[i]	
Source Receptor Area No.	Location of Air Monitoring Station	Max. Monthly Average Conc. m) $\mu g/m^3$	Max. 3-Month Rolling Average m) $\mu g/m^3$	No. Days of Data	Max. Conc. $\mu g/m^3$, 24-hour
LOS ANGELES COUNTY					
1	Central LA	0.017	0.01	58	5.1
2	Northwest Coastal LA County	--	--	--	--
3	Southwest Coastal LA County	0.005	0.00	57	5.2
4	South Coastal LA County 1	--	--	--	--
4	South Coastal LA County 2	0.010	0.01	34	3.1
4	South Coastal LA County 3	--	--	45	3.8
4	I-710 Near Road##	--	--	--	--
6	West San Fernando Valley	--	--	--	--
8	West San Gabriel Valley	--	--	--	--
9	East San Gabriel Valley 1	0.018	0.01	55	3.9
9	East San Gabriel Valley 2	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--
11	South San Gabriel Valley	0.010	0.01	--	--
12	South Central LA County	0.016	0.01	--	--
13	Santa Clarita Valley	--	--	53	4.5
ORANGE COUNTY					
16	North Orange County	--	--	--	--
17	Central Orange County	--	--	58	3.3
17	I-5 Near Road##	--	--	--	--
18	North Coastal Orange County	--	--	--	--
19	Saddleback Valley	--	--	57	3.0
RIVERSIDE COUNTY					
22	Corona/Norco Area	--	--	--	--
23	Metropolitan Riverside County 1	0.008	0.01	119	4.0
23	Metropolitan Riverside County 3	--	--	58	3.3
24	Perris Valley	--	--	59	3.0
25	Elsinore Valley	--	--	--	--
26	Temecula Valley	--	--	--	--
29	San Gorgonio Pass	--	--	59	2.8
30	Coachella Valley 1**	--	--	56	2.8
30	Coachella Valley 2**	--	--	118	3.4
30	Coachella Valley 3**	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	0.004	0.00	--	--
33	I-10 Near Road##	--	--	--	--
33	CA-60 Near Road##	--	--	--	--
34	Central San Bernardino Valley 1	--	--	43	3.7
34	Central San Bernardino Valley 2	0.010	0.01	59	3.6
35	East San Bernardino Valley	--	--	59	3.2
37	Central San Bernardino Mountains	--	--	55	2.4
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM		**0.018**	**0.01**		**5.2**
South Coast AIR BASIN		**0.018**	**0.01**		**5.2**

$\mu g/m^3$= micrograms per cubic meter of air
-- Pollutant not monitored
* Incomplete Data
** 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.

\+ High PM10 ($\geq$ 155 $\mu g/m^3$) 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.
++ 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/m^3 and 0.06 μ/m^3.

h Federal lead standard is 3-months rolling average > 0.15 $\mu g/m^3$; state standard is monthly average $\geq$ 1.5 $\mu g/m^3$. Lead standards were not exceeded.
i State sulfate standard is 24-hour $\geq$ 25 $\mu g/m^3$. There is no federal standard for sulfate. Sulfate data is not available at this time.

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 2017. CO concentrations did not exceed the standards in 2017. The highest 1-hour average CO concentration recorded (8.4 ppm at the I-5 near-road monitoring station in LA County) was 24 percent of the federal 1-hour CO standard of 35 ppm and 42 percent of the state 1-hour standard of 20 ppm. The highest 8-hour average CO concentration recorded (4.6 ppm in the South Central Los Angeles County area) was 51 percent of the federal and state 8-hour CO standard of 9.0 ppm.

In 2004, South Coast AQMD formally requested the U.S. EPA to re-designate the Basin from non-attainment 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 non-attainment 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 South Coast AQMD'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 2017, South Coast AQMD 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 3-2). All counties in the Basin, as well as the Coachella Valley, exceeded the level of the new 2015 8-hour ozone NAAQS (0.070 ppm), the former 2008 8-hour ozone NAAQS (0.075 ppm), and/or the 1997 8-hour ozone NAAQS (0.08 ppm) in 2017. While not all stations had days exceeding the previous 8-hour standards, all monitoring stations except two (Southwest Coastal LA County and South Coastal LA County 3) had at least one day over the 2015 federal ozone standard (70 ppb).

In 2017, 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 0.158 ppm and 0.136 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 0.136 ppm was 194 percent of the new federal standard (0.070 ppm). The maximum 1-hour concentration was 176 percent of the 1-hour state ozone standard of 0.09 ppm. The 8-hour average concentration was 194 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 2017, nitrogen dioxide concentrations were monitored at 27 locations. No area of the Basin or SSAB exceeded the federal for NO2. However, the state annual average at the CA-60 near-road location was 0.032 ppm in 2017 which exceeded the state annual standard of 0.030 ppm. 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) State Route 60 (CA-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 2017 at any of the six locations monitored the Basin. The maximum 1-hour SO2 concentration was 19.7 ppb, as recorded in the South Coastal Los Angeles County area. The 99^{th} percentile of 1-hour SO2 concentration was 14.3 ppb, as recorded in the South Coastal Los Angeles County 3 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.

South Coast AQMD monitored PM10 concentrations at 23 locations in 2017. The federal 24-hour PM10 standard (150 $\mu g/m^3$) was not exceeded in 2017. The Basin has remained in attainment of the PM10 NAAQS since 2006. The maximum three-year average 24-hour PM10 concentration of 150 $\mu g/m^3$ 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 $\mu g/m^3$). The state 24-hour PM10 standard was exceeded at several of the monitoring stations. The maximum annual average PM10 concentration of 54.4 $\mu g/m^3$ was recorded in Metropolitan Riverside County. The federal annual PM10 standard has been revoked. The much more stringent state annual PM10 standard (20 $\mu g/m^3$) was exceeded in most stations in each county in the Basin and in the Coachella Valley.

In 2017, PM2.5 concentrations were monitored at 19 locations throughout the Basin. U.S. EPA revised the federal 24-hour PM2.5 standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$, effective December 17, 2006. In 2017, the maximum PM2.5 concentrations in the Basin exceeded the new federal 24-hour PM2.5 standard in 13 out of 19 locations. The maximum 24-hour PM2.5 concentration of 85.4 $\mu g/m^3$ was recorded at the I-710 near-road monitoring station in LA County. The 98th percentile 24-hour PM2.5 concentration of 41.3 $\mu g/m^3$ was recorded at the CA-60 near-road monitoring station in San Bernardino County. The maximum annual average concentration of 14.43 $\mu g/m^3$ was recorded in San Bernardino County, which represents 96 percent of the 2006 federal standard of 15 $\mu g/m^3$.

On December 14, 2012, U.S. EPA strengthened the annual NAAQS for PM2.5 to 12 $\mu g/m^3$ 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. South Coast AQMD 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) State Route 60 (CA-60) near-road, 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

Under the federal Clean Air Act, lead is classified as a "criteria pollutant." Lead has observed adverse health effects at ambient concentrations. Lead is also deemed a carcinogenic toxic air contaminant (TAC) by the Office of Environmental Health Hazard Assessment (OEHHA). 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. In fact, there were no violations of the lead standards at South Coast AQMD's regular air monitoring stations from 1982 to 2007, as a result of removal of lead from gasoline.

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.

On November 12, 2008, the U.S. EPA published a NAAQS for lead, which became effective January 12, 2010. At that time, the existing national lead standard, 1.5 $\mu g/m^3$, was reduced to 0.15 $\mu g/m^3$, averaged over a rolling three-month period. The U.S. EPA has thoroughly reviewed the lead exposure and health effects research, and has prepared substantial documentation in the form of a Criteria Document to support the selection of the 2008 NAAQS for lead. The Criteria Document used for the development of the 2008 NAAQS for lead states that studies and evidence strongly substantiate that blood lead levels in a range of 5-10 µg/dL, or possibly lower, could likely result in neurocognitive effects in children. The report further states that "there is no level of lead exposure that can yet be identified with confidence, as clearly not being associated with some risk of deleterious health effects[13]."

In 2010, a portion of Los Angeles County was designated as not attaining the NAAQS of 0.15 $\mu g/m^3$ for lead based on monitored air quality data from 2007 to 2009. South Coast AQMD identified two large lead-acid battery recycling facilities as possible sources of lead. One of the facilities was the main contributor to the area's nonattainment status. In response to the nonattainment designation, the State submitted the *Final 2012 Lead State Implementation Plan – Los Angeles County* to the U.S. EPA on June 20, 2012. The plan outlined steps that will bring the area into attainment with the standard. As of February 11, 2014, the U.S. EPA announced in the Federal Register (FR) final approval of the lead air quality plan, effective 30 days after publication (e.g., March 12, 2014).

In May 2014, the U.S. EPA released its "Policy Assessment for the Review of the Lead National Ambient Air Quality Standards," reaffirming the primary (health-based) and secondary (welfare-based) staff conclusions regarding whether to retain the current standards. In January 2015, the U.S. EPA announced that the ambient lead concentration standard of 0.15 $\mu g/m^3$ averaged over a rolling 3-month period would remain unchanged.

To continue to pursue reducing lead emissions from large lead-acid battery recycling facilities, in March 2015, South Coast AQMD Rule 1420.1 was amended to further lower the ambient lead concentration limit to 0.120 $\mu g/m^3$ effective January 1, 2016 and 0.100 $\mu g/m^3$ effective January 1, 2017 and the point source lead emission rate to 0.023 pounds per hour, as well as adding additional housekeeping and maintenance requirements.

On April 7, 2015, the larger of the two lead-acid battery recycling facilities withdrew its California Department of Toxic Substance Control (DTSC) permit application and provided notification of its intent to permanently close.

[13] Environmental Protection Agency, Office of Research and Development, "Air Quality Criteria Document for Lead, Volumes I-II," October 2006.

While Rule 1420.1 will be effective in reducing emissions from the large lead-acid battery recycling industry, lead emissions from the broader industry source category of metal melting is still a concern because the metal melting industry is the most significant stationary source of reported lead emissions. While existing federal and state regulations currently control lead emissions from the metal melting industry, additional requirements similar to those that have effectively reduced emissions from large lead-acid battery recyclers are also necessary to adequately protect public health by minimizing public exposure to lead emissions and preventing exceedances of the lead NAAQS in the Basin. As a result, the South Coast AQMD developed new Rule 1420.2 – Emission Standards for Lead from Metal Melting Facilities, which was adopted by the Governing Board on October 2, 2015.

In December 2017, South Coast AQMD Rule 1420 – Emissions Standard for Lead was amended to reduce lead emissions from facilities not covered under Rule 1420.1 and 1420.2. The ambient lead concentration limit was updated to reflect the current standard of 0.150 $\mu g/m^3$ and 0.100 $\mu g/m^3$ effective on January 1, 2021. The rule was also amended to include requirements for air pollution control systems and additional housekeeping and maintenance requirements, similar to Rules 1420.1 and 1420.2.

The current lead concentrations in Los Angeles County are now below the NAAQS. Further, the state standards for lead were not exceeded in any area of the South Coast AQMD in 2017. The maximum quarterly average lead concentration (0.01 $\mu g/m^3$ at several monitoring) was seven percent of the federal quarterly average lead standard (0.15 $\mu g/m^3$). The maximum monthly average lead concentration (0.018 $\mu g/m^3$ in East San Gabriel Valley 1) was one percent of the state monthly average lead standard. As a result of the 2012-2014 design value below the NAAQS, South Coast AQMD will be requesting that U.S. EPA re-designate the nonattainment area as attaining the federal lead standard.

Stringent South Coast AQMD 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.

In 2017, the state 24-hour sulfate standard (25 µg/m^3) was not exceeded in any of the 19 monitoring locations in the Basin. The maximum 24-hour sulfate concentration was 5.2 ppb, as recorded in Southwest Coastal LA County. 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 South Coast AQMD 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, South Coast AQMD 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 South Coast AQMD's primary mandate is attaining the state and NAAQS for criteria pollutants within the Basin, South Coast AQMD 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 South Coast AQMD to implement airborne toxic control measures (ATCM) adopted by CARB and to implement the Air Toxics "Hot Spots" Act. As a result, South Coast AQMD has regulated pollutants other than criteria pollutants such as TACs, GHGs, and stratospheric ozone depleting compounds. South Coast AQMD 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 South Coast AQMD rulemaking process.

In addition to promulgating non-criteria pollutant rules, South Coast AQMD has been evaluating control measures in the 2016 Air Quality Management Plan (AQMP) 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 compounds that contribute to TACs.

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). South Coast AQMD 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 South Coast AQMD 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 South Coast AQMD. Phase I consists of facilities that emit over 25 tpy of any criteria pollutant and facilities present on South Coast AQMD'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.

South Coast AQMD

South Coast AQMD 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 South Coast AQMD’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 South Coast AQMD 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 South Coast AQMD'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 South Coast AQMD. 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 South Coast AQMD’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 South Coast AQMD 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 South Coast AQMD'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 South Coast AQMD 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 South Coast AQMD. The plan proposed control strategies to reduce TACs in the South Coast AQMD implemented between years 2000 and 2010 through cooperative efforts of South Coast AQMD, local governments, CARB, and U.S. EPA.

Cumulative Impact Reduction Strategies (CIRS): The CIRS was presented to the South Coast AQMD 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 South Coast AQMD 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
- South Coast AQMD'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 South Coast AQMD 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 South Coast AQMD 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 South Coast AQMD 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 South Coast AQMD, 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 South Coast AQMD 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 South Coast AQMD 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 x 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. South Coast AQMD 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 South Coast AQMD’s AB 2588 program. Since 1992 when the state Health and Safety Code incorporated a risk reduction requirement in the program, South Coast AQMD 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. (South Coast AQMD, 2015a.)

CEQA Intergovernmental Review Program: South Coast AQMD 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:

- South Coast AQMD’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 South Coast AQMD. In 1990, South Coast AQMD 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 South Coast AQMD in protecting and improving public health in South Coast AQMD's most impacted communities through the reduction and prevention of air pollution.

In 1997, the South Coast AQMD Governing Board adopted four guiding principles and ten initiatives (http://www.aqmd.gov/nav/about/initiatives/environmental-justice/history) to ensure environmental equity. Also in 1997, the South Coast AQMD 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 South Coast AQMD'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 South Coast AQMD'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 South Coast AQMD, 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 South Coast AQMD, 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 South Coast

AQMD'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. South Coast AQMD Rule 1402 was adopted on April 8, 1994, to implement the requirements of SB 1731. In addition to the TAC rules adopted by South Coast AQMD under authority of AB 1807 and SB 1731, South Coast AQMD 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, South Coast AQMD 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 South Coast AQMD 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 South Coast AQMD 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).

Climate Change

Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. Data indicate that the current temperature record differs from previous climate changes in rate and magnitude.

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs), comparable to a greenhouse, which captures and traps radiant energy. GHGs are emitted by natural processes and human activities. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature. Global warming is the observed increase in average temperature of the earth's surface and atmosphere. The primary cause of global warming is an increase of GHGs in the atmosphere. The six major GHGs are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), and perfluorocarbon (PFCs). The GHGs absorb longwave radiant energy emitted by the Earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the Earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect." Emissions from human activities such as fossil fuel combustion for electricity production and vehicles have elevated the concentration of these gases in the atmosphere.

CO_2 is an odorless, colorless greenhouse gas. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources of CO_2 include burning coal, oil, gasoline, natural gas, and wood.

CH_4 is a flammable gas and is the main component of natural gas. N_2O, also known as laughing gas, is a colorless greenhouse gas. Some industrial processes such as fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions also contribute to the atmospheric load of N_2O. HFCs are synthetic man-made chemicals that are used as a substitute for chlorofluorocarbons (whose production was stopped as required by the Montreal Protocol) for automobile air conditioners and refrigerants. The two main sources of PFCs are primary aluminum production and semiconductor manufacture. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Scientific consensus, as reflected in recent reports issued by the United Nations Intergovernmental Panel on Climate Change, is that the majority of the observed warming over the last 50 years can be attributable to increased concentration of GHGs in the atmosphere due to human activities. Industrial activities, particularly increased consumption of fossil fuels (e.g., gasoline, diesel, wood, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of greenhouse gases at 400 to 450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below two degrees Celsius, which has been identified as necessary to avoid dangerous impacts from climate change.

The potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, air quality impacts, and sea level rise. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (e.g., heat rash and heat stroke). In addition, climate sensitive diseases may increase, such as those spread by mosquitoes and other disease carrying insects. Those diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding, hurricanes, and wildfires can displace people and agriculture, which would have negative consequences. Drought in some areas may increase, which would decrease water and food availability. Global warming may also contribute to air quality problems from increased frequency of smog and particulate air pollution.

The impacts of climate change will also affect projects in various ways. Effects of climate change are rising sea levels and changes in snow pack. The extent of climate change impacts at specific locations remains unclear. It is expected that Federal, State and local agencies will more precisely quantify impacts in various regions. As an example, it is expected that the California Department of Water Resources will formalize a list of foreseeable water quality issues associated with various degrees of climate change. Once state government agencies make these lists available, they could be used to more precisely determine to what extent a project creates global climate change impacts.

Federal

Greenhouse Gas Endangerment Findings: On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding greenhouse gases pursuant to CAA §202 (a). The Endangerment Finding stated that CO2, CH4, N2O, HFCs, PFCs, and SF6 taken in combination endanger both the public health and the public welfare of current and future generations. The *Cause or Contribute Finding* stated that the combined emissions from motor vehicles and motor vehicle engines contribute to the greenhouse gas air pollution that endangers public health and welfare. These findings were a prerequisite for implementing GHG standards for vehicles. The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) finalized emission standards for light-duty vehicles in May 2010 and for heavy-duty vehicles in August of 2011.

Renewable Fuel Standard: The Renewable Fuel Standard (RFS) program was established under the Energy Policy Act (EPAct) of 2005, and required 7.5 billion gallons of renewable-fuel to be blended into gasoline by 2012. Under the Energy Independence and Security Act (EISA) of 2007, the RFS program was expanded to include diesel, required the volume of renewable fuel blended into transportation fuel be increased from nine billion gallons in 2008 to 36 billion gallons by 2022, established new categories of renewable fuel and required U.S. EPA to apply lifecycle GHG performance threshold standards so that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces. The RFS is expected to reduce greenhouse gas emissions by 138 million metric tons[14], about the annual emissions of 27 million passenger vehicles, replacing about seven percent of expected annual diesel consumption and decreasing oil imports by $41.5 billion.

GHG Tailoring Rule: On May 13, 2010, U.S. EPA finalized the GHG Tailoring Rule to phase in the applicability of the Prevention of Significant Deterioration (PSD) and Title V operating permit programs for GHGs. The GHG Tailoring Rule was tailored to include the largest GHG emitters, while excluding smaller sources (restaurants, commercial facilities and small farms). The first phase (from January 2, 2011 to June 30, 2011) addressed the largest sources that contributed 65 percent of the stationary GHG sources. Title V GHG requirements were triggered only when affected facility owners/operators were applying, renewing or revising their permits for non-GHG pollutants. PSD GHG requirements were applicable only if sources were undergoing permitting actions for other non-GHG pollutants and the permitted action would increase GHG emission by 75,000 metric tons of CO2 equivalent emissions (CO2e) per year or more.

The second phase (from July 1, 2011 to June 30, 2013) included sources that emit or have the potential to emit 100,000 of CO2e metric tons per year or more. Newly constructed sources that are not major sources for non-GHG pollutants would not be subject to PSD GHG requirements unless it emits 100,000 metric tons of CO2e per year or more. Modifications to a major source would not be subject to PSD GHG requirements unless it generates a net increase of 75,000 metric tons of CO2e per year or more. Sources not subject to Title V would not be subject to Title V GHG requirements unless 100,000 metric tons of CO2e per year or more would be emitted.

The third phase of the GHG Tailoring Rule, finalized on July 12, 2012, determined not to lower the current PSD and Title V applicability thresholds for GHG-emitting sources established in the GHG Tailoring Rule for phases 1 and 2. The GHG Tailoring Rule also promulgated regulatory revisions for better implementation of the federal program for establishing plantwide applicability

[14] One metric ton is equal to 2, 205 pounds.

limitations (PALs) for GHG emissions, which will improve the administration of the GHG PSD permitting programs. Recently, the U.S. Supreme Court held that U.S. EPA was limited to Step 1.

GHG Reporting Program: U.S. EPA issued the Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98) under the 2008 Consolidated Appropriations Act. The Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG data from large sources and suppliers under the Greenhouse Gas Reporting Program (GHGRP). Suppliers of certain products that would result in GHG emissions if released, combusted or oxidized; direct emitting source categories; and facilities that inject CO2 underground for geologic sequestration or any purpose other than geologic sequestration are included. Facilities that emit 25,000 metric tons or more per year of GHGs as CO2e are required to submit annual reports to U.S. EPA. For the 2010 calendar, there were 6,260 entities that reported GHG data under this program, and 467 of the entities were from California. Of the 3,200 million metric tons of CO2e that were reported nationally, 112 million metric tons of CO2e were from California. Power plants were the largest stationary source of direct U.S. GHG emissions with 2,326 million metric tons of CO2e, followed by refineries with 183 million metric tons of CO2e. CO2 emissions accounted for largest share of direct emissions with 95 percent, followed by CH4 with four percent, and N2O and fluorinated gases representing the remaining one percent.

State

Executive Order S-3-05: In June 2005, Governor Schwarzenegger signed Executive Order S-3-05, which established emission reduction targets. The goals would reduce GHG emissions to 2000 levels by 2010, then to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

AB 32 - Global Warming Solutions Act: On September 27, 2006, AB 32, the California Global Warming Solutions Act of 2006, was signed by Governor Schwarzenegger. AB 32 expanded on Executive Order S-3-05. The California legislature stated that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB 32 represents the first enforceable state-wide program in the U.S. to cap all GHG emissions from major industries that includes penalties for non-compliance. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce greenhouse gas emissions in California and from power generation facilities located outside the state that serve California residents and businesses. AB 32 requires CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions by January 1, 2008;
- Adopt mandatory reporting rules for significant sources of GHG by January 1, 2008;
- Adopt a GHG emission reduction plan by January 1, 2009, indicating how the GHG emission reductions will be achieved via regulations, market mechanisms, and other actions; and
- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHG by January 1, 2011.

The combination of Executive Order S-3-05 and AB 32 will require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

Consistent with the requirement to develop an emission reduction plan, CARB prepared a Scoping Plan indicating how GHG emission reductions will be achieved through regulations, market mechanisms, and other actions. The Scoping Plan was released for public review and comment in October 2008 and approved by CARB on December 11, 2008. The Scoping Plan calls for reducing GHG emissions to 1990 levels by 2020. This means cutting approximately 30 percent from business-as-usual (BAU) emission levels projected for 2020, or about 15 percent from today's levels. Key elements of CARB staff's recommendations for reducing California's GHG emissions to 1990 levels by 2020 contained in the Scoping Plan include the following:

- Expansion and strengthening of existing energy efficiency programs and building and appliance standards;
- Expansion of the Renewables Portfolio Standard to 33 percent;
- Development of a California cap-and-trade program that links with other Western Climate Initiative (WCI) partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gases and pursuing policies and incentives to achieve those targets;
- Adoption and implementation of existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS); and
- Targeted fees, including a public good charge on water use, fees on high global warming potential (GWP) gases and a fee to fund the state's long-term commitment to AB 32 administration.

In response to the comments received on the Draft Scoping Plan and at the November 2008 public hearing, CARB made a few changes to the Draft Scoping Plan, primarily to:

- State that California "will transition to 100 percent auction" of allowances and expects to "auction significantly more [allowances] than the Western Climate Initiative minimum;"
- Make clear that allowance set-asides could be used to provide incentives for voluntary renewable power purchases by businesses and individuals and for increased energy efficiency;
- Make clear that allowance set-asides can be used to ensure that voluntary actions, such as renewable power purchases, can be used to reduce greenhouse gas emissions under the cap;
- Provide allowances are not required from carbon neutral projects; and
- Mandate that commercial recycling be implemented to replace virgin raw materials with recyclables.

SB 97 – CEQA, Greenhouse Gas Emissions: On August 24, 2007, Governor Schwarzenegger signed into law SB 97 – CEQA: Greenhouse Gas Emissions, and stated, "This bill advances a coordinated policy for reducing greenhouse gas emissions by directing the Office of Planning and Research (OPR) and the Resources Agency to develop CEQA guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions." As directed by

SB 97, the Natural Resources Agency adopted amendments to the CEQA Guidelines for GHG emissions on December 30, 2009 to provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments did not establish a threshold for significance for GHG emissions. The amendments became effective on March 18, 2010.

OPR - Technical Advisory on CEQA and Climate Change: Consistent with SB 97, on June 19, 2008, OPR released its "Technical Advisory on CEQA and Climate Change," which was developed in cooperation with the Resources Agency, the CalEPA, and the CARB. According to OPR, the "Technical Advisory" offers the informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions.

According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively considerable" even though its GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

In 2009, total California greenhouse gas emissions were 457 million metric tons of CO2e (MMTCO2e); net emissions were 453 MMTCO2e, reflecting the influence of sinks (net CO2 flux from forestry). While total emissions have increased by 5.5 percent from 1990 to 2009, emissions decreased by 5.8 percent from 2008 to 2009 (485 to 457 MMTCO2e). The total net emissions between 2000 and 2009 decreased from 459 to 453 MMTCO2e, representing a 1.3 percent decrease from 2000 and a 6.1 percent increase from the 1990 emissions level. The transportation sector accounted for approximately 38 percent of the total emissions, while the industrial sector accounted for approximately 20 percent. Emissions from electricity generation were about 23 percent with almost equal contributions from in-state and imported electricity.

Per capita emissions in California have slightly declined from 2000 to 2009 (by 9.7 percent), but the overall nine percent increase in population during the same period offsets the emission reductions. From a per capita sector perspective, industrial per capita emissions have declined 21 percent from 2000 to 2009, while per capita emissions for ozone depleting substance (ODS) substitutes saw the highest increase (52 percent).

From a broader geographical perspective, the state of California ranked second in the U.S. for 2007 greenhouse gas emissions, only behind Texas. However, from a per capita standpoint, California had the 46th lowest GHG emissions. On a global scale, California had the 14th largest carbon dioxide emissions and the 19th largest per capita emissions. The GHG inventory is divided into three categories: stationary sources, on-road mobile sources, and off-road mobile sources.

AB 1493 Vehicular Emissions - CO2: Prior to the U.S. EPA and NHTSA joint rulemaking, Governor Schwarzenegger signed Assembly Bill AB 1493 (2002). AB 1493 requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

CARB originally approved regulations to reduce GHGs from passenger vehicles in September 2004, with the regulations to take effect in 2009 (see amendments to CCR Title 13 §§1900 and 1961 (13 CCR 1900, 1961), and the adoption of CCR Title 13 §1961.1 (13 CCR 1961.1)). California's first request to the U.S. EPA to implement GHG standards for passenger vehicles was made in December 2005 and subsequently denied by the U.S. EPA in March 2008. The U.S. EPA then granted California the authority to implement GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles on June 30, 2009.

On April 1, 2010, CARB filed amended regulations for passenger vehicles as part of California's commitment toward the national program to reduce new passenger vehicle GHGs from 2012 through 2016. The amendments will prepare California to harmonize its rules with the federal Light-Duty Vehicle GHG Standards and CAFE Standards.

SB 1368: SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the CPUC to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The CEC was also required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural gas fired plant. The legislation further required that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

Executive Order S-1-07: Governor Schwarzenegger signed Executive Order S-1-07 in 2007 which established the transportation sector as the main source of GHG emissions in California. Executive Order S-1-07 proclaims that the transportation sector accounts for over 40 percent of statewide GHG emissions. Executive Order S-1-07 also establishes a goal to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020.

In particular, Executive Order S-1-07 established the LCFS and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, CARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. The analysis supporting development of the protocols was included in the SIP for alternative fuels (State Alternative Fuels Plan adopted by CEC on December 24, 2007) and was submitted to CARB for consideration as an "early action" item under AB 32. CARB adopted the LCFS on April 23, 2009.

SB 375: SB 375, signed into law in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. As part of the alignment, SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) which prescribes land use allocation in that MPO's Regional Transportation Plan (RTP). CARB, in consultation with MPOs, is required to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned GHG emission reduction targets. If MPOs do not meet the GHG reduction targets, transportation projects located in the MPO boundaries would not be eligible for funding programmed after January 1, 2012.

CARB appointed the Regional Targets Advisory Committee (RTAC), as required under SB 375, on January 23, 2009. The RTAC's charge was to advise CARB on the factors to be considered and methodologies to be used for establishing regional targets. The RTAC provided its recommendation to CARB on September 29, 2009. CARB was required to adopt final targets by September 30, 2010.

Executive Order S-13-08: Governor Schwarzenegger signed Executive Order S-13-08 on November 14, 2008 which directed California to develop methods for adapting to climate change through preparation of a statewide plan. Executive Order S-13-08 directed OPR, in cooperation with the Resources Agency, to provide land use planning guidance related to sea level rise and other climate change impacts by May 30, 2009. Executive Order S-13-08 also directed the Resources Agency to develop a state Climate Adaptation Strategy by June 30, 2009 and to convene an independent panel to complete the first California Sea Level Rise Assessment Report. The assessment report was required to be completed by December 1, 2010 and required to meet the following four criteria:

1. Project the relative sea level rise specific to California by taking into account issues such as coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates;
2. Identify the range of uncertainty in selected sea level rise projections;
3. Synthesize existing information on projected sea level rise impacts to state infrastructure (e.g., roads, public facilities, beaches), natural areas, and coastal and marine ecosystems; and
4. Discuss future research needs relating to sea level rise in California.

SB 1078, SB 107 and Executive Order S-14-08: SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020.

SB X-1-2: SB X1-2 was signed by Governor Brown in April 2011. SB X1-2 created a new Renewables Portfolio Standard (RPS), which pre-empted CARB's 33 percent Renewable Electricity Standard. The new RPS applies to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. These entities must adopt the new RPS goals of 20 percent of retails sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirement by the end of 2020.

South Coast AQMD

The South Coast AQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the South Coast AQMD to consider global impacts in rulemaking and in drafting revisions to the AQMP. In March 1992, the South Coast AQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include support of the adoption of a California GHG emission reduction goal.

Basin GHG Policy and Inventory: The South Coast AQMD has established a policy, adopted by the South Coast AQMD Governing Board at its September 5, 2008 meeting, to actively seek opportunities to reduce emissions of criteria, toxic, and climate change pollutants. The policy includes the intent to assist businesses and local governments implementing climate change measures, decrease the agency's carbon footprint, and provide climate change information to the public. The South Coast AQMD will take the following actions:

1. Work cooperatively with other agencies/entities to develop quantification protocols, rules, and programs related to greenhouse gases;
2. Share experiences and lessons learned relative to South Coast AQMD Regulation XX - Regional Clean Air Incentives Market (RECLAIM), to help inform state, multi-state, and federal development of effective, enforceable cap-and-trade programs. To the extent practicable, staff will actively engage in current and future regulatory development to ensure that early actions taken by local businesses to reduce greenhouse gases will be treated fairly and equitably. South Coast AQMD staff will seek to streamline administrative procedures to the extent feasible to facilitate the implementation of AB 32 measures;
3. Review and comment on proposed legislation related to climate change and greenhouse gases, pursuant to the 'Guiding Principles for South Coast AQMD Staff Comments on Legislation Relating to Climate Change' approved at the South Coast AQMD Governing Board's Special Meeting in April 2008;
4. Provide higher priority to funding Technology Advancement Office (TAO) projects or contracts that also reduce greenhouse gas emissions;
5. Develop recommendations through a public process for an interim greenhouse gas CEQA significance threshold, until such time that an applicable and appropriate statewide greenhouse gas significance level is established. Provide guidance on analyzing greenhouse gas emissions and identify mitigation measures. Continue to consider GHG impacts and mitigation in South Coast AQMD lead agency documents and in comments when South Coast AQMD is a responsible agency;
6. Revise the South Coast AQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning to include information on greenhouse gas strategies as a resource for local governments. The Guidance Document will be consistent with state guidance, including CARB's Scoping Plan;
7. Update the Basin's greenhouse gas inventory in conjunction with each Air Quality Management Plan. Information and data used will be determined in consultation with CARB, to ensure consistency with state programs. Staff will also assist local governments in developing greenhouse gas inventories;
8. Bring recommendations to the South Coast AQMD Governing Board on how the agency can reduce its own carbon footprint, including drafting a Green Building Policy with recommendations regarding South Coast AQMD purchases, building maintenance, and other areas of products and services. Assess employee travel as well as other activities that are not part of a GHG inventory and determine what greenhouse gas emissions these activities represent, how they could be reduced, and what it would cost to offset the emissions;
9. Provide educational materials concerning climate change and available actions to reduce greenhouse gas emissions on the South Coast AQMD website, in brochures,

and other venues to help cities and counties, businesses, households, schools, and others learn about ways to reduce their electricity and water use through conservation or other efforts, improve energy efficiency, reduce vehicle miles traveled, access alternative mobility resources, utilize low emission vehicles and implement other climate friendly strategies; and

10. Conduct conferences, or include topics in other conferences, as appropriate, related to various aspects of climate change, including understanding impacts, technology advancement, public education, and other emerging aspects of climate change science.

On December 5, 2008, the South Coast AQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the South Coast AQMD is lead agency. South Coast AQMD's recommended interim GHG significance threshold proposal uses a tiered approach to determining significance. Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. Tier 2 consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan, for example. Tier 3 establishes a screening significance threshold level to determine significance using a 90 percent emission capture rate approach, which corresponds to 10,000 metric tons of CO2 equivalent emissions per year (MTCO2e/year). Tier 4, to be based on performance standards, is yet to be developed. Under Tier 5 the project proponent would allow offsets to reduce GHG emission impacts to less than the proposed screening level. If CARB adopts statewide significance thresholds, South Coast AQMD staff plans to report back to the South Coast AQMD Governing Board regarding any recommended changes or additions to the South Coast AQMD's interim threshold.

Table 3-3 presents the GHG emission inventory by major source categories in calendar year 2008. The emissions reported herein are based on in-Basin energy consumption and do not include out-of-Basin energy production (e.g., power plants, crude oil production) or delivery emissions (e.g., natural gas pipeline loss). These GHG emissions are reported in MMTCO2e. Mobile sources generate 59.4 percent of the equipment, airport equipment, oil and gas drilling equipment. The remaining 40.6 percent of the total Basin GHG emissions are from stationary and area sources. The largest stationary/area source is fuel combustion, which is 27.8 percent of the total Basin GHG emissions (68.6 percent of the GHG emissions from the stationary and area source category).

Table 3-3
2008 GHG Emissions for the South Coast Air Basin

Source Category	**Emissions**						
	CO_2	**N_2O**	**CH_4**	**CO_2**	**N_2O**	**CH_4**	**CO_2e**
	(TPD)			**(TPY)**			**(MMT)**
Fuel Combustion							
Electric Utilities	34,303	0.08	0.71	12,520,562	29.0	258	11.4
Cogeneration	872	0.00	0.02	318,340	0.60	6.00	0.29
Oil and Gas Production (Combustion)	2,908	0.01	0.08	1,061,470	4.71	29.5	0.96
Petroleum Refining (Combustion)	44,654	0.06	0.57	16,298,766	20.7	207	14.8
Manufacturing and Industrial	22,182	0.06	0.48	8,096,396	20.9	174	7.35
Food and Agricultural Processing	927	0.00	0.02	338,516	0.84	7.16	0.31
Service and Commercial	21,889	0.08	0.59	7,989,416	30.8	215	7.26
Other	2,241	0.02	0.16	818,057	8.58	58	0.75
Total Fuel Combustion	**129,977**	**0.32**	**2.62**	**47,441,523**	**116**	**956**	**43.1**
Petroleum Production and Marketing							
Oil and Gas Production	92.1	0.00	0.92	33,605	0.06	336	0.04
Petroleum Refining	770	0.00	1.65	280,932	0.36	603	0.27
Petroleum Marketing			83.8	0	0.00	30,598	0.58
Other			0.00	0	0.00	0	0.00
Total Petroleum Production and Marketing	**862**	**0.00**	**86.4**	**314,536**	**0.42**	**31,537**	**0.89**

Table 3-3
2008 GHG Emissions for the South Coast Air Basin (concluded)

Source Category	Emissions						
	CO2	N2O	CH4	CO2	N2O	CH4	CO2e
	(TPD)			(TPY)			(MMT)
Other Source Categories							
Total Waste Disposal[b]	3,772	0.04	508	1,376,870	14.9	185,278	4.78
Total Cleaning and Surface Coatings[c]	2,648	0.00	0.33	966,628	1.22	122	0.88
Total Industrial Processes[d]	279	0.00	1.49	101,832	0.19	543	0.10
Total Solvent Evaporation[e]	0.00	0.00	0.07	0.00	0.00	24.20	0.00
Total Miscellaneous Processes[f]	38,850	0.12	27.9	14,180,326	45.3	10,179	13.1
Total On-Road Motor Vehicles[g]	217,480	6.11	8.26	79,380,188	155	187	72.7
Total Other Mobile Sources[h]	57,572	1.83	8.95	21,013,816	668	3,268	19.3
Total Other Source Categories	**320,601**	**8.10**	**555**	**117,019,660**	**885**	**199,601**	**111**
Total 2008 Baseline GHG Emissions for Basin	**451,440**	**8.42**	**644**	**164,775,719**	**1,001**	**232,094**	**155**

Source: (South Coast AQMD, 2012)

(a) MMT = million metric tons.
(b) Waste Disposal includes sewage treatment, landfills, incineration, and other waste disposal.
(c) Cleaning and Surface Coatings includes laundering, degreasing, coatings and related processes, printing, adhesives and sealants, and other cleaning and surface coatings.
(d) Industrial Processes include chemical, food and agriculture, mineral processes, metal processes, wood and paper, glass and related products, electronic, and other industrial processes.
(e) Solvent Evaporation includes consumer products, architectural coating and related solvents, pesticides and fertilizers, and asphalt paving and roofing.
(f) Miscellaneous Processes include residential fuel combustion, farming operations, construction and demolition, paved road dust, unpaved road dust, fugitive windblown dust, fires, waste burning and disposal, utility equipment, cooking, and other miscellaneous processes.
(g) On-Road Motor Vehicles include trucks (all sizes), motorcycles, buses (all types), and motorhomes.
(h) Other Mobile Sources include aircraft; trains; ships; commercial boats, construction, airport, and oil and gas drilling equipment.

Table 3-4 presents the GHG emission inventory by fuel type in calendar year 2012 for the Basin. These GHG emissions are reported in metric tons of CO2. Gasoline generates 53 percent of the GHG emissions from fuel combustion. Natural gas generates 31 percent of the GHG emissions from fuel combustion. The remaining 20 percent of the total Basin GHG emissions from fuel combustion are from diesel, jet fuel, LPG, and fuel oil (2016 AQMP, Chapter 10).

Table 3-4
2012 GHG Emissions from Fuel Use in the Basin

Fuel Type	Consumption (Gallons)	Gas Supply (Therms)	CO2 Emissions (MT)
Gasoline	7,647,883,106	-	67,148,414
On-Road	7,108,714,450		62,414,512.87
Off-Road	539,168,656		4,733,900.80
Diesel	1,423,889,933	-	14,537,916
On-Road	872,963,200		8,912,954.27
Commercial Harborcraft	21,912,232		223,723.89
Trains	33,129,134		338,248.46
Off-Road	495,885,367		5,062,989.59
Jet Fuel	508,249,568.11		4,955,433.29
Fuel Oil - OGV (Residual Fuel Oil 5/6)	23,960,515.63		282,734.08
Natural Gas	8,831,724,016	7,359,770,013	39,389,489
Residential	2,445,612,164	2,038,010,137	10,907,430.25
Commercial	990,525,700	825,438,083	4,417,744.62
Industrial	1,592,974,552	1,327,478,793	7,104,666.50
NGV	132,285,600	110,238,000	589,993.78
EG	3,670,326,000	3,058,605,000	16,369,653.96
LPG	182,009,738		1,053,836
Residential	115,838,116		670,702.69
Commercial	43,807,549		253,645.71
Industrial	22,364,073		129,487.98
Total	**18,671,716,877**		**127,367,823**

Source: 2016 AQMP

Air Quality – Ozone Depletion

The Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) is an international treaty designed to phase out halogenated hydrocarbons such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), which are considered ODSs. The Montreal Protocol was first signed in September 16, 1987 and has been revised seven times. The U.S. ratified the original Montreal Protocol and each of its revisions.

Federal

Under the CAA Title VI, the U.S. EPA is assigned responsibility for implementing programs that protect the stratospheric ozone layer. 40 CFR Part 82 contains USEPA's regulations specific to protecting the ozone layer. These U.S. EPA regulations phase out the production and import of ozone depleting substances (ODSs) consistent with the Montreal Protocol. ODSs are typically used as refrigerants or as foam blowing agents. ODS are regulated as Class I or Class II controlled substances. Class I substances have a higher ozone-depleting potential and have been completely phased out in the United States, except for exemptions allowed under the Montreal Protocol. Class II substances are HCFCs, which are transitional substitutes for many Class I substances and are being phased out.

State

AB 32 - Global Warming Solutions Act: Some ODSs exhibit high global warming potentials. CARB developed a cap and trade regulation under AB 32. The cap and trade regulation includes the Compliance Offset Protocol Ozone Depleting Substances Projects, which provides methods to quantify and report GHG emission reductions associated with the destruction of high global warming potential ODS sourced from and destroyed within the U.S. that would have otherwise been released to the atmosphere. The protocol must be used to quantify and report GHG reductions under the ARB's GHG Cap and Trade Regulation.

Refrigerant Management Program: As part implementing AB 32, CARB also adopted a Refrigerant Management Program in 2009. The Refrigerant Management Program is designed to reduce GHG emissions from stationary sources through refrigerant leak detection and monitoring, leak repair, system retirement and retrofitting, reporting and recordkeeping, and proper refrigerant cylinder use, sale, and disposal.

HFC Emission Reduction Measures for Mobile Air Conditioning - Regulation for Small Containers of Automotive Refrigerant: The Regulation for Small Containers of Automotive Refrigerant applies to the sale, use, and disposal of small containers of automotive refrigerant with a GWP greater than 150. Emission reductions are achieved through implementation of four requirements: 1) use of a self-sealing valve on the container, 2) improved labeling instructions, 3) a deposit and recycling program for small containers, and 4) an education program that emphasizes best practices for vehicle recharging. This regulation went into effect on January 1, 2010 with a one-year sell-through period for containers manufactured before January 1, 2010. The target recycle rate is initially set at 90 percent, and rose to 95 percent beginning January 1, 2012.

South Coast AQMD

The South Coast AQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy targeted a transition away from CFCs as an industrial refrigerant and propellant in aerosol cans. In March 1992, the South Coast AQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives for ODSs:

- phase out the use and corresponding emissions of CFCs, methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- phase out the large quantity use and corresponding emissions of HCFCs by the year 2000;
- develop recycling regulations for HCFCs; and
- develop an emissions inventory and control strategy for methyl bromide.

South Coast AQMD Rule 1122 – Solvent Degreasers: Rule 1122 applies to all persons who own or operate batch-loaded cold cleaners, open-top vapor degreasers, all types of conveyorized degreasers, and air-tight and airless cleaning systems that carry out solvent degreasing operations with a solvent containing VOCs or with a NESHAP halogenated solvent. Some ODSs such as carbon tetrachloride and TCA are NESHAP halogenated solvents.

South Coast AQMD Rule 1171 – Solvent Cleaning Operations: Rule 1171 reduces emissions of VOCs, TACs, and stratospheric ozone-depleting or global warming compounds from the use, storage and disposal of solvent cleaning materials in solvent cleaning operations and activities

South Coast AQMD Rule 1411 - Recovery or Recycling of Refrigerants from Motor Vehicle Air Conditioners: Rule 1411 prohibits release or disposal of refrigerants used in motor vehicle air conditioners and prohibits the sale of refrigerants in containers which contain less than 20 pounds of refrigerant.

South Coast AQMD Rule 1415 - Reduction of Refrigerant Emissions from Stationary Air Conditioning Systems: Rule 1415 reduces emissions of high-global warming potential refrigerants from stationary air conditioning systems by requiring persons subject to this rule to reclaim, recover, or recycle refrigerant and to minimize refrigerant leakage.

South Coast AQMD Rule 1418 - Halon Emissions from Fire Extinguishing Equipment: Rule 1418 reduce halon emissions by requiring the recovery and recycling of halon from fire extinguishing systems, by limiting the use of halon to specified necessary applications, and by prohibiting the sale of portable halon fire extinguishers that contain less than five pounds of halon.

HAZARDOUS AND HAZARDOUS MATERIALS

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.

PARs 1110.2 and 1100 are intended to improve overall air quality; however, it may have direct or indirect hazards associated with the implementation. In order to achieve the desired reduction of NOx emissions from PAR 1110.2, some internal combustion engines may require the installation of air pollution control equipment such as SCR systems which utilize ammonia. As such, implementation of PAR 1110.2 may affect the use, storage, and transport of hazards and hazardous materials for any facility that installs SCR technology for reducing NOx emissions. 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 to meet NOx emission limits and in doing so, may result in the overall increase in the amount of ammonia delivered, stored and injected. Installation of SCR equipment may also result in potential ammonia slip emissions, an increase the amount of fresh catalyst needed, and an increase spent catalyst replaced over time.

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. Health and Safety Code 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.

Comprehensive Environmental Response, Compensation, and Liability Act: The Comprehensive Environmental Response, Compensation, and Liability Act (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 section112 (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 3-5 summarizes what the codes mean for each hazards category.

In addition to the information in Table 3-5, 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 3-5
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 Health and Safety Code. 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:

- Health and Safety Code §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 (Health and Safety Code 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 Health and Safety Code 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 South Coast AQMD 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[15] 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 3-6 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[16].

Table 3-6
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[17,18]

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[19].

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

[15] 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

[16] 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

[17] 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

[18] 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

[19] 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 3-7 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[20]. Data presented is for the entire county and not limited to the portion of the county located within the jurisdiction of the South Coast AQMD.

Table 3-7
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 3-7, the number of incidents has reduced over the years.

Hazards Associated with Air Pollution Control

The South Coast AQMD has evaluated the hazards associated with previous AQMPs, proposed South Coast AQMD rules, and non-South Coast AQMD projects where the South Coast AQMD 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 South Coast AQMD 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.

[20] 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

Ammonia

Ammonia is the primary hazardous chemical identified with the use SCR 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 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, current South Coast AQMD 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, no more than 19 percent by ~~volume~~weight, 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.

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 §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 the proposed project indicated that a SEA is the appropriate type of CEQA document to be prepared.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This document is a SEA to the March 2017 Final Program EIR for the 2016 AQMP. 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 selective non-catalytic reduction (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.

The proposed project is comprised of amendments to Rules 1110.2 and 1100. ~~However, PAR 1100 contains administrative changes that would not require any physical modifications to occur at affected facilities; thus, no environmental impacts are expected to occur from implementing PAR 1100.~~ Thus, the analysis in this SEA focuses on the physical modifications expected to occur at affected facilities in response to complying with PARs 1110.2 and 1100 and the corresponding environmental effects.

PAR 1110.2 proposes to remove exemptions previously allowed under the RECLAIM program for internal combustion engines with a rating greater than 50 bhp. Engines operated at RECLAIM or former RECLAIM facilities would therefore be required to comply with current BARCT in accordance with existing Rule 1110.2 NOx emission limits and also comply with existing monitoring, reporting, and recordkeeping requirements. ~~PAR 1110.2 also proposes to establish ammonia limits and require ammonia emissions monitoring.~~ Staff is proposing to add language to clarify the applicability of the rule to engines operated at remote radio transmission towers. Additional changes to PAR 1110.2 were made after the release of the Draft SEA, which include establishing an interim VOC limit of 25 ppmvd for electric generating units also referred to as linear generator engines, that: 1) do not have ammonia emissions from add-on control equipment; 2) meet the NOx limit of Rule 1110.2 Table IV; and 3) were installed before January 1, 2024. Additionally, staff has added an exemption for Tier 4 – Final diesel engines which are used to power cranes operated in the Southern California Coastal Waters or Outer Continental Shelf. Internal combustion engines located at RECLAIM and former RECLAIM facilities subject to Rule 1110.2 will be required to meet the applicable NOx concentration limit by December 31, 2023. For PAR 1110.2, compliance is expected to be achieved through repowering or replacing existing engines and installing new NOx control technology such as SCR systems or modifying the existing control system. The proposed NOx emission reductions are expected to improve overall air quality in the South Coast AQMD's jurisdiction 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.

As demonstrated in the following analysis, the construction associated with installing new air pollution control equipment, or repowering, replacing, or retrofitting existing engines in order to reduce NOx emissions, is not expected to exceed the South Coast AQMD's air quality significance thresholds for construction or operation. Further, after construction is completed, the operation of any repowered, replaced, or retrofitted engines would reduce NOx emissions overall, thus, reducing any potential adverse impact to air quality. However, for the topic of hazards and hazardous materials, the analysis assumes that for any installation of a SCR system, a corresponding installation of one new ammonia storage tank will be necessary. The potential proximity of any new ammonia storage tank to any nearby sensitive receptor could potentially have a significant adverse hazards and hazardous materials impact. For this reason, the analysis concludes that the implementation of the proposed project would be expected to have significant adverse hazards and hazardous materials impacts from the storage and use of ammonia to operate any new SCR systems that are installed.

No other environmental topic areas are expected to have new adverse impacts that were not previously analyzed in the March 2017 Final Program EIR for the 2016 AQMP. Thus, only the topics of air quality and hazards and hazardous materials have been analyzed in this SEA.

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 proposed project.

AIR QUALITY IMPACTS

Significance Criteria

The environmental analysis assumes that installation of NOx air pollution control equipment (e.g., SCR systems) for the affected sources will reduce NOx emissions overall, but construction activities associated with both the installation of new air pollution control devices and the repowering or replacement of existing gas turbines and modification of existing control devices will create secondary air quality impacts (e.g., emissions), which can adversely affect local and regional air quality. An affected facility may generate emissions both during the construction period and through ongoing daily operations. During installation of SCR systems or the repowering or replacement of existing engines or modification of 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 SCRs (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 implementing the proposed project are significant, impacts will be evaluated and compared to the criteria in Table 4-1. If impacts exceed any of the air quality 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. The proposed project 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 South Coast AQMD 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 the proposed project are primarily the installation of SCR technology and the repowering or replacement of existing engines; thus, this will be analyzed in this SEA.

To comply with the proposed emission limits of PAR 1110.2, a facility has the following options: 1) modify the existing NSCR system for rich-burn engines; 2) modify the existing SCR system(s); 3) install an SCR system and associated ammonia storage tank for lean-burn engines; 4) repower their existing engine and install air pollution controls; or 5) replace their existing engine and install air pollution controls. The analysis also evaluates the impacts from operation of linear generators. Since linear generator engines are standalone units that do not require construction, only operational impacts are evaluated for this type of equipment. The following construction analysis evaluates each of these options individually. However, due to the number of affected engines and a compliance date of December 31, 2023, the "worst-case" construction analysis is based on a combination of these options with overlapping construction activities.

Table 4-1
South Coast AQMD 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 South Coast AQMD 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	South Coast AQMD 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/m³ (construction)[e] & 2.5 μg/m³ (operation) 1.0 μg/m³	
$PM_{2.5}$ 24-hour average	10.4 μg/m³ (construction)[e] & 2.5 μg/m³ (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/m³ (state)	
CO 1-hour average 8-hour average	South Coast AQMD 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/m³ (state) 0.15 μg/m³ (federal)	

[a] Source: South Coast AQMD CEQA Handbook (South Coast AQMD, 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 South Coast AQMD Rule 1303, Table A-2 unless otherwise stated.
[e] Ambient air quality threshold based on South Coast AQMD Rule 403.

KEY: lbs/day = pounds per day; ppm = parts per million; μg/m³ = microgram per cubic meter; ≥ = greater than or equal to; MT/yr CO_2eq = metric tons per year of CO_2 equivalents; > = greater than

Revision: April 2019

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 each affected facility, typically, has already been graded and paved. Further, operators at each affected facility who install air pollution control equipment such as SCR technology to reduce NOx emissions will also need to utilize chemicals such as ammonia and catalyst as part of the process. As such, a new ammonia storage tank will need to be installed along with 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 repowering or replacing an internal combustion engine and installing new SCR systems in order to comply with the NOx emission limits in PAR 1110.2, assumptions were made to estimate combustion emissions from construction activities occurring onsite, off-site on-road emissions from worker trips, deliveries and haul trips, and on-site fugitive dust emissions, and operational emissions from deliveries and haul trips.

Among the 21 RECLAIM facilities subject to PAR 1110.2, a total of 10 facilities that are expected to require modifications to comply with the proposed emission limits. The remaining facilities operate engines that either currently meet the proposed emission limits or are eligible for exemptions from the emission limits in PAR 1110.2. Amongst the 10 facilities that will require modifications to comply with PAR 1110.2, 45 engines are expected to be replaced, repowered, or retrofitted with air pollution control equipment in order to comply with the NOx limits in PAR 1110.2. Of the 45 engines, six are equipped with SCR systems that are not capable of achieving the more stringent NOx emission limits in PAR 1110.2 and will need to increase the amount of urea injected and possibly require new, more efficient catalyst. Subsequently, there will be an increase in their urea usage in order to meet the proposed emission limits in PAR 1110.2. Fifteen lean burn engines are expected to be retrofitted with new SCR systems. For any facility that operates a lean burn engine that is not equipped with any air pollution control equipment for reducing NOx emissions, a new SCR system with a new ammonia tank will need to be installed. There are currently six lean burn engines operated at a facility in the OCS. Due to operational limitations, retrofitting the engines with SCR technology is not feasible. Therefore, it is assumed that these engines will be replaced with rich burn engines equipped with NSCR technology such as a three-way catalyst. There are also eight lean burn engines operated at two facilities which ~~will be~~ may be repowered with stationary gas turbines equipped with SCR technology. Further, some facilities may undergo a facility-wide engine modernization where engines are replaced with zero-emission technology such as electrification or fuel cell technology. Although some of the impacts associated with the construction of new SCR systems were evaluated in the Final Subsequent Environmental Assessment for PAR 1134 that was certified on April 5, 2019[21], for the purpose of

[21] South Coast AQMD, Final Subsequent Environmental Assessment for Proposed Amended Rule 1134 – Emissions of Oxides of Nitrogen from Stationary Gas Turbines, certified April 2019. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2019/par-1134---final-sea_with_appdx.pdf

this SEA, impacts from construction of the new stationary gas turbines, SCR systems, and associated ammonia tanks will be included and evaluated as the "worst-case" scenario. Other minor construction activities will also be required for existing rich burn engines utilizing NSCR catalysts. This includes replacing the air-to-fuel ratio controller, tuning the system, and/or replacing the NSCR catalyst with new, more efficient catalyst. A summary of the affected units analyzed in this SEA are shown in Table 4-2.

Table 4-2
Proposed Construction Activities

Construction Activities	Number of Affected Units
Modification of existing SCR or NSCR systems	16
Engines expected to be retrofitted with new SCR	15
Engines expected to be replaced and new NSCR catalyst to be installed (OCS facility)	6
Engines expected to be repowered with new stationary gas turbines and new SCR	8
Total Number of Affected Stationary Engines	**45**

The scenarios requiring the most construction and subsequently resulting in the highest daily peak emissions are the following: 1) retrofitting lean burn engines with SCR technology; 2) replacing lean burn engines operated in the OCS with rich burn engines utilizing NSCR technology; and 3) repowering lean burn engines with stationary gas turbines and installing SCR technology for NOx control. However, there are only six engines which are all located at the same facility that will need to be replaced. Further, as discussed previously, although there are 16 engines with existing NOx control equipment, only six are equipped with SCR and will need to replace their existing catalyst and potentially the catalyst housing. The remaining ten engines will need minor changes such as replacing the air-to-fuel ratio controller or replacing the catalyst with more efficient catalyst. For this reason, the environmental analysis in this SEA assumes that overlapping construction activities from the installation of SCR systems and associated ammonia storage tank at one facility and repowering of engines with stationary gas turbines at two facilities, which is expected to result in the "worst-case" emissions.

Existing SCR or NSCR System Modifications

There are currently six lean burn engines at one facility utilizing SCR systems to control NOx. To comply with current BARCT limits, the SCR system is expected to be modified which includes using a different catalyst that may require new catalyst housing and piping. This facility has an existing 5,000 gallon urea tank and is not expected to require any additional tanks. Additional urea usage is expected to achieve BARCT limits and subsequently truck trips are assumed to be required.

There are 10 rich burn engines at three facilities that are currently equipped with NSCR systems. The existing NSCR systems are currently capable of achieving NOx emissions levels of 28 ppm or less. Therefore, minor modifications such as replacing and tuning the air-to-fuel ratio controller and/or replacing the NSCR catalyst are expected to reach BARCT NOx limits of 11 ppm. However, in the event new, more efficient catalysts is required, the facility may also need to replace the catalyst housing if the new catalyst is not compatible with the existing housing. This scenario represents the "worst-case" and would require similar construction activities as modifying an existing SCR system. Typical equipment that may be needed to complete each construction phase at a single affected facility is presented in Table 4-3.

Table 4-3
Construction Equipment That May Be Needed to Modify an Existing SCR or NSCR System at One Facility

Construction Phase	Off-Road Equipment Type	Quantity	Daily Usage Hours
Demolition	Concrete/Industrial Saws	1	8
Demolition	Tractors/Loaders/Backhoes	2	6
Building Construction	Aerial Lifts	1	4
Building Construction	Cranes	1	3
Building Construction	Forklifts	1	6
Building Construction	Generator Sets	1	7
Building Construction	Tractors/Loaders/Backhoes	1	4

Construction emissions associated with modifying an existing SCR system at one facility were estimated using the California Emission Estimator Model (CalEEMod®), version 2016.3.2. The following assumption were made:

- The dismantling and demolition process is estimated to take two days and construction of the catalyst housing and catalyst installation is expected to take 10 days. No site preparation or paving is expected since modifications will be made to existing SCR or NSCR systems.
- Four workers would be needed to dismantle the catalyst housing and install the new catalyst housing and catalyst. One hauling trip would be needed for demolition and one vendor trip would be needed per day during construction.
- No additional employees are expected to be needed to operate and maintain the SCR system since operation and maintenance activities are expected to be similar.

Table 4-4 presents the peak daily emissions for the construction of one SCR system and ammonia storage tank at one facility, and the quantity of peak daily construction emissions are less than the South Coast AQMD's air quality significance thresholds for construction. 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 4-4
Peak Daily Emissions from Construction Activities of Modifying an Existing SCR or NSCR System at One Facility

Peak Daily Construction Emissions	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Modification of 1 SCR system	0.6	5.0	5.6	0.0	0.4	0.3
Significance Threshold for Construction	75	100	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

SCR System Installation

Currently, there are 23 engines that are not equipped with SCR technology. Eight of the engines will be repowered with stationary gas turbines and also new SCR systems. The remaining 15 engines will be retrofitted with a new SCR system. If facility owners/operators of these 15 turbines decide to install 15 SCR systems, 15 ammonia or urea storage tanks (e.g., one storage tank for each SCR system) could potentially be installed because SCR systems utilize ammonia or urea in the NOx reduction process. However, for 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 ammonia storage tanks, because it is likely and expected the facilities would want to simplify their ammonia delivery schedule. For example, several RECLAIM facilities have at least two engines that are each expected to utilize new SCR technology; therefore, it is possible that the facility operator of these facilities would elect to install one larger aqueous ammonia or urea storage tank, in lieu of two smaller tanks, to service the two new SCR systems. Also by assuming that one larger storage tank would be installed in lieu of multiple smaller storage tanks, the hazards and hazardous materials impacts from a catastrophic failure of the larger ammonia tank would represent the "worst-case" off-site consequence in the event of a spill. The size of each storage tank that may be needed to supply ammonia or urea to each SCR system has been estimated to range between 250 and 5,000 gallons in capacity. As previously discussed, there are also six existing SCR systems located at one facility that may not be capable of achieving the proposed NOx emission limits. As such, it is assumed that the facility will continue to use the existing urea tank. The existing urea tank is 5,000 gallons in capacity; however, the increase in ammonia usage will only affect the number of truck trips to deliver the ammonia and not the amount of ammonia stored on site.

Some facilities may have sufficient space to install one new SCR system and one new ammonia storage tank for their engine and would likely expect minor modifications to the existing facility. However, because installation of a SCR system and associated ammonia storage tank may need to occupy the space of existing equipment, demolition activities are assumed to occur prior to installation of the new equipment in order to remove any existing equipment or structures (as applicable), remove old piping and electrical connections, and break up the old foundation. For these reasons, slab pouring or paving activities are also anticipated and were analyzed.

The type of construction-related activities attributable to installing a new SCR system and associated ammonia storage tank 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 engines are currently operating at existing facilities, the analysis assumes that no more than 2,500 square feet of area would need to be disturbed at a single facility at a given time. Based on previous CEQA analyses conducted for the installation of one SCR system and one ammonia storage tank, the typical equipment that may be needed to complete each construction phase at a single affected facility is presented in Table 4-5. SCR systems associated with engines that will be repowered with stationary gas turbines will be analyzed separately.

Table 4-5
Construction Equipment That May Be Needed to Install One SCR System and One Ammonia Tank at One Facility

Construction Phase	Off-Road Equipment Type	Quantity	Daily Usage Hours
Demolition	Concrete/Industrial Saws	1	8
Demolition	Cranes	1	2
Demolition	Forklift	2	8
Building Construction	Aerial Lifts	1	8
Building Construction	Cranes	1	3
Building Construction	Forklifts	1	6
Building Construction	Generator Sets	1	7
Building Construction	Tractors/Loaders/Backhoes	1	4
Building Construction	Welders	2	7
Paving	Cement and Mortar Mixers	2	6
Paving	Pavers	1	8
Paving	Plate Compactors	1	4
Paving	Rollers	1	4
Paving	Tractors/Loaders/Backhoes	1	8

Construction emissions associated with installing one SCR system and one associated ammonia tank at one facility 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 one 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 engines, the installation of SCR systems and associated ammonia storage tank(s) are assumed to occur in sequential order with the same construction crew and equipment in order to avoid all gas turbines being offline at the same time.

- The three 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 – 10 days; installation of NOx control equipment – 60 days; and paving – five days.

- During construction of each SCR system and ammonia storage tank the following number of round-trip trips would occur from worker trips each day: demolition - 8 trips; installation of SCR system and ammonia tank – 15 trips; and paving – 8 trips. In addition, four on-road hauling trips are estimated to be needed during demolition, seven on-road vendor trips are estimated to be needed during the installation of the SCR system and ammonia storage tank, and one vendor trip per day will be needed during paving.

- Taking into account the lead time needed to complete design and engineering, procure contracts, order equipment and obtain South Coast AQMD permits, construction is expected to begin in year 2020 at the earliest. Further, depending on the facility, construction could span from two months to one year or more if multiple SCR systems and multiple ammonia storage tanks (or one larger ammonia storage tank) will be installed at one facility. The maximum number of SCR systems expected to be installed at one facility is five.

Table 4-6 presents the peak daily emissions from construction activities to install one SCR system and one ammonia storage tank at one facility. There are 15 engines located at six facilities where each engine is assumed to need one SCR system and one ammonia storage tank installed. For the facilities that have more than one gas turbine and thus require more than one SCR system to be installed, it is possible only one ammonia storage tank with a large enough capacity to supply enough ammonia to all of the SCR systems would be needed. Further, for these six facilities, the installations of the SCR systems are assumed to occur sequentially (e.g., one SCR system and one ammonia storage tank at a time) in order to avoid all gas turbines being offline simultaneously and to maintain operations at each facility. PAR 1110.2 provides approximately four years (compliance date of December 31, 2023) for facilities to take the necessary actions in order to achieve compliance, e.g., to construct each SCR system and ammonia or urea storage tank at the seven affected facilities. With a four-year compliance timeframe, construction at these seven facilities would likely be staggered because of the lead time needed to complete design and engineering, procure contracts, order equipment, and obtain South Coast AQMD permits prior to beginning construction. Thus, the analysis assumes that not all seven facilities would begin construction on the exact same day and maintain the exact same schedule. However, it is possible that some facilities may have overlapping construction phases (e.g., Facility 1 would have demolition occurring, while Facility 2 may be conducting site preparation, etc.). Table 4-6 presents the peak daily emissions for the construction of one SCR system and ammonia storage tank at one facility, and the quantity of peak daily construction emissions are less than the South Coast AQMD's air quality significance thresholds for construction. 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 4-6
Peak Daily Emissions from Construction Activities of One SCR System and One Ammonia Storage Tank at One Facility

Peak Daily Construction Emissions	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Installation of 1 SCR and 1 ammonia storage tank	1.4	10.2	9.9	0.0	0.7	0.5
Significance Threshold for Construction	75	100	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Repowering of Existing Engine with a Stationary Gas Turbine Utilizing SCR Technology
There are two facilities that plan to repower their engines. One of the facilities currently has four existing stationary gas turbines and six engines. Three of the engines and all four stationary gas turbines will be removed from service and replaced with three stationary gas turbines. Although the repowering of the three engines is within the scope of the stationary gas turbine replacement project, construction impacts associated with the repowering of the three engines will be evaluated in this SEA. The other facility is planning to repower five engines with five stationary gas turbines. The assumptions relied upon for this analysis is as follows:

- The dismantling and demolition process is estimated to take 20 days and then it would require approximately five days of site preparation, 150 days of building construction, and five days of paving, for a total of 180 days.

- 20 workers would be needed to dismantle the existing engine and install the new stationary gas turbine.
- Equipment needed to repower the engine is presented in Table 4-7.
- The footprint of the existing engines is assumed to be approximately 3,000 square feet and the facility operator is assumed to replace the unit with equipment of the same or similar size and footprint.
- To provide a "worst-case" analysis, each engine repower will require its own construction crew and equipment. Since multiple engines are undergoing replacement, the replacements are assumed to occur in sequential order with the same construction crew and equipment in order to avoid all engines being offline at the same time.
- Once the new gas turbine becomes operational, the NOx emissions are expected to be fewer in the new gas turbine relative to the existing engine.
- No additional employees are expected to be needed to operate and maintain the new gas turbine. The required operation and maintenance activities are expected to be similar for the new gas turbine.

Table 4-7
Construction Equipment That May Be Needed to Repower One Engine at One Facility

Construction Phase	Off-Road Equipment Type	Quantity	Daily Usage Hours
Demolition	Concrete/Industrial Saws	1	8
Demolition	Cranes	1	4
Demolition	Rubber Tired Dozers	1	4
Demolition	Forklifts	2	7
Site Preparation	Rubber Tired Dozers	1	7
Site Preparation	Tractors/Loaders/Backhoes	1	4
Site Preparation	Trenchers	1	4
Building Construction	Aerial Lifts	1	4
Building Construction	Cranes	1	4
Building Construction	Forklifts	2	6
Building Construction	Generator Sets	1	8
Building Construction	Welders	2	4
Paving	Cement and Mortar Mixers	1	6
Paving	Pavers	1	5
Paving	Paving Equipment	1	4
Paving	Rollers	1	4
Paving	Tractors/Loaders/Backhoes	1	4

Construction emissions associated with removing engine and replacing it with a stationary gas turbine of comparable size and footprint were estimated using CalEEMod® version 2016.3.2. Appendix B contains the detailed construction estimates for replacing one engine with a stationary gas turbine. Table 4-8 summarizes the peak daily construction emissions from replacing an engine with a stationary gas turbine.

Table 4-8
Peak Daily Construction Emissions from Repowering an Engine

Construction Emissions	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Repower 1 Engine	1.5	14.1	9.8	0.0	6.1	3.6
Significance Threshold for Construction	75	100	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

As shown in Table 4-8, the construction emissions from the repowering one engine with a stationary gas on a peak day are less than South Coast AQMD's air quality significance thresholds for construction.

Complete Replacement of Existing Engine and Installation of NSCR Catalyst in the OCS

As noted previously, there are six lean burn engines operated in the OCS which would require the installation of SCR technology to achieve the NOx emission limit of PAR 1110.2. However, due to operational limits and space constraints, the facility will likely replace the existing engines. For this SEA, it is assumed that the facility will replace the lean burn engines with rich burn engines and utilize NSCR catalysts to achieve the proposed NOx emissions limit. Replacement of the engine and installation of the NSCR system will require more construction than installing an SCR system and therefore, will likely result in higher peak daily emissions. The decision to completely replace a gas turbine will be based on a number of factors such as age, reliability, high maintenance and operating costs, fuel efficiency issues, and/or the lack of replacement parts. However, 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.).

In the event that a facility operator decides to completely replace an existing engine, the following assumptions were made:

- The dismantling and demolition process is estimated to take 10 days, building construction would take about 60 days for each replacement engine and new NSCR unit. The replacement is assumed to be sequential to minimize power disruptions or reductions to the facility's customers during construction.
- Each engine and NSCR unit is assumed to be transported to the facility via barge from the Port of Los Angeles.
- 8 workers would be needed to dismantle the existing engine and 15 would be needed to install the new engine and NSCR unit.
- Equipment needed to replace an engine and install the NSCR system is presented in Table 4-9. Due to space constraints on the platforms, on-site cranes will be used to move equipment during demolition and building construction. All construction equipment and materials would need to be delivered to the facility via barge.
- To provide a "worst-case" analysis, each engine replacement will require its own construction crew and equipment. For any facility with multiple engines undergoing replacement, the replacements are assumed to occur in sequential order with the same

construction crew and equipment in order to avoid all engines being offline at the same time.

- Once the new engines become operational, the NOx emissions are expected to be fewer in the new engines relative to the existing engines. Similarly, the fuel efficiency of the new engine will be improved and will likely use less fuel than the existing engines.
- No additional employees are expected to be needed to operate and maintain the new engines. The required operation and maintenance activities are expected to be similar for the new engines.

Table 4-9
Construction Equipment That May Be Needed to Replace One Engine and Install an NSCR System at a Facility in the OCS

Construction Phase	Off-Road Equipment Type	Quantity	Daily Usage Hours
Demolition	Concrete/Industrial Saws	1	8
Demolition	Cranes	2	6
Building Construction	Cranes	2	6
Building Construction	Welders	2	4

Construction emissions associated with removing one engine and replacing it with a new engine of comparable size and footprint were estimated using CalEEMod® version 2016.3.2. Appendix B contains the detailed construction estimates for replacing one engine. Table 4-10 summarizes the peak daily construction emissions from replacing an engine with a new engine.

Table 4-10
Peak Daily Construction Emissions from Replacing One Engine and Installing One NSCR Unit

Construction Emissions	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Replacement of 1 Engine and Installation of 1 NSCR Unit (Construction)	1.14	8.05	5.99	0.01	0.55	0.40
Replacement of 1 Engine and Installation of 1 NSCR Unit (Equipment Delivery via Barge)	0.66	5.13	11.14	0.05	0.18	0.18
Daily Peak Construction Emissions	**1.81**	**13.18**	**17.13**	**0.06**	**0.73**	**0.57**
Significance Threshold for Construction	75	100	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

As shown in Table 4-10, the construction emissions from the replacement of one engine and installation of the NSCR unit on a peak day are less than South Coast AQMD's air quality significance thresholds for construction.

The existing six engines located in the OCS will likely be replaced new engines equipped with NSCR technology or other NOx reduction control technology that does not utilize ammonia or urea to comply with PAR 1110.2. However, as explained earlier, to minimize disruption at the facility, each replacement is assumed to occur in sequential order with the same construction crew and equipment in order to avoid all engines being offline at the same time.

There may be other facilities that will elect to replace their existing engine(s), but South Coast AQMD staff is unable to predict if there are additional facilities that would choose replacement since there are a variety of factors to be considered. Some facility operators may decide to replace an old engine with a new engine to improve operational efficiency or if the existing engine cannot be retrofitted with a new SCR system. Overall, the decision to replace an existing engine will depend upon cost, the feasibility to install a new SCR system and achieve the NOx emission limits in PAR 1110.2, as well equipment age and size, and the facility's operational needs.

Facility-wide Engine Modernization

Some compressor gas lean-burn engines are nearing the end of their useful life. As such, a RECLAIM or former RECLAIM facility operating compressor gas engines may consider undergoing a facility-wide engine modernization. One facility has indicated that they are considering a potential facility-wide engine modernization project which could require installing new engines on a new footprint followed by the demolition of the existing engines and surrounding structure once the new engines become operational. Although the Draft SEA evaluated a scenario where an engine would be repowered with a new stationary gas turbine, that scenario assumed that construction of the new equipment would occur sequentially (e.g., one new engine would be constructed at a time and one existing engine would be dismantled). However, since the existing engines under this facility-wide engine modernization scenario will instead remain online until construction of all the new engines is complete, all of the new engines will be constructed concurrently. The assumptions relied upon for this analysis are as follows:

- Site preparation is estimated to take 15 days followed by, 279 days of building construction, and 12 days of paving. Once the new engines are operational, demolition of the existing engines would take approximately 40 days to complete. Overall, total construction will take approximately 346 days.
- 23 workers would be needed to complete during site preparation phase, 38 workers for building construction, 30 workers for paving, and 25 workers would be needed to dismantle the existing engines and demolish the structure of the existing engines.
- Equipment needed to replace each engine is presented in Table 4-11.
- The affected facility indicated that an area of up to 20,000 square feet per engine would be required for a total of 100,000 square feet for five engines.
- Since construction would occur on a parcel of land that is separate from the existing engines, construction of all five new engines is assumed to occur concurrently.
- Once the engines become operational, the NOx emissions are expected to be fewer for the new engines relative to the existing engines.

- No additional employees are expected to be needed to operate and maintain the new engines. The required operation and maintenance activities are expected to be similar for the new engines.

Table 4-11
Construction Equipment That May Be Needed for a Facility-wide Engine Modernization of Five Engine Replacements at One Facility

Construction Phase	Off-Road Equipment Type	Quantity	Daily Usage Hours
Site Preparation	Tractors/Loaders/Backhoes	2	6
Site Preparation	Water Truck	2	6
Site Preparation	Rubber Tired Dozers	2	7
Site Preparation	Compactor	1	8
Site Preparation	Tractors/Loaders/Backhoes	1	4
Site Preparation	Trenchers	1	4
Building Construction	Aerial Lifts	3	7
Building Construction	Cranes	4	8
Building Construction	Forklifts	2	6
Building Construction	Generator Sets	2	8
Building Construction	Welders	2	6
Paving	Cement and Mortar Mixers	2	6
Paving	Pavers	1	5
Paving	Paving Equipment	2	8
Paving	Rollers	2	6
Paving	Tractors/Loaders/Backhoes	3	6
Paving	Water Truck	2	6
Demolition	Concrete/Industrial Saws	2	6
Demolition	Cranes	1	6
Demolition	Rubber Tired Dozers	2	6
Demolition	Forklifts	2	7
Demolition	Water Truck	2	6
Demolition	Dump Truck	3	8

Construction emissions associated with removing one engine and replacing it with one stationary gas turbine of comparable size and footprint were estimated using CalEEMod® version 2016.3.2. Appendix B-5 contains the detailed construction estimates for replacing five engines with five stationary gas turbines. Table 4-12 summarizes the peak daily construction emissions from a facility-wide engine modernization project of five engines at one facility.

Table 4-12
Peak Daily Construction Emissions from a Facility-wide Engine Modernization of Five Engine Replacements at One Facility

Construction Emissions	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Facility-wide Engine Modernization of Five Engines at One Facility	4.51	35.74	32.54	0.10	12.16	6.98
Significance Threshold for Construction	75	100	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

As shown in Table 4-12, the construction emissions from replacing five engines with five stationary gas turbines on a peak day are less than South Coast AQMD's air quality significance thresholds for construction.

Overlapping Construction Emissions

Given the duration of construction that would be needed to replace an existing engine and install an SCR system and ammonia storage tank and the length of time provided to comply with the requirements of PAR 1110.2 (on or before December 31, 2023, approximately four years to achieve compliance), the construction phases for multiple facilities could potentially overlap on a peak day. However, PAR 1100 allows compressor gas engines to meet the emissions limits of PAR 1110.2 24 months after a permit to construct is issued ~~or 36 months after a permit to construct is issued~~ if the application is submitted by July 1, 2021. Of the 15 lean burn engines that are expected to be retrofitted with new SCR systems, 11 are compressor gas lean-burn engines. All eight engines that are expected to be repowered with stationary gas turbines are also compressor gas lean-burn engines. Construction of some or all of these stationary engines may occur outside of the four year window which would result in fewer overlapping construction activities and subsequently fewer impacts from construction. As a "worst-case", it is conservatively assumed that all affected stationary engines will be constructed within four years (e.g., by December 31, 2023). Therefore, a peak day is expected to consist of one SCR system and associated ammonia storage tank installation and repowering of an engine with a stationary gas turbine at two facilities for a total of two engine repowers. Overlapping peak daily construction emissions are shown in Table 4-13.

Table 4-13
Overlapping Peak Daily Construction Emissions

Construction Emissions	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day	PM10 (lb/day)	PM2.5 (lb/day)
Installation of One SCR System and One Ammonia Storage Tank	1.36	10.22	9.90	0.02	0.71	0.54
Repowering of Two Engines with Two Stationary Gas Turbines	3.08	28.27	19.58	0.04	12.15	7.13
Total Overlapping Peak Daily Construction Emissions	**4.44**	**38.49**	**29.48**	**0.06**	**12.86**	**7.67**

Table 4-13
Overlapping Peak Daily Construction Emissions

Construction Emissions	**VOC (lb/day)**	**NOx (lb/day)**	**CO (lb/day)**	**SOx (lb/day**	**PM10 (lb/day)**	**PM2.5 (lb/day)**
Significance Threshold for Construction	75	100	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

As shown in Table 4-13, the air quality impacts due to construction from the implementation of PAR 1110.2 are expected to be less than significant.

<u>Based on the delayed compliance schedule allowed for compressor gas lean-burn engines undergoing facility-wide engine modernization activities in PAR 1100, it is unlikely that a facility undergoing a facility-wide engine modernization will overlap with other facilities complying with PAR 1110.2. In particular, RECLAIM and former RECLAIM facilities that do not operate compressor gas lean-burn engines have a compliance date of December 31, 2023. By comparison, facilities with compressor gas lean-burn engines undergoing a facility-wide engine modernization project will not be required to submit a permit application until July 1, 2022 and by the equipment is procured, and environmental reviews are completed and a Permit to Construct is issued, construction will commence after the December 31, 2023 compliance date. Therefore, construction impacts associated with facility-wide engine modernization projects are expected to occur after construction of projects that do not involve compressor gas lean-burn engines undergoing facility-wide engine modernization.</u>

Project-Specific Air Quality Impacts During Operation

The proposed project is expected to result in direct air quality benefits from the reduction of 0.29 ton per day of NOx emissions by December 31, 2023. Implementation is expected to be achieved through any of the following modifications: 1) modify the existing SCR system or NSCR system; 2) install one new SCR system for one existing lean burn engine that does not have post-combustion air pollution control equipment; 3) repower one existing engine with one stationary gas turbine and install one new SCR system; or 4) replace one existing lean-burn engine operated at a facility located in the OCS with one rich-burn engine and install an NSCR system. Once construction is complete, secondary criteria pollutant emissions may be generated as part of operation activities necessary with operating and maintaining the SCR systems and gas turbines. In particular, the following activities may be sources of secondary criteria pollutant emissions during operation: 1) new vehicle trips via heavy-duty for periodic ammonia/urea deliveries for each SCR system installed; 2) new vehicle trips via heavy-duty trucks for periodic deliveries of fresh catalyst and hauling away spent catalyst the new SCR systems are installed; and 3) increased vehicle trips vial heavy-duty periodic ammonia/urea deliveries for facilities increasing ammonia usage on existing SCR systems with replaced catalyst modules.

The following assumptions were made about the operation of new SCR systems:

- One new ammonia or urea storage tank is assumed to require two one-way truck deliveries of 19 percent aqueous ammonia or 40 percent urea. Ammonia and urea delivery trucks can deliver approximately 6,700 gallons at any one time.

- Each facility with only one new SCR system installed will need at least new ammonia or urea delivery trip per month and the quantity delivered will vary according to the capacity of the ammonia or urea storage tank and monthly usage. For facilities that will have more than one SCR system installed, the analysis assumes that one new large ammonia or urea storage tank will require two one-way truck deliveries of 19 percent aqueous ammonia or 40 percent urea.
- Since the ammonia tanks will be pressurized, no ammonia emissions are expected from filling the storage tanks.
- As a conservative estimate, it is assumed the peak daily trips associated with ammonia/urea deliveries will be one truck per facility for all gas turbines that are equipped with new SCR systems. The delivery distance of one ammonia truck is assumed to be 100 miles round-trip.
- All initial catalyst deliveries are assumed to occur during the construction phase. However, catalyst modules are expected to be replaced once every 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.
- Seven facilities are expected to install new SCR systems with new ammonia/urea deliveries with five of the aforementioned facilities located within one quarter mile of sensitive receptors (e.g., schools, residences, etc.).
- One facility with existing SCR systems are expected to increase their ammonia usage and is located within one quarter mile of sensitive receptors (e.g., schools, residences, etc.).
- One facility in the OCS is expected to replace their existing engines and install NSCR systems. Since the engines operated at the facility currently use oxidation catalysts to control CO and VOC, future NSCR catalyst deliveries will likely coincide with the oxidation catalyst delivery. Further, multiple three-way catalysts may be delivered in one day on the same delivery truck and barge. For this analysis, up to six new catalyst deliveries will be included to account for the “worst-case.”
- The projected increase in aqueous ammonia usage will not change the number of aqueous ammonia deliveries occurring on a peak day (e.g., one truck) per facility.

A total of eight facilities will need new ammonia deliveries. Of the eight facilities with SCR systems, one had existing SCR systems and therefore, would not result in new catalyst delivery trips. Secondary operational emissions from these facilities were estimated using EMFAC2017 emission factors and are presented in Table 4-14. Appendix B contains the detailed emissions calculations from the operational activities from the operating the new SCR systems and increase in delivery trucks as a result of increasing ammonia usage for facilities with existing SCR systems as well as new catalyst deliveries.

Table 4-14
Peak Daily Operational Emissions at One Facility

Operational Activity	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Increased Ammonia Delivery Trucks for 1 Facility	0.08	0.52	0.34	0.0	0.03	0.02
New Catalyst Delivery and Spent Catalyst Haul Trip at 1 Facility	0.15	1.04	0.68	0.0	0.07	0.04
Total	**0.23**	**1.56**	**1.01**	**0.01**	**0.1**	**0.06**
Significance Threshold for Operation	55	55	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Linear Generator Engines

Staff received comments from a manufacturer of linear generator engines. As described in Chapter 2, this technology is capable of meeting the DG limits for NOx and CO. However, due to the low reaction temperature, the oxidation catalyst cannot achieve VOC levels that meet the DG limit of 10 ppmv VOC. However, staff recognizes the benefit in having a technology available that is capable of meeting 2.5 ppmv NOx and 12 ppmv CO without the use of SCR technology. Further, ammonia would not be needed since linear generators would not need to utilize SCR technology and subsequently, there would be no ammonia slip emissions that would result in PM2.5 emissions.

Staff is proposing to establish a 25 ppmv VOC limit for engines that are capable of meeting 2.5 ppmvd NOx at startup and that do not have ammonia emissions from add-on control equipment. To minimize the VOC impacts from the operation of these engines, the total accumulated increase of VOC emissions from all qualifying engines that are installed before January 1, 2024 will be limited to 45 pounds per day.

Overlapping Operational Emissions

As indicated in Table 4-14, operational emissions from one facility as a result in an increase in delivery trucks is below the South Coast AQMD's air quality significance thresholds for operation. Due to the number of affected facilities with eight additional ammonia deliveries, operational emissions may overlap on a peak day. However, in the most conservative assumption, if two facilities were to overlap their scheduled ammonia/urea delivery with a new catalyst delivery to a facility operating in the OCS, air quality impacts from operations are expected to be less than significant as shown in Table 4-15. For the worst case, it is assumed that the overlap will occur with the facility located in the OCS.

Table 4-15
Peak Daily Operational Emissions

Operational Activity	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Increased Ammonia Delivery Trucks for 2 Facilities	0.15	1.04	0.68	0.00	0.07	0.04
New Catalyst Delivery and Spent Catalyst Haul Trip at 1 Facility Located in the OCS[1]	1.34	6.16	11.21	0.09	0.33	0.18
Linear Generator Engines[2]	45	-	-	-	-	-
Total	**~~1.49~~46.49**	**7.20**	**11.88**	**0.09**	**0.40**	**0.22**
Significance Threshold for Operation	55	55	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

1. Catalyst delivery to the OCS will include a roundtrip for the delivery truck between the vendor and the Port of LA and a roundtrip for the barge between the Port of LA and the platform.
2. Operation of linear generators are only expected to impact VOC emissions since linear generator are still required to meet the current NOx and CO limits of existing Rule 1110.2.

Construction and Operation Overlap Impact

Given the number of affected facilities and the varying modifications expected to occur at each affected facility in order to comply with PAR 1110.2, construction activities at some facilities could potentially overlap with operational activities occurring at other facilities that have completed construction. The overlap could occur during the period from the date of adoption of PAR 1110.2 until December 31, 2023, at which all affected engines are required to meet the NOx emission limits set forth in PAR 1110.2. The peak daily construction emissions during this overlap period are assumed to occur when one new SCR systems and associated ammonia storage tanks are being installed and two existing engines are being repowered (see Table 4-13). Peak operational emissions are assumed to occur when ~~three~~two facilities receive ammonia deliveries, ~~and~~ one facility receives new catalyst and hauls off spent catalyst, and from the operation of linear generator engines (see Table 4-15). The overlap could also occur after December 31, 2023 construction for facility-wide engine modernization projects are expected to commence and when non-compressor gas lean-burn engines are expected to have completed construction. The peak daily emissions for this scenario are shown in Table 4-12. Peak daily operational emissions are still assumed to occur when two facilities receive ammonia deliveries, one facility receives new catalyst and hauls off spent catalyst, and from the operation of linear generator engines (see Table 4-15). According to South Coast AQMD policy, in the event that there is an overlap of construction and operation phases, the peak daily emissions from the construction and operation overlap period should be summed and compared to the South Coast AQMD's air quality significance thresholds for operation because the latter are more stringent, and thus, more conservative. As such, total emissions from both scenarios of overlapping construction and operational activities have been compared to the air quality significance thresholds for operation in Table 4-16 and Table 4-17.

Table 4-16
Peak Daily Overlapping Construction and Operational Emissions

Operational Activity	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Installation of 1 new SCR Systems and 1 new ammonia storage tanks (construction)	1.36	10.22	9.90	0.02	0.71	0.54
Repowering of 2 engines with stationary gas turbines (construction)	3.08	28.27	19.58	0.04	12.15	7.13
Increased Truck Trips for ammonia delivery for 2 facilities (operation)	0.15	1.04	0.68	0.00	0.07	0.04
Increased Truck Trips for New Catalyst Delivery and Hauling Spent Catalyst at 1 Facility in the OCS	1.34	6.16	11.21	0.09	0.33	0.18
Linear Generator Engines	45	-	-	-	-	-
Total	~~5.94~~50.94	45.69	41.36	0.15	13.27	7.89
Significance Threshold for Operation*	55	55	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

*When construction and operation phases overlap, the operational air quality significance thresholds are applied.

Table 4-17
Peak Daily Overlapping Construction and Operational Emissions (Facility-wide Engine Modernization)

Operational Activity	VOC (lb/day)	NOx (lb/day)	CO (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Facility-wide Engine Modernization of Five Engines at One Facility	4.51	35.74	32.54	0.10	12.16	6.98
Increased Truck Trips for ammonia delivery for 2 facilities (operation)	0.15	1.04	0.68	0.00	0.07	0.04
Increased Truck Trips for New Catalyst Delivery and Hauling Spent Catalyst at 1 Facility in the OCS	1.34	6.16	11.21	0.09	0.33	0.18
Linear Generator Engines	45	-	-	-	-	-
Total	50.87	42.94	44.43	0.19	12.56	7.20
Significance Threshold for Operation*	55	55	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

*When construction and operation phases overlap, the operational air quality significance thresholds are applied.

As indicated in Tables 4-16 and 4-17, the peak daily emissions during the construction and operational overlap period for both scenarios do not exceed any of the South Coast AQMD's air quality significance thresholds for operation. Further, as construction commences for a facility-wide engine modernization project, the retrofit, replacement, or repowering of engines affected would have been completed and the incremental NOx emission reductions that are expected to occur would offset the NOx emissions generated during construction. Therefore, the air quality impacts during the construction and operation overlap period are considered to be less than significant. In conclusion, the proposed project is also not expected to result in significant adverse air quality impacts during the construction and operation overlap period.

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[22], but they can move to multiple locations and idle at each location for up to five minutes. As a worst case, one a facility may have up to 12 additional ammonia deliveries per year due to the increase in ammonia usage. The CARB emission factor for an idling heavy-duty diesel truck is 1.67 grams per hour of diesel particulate matter (DPM). Therefore, DPM emissions are no more than 0.004 pounds per year (4.6E-07 lbs/hr) for one facility and is not expected to cause any adverse health effects.

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. BACT for ~~A~~ammonia slip ~~is typically limited to~~ five ppm and is enforced through permit conditions for new SCR installations. Based on the December 2015 Final Program Environmental Analysis for Proposed Amended Regulation XX - RECLAIM[23] the concentration at a receptor located 25 meters from a stack would be much less 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 µg/m^3) and acute (3,200 µg/m^3) reference exposure levels (RELs). Table 4-18 summarizes the calculated non-carcinogenic chronic and acute hazard indices for ammonia and compared these values to the respective significance thresholds for engines with an ammonia slip limit of five ppmv ~~and stationary compressor gas turbines with an ammonia slip limit of 10 ppmv; both were~~ which is shown to be less than significant.

[22] 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

[23] South Coast AQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX -RECLAIM, December 2015. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/regxxfinalpeaplusappendices.pdf

Table 4-18
Health Risk from the Facilities Using Ammonia or Urea

Ammonia Slip Concentration at the Exit of the Stack (ppm)	**Peak Concentration at a Receptor 25 m from the Stack** (µg/m^3)	**Acute REL** (µg/m^3)	**Chronic REL** (µg/m^3)	**Acute Hazard Index**	**Chronic Hazard Index**
5	35	3,200	200	**0.01**	**0.17**
~~10[1]~~	~~70~~	~~3,200~~	~~200~~	**~~0.02~~**	**~~0.35~~**
		Significance Threshold		**1.0**	**1.0**
		Exceed Significance?		**NO**	**NO**

1. Stationary engines operated at RECLAIM and former-RECLAIM facilities will be required to meet ~~have an~~ ammonia ~~slip~~ limit of 5 ppmv which is BACT. ~~Two of the facilities are expected to repower their compressor gas engines with stationary compressor gas turbines which will be subject to Rule 1134 and have an ammonia slip limit of 10 ppmv at 15 percent oxygen on a dry basis.~~

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 could be routed to one stack which would still be limited to five ppm ammonia slip. Nevertheless, 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 an SCR system, the ammonia or urea 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 South Coast AQMD through permit conditions limits ammonia slip to five ppm. In the December 2015 Final Program EA for NOx RECLAIM[24], South Coast AQMD 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 systems. 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 ton 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/m^3. However, since the usage of ammonia is necessary to achieve the NOx emission reductions (via SCR technology), the ammonia usage would cause a concurrent increase in annual PM2.5 of approximately 0.6 µg/m^3. Thus, increasing the amount of ammonia slip would result in a net average 0.1 µg/m^{3}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

24 South Coast AQMD, Final Program Environmental Assessment for Proposed Amended Regulation XX -RECLAIM, December 2015. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2015/regxxfinalpeaplusappendices.pdf

the regional simulations, the impacts to regional PM2.5 and ozone due to increased ammonia slip from PAR 1110.2 would not create a significant adverse air quality impact.

Odor Impacts

During construction, there will be odors associated with the operation of diesel-fueled off-road construction equipment used to install the new SCR systems, replace catalyst modules in existing SCR systems and to replace existing engines. In addition, diesel-fueled on-road vehicles may be utilized during both construction and operation activities at the facilities and these vehicles will be required to use diesel fuel with a low sulfur content (e.g., 15 ppm by weight or less in accordance with South Coast AQMD Rule 431.2 - Sulfur Content of Liquid Fuels). Further, as explained earlier, the use of diesel-fueled trucks as part of construction and operation activities will not be allowed to idle longer than five minutes onsite, so lingering odors would not be expected from these vehicles. Finally, because of the relatively small number of pieces of diesel-fueled on- and off-road equipment being utilized at any one site and because construction will only be short-term, odor impacts are not expected to be significant.

Once the new SCR systems are installed and operational and the existing SCR systems have their catalyst modules replaced, the amount of ammonia used by these systems will increase. However, engines with new SCR systems will be required to meet a BACT limit for ammonia which is currently five ppmv. ~~PAR 1110.2 contains an ammonia slip limit of five ppm to prevent the over-injection of excess ammonia. The stationary gas turbines that are replacing the internal combustion engines at two facilities are subject to Rule 1134 which has an ammonia slip limit of 10 ppm.~~ Because the exhaust gases from the engines 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 can range from 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 ammonia odor threshold during operation.

The replacement engines are expected to be the same size as the existing engines and therefore are not expected to cause any additional odors. Since the replacement engines are newer and more gas efficient, there is potentially fewer odors due to a decrease in fuel usage.

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 CO_2 "domes" that form over urban areas cause increases in local temperatures and local criteria pollutants, which have adverse health effects[25].

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 CO_2 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 South Coast AQMD'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 CO_2 emissions.

The South Coast AQMD 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 South Coast AQMD adopted an interim CEQA GHG Significance Threshold for projects where South Coast AQMD is the lead agency (South Coast AQMD, 2008). This interim threshold is set at 10,000 metric tons of CO_2 equivalent emissions ($MTCO_2eq$) per year. The South Coast AQMD prepared a "Draft Guidance Document – Interim CEQA GHG Significance Thresholds" that outlined the approved tiered approach to determine GHG significance of projects (South Coast AQMD, 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 $MTCO_2eq$ per year as the incremental increase representing a significance threshold for projects where South Coast AQMD is the lead agency (South Coast AQMD, 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 CO_2 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. Modification of existing air pollution control systems and the installation of new air pollution control system does not affect the combustion process of the existing engine. In addition, engines that will be replaced or repowered are expected to be replaced with equipment ~~of~~ having an identical or similar rating. Therefore, an increase in GHG emissions from combustion of fuel is not expected from affected engines that are retrofitted, replaced, or repowered.

[25] 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

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 emissions produced from additional truck hauling and deliveries necessary to accommodate the additional solid waste generation and increased use of chemicals and supplies. Direct GHG emissions from construction equipment, mobile sources, and indirect GHG emissions from electricity usage during construction of the potential engine retrofits, replacements, and repower were estimated in CalEEMod®. ~~Operational GHG emissions from mobile sources such as ammonia delivery trips and catalyst delivery and hauling trips were estimated based on the~~

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 2020. 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 time construction is expected to commence (January 1, 2020) the end of the project (December 31, 2023). The beginning of the proposed project was assumed to be no sooner than 2020, since installing NOx control equipment takes considerable advance planning and engineering. The proposed project is expected to achieve 0.29 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. However, compressor gas engines have an effective compliance date of two years after a permit to construct is issued ~~or three years after a permit to construct is issued if~~ and a permit application is required ~~is~~ <u>to be</u> submitted before July 1, 2021~~12~~. Thus, once construction is complete and the equipment is operational, CO2e emissions will remain constant.

Approximately 15 new SCR systems and associated ammonia storage tanks, six SCR system modifications, 10 NSCR modifications, eight engine repowers, and six engine replacements are expected as a result of the implementation of PAR 1110.2. Also, eight facilities will need new or additional ammonia deliveries. Each facility is expected to need one additional delivery per month for a total of 96 ammonia deliveries per year. Additionally, SCR catalysts will need to be replaced. For GHG emission estimates, it is conservatively assumed that 29 additional catalyst deliveries will occur per year for the 23 new SCR systems and six new NSCR systems and 29 truck trips to remove spent catalyst. Additionally, since the six engines with NSCR will be installed at a facility located in the OCS, six barge roundtrips per year is included in the analysis. The total increased truck trips per year is therefore 154 truck trips and 12 barge trips. GHG Emissions from construction activities were estimated using CalEEMod® version 2016.3.2 and GHG emissions from operational activities were estimated based on EMFAC2017 factors for heavy duty trucks. Emissions from the barge are estimated using Appendix B contains CalEEMod® files for construction emissions and Appendix C contains detailed calculations for operational emissions. As summarized in Table 4-16, implementation of PAR 1110.2 may result in the generation of 80.5 amortized metric tons of CO2e emissions during construction and 91.2 metric tons of CO2e emissions from mobile sources during operation.

Table 4-19
GHG Emissions from the Proposed Project

Activity	CO2 (MT/year[a])
Construction[b] – 15 SCR systems and associated ammonia storage tanks, 6 engine replacements with new engine and SCR system, 16 SCR or NSCR system modifications, 8 engine replacements with stationary gas turbines and new SCR system and associated ammonia storage tank; Facility-wide engine modernization of five engines at one facility	~~80.5~~111.4
Operation – On-road vehicles	91.2
Total GHG	~~171.7~~201.6
Significance Threshold	10,000
Exceed Significance?	**NO**

a. 1 metric ton = 2,205 pounds
b. GHGs from short-term construction activities are amortized over 30 years

As summarized in Table ~~4-16~~4-19, GHG emissions from the installation of new SCR systems and the replacement of SCR and NSCR catalyst modules and existing engines 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[26] that was adopted by the South Coast AQMD Governing Board in December 2008.

Thus, as shown in Table ~~4-16~~4-19, total GHG emissions are ~~171.7~~201.6 metric tons per year, which is below the South Coast AQMD's GHG significance threshold for industrial sources. For this reason, implementing the proposed project is not expected to generate significant adverse cumulative GHG air quality impacts. Further, PAR 1110.2 is not expected to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG gases.

PROJECT-SPECIFIC IMPACTS – CONCLUSION: Based on the preceding analysis, the overall conclusion is that air quality and GHG impacts for the proposed project are less than significant during construction, during construction overlapping with operation, and during operation.

PROJECT-SPECIFIC MITIGATION MEASURES: The analysis indicates that air quality impacts during the construction and operational phase are less than significant. Additionally, there will be an overall reduction in NOx emissions during the operational phase of the proposed project. Thus, because there are no significant adverse air quality impacts as a result of the proposed project, no air quality mitigation measures are required.

REMAINING IMPACTS: The air quality analysis concluded that potential construction and operational air quality impacts would be less than significant, no mitigation measures were required; thus, air quality impacts remain less than significant.

[26] 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

CUMULATIVE IMPACTS: The preceding analysis concluded that air quality impacts from construction and operational activities would be less than significant as a result of implementing the proposed project. Thus, the air quality impacts due to construction and operation are not considered to be cumulatively considerable pursuant to CEQA Guidelines Section 15064(h)(1) and therefore, there are no significant adverse cumulative air quality impacts. Further, it should be noted that the air quality analysis is a conservative, "worst case" analysis so the actual construction and operational impacts are not expected to be as great as estimated in this SEA. Additionally, the construction activities are temporary when compared to the permanent project long-term emission reductions of NOx as a result of the proposed project. Even though the proposed project will cause a temporary, less than significant increase in air emissions during the construction and operation phase, the temporary net increase in construction emissions combined with the total permanent emission reductions projected overall during operation would not interfere with the expected overall NOx reductions as part of the proposed project. For example, an increase in NOx emissions during the construction and operation overlap period is expected to result in approximately 46 pounds of NOx per day as indicated in Table ~~4-14~~4-16; however, the proposed project is expected to result in NOx emission reductions of 0.29 ton per day (580 pounds per day) after implementation of BARCT limits. Further, as facilities complete modifications to their existing stationary engines to comply with PAR 1110.2, the incremental NOx emission reductions that are expected to occur would offset the NOx emissions generated during construction. NOx emission reductions for each facility and engine after implementation are provided in Appendix F.

Also, implementing control measure CMB-05 contained in the 2016 AQMP, in addition to the air quality benefits of existing and proposed South Coast AQMD rules, is anticipated to bring the South Coast AQMD into attainment with all national and most state ambient air quality standards by the year 2023. Therefore, cumulative operational air quality impacts from the proposed project and previous amendments considered together, are not expected to be significant because implementation of the proposed project is expected to result in net emission reductions and overall air quality improvement. Therefore, there will be no significant cumulative adverse operational air quality impacts from implementing the proposed project.

Though the proposed project involves combustion processes which could generate GHG emissions such as CO2, CH4, and N2O, the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as SF6, HFCs or PFCs. Relative to GHGs, implementing the proposed project is not expected to increase GHG emissions that exceed the South Coast AQMD's GHG significance threshold. In addition, implementing the proposed project is expected to generate less than significant adverse cumulative GHG air quality impacts.

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 South Coast AQMD to require the use of 19 percent by ~~volume~~weight 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, South Coast AQMD staff does not issue permits for the use of anhydrous ammonia or aqueous ammonia in concentrations higher than 19 percent by ~~volume~~weight for use in SCR systems. As a result, this analysis focuses on the use of 19 percent by ~~volume~~weight aqueous ammonia. The only exception to this assumption is the scenario analyzed under the "Ammonia Gas Release" subsection.

Six facilities utilizing SCR systems requiring either ammonia or urea injection 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 significant adverse 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. These sites are also identified in Appendix D. The proposed project is not expected to interfere with existing hazardous waste management programs since facilities that currently handle 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 South Coast AQMD rules and regulations and installation of associated ammonia storage tanks) where the South Coast AQMD 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 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 6,700 gallons. The estimated ammonia use and storage needed to meet the NOx emission limits for PAR 1110.2 are shown in Appendix E. The "worst-case" assumption for delivery frequency from a supplier would be to deliver one ammonia tanker truck to fill one 10,000-gallon tank of ammonia at a facility (Facility A). When comparing the proposed project to what was analyzed in the following Transportation Release Scenarios, the "worst-case" for PAR 1110.2 would result in eight additional ammonia deliveries in a month compared to the six in Scenario 1. As discussed in the following section for Scenario 1, the estimated accident rate associated with transporting aqueous ammonia for the ConocoPhillips project is 0.00101, or about one accident every 992 years. Using the same calculation methodology, the estimated accident rate for the proposed project would be 0.00134, or about one accident every 744 years. Further, the maximum capacity of the storage tank evaluated in the proposed project is 5,000 gallons which is less than the tank capacity in Scenario 2, resulting in fewer impacts than Scenario 2. For both scenarios, the potential impacts from transportation release are expected to be less than significant. Thus, the potential impacts from a transportation release as a result of PAR 1110.2 would also be less than significant. Regulations for the transport of hazardous materials by public highway are described in 49 CFR Sections 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, South Coast AQMD 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 U.S. 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 ~~4-17~~4-20. 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 4-20
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: U.S. EPA, 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 6,700 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; South Coast AQMD, 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 °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 U.S. EPA RMP*Comp (Version 1.07) is typically performed. South Coast AQMD staff estimated that the largest aqueous ammonia tank that would be installed as a result of implementing PAR 1110.2 would be 5,000 gallons at one facility. The facilities that were identified as installing SCR systems and the associated ammonia storage tanks were estimated to need storage tanks with a capacity from 250 to 5,000 gallons. Seven facilities were each assumed to install at least one new SCR system and one new ammonia storage tank. Of these seven facilities, five are located within one-quarter mile of sensitive receptors. As summarized in Table 4-21, one facility would require the installation of six new SCR systems, two facilities would require the installation of five new SCR systems at each facility, one facility would require the installation of three SCR systems, one facility would require the installation of two SCR systems, and two facilities would only install one new SCR system per facility. The analysis assumed that each facility would install one large aqueous ammonia storage tank with enough capacity to service all of their new SCR systems.

Table 4-21
Number of New SCR Systems and Affected Facilities

	Number of SCR Systems to be Installed at Each Facility	Number of Affected Facilities
	6	1
	5	2
	3	1
	2	1
	1	2
Total	**23**	**7**

Although it is South Coast AQMD 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 South Coast AQMD 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:

- Location of tanks: Edge of property line, near (i.e., less than ¼-mile) existing residences or sensitive receptors
- Liquid Temperature: 77 °F
- Mitigation Measures: None

Appendix E shows the 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. The largest tank expected to be installed at a facility is 5,000 gallons. However, the tank can only hold about 67 percent of its capacity at any one time which in this case is 6,700 gallons of aqueous ammonia. Facility A is expected to need one 1,500 gallon tank which will be sited adjacent to a sensitive receptor; Facility A is considered to be the "worst case" for determining offsite consequence in the event of an ammonia release. It is important to note that there are facilities that have existing ammonia storage tanks; however, since these tanks are existing, there is no increase in the amount of ammonia that will be stored at the facility at any one time. Five 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., a secondary containment (dikes and/or berms), installation of grating-covered trench around the perimeter, and tertiary containment) were to occur, the toxic endpoint distance for 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 the affected facilities 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, South Coast AQMD staff will conduct a CEQA evaluation of the facility-specific project to determine if the project is covered by the analysis in this 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 South Coast AQMD permits to construct for the facility-specific project. These mitigation measures will be enforceable by South Coast AQMD personnel.

HZ-1 Require the use of aqueous ammonia at concentrations less than ~~20~~19 percent by ~~volume~~weight.

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 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 minimize the offsite hazards impacts to the maximum extent feasible in the event of an accidental release during transfer of aqueous ammonia.

HZ-6 Install tertiary containment that is capable of evacuating 110 percent 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 will remain ~~are~~ significant after mitigation measures are applied.

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 milligrams per liter (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 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). 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 there are no cumulative secondary impacts associated with the NOx emissions limits and compliance dates as contained in PARs 1110.2 and 1100. Further, upon completion of construction at all affected facilities, the net effect of the proposed project will result in overall emission reductions of NOx. In addition, any construction as part of the proposed project will be temporary (for approximately one to four years) and the overall NOx emissions will be reduced during the construction and operation overlap. For example, an increase in NOx emissions during the construction and operation overlap period is expected to result in approximately 46 pounds of NOx per day as indicated in Table 4-14, however the proposed project is expected to result in NOx emission reductions of 0.29 ton per day (approximately 580 pounds per day) after implementation of BARCT limits. Further, as facilities complete modifications to their existing stationary engines to comply with PAR 1110.2, the incremental NOx emission reductions that are expected to occur would offset the NOx emissions generated during construction. To achieve NOx emission reductions in the proposed project, new SCR systems, modifications to existing SCR and NSCR systems, replacement engines, and repowering of engines would need to be occur and ammonia usage would need to be increased. Further, no exceedances of the South Coast AQMD's air quality significance thresholds for any pollutant are expected to occur either during construction, during construction with overlapping operational impacts, or during operation after all construction is completed. Any 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 South Coast AQMD region 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).

Full implementation of the proposed project would achieve NOx emission reductions capable of offsetting the construction NOx emissions. As facilities implement modifications to retrofit existing stationary engines with new air pollution control equipment (e.g., SCR technology/systems installation), modify existing SCR or NSCR systems, or repower or replace existing stationary engines, emissions from construction are expected to occur. However, as RECLAIM facilities transition their existing stationary engines to achieve BARCT emission levels over the four-year compliance period, some facilities will have completed construction, which will create incremental NOx emission reductions, an air quality benefit. Upon completion of construction at all affected facilities, an overall benefit to operational air quality will occur due to the project's overall NOx emission reductions. Specifically, as facilities complete their engine retrofit, repower, or replacement, most facilities may reduce their NOx emissions ranging from five pounds per day to 229 pounds per day, as illustrated in Appendix F. There are two facilities, each with one engine, which will see NOx emission reductions less than 0.5 pound per day. However, these are smaller engines rated at or less than 450 bhp and with limited operating hours as specified in their operating permits. Thus, when all of the affected facilities complete their modifications to the affected engines in order to comply with PAR 1110.2, the expected NOx emission reductions of 0.29 ton per day (580 pounds per day) will be permanent and cumulatively a larger quantity relative to the temporary NOx emissions (46 pounds per day) generated during construction. 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. Therefore, there will be no significant cumulative adverse 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 U.S. EPA RMP*Comp) and the proximity of affected facilities 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 Section 15064(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.

POTENTIAL ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

Because this SEA is a subsequent CEQA document to the March 2017 Final Program EIR for the 2016 AQMP, this SEA relies on the conclusions reached in that document as evidence for environmental areas where impacts were found not to be significant. The previous CEQA document reviewed approximately 17 environmental topic areas and analyzed whether the respective project would create potentially significant adverse impacts. 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 1110.2 and 1100. Table ~~4-19~~4-22 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.

Table 4-22
Applicability of Significant Impacts in March 2017 Final Program EIR to Proposed Project

CONCLUSION OF SIGNIFICANT IMPACTS IN MARCH 2017 FINAL PROGRAM EIR[1]	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	This environmental topic area is not applicable to ~~PAR 1110.2~~ the proposed project because neither catenary lines nor the use of bonnet technology for ships are applicable to stationary engines and the corresponding NOx emission controls (e.g., SCR technology). Therefore, this conclusion is not applicable to the proposed project.
Construction air quality and GHGs	Yes, but less than significant	These environmental topic areas are applicable to the proposed project. The impacts for these environmental topics areas are analyzed in this SEA (see pp. 4-3 to 4-28 for construction air quality and GHGs), and the analysis concluded less than significant impacts.
Energy due to increased electricity demand	No	While the use of SCR technology will require some electricity to operate, the amount of electricity that would be needed to install SCR technology for ~~PAR 1110.2~~the proposed project would be less than significant.
Hazards and hazardous materials due the increased flammability of solvents	No	Internal combustion engines and the corresponding NOx emission controls (e.g., SCR 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 environmental topic area is applicable to the proposed project because SCR technology utilizes ammonia. The impacts for this environmental topic area are analyzed in this SEA (see pp. 4-~~24~~28 to 4-~~32~~36). The analysis concluded significant impacts for the storage and accidental release of ammonia and less than significant impacts for the transportation of ammonia.
Hazards and hazardous materials due to the storage and transportation of LNG	No	Affected internal combustion engines and the corresponding NOx emission controls (e.g., SCR technology) do not utilize LNG for their operation. Therefore, this conclusion is not applicable to the proposed project.

Table 4-22
Applicability of Significant Impacts in March 2017 Final Program EIR to Proposed Project (concluded)

CONCLUSION OF SIGNIFICANT IMPACTS IN MARCH 2017 FINAL PROGRAM EIR[1]	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 new SCR systems are located near schools. The impacts for this environmental topic area are analyzed in this SEA (see pp. ~~4-24~~ 4-28 to ~~4-32~~ 4-36).
Hydrology (water demand)	No	Stationary engines and the corresponding NOx emission controls (e.g., SCR 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 new SCR technology for affected stationary engines may create some noise and vibration, the existing noise environment at each facility is typically dominated by noise from existing equipment on-site, vehicular traffic around the facilities, and trucks entering and existing facility premises. Operation of the construction equipment would be expected to comply with all existing noise control laws and ordinances. Further, since the facilities are located in industrial or commercial land use areas, the noise generated during construction will likely be indistinguishable from the background noise levels at the property line. Therefore, the potential noise increases are expected to be within the allowable noise levels established by the local noise ordinances for industrial areas, and thus are expected to be less than significant.
Solid construction waste and operational waste from vehicle and equipment scrapping	No	Vehicle scrapping is not applicable to stationary engines and the corresponding NOx emission controls (e.g., SCR 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 harbors are not applicable to stationary engines and the corresponding NOx emission controls (e.g., SCR technology). Therefore, this conclusion is not applicable to the proposed project.

1. The March 2017 Final Program EIR for the 2016 AQMP concluded that impacts on biological resources were less than significant. However, one of the affected facilities is located near a wetland. A review of the site shows that the affected engines are located in the upper bluff and not directly adjacent to the wetland. Additionally, based on South Coast AQMD staff's discussion with the facility during a site visit in December 2018, construction will occur within an existing building with minimal construction on the exterior of the building. Therefore, significant impacts to biological resources are not expected as a result of the proposed project.

The proposed project is expected to have: 1) significant effects that were not discussed in the previous 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 March 2017 Final Program EIR for the 2016 AQMP [CEQA Guidelines Section 15162(a)(3)(B)].

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 the proposed project no other environmental topic areas have been evaluated in this SEA. Thus, the conclusions reached in this Final ~~Draft~~ SEA are consistent with the conclusions reached in the previously certified CEQA document (e.g., the March 2017 Final Program EIR for the 2016 AQMP) that aside from the topic of 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
- 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 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 of hazards and hazardous materials as the only environmental topic area having 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 hazards and hazardous materials as the only environmental area with potentially significant adverse impacts if the proposed project is implemented. 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 SCRs 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 South Coast AQMD'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. PAR 1110.2 will transition internal combustion engines operated at RECLAIM facilities to a command-and-control regulatory structure. The primary objective of this project is to ensure engines operated at RECLAIM and former RECLAIM facilities meet NOx emission limits and BARCT level equivalency. The proposed project implements 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 reduction occurring after implementation of the BARCT limits and these 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 hazards and hazardous materials for ammonia storage are concluded to have potentially significant adverse effects.

CHAPTER 5

ALTERNATIVES

INTRODUCTION

This 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. South Coast AQMD Rule 110 (the rule which implements the South Coast AQMD'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 South Coast AQMD 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 the emission limits and the timing of compliance. Of the amendments proposed to Rules 1110.2 and 1100, ~~only~~ the components that pertain to complying with the NOx emission limits in PAR 1110.2 could entail physical modifications to the affected equipment and that these physical modifications could create adverse environmental impacts. Since the interim VOC limit allowed for linear generator engines is greater than the current limit in the existing Rule 1110.2, it would result in a limited increase in VOC emissions which could contribute to adverse air quality impacts. As such, in addition to the no project alternative, ~~two~~ three alternatives were developed by modifying compliance deadlines of the proposed project as well as the emission limits, which effect the manner and timing in which compliance with the NOx emission limits 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, as previously explained, the proposed project is a subsequent CEQA document to the previously approved project that was analyzed in the March 2017 Final Program EIR for the 2016 AQMP.

The March 2017 Final Program EIR for the 2016 AQMP concluded 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. However, as outlined in Table 4-~~15~~22, only the topics of air quality and hazards and hazardous materials are applicable to the proposed project (e.g., PARs 1110.2 and 1100).

CEQA Guidelines Section 15125(a) recognizes that a baseline may be established at times other than when the NOP/IS 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 versions of Rules 1110.2 and 1100.

DESCRIPTION OF ALTERNATIVES

The evaluation of the components that comprise PAR 1110.2 indicate that only the installation of new ammonia storage tanks to support the installation of new SCR systems in order to comply with the proposed NOx emission limits could result in potentially significant adverse hazards and hazardous materials impacts for ammonia storage and use. In particular, for each affected facility that was identified as having the potential to install one new ammonia storage tank, an analysis to determine the potential for an offsite consequence in the event of a release of ammonia was conducted using U.S. EPA RMP*Comp (see Appendix D - List of Affected Facilities and Chapter 4 for the analysis). The analysis indicated that a catastrophic failure of an aqueous ammonia storage tank would cause a significant adverse hazards and hazardous materials impact to nearby sensitive receptors located within 0.1 mile of the storage tank (e.g., the toxic endpoint distance), and up to 0.5 mile for one facility located in a rural area with terrain that is generally flat and unobstructed.

The evaluation also indicates that implementation of PAR 1110.2 will result in facility owners/operations making physical modifications to affected equipment and these activities will cause adverse, but less than significant, impacts to air quality during construction, during the period when construction and operation activities overlap, and during operation.

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.

Three alternatives to the proposed project have been developed and summarized in Table 5-1, as follows: Alternative A - No Project, Alternative B – Distributed Generation Limits, Alternative C – Lower Limits, Alternative D – Phased Compliance Dates. The primary components of the proposed alternatives that have been modified are timing in which compliance with the NOx emission limits may be achieved or having stricter limits within the same compliance schedule. 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. Written suggestions on potential project alternatives received during the comment period for the 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 summary of the proposed project along with a description of the alternatives.

Proposed Project

PAR 1110.2 will facilitate the transition of the NOx RECLAIM program to a command-and-control regulatory structure and will implement Control Measure CMB-05, of the 2016 AQMP for RECLAIM internal combustion engines. The main objectives of PAR 1110.2 are to: 1) include internal combustion engines operated at current and former RECLAIM facilities which were not previously subject to Rule 1110.2 and require them to comply with BARCT; ~~2) establish ammonia slip limits and require ammonia emissions monitoring;~~ and ~~3~~2) exempt non-emergency engines operated at remote two-way radio transmission towers. Additionally, staff is proposing to add definitions for additional clarity, add language to help facilitate the transition from RECLAIM, and revise exemptions to remove provisions that are obsolete. To address concerns from stakeholders, changes were made to PAR 1110.2 after the release of the Draft SEA, which include establishing an interim VOC limit of 25 ppmvd for electric generating units, also referred to as linear generator engines, that: 1) do not have ammonia emissions from add-on control equipment; 2) meet the NOx limit of Rule 1110.2 Table IV; and 3) were installed before January 1, 2024. Additionally, staff has added an exemption for Tier 4 – Final diesel engines which are used to power cranes operated in the Southern California Coastal Waters or Outer Continental Shelf. PAR 1110.2 implements control measure CMB-05 from the 2016 Final AQMP in accordance to the implementation schedule of PAR 1100, which requires: 1) two- and four-stroke lean-burn compressor gas engines to comply with the NOx emission limits in PAR 1110.2 within 24 months after a permit to construct is issued~~, or 36 months after a permit to construct is issued if~~ and require the permit application ~~is~~ to be submitted by July 1, 2021; and 2) all other qualifying engines to meet the NOx emission limits by December 31, 2023. As such, affected engines, except for two- and four-stroke lean-burn compressor gas engines, would have four years to comply with PAR 1110.2. Further, to address comments from stakeholders, staff has included the following changes to PAR 1100 since the release of the Draft SEA: 1) extending compliance date for achieving the emission limits specified in the rule and adding interim emission limits for compressor gas lean-burn engine if the owners or operators submit a request for a time extension; 2) adding alternative emission limits for compressor gas lean-burn engines; 3) extending the compliance date for achieving the emission limits for compressor gas lean-burn engines undergoing a facility-wide engine modernization; 4) adding a requirement for permit applications to be submitted by July 1, 2021; and 5) adding low-use criteria for diesel engines operated at ski resorts.

Alternative A: No Project (Current Versions Rules 1110.2 and 1100 Remain in Effect)

Alternative A, the no project alternative, means that the current versions of Rules 1110.2 and 1100 that were amended in June 2016 and adopted in December 2018, respectively, would remain in effect. Under the current version of Rule 1110.2, engines at RECLAIM facilities would not have to comply with the NOx emission limits in set forth in Rule 1110.2. Further, these engines would not be required to transition out of the NOx RECLAIM program in accordance with the schedule outlined in the current version of Rule 1100. Under the no project alternative, no NOx emission reductions will be achieved, no ammonia use would be needed, and the stationary engines at RECLAIM and non-RECLAIM facilities would not meet BARCT level equivalency. Further, linear generator engines will be required to meet the DG limits in existing Rule 1110.2 such that there will be no interim VOC limit of 25 ppmv and no increase in VOC emissions.

Alternative B: Distributed Generation Emission Limits

Under Alternative B, the timeline for the facilities transitioning out of RECLAIM would be the same as the proposed project as proposed in PAR 1100. However, engines would be required to meet the NOx, VOC, and CO emission limits listed in Table IV of Rule 1110.2 which are lower than the NOx emission limits in the proposed project and thus result in more NOx reductions by

December 31, 2023 (four years). However, to meet the emission limits, both RECLAIM and non-RECLAIM facilities would be affected and more construction impacts are expected. In addition to the new SCR systems being installed, facilities with existing SCR system may need to modify their systems or replace their system. Also, in order to meet the limits, more ammonia or urea would need to be used, and potentially result in more ammonia delivery trips. ~~Further, a higher ammonia slip limit would be implemented and higher ammonia emissions are expected.~~ However, implementation of this alternative would also result in lower VOC and CO emissions. Affected engines are currently required to meet the VOC and CO emission limits listed in Table III of Rule 1110.2. However, VOC and CO emission limits listed in Table IV are more stringent and although actual emissions are not quantified, VOC and CO emission reductions are expected. While the emission limits for NOx, CO, and VOC in Alternative B are more stringent than the proposed project, the adverse environmental impacts are greater than the proposed project due to the increase in number of affected facilities which would in turn cause an increase in construction activities within the same compliance schedule as the proposed project. Alternative A is less stringent than the proposed project with no air quality benefits and no adverse hazards and hazardous materials impacts. Further, linear generator engines will be required to meet the DG limits in existing Rule 1110.2 such that there will be no interim VOC limit of 25 ppmv and no increase in VOC emissions.

Alternative C: Stricter Limits

For Alterative C, the requirements would be equivalent to the proposed project and the timeline for the facilities transitioning out of RECLAIM would be the same as the proposed project as proposed in PAR 1100. However, engines would need to comply with a lower NOx emission limit of seven ppm. As such, implementing this alternative will result in more NOx reductions. However, similar to Alternative B, Alternative C will also affect both RECLAIM and non-RECLAIM facilities and subsequently result in more emission impacts from construction. In addition to the new SCR systems being installed, facilities with existing SCR system may need to modify their systems or replace their system. Also, in order to meet the limits, more ammonia or urea would need to be used, and potentially result in more ammonia delivery trips. As such, higher ammonia emissions are expected. Alternative C is more stringent than the proposed project, but less stringent than Alternative B. Further, linear generator engines will be required to meet the DG limits in existing Rule 1110.2 such that there will be no interim VOC limit of 25 ppmv and no increase in VOC emissions.

Alternative D: Phased Compliance Dates

Under Alternative D, the requirements would be equivalent to the proposed project and the timeline for the facilities transitioning out of RECLAIM would be the same as the proposed project as proposed in PAR 1100, but the compliance dates for achieving the NOx and ammonia emission limits for engines used for natural gas compression and pipeline transmission operated at RECLAIM and former RECLAIM facilities would be delayed until December 31, ~~2027~~2030. The same number of facilities and equipment would be affected; however, a portion of the NOx reductions would be delayed~~foregone~~. Additionally, with the compliance date delayed for engines used for natural gas compression and pipeline transmission, there will be fewer overlapping construction activities. Therefore, Alternative D would have fewer impacts from construction activities on a peak daily basis since some facilities will have an additional four years to comply with the NOx and ammonia emission limits in PAR 1110.2. Alternative D is less stringent than the proposed project. Further, linear generator engines will be required to meet the DG limits in existing Rule 1110.2 such that there will be no interim VOC limit of 25 ppmv and no increase in VOC emissions.

Table 5-1
Summary of the Proposed Project and Alternatives

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Emissions Limit[1]	11 ppmv NOx @ 15% O2	No emission limits except for existing permit limits	Meet NOx, CO, and VOC limits listed in Table IV of existing Rule 1110.2 for new non-emergency engines driving electrical generators 0.070 lbs/MW-hr NOx <u>(2.5 ppmv @ 15% O2)</u> 0.20 lbs/MW-hr CO <u>(12 ppmv @ 15% O2)</u>0.10 lbs/MW-hr VOC <u>(10 ppmv @ 15% O2)</u>	7 ppmv NOx @ 15% O2	11 ppmv NOx @ 15% O2
<u>**Interim Emissions Limit[2] (Compressor Gas Lean-burn Engines at RECLAIM and former RECLAIM Facilities)**</u>	<u>45 ppmv NOx @ 15% O2</u> <u>250 ppmv CO @ 15% O2</u> <u>30 ppm VOC @15% O2</u>	<u>Same as above</u>	<u>Same as above</u>	<u>Same as above</u>	<u>Same as above</u>
<u>**Emissions Limit[3] (Linear Generator Engines)**</u>	<u>2.5 ppmv NOx @ 15% O2</u> <u>12 ppmv CO @ 15% O2</u> <u>25 ppm VOC @15% O2</u>	<u>Existing Rule 1110.2 limits:</u> <u>2.5 ppmv NOx @ 15% O2</u> <u>12 ppmv CO @ 15% O2</u> <u>10 ppm VOC @15% O2</u>	<u>Same as Alternative A</u>	<u>Same as Alternative A</u>	<u>Same as Alternative A</u>

1. Existing engines operated at RECLAIM and former RECLAIM facilities are already in compliance with the CO and VOC emission limits of Rule 1110.2.
2. ~~Compressor gas two-stroke or four-stroke lean-burn engines have up to 24 months after a permit to construct is issued or up to 36 months if the application for permit to construct is submitted by July 1, 2021. Facility may request extensions pursuant to PAR 1100.~~<u>Compressor gas lean burn engines shall comply with the CO and VOC emission limits of Rule 1110.2 (d)(2) or a previously established alternate emission limit as listed in their operating permit if they are granted a time extension pursuant to PAR 1100.</u>
3. <u>At the time of publishing this Final SEA, no linear generators were permitted within the South Coast AQMD jurisdiction. Linear generators permitted and installed prior to January 1, 2024 will be required to comply with a VOC emission limit of 25 ppmv @ 15% O2. Linear generators installed on or after January 1, 2024 will be required to meet the DG limits listed in Table IV in existing Rule 1110.2 including the VOC limit of 10 ppmv @ 15% O2.</u>

Table 5-1
Summary of the Proposed Project and Alternatives (concluded)

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
~~Ammonia SlipLimit~~	~~5 ppm @ 15% O2~~	~~No emission limits except for existing permit limits~~	~~10 ppm @ 15% O2~~	~~5 ppm @ 15% O2~~	~~5 ppm @ 15% O2~~
Compliance Date[5]	Submit permit application by July 1, 2021; meet limits by December 31, 2023	N/A	December 31, 2023	December 31, 2023	December 31, 2023~~, except for compressor gas two-stroke or four-stroke lean-burn engines which will have a compliance date of December 31, 2027~~
Compliance Date (Compressor Gas Lean-burn Engines)	Submit application by July 1, 2021; meet emission limits no later than 24 months after issuance of the Permit to Construct	N/A	December 31, 2023	December 31, 2023	December 31, 2031
Control Technology to Meet Project Objectives	*Lean-burn engines*: SCR with ammonia injection *Rich-burn engines*: 3-way catalyst (NSCR)	N/A	*Lean-burn engines*: SCR with ammonia injection *Rich-burn engines*: 3-way catalyst (NSCR)	*Lean-burn engines*: SCR with ammonia injection *Rich-burn engines*: 3-way catalyst (NSCR)	*Lean-burn engines*: SCR with ammonia injection *Rich-burn engines*: 3-way catalyst (NSCR)

4. For new SCRs, current Best Available Control Technology (BACT) for ammonia emissions is 5 ppmv. This limit is not specified in PAR 1110.2; however, BACT will be evaluated under Regulation XIII – New Source Review, by Engineering and Permitting staff during permitting of any engine with a new SCR.
5. Under the proposed project, with the exception of compressor gas lean-burn engines, affected engines must comply with the emission limits by December 31, 2023. Additionally, permit applications must be submitted by July 1, 2021. Under Alternatives B, C, and D, permit applications are not required to be submitted by a specific date.
6. Under the proposed project, permit applications for compressor gas lean-burn engines must be submitted by July 1, 2021. Compressor gas lean-burn engines must comply with the emission limits no later than 24 months after issuance of the Permit to Construct. Under Alternatives B, C, and D, permit applications are not required to be submitted by a specific date. Gas compressor lean-burn engines may also qualify for a time extension provided that a compliance plan is submitted and approved pursuant to PAR 1100. Additional time may be granted for facilities that undergo facility-wide engine modernization to comply with PAR 1110.2 limits provided that a compliance plan is submitted and approved pursuant to PAR 1100.

COMPARISON OF ALTERNATIVES

The following section describes the potential air quality and hazards and hazardous materials impacts that may occur for the project alternatives. 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 the overlapping construction and operation phase for Alternatives B and C and hazards and hazardous materials for the proposed project, and Alternatives B and C were determined to be significantly adversely affected by implementing alternatives.

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 hazards and hazardous materials from storage of ammonia (due to an accidental rupture of the storage tank). The proposed project is considered to provide the best balance between emission reductions and the adverse environmental impacts due to the storage of ammonia (accidental rupture) while achieving 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 Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Air Quality	Expected to result in NOx emission reductions of 0.29 ton per day. Engines at affect RECLAIM and former RECLAIM facilities will transition to a command-and-control regulatory structure. The affected lean burn engines are expected to be retrofitted with SCR technology, replaced, or retrofitted. Affected lean burn engines equipped with existing SCR systems are expected to modify their air pollution control system. The affected rich burn engines are equipped with NSCR systems and are expected to modify or replace their air-to-fuel ratio controller and catalyst. Upon project implementation, all affected engines at RECLAIM and non-RECLAIM facilities will achieve BARCT equivalency for NOx. Expected to result in a fixed increase in VOC emissions of up to 45 pounds per day from the operation of linear generator engines installed before January 1, 2024.[2]	No NOx emission reductions will occur because RECLAIM facilities would not transition to a command-and-control regulatory structure such that their engines will not be retrofitted with air pollution control equipment, repowered, or replaced.	Expected to meet project objectives of achieving BARCT for NOx~~ but there would be a higher ammonia slip limit~~. In addition to NOx emission reductions, there will also be CO and VOC emission reductions.[1] Additional NOx reductions beyond the expected 0.29 ton of NOx per day of the proposed project but would expand the project scope to include non-RECLAIM facilities. Therefore, more facilities are expected to undergo construction on a peak day leading to potentially higher peak day emissions and subsequently significant impacts for air quality. ~~Moreover, ammonia slip limit will be higher which will result in more ammonia emissions than the proposed project.~~	Expected to meet project objectives of achieving BARCT for NOx~~ and ammonia slip~~. Additional NOx emission reductions beyond the proposed project's estimated 0.29 ton per day from expanding the project scope to include non-RECLAIM facilities. More facilities are expected to undergo construction on a peak day leading to potentially higher peak daily construction emissions and subsequently significant impacts for air quality during construction.	Expected to meet project objectives of achieving BARCT for NOx~~ and ammonia slip~~. NOx emission reductions will be delayed; however, there will be fewer impacts from construction emissions since engines used for natural gas compression and pipeline transmission have an additional 4 years to comply. As such, fewer facilities are expected to undergo construction on a peak day and therefore would result in lower peak day emissions.

1. CO and VOC limits listed in Table IV of Rule 1110.2 are more stringent than the current limits for existing engines. Although emission reductions are not quantified, the requirement to meet the lower CO and VOC limits of Table IV would result in CO and VOC emission reductions.
2. Linear generator engines are pre-fabricated, stand-alone units. Therefore, no additional impacts from construction is expected from the installation of these units.

Table 5-2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (continued)

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Significance of Air Quality Impacts	**Less than Significant:** No exceedances of the South Coast AQMD's air quality significance thresholds for any pollutant are expected to occur either during construction, during construction with overlapping operational impacts, or during operation after all construction is completed. As facilities implement modifications to retrofit existing stationary engines with air pollution control equipment (e.g., SCR technology/systems installation), or repower or replace existing stationary engines, emissions from construction are expected to occur. As affected RECLAIM and former RECLAIM facilities transition their existing engines to achieve BARCT emission levels over the 4-year compliance period, some facilities will have completed construction, which will create incremental NOx emission reductions, an air quality benefit (see Appendix F). Compressor gas lean-burn engines could qualify for time extension which would result in less overlapping construction impacts on a peak day. Upon completion of construction at all affected facilities, an overall benefit to operational air quality will occur due to the project's overall NOx emission reductions.	**Not Significant:** Alternative A would not result in an exceedance of any South Coast AQMD air quality significance thresholds during construction or operation because no physical modifications would be expected to occur that would create construction emissions or reduce overall NOx emissions from the affected equipment. The South Coast AQMD will not achieve any emission reductions of NOx (a pre-cursor to the formation of ozone); thus, progress towards attainment for the South Coast AQMD for ozone is unlikely to occur.	**Significant:** Due to lower emissions limits, the construction schedules of the affected facilities under Alternative B would be expected to occur over a shorter period time such that more facilities would be expected to undergo construction on a peak day since both RECLAIM and non-RECLAIM facilities would be affected. As such, an exceedance of the South Coast AQMD's air quality significance threshold for NOx is expected to occur during overlapping construction of more SCR systems and more retrofit, repower or replacement of stationary engines on a peak day, than the proposed project. As facilities transition their existing stationary engines to achieve BARCT emission levels over the 4-year compliance period, some facilities will have completed construction, which will create incremental NOx emission reductions, an air quality benefit. Upon completion of construction at all affected facilities, an overall benefit to operational air quality will occur sooner due to the project's overall NOx emission reductions.	**Significant:** Due to lower emissions limits, the construction schedules of the affected facilities under Alternative B would be expected to occur over a shorter period time such that more facilities would be expected to undergo construction on a peak day since both RECLAIM and non-RECLAIM facilities would be affected. As such, an exceedance of the South Coast AQMD's air quality significance threshold for NOx is expected to occur during overlapping construction of more SCR systems and more retrofit, repower or replacement of stationary engines on a peak day, than the proposed project. As facilities transition their existing stationary engines to achieve BARCT emission levels over the 4-year compliance period, some facilities will have completed construction, which will create incremental NOx emission reductions, an air quality benefit. Upon completion of construction at all affected facilities, an overall benefit to operational air quality will occur sooner due to the project's overall NOx emission reductions.	**Less than Significant:** Due to the delayed compliance date for engines used for natural gas compression and pipeline transmission, the construction schedules of the affected facilities would be expected to occur over a longer period of time such that fewer facilities would be expected to undergo construction on a peak day. As such, exceedances of the South Coast AQMD's air quality significance threshold are not expected to occur and there will likely be fewer overlapping construction of SCR systems and/or retrofit, repower or replacement of engines on a peak day than the proposed project. As facilities transition their existing engines to achieve BARCT emission levels over the 4-year compliance period for engines not used for natural gas compression or distribution, and over the additional 3-year compliance period for the remaining engines, some facilities will have completed construction, which will create incremental NOx emission reductions, an air quality benefit. Although there will be a delay in NOx emission reductions, upon completion of construction at all affected facilities, an overall benefit to air quality will occur due to the project's overall NOx emission reductions.

Table 5-2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (continued)

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Hazards and Hazardous Materials	Some of the affected engines are expected to be retrofitted with SCR technology, which requires ammonia for operation. Thus, the analysis assumes that one new ammonia storage tank will be needed for each SCR system installed at each facility. Further, there are new ammonia delivery trips for facilities operating new SCR systems and one facility operating an existing SCR system will need additional urea deliveries. Ammonia is considered to be a hazardous material. <u>Linear generator engines do not require SCR technology to meet NOx emission limits; therefore, no ammonia usage is required for these types of engines.</u>	None of the affected facilities will be required to achieve BARCT level equivalency through compliance with the proposed project. As such, no engines will be retrofitted with SCR technology. Thus, no new ammonia storage tanks will be needed.	Some of the affected engines are expected to be retrofitted with SCR technology, which requires ammonia for operation. Thus, the analysis assumes that one new ammonia storage tank will be needed for each SCR system installed at each facility. Further, there are new ammonia delivery trips for facilities operating new SCR systems and facilities operating an existing SCR system will use more ammonia or urea to meet the emission limits and subsequently, need additional ammonia/urea deliveries. Facilities are also expected to use more ammonia to achieve the NOx emission limits ~~and with a higher ammonia slip limit.~~ Ammonia is considered to be a hazardous material.	Some of the affected engines are expected to be retrofitted with SCR technology, which requires ammonia for operation. Thus, the analysis assumes that one new ammonia storage tank will be needed for each SCR system installed at each facility. Further, there are new ammonia delivery trips for facilities operating new SCR systems and facilities operating an existing SCR system will use more ammonia or urea to meet the emission limits and subsequently, need additional ammonia/urea deliveries. Ammonia is considered to be a hazardous material.	Some of the affected stationary engines are expected to be retrofitted with SCR technology, which requires ammonia for operation. Thus, the analysis assumes that one new ammonia storage tank will be needed for each SCR system installed at each facility. Ammonia is considered to be a hazardous material.

Table 5-2
Comparison of Adverse Environmental Impacts of the Proposed Project and Alternatives (concluded)

CATEGORY	PROPOSED PROJECT	ALTERNATIVE A No Project	ALTERNATIVE B Distributed Generation (DG) Limits	ALTERNATIVE C Stricter Limits	ALTERNATIVE D Phased in Compliance Date
Significance of Hazards and Hazardous Materials Impacts	**Significant:** Based on the analysis, using U.S. EPA RMP*Comp, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors could result in significant impacts for any facility that installs a new ammonia storage tank, depending on the location of where the storage tank is installed, relative to the location of the offsite receptor. If the toxic endpoint is outside of a facility's boundaries, mitigation measures will be required. Since linear generator engines do not utilize SCR technology, use of ammonia is not required. Therefore, adverse impacts to hazard and hazardous materials from the installation and operation of linear generator engines are not expected.	**Not Significant:** The construction of SCR systems would not be necessary; thus, there would be no need to use ammonia or build new ammonia storage tanks. No significant hazards or hazardous materials impacts would be expected to occur.	**Significant:** Based on the analysis, using U.S. EPA RMP*Comp, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors could result in significant impacts for any facility that installs a new ammonia storage tank, depending on the location of where the storage tank is installed, relative to the location of the offsite receptor. If the toxic endpoint is outside of a facility's boundaries, mitigation measures will be required. The number of new SCR systems will likely be the same as the proposed project since non-RECLAIM facility are already required to meet current BARCT. However, to meet the DG emission limits, facilities with existing SCR will need to use more ammonia and subsequently result in more ammonia deliveries. The level of significance in Alternative B would be greater than the proposed project.	**Significant:** Based on the analysis, using U.S. EPA RMP*Comp, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors could result in significant impacts for any facility that installs a new ammonia storage tank, depending on the location of where the storage tank is installed, relative to the location of the offsite receptor. If the toxic endpoint is outside of a facility's boundaries, mitigation measures will be required. The number of new SCR systems will likely be the same as the proposed project since non-RECLAIM facility are already required to meet current BARCT. However, to meet the lower NOx emission limits, facilities with existing SCR will need to use more ammonia and subsequently result in more ammonia deliveries. The level of significance in Alternative C would be greater than the proposed project.	**Significant:** Based on the analysis, using U.S. EPA RMP*Comp, the estimated distance of the toxic endpoint from the catastrophic failure of an aqueous ammonia storage tank to sensitive receptors could result in significant impacts for any facility that installs a new ammonia storage tank, depending on the location of where the storage tank is installed, relative to the location of the offsite receptor. If the toxic endpoint is outside of a facility's boundaries, mitigation measures will be required. The number of affected facilities would be the same as the proposed project. The level of significance in Alternative D would be equivalent to 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 South Coast AQMD 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 March 2017 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 South Coast AQMD's policy document Environmental Justice Program Enhancements for FY 2002-03, Enhancement II-1 recommends for all South Coast AQMD 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) utilized. The main NOx reduction technology considered for the proposed project is based on employing SCR systems. The analysis shows that in order to control NOx from existing stationary internal combustion engines, the use of SCRs 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 either no control technologies are employed that utilize hazardous or toxic materials or NOx control technologies are employed that use the least amount of hazardous or toxic materials. For the proposed project and Alternatives B, C, and D, it is assumed that SCR technology may be used control NOx emissions, since PAR 1110.2 neither prescribes the method for controlling NOx emissions nor requires replacement of the existing engines with newer, cleaner equipment without the use of SCR systems. Of the three alternatives, only Alternative A – the No Project alternative, does not assume that SCR systems and ammonia will be utilized. Thus, hazardous materials would not be needed if Alternative A is implemented.

Under Alternative A, the No Project alternative, RECLAIM and former RECLAIM facilities would not be required to meet the NOx emission limits in PAR 1110.2, no new ammonia emission limits would be imposed on stationary engines, no NOx air pollution control equipment (e.g., SCR systems) would be installed, and no NOx emission reduction benefits would occur. As such, Alternative A does not meet the project objectives. Further, no significant adverse impacts from constructing and operating NOx air pollution control equipment would be expected to occur under Alternative A, and no hazards and hazardous materials impacts would be expected because no hazardous or toxic materials would be needed. Further, linear generator engines will be required to meet the DG limits in existing Rule 1110.2 such that there will be no interim VOC limit of 25 ppmv and no increase in VOC emissions. Because Alternative A would not change toxic emissions or alter the existing use of hazardous materials when compared to the proposed project, Alternative A, if implemented, 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 1110.2 and 1100 would not be adopted, the proposed project's objectives would not be achieved such that no NOx emission reductions and the corresponding health benefits would not occur. If Alternative A is implemented, the quantity of NOx emissions currently generated by the affected engines (the baseline) will remain unchanged. Currently, the Basin is in non-attainment for ozone and cannot achieve attainment unless NOx emission reductions occur. In addition, RECLAIM and former RECLAIM facilities with engines would not transition to a command-and-control regulatory structure or some engines would not achieve BARCT level equivalency if Alternative A is implemented. While Alternative A would not result in any significant adverse air quality or hazards and hazardous materials impacts, Alternative A would also not achieve the project objectives and air quality benefits. Therefore, Alternative A is not the environmentally superior alternative.

If Alternative B is implemented, RECLAIM and non-RECLAIM facilities would be required to meet the NOx, CO, and VOC limits listed in Table IV of Rule 1110.2 which are referred to as the distributed generation (DG) limits and exceed the requirements to meet current BARCT. ~~However, the ammonia slip limit would be 10 ppmv instead of five ppmv as in the proposed project.~~ The compliance date would be the same as the proposed project and result in additional NOx emission reductions beyond the 0.29 ton per day. While Alternative B will meet the project objectives, a substantial number of facilities would be affected, resulting in more potential overlapping construction activities. The air quality impacts due to the physical modifications expected to take place at the affected facilities would be expected to exceed the South Coast AQMD's regional air quality significance threshold for NOx during the overlapping construction and operation phase. While a concurrent operational air quality benefit would result due to Alternative B's overall NOx as well as CO and VOC emission reductions, to achieve the reductions would result in construction occurring over the same compliance period as the proposed projects but with more affected facilities. As such, the operational benefit from NOx emission reductions may not fully reduce the concurrent temporary increases in NOx emissions occurring during construction to less than significant levels. Under Alternative B, the hazards and hazardous materials impacts could be potentially be more significant than the proposed project as there are more affected facilities that may need to use more ammonia or urea to achieve the DG emission limits. ~~Furthermore, ammonia emissions of ammonia are expected to be greater than the proposed project since ammonia slip limits would be higher (less stringent).~~ If Alternative B is implemented, the project objectives would be achieved but potentially significant adverse air quality impacts during overlapping construction and operations will be expected to occur in addition to the significant adverse hazards and hazardous materials due to ammonia storage and use during operation.

Alternative C is the same as the proposed project except that Alternative C would require both RECLAIM and non-RECLAIM facilities to comply with a NOx emission limit below the current limits of Rule 1110.2. The compliance date would be the same as the proposed project and result in additional NOx emission reductions beyond the 0.29 ton per day. While Alternative C will meet the project objectives, similar to Alternative B, a substantial number of facilities would be affected, resulting in more potential overlapping construction activities. The air quality impacts due to the physical modifications expected to take place at the affected facilities would be expected to exceed the South Coast AQMD's regional air quality significance threshold for NOx during the overlapping construction and operation phase. While a concurrent operational air quality benefit would result due to Alternative C's overall NOx emission reductions, to achieve the reductions would result in construction occurring over the same compliance period as the proposed projects but with more affected facilities. As such, the operational benefit from NOx emission reductions may not fully reduce the concurrent temporary increases in NOx emissions occurring during construction to less than significant levels. Under Alternative C, the hazards and hazardous materials impacts could be potentially be more significant than the proposed project as there are more affected facilities that may need to use more ammonia or urea to achieve the NOx emission limit. ~~However, since the ammonia slip limit is the same as the proposed project, emissions of ammonia are not expected to be more significant than the proposed project.~~ If Alternative C is implemented, the project objectives would be achieved but potentially significant adverse air quality impacts during overlapping construction and operations will be expected to occur in addition to the significant adverse hazards and hazardous materials due to ammonia storage and use during operation.

If Alternative D is implemented, the compliance dates for achieving the NOx emission limits for affected engines at RECLAIM and former RECLAIM and ammonia emission limits would be the same as the proposed project. However, engines used for natural gas compression and pipeline transmission would be delayed until December 31, 2031~~2027~~. While the same quantity of NOx emission reductions would be achieved under Alternative D as the proposed project (e.g., 0.29 ton per day), a portion of these NOx emission reductions would be ~~foregone~~delayed until ~~2028~~2031. While the number of affected facilities would be the same as the proposed project, engines used for natural gas compression and pipeline transmission at RECLAIM and former RECLAIM facilities would have up to an additional ~~four~~seven years to retrofit, repower, or replace their equipment to comply with BARCT (up to four years more). The air quality impacts due to the physical modifications expected to take place at the affected facilities would not be expected to exceed the South Coast AQMD's regional air quality significance threshold for NOx during the overlapping construction and operation phase. A concurrent operational air quality benefit would result due to Alternative D's overall NOx emission reductions, and with a later compliance date for certain facilities there will likely be fewer overlapping facilities on a peak day since fewer facilities will need to meet the December 31, 2023 deadline. Under Alternative D, there will be fewer impacts during the construction and operation phase than the proposed project; however, a portion of NOx reductions will be delayed until 2028.

In summary, of the three alternatives, Alternative B would be considered the environmentally superior alternative.

CONCLUSION

Of the three alternatives analyzed, Alternative A would generate the least severe and fewest number of adverse and beneficial environmental impacts compared to the proposed project. However, of the project alternatives, Alternative A would achieve none of the project objectives and would have no NOx emission reduction benefits.

Also, because Alternative A would not involve any use of any hazardous or toxic materials, Alternative A is considered to be the lowest toxic alternative.

Thus, when comparing the environmental effects of the project alternatives to the proposed project and evaluating the effectiveness of whether each alternative is achieving the project objectives, while the proposed project has potentially significant hazards and hazardous materials impacts due to ammonia storage and use, these impacts are smaller relative to what was analyzed for Alternatives B and C, and mitigation measures have been crafted to help affected facilities reduce or completely prevent, depending on each facility's proximity to a sensitive receptor, their potential for an offsite release. Implementation of Alternative D would result in fewer impacts than the proposed project; however, a portion of the NOx emission reductions will be ~~foregone~~ delayed due to a later compliance date for certain facilities. Subsequently the project objective of requiring engines operated at RECLAIM and former RECLAIM facilities to meet current BARCT in accordance with existing Rule 1110.2 NOx emission limits by December 31, 2023 would not be met. The proposed project provides the best balance in achieving the project objectives while, unlike Alternatives B and C, assuring that less than significant air quality impacts will occur during construction, during the construction and operation overlap, and during operation after full implementation of the proposed project.

APPENDIX A

Proposed Amended Rule 1110.2 - Emissions from Gaseous-and Liquid-Fueled Engines, and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities

In order to save space and avoid repetition, please refer to the latest versions of PARs 1110.2 and PAR 1100 located elsewhere in the Governing Board Package (meeting date November 1, 2019). The versions of PARs 1110.2 and 1100 that were circulated with the Draft SEA for a 46-day public review and comment period starting on which was released on July 26, 2019 and ending on September 10, 2019 were identified as follows:

> Appendix A1: PAR 1110.2 was identified as version "PAR 1110.2 July 2019."
> Appendix A2: PAR 1100 was identified as version "PAR 1100 July 2019."

An original hard copy of the Draft SEA, which includes the draft versions of the proposed amended rules listed above, can be obtained through the South Coast AQMD Public Information Center at the Diamond Bar headquarters or by contacting Fabian Wesson at the South Coast AQMD's Public Information Center by phone at (909) 396-2001 or by email at PICrequests@aqmd.gov.

APPENDIX B

CalEEMod® Files And Assumptions

APPENDIX B-1

CalEEMod® Files and Assumptions

PAR 1110.2 Construction: SCR or NSCR Modification

PAR1110.2_Construction_modify existing SCR or NSCR system

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**	2020
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

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - Demolition: 2 days; Building Construction: 10 days

Off-road Equipment - Cranes (1): 2 hours per day; Forklifts (1): 4 hours per day; Welders (1): 6 hours per day; Aerial Lifts (1): 4 hours per day; Tractors/Loaders/Backhoe (1): 4 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Tractors/loaders/backhoes (1): 6 hours per day

Off-road Equipment -

Trips and VMT - Demolition: 4 Worker Trips, 0 Vendor Trips, 1 Hauling Trips
Building Construction: 4 Worker Trips, 1 Vendor Trips, 0 Hauling

Demolition -

Stationary Sources - Emergency Generators and Fire Pumps -

PAR1110.2_Construction_modify existing SCR or NSCR system - South Coast AQMD Air District, Annual

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	UsageHours	4.00	2.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	15.00	4.00
tblTripsAndVMT	WorkerTripNumber	0.00	4.00

2.0 Emissions Summary

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					
2020	3.5300e-003	0.0284	0.0271	5.0000e-005	3.0000e-004	1.5200e-003	1.8200e-003	8.0000e-005	1.4400e-003	1.5200e-003	0.0000	3.8632	3.8632	8.7000e-004	0.0000	3.8851
Maximum	**3.5300e-003**	**0.0284**	**0.0271**	**5.0000e-005**	**3.0000e-004**	**1.5200e-003**	**1.8200e-003**	**8.0000e-005**	**1.4400e-003**	**1.5200e-003**	**0.0000**	**3.8632**	**3.8632**	**8.7000e-004**	**0.0000**	**3.8851**

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					
2020	3.5300e-003	0.0284	0.0271	5.0000e-005	3.0000e-004	1.5200e-003	1.8200e-003	8.0000e-005	1.4400e-003	1.5200e-003	0.0000	3.8632	3.8632	8.7000e-004	0.0000	3.8851
Maximum	**3.5300e-003**	**0.0284**	**0.0271**	**5.0000e-005**	**3.0000e-004**	**1.5200e-003**	**1.8200e-003**	**8.0000e-005**	**1.4400e-003**	**1.5200e-003**	**0.0000**	**3.8632**	**3.8632**	**8.7000e-004**	**0.0000**	**3.8851**

	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-2-2020**	**4-1-2020**	0.0265	0.0265
		Highest	0.0265	0.0265

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

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2020	1/3/2020	5	2	
2	Building Construction	Building Construction	1/6/2020	1/17/2020	5	10	

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Welders	1	6.00	46	0.45
Building Construction	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction	Cranes	1	2.00	231	0.29
Building Construction	Forklifts	1	4.00	89	0.20
Building Construction	Aerial Lifts	1	4.00	63	0.31
Demolition	Tractors/Loaders/Backhoes	1	6.00	97	0.37

Trips and VMT

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	4.00	0.00	1.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	4.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 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					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7000e-004	4.8700e-003	5.3900e-003	1.0000e-005		3.0000e-004	3.0000e-004		2.9000e-004	2.9000e-004	0.0000	0.7415	0.7415	1.0000e-004	0.0000	0.7440
Total	**5.7000e-004**	**4.8700e-003**	**5.3900e-003**	**1.0000e-005**	**0.0000**	**3.0000e-004**	**3.0000e-004**	**0.0000**	**2.9000e-004**	**2.9000e-004**	**0.0000**	**0.7415**	**0.7415**	**1.0000e-004**	**0.0000**	**0.7440**

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	1.4000e-004	3.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0377	0.0377	0.0000	0.0000	0.0378
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	1.0000e-005	1.5000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0395	0.0395	0.0000	0.0000	0.0395
Total	**2.0000e-005**	**1.5000e-004**	**1.8000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0772**	**0.0772**	**0.0000**	**0.0000**	**0.0773**

3.2 Demolition - 2020

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7000e-004	4.8700e-003	5.3900e-003	1.0000e-005		3.0000e-004	3.0000e-004		2.9000e-004	2.9000e-004	0.0000	0.7415	0.7415	1.0000e-004	0.0000	0.7440
Total	**5.7000e-004**	**4.8700e-003**	**5.3900e-003**	**1.0000e-005**	**0.0000**	**3.0000e-004**	**3.0000e-004**	**0.0000**	**2.9000e-004**	**2.9000e-004**	**0.0000**	**0.7415**	**0.7415**	**1.0000e-004**	**0.0000**	**0.7440**

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	1.4000e-004	3.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0377	0.0377	0.0000	0.0000	0.0378
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	1.0000e-005	1.5000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0395	0.0395	0.0000	0.0000	0.0395
Total	**2.0000e-005**	**1.5000e-004**	**1.8000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0772**	**0.0772**	**0.0000**	**0.0000**	**0.0773**

3.3 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	2.8300e-003	0.0227	0.0206	3.0000e-005		1.2100e-003	1.2100e-003		1.1400e-003	1.1400e-003	0.0000	2.7240	2.7240	7.6000e-004	0.0000	2.7429
Total	**2.8300e-003**	**0.0227**	**0.0206**	**3.0000e-005**		**1.2100e-003**	**1.2100e-003**		**1.1400e-003**	**1.1400e-003**	**0.0000**	**2.7240**	**2.7240**	**7.6000e-004**	**0.0000**	**2.7429**

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	2.0000e-005	5.3000e-004	1.3000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1230	0.1230	1.0000e-005	0.0000	0.1232
Worker	9.0000e-005	7.0000e-005	7.6000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1975	0.1975	1.0000e-005	0.0000	0.1977
Total	**1.1000e-004**	**6.0000e-004**	**8.9000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.3205**	**0.3205**	**2.0000e-005**	**0.0000**	**0.3209**

3.3 Building Construction - 2020

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	2.8300e-003	0.0227	0.0206	3.0000e-005		1.2100e-003	1.2100e-003		1.1400e-003	1.1400e-003	0.0000	2.7240	2.7240	7.6000e-004	0.0000	2.7429
Total	**2.8300e-003**	**0.0227**	**0.0206**	**3.0000e-005**		**1.2100e-003**	**1.2100e-003**		**1.1400e-003**	**1.1400e-003**	**0.0000**	**2.7240**	**2.7240**	**7.6000e-004**	**0.0000**	**2.7429**

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	2.0000e-005	5.3000e-004	1.3000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1230	0.1230	1.0000e-005	0.0000	0.1232
Worker	9.0000e-005	7.0000e-005	7.6000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1975	0.1975	1.0000e-005	0.0000	0.1977
Total	**1.1000e-004**	**6.0000e-004**	**8.9000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.3205**	**0.3205**	**2.0000e-005**	**0.0000**	**0.3209**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

PAR1110.2_Construction_modify existing SCR or NSCR system - South Coast AQMD Air District, Annual

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**

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**

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**

6.2 Area by SubCategory

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

PAR1110.2_Construction_modify existing SCR or NSCR system

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**	2020
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

PAR1110.2_Construction_modify existing SCR or NSCR system - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - Demolition: 2 days; Building Construction: 10 days

Off-road Equipment - Cranes (1): 2 hours per day; Forklifts (1): 4 hours per day; Welders (1): 6 hours per day; Aerial Lifts (1): 4 hours per day; Tractors/Loaders/Backhoe (1): 4 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Tractors/loaders/backhoes (1): 6 hours per day

Off-road Equipment -

Trips and VMT - Demolition: 4 Worker Trips, 0 Vendor Trips, 1 Hauling Trips
Building Construction: 4 Worker Trips, 1 Vendor Trips, 0 Hauling

Demolition -

Stationary Sources - Emergency Generators and Fire Pumps -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	UsageHours	4.00	2.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	15.00	4.00
tblTripsAndVMT	WorkerTripNumber	0.00	4.00

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					
2020	0.5966	5.0193	5.5800	9.4300e-003	0.0535	0.2984	0.3519	0.0143	0.2904	0.3046	0.0000	905.0197	905.0197	0.1699	0.0000	907.8780
Maximum	**0.5966**	**5.0193**	**5.5800**	**9.4300e-003**	**0.0535**	**0.2984**	**0.3519**	**0.0143**	**0.2904**	**0.3046**	**0.0000**	**905.0197**	**905.0197**	**0.1699**	**0.0000**	**907.8780**

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					
2020	0.5966	5.0193	5.5800	9.4300e-003	0.0535	0.2984	0.3519	0.0143	0.2904	0.3046	0.0000	905.0197	905.0197	0.1699	0.0000	907.8780
Maximum	**0.5966**	**5.0193**	**5.5800**	**9.4300e-003**	**0.0535**	**0.2984**	**0.3519**	**0.0143**	**0.2904**	**0.3046**	**0.0000**	**905.0197**	**905.0197**	**0.1699**	**0.0000**	**907.8780**

	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**

	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	1/2/2020	1/3/2020	5	2	
2	Building Construction	Building Construction	1/6/2020	1/17/2020	5	10	

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Welders	1	6.00	46	0.45
Building Construction	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction	Cranes	1	2.00	231	0.29
Building Construction	Forklifts	1	4.00	89	0.20
Building Construction	Aerial Lifts	1	4.00	63	0.31
Demolition	Tractors/Loaders/Backhoes	1	6.00	97	0.37

Trips and VMT

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	4.00	0.00	1.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	4.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 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					
Fugitive Dust					5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005			0.0000			0.0000
Off-Road	0.5747	4.8711	5.3894	8.5800e-003		0.2976	0.2976		0.2896	0.2896		817.3265	817.3265	0.1102		820.0816
Total	**0.5747**	**4.8711**	**5.3894**	**8.5800e-003**	**5.0000e-005**	**0.2976**	**0.2976**	**1.0000e-005**	**0.2896**	**0.2896**		**817.3265**	**817.3265**	**0.1102**		**820.0816**

3.2 Demolition - 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	3.8000e-003	0.1361	0.0271	3.9000e-004	8.7400e-003	4.4000e-004	9.1800e-003	2.3900e-003	4.2000e-004	2.8100e-003		41.9165	41.9165	2.8100e-003		41.9868
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	0.0181	0.0122	0.1635	4.6000e-004	0.0447	3.4000e-004	0.0451	0.0119	3.1000e-004	0.0122		45.7767	45.7767	1.3200e-003		45.8096
Total	**0.0219**	**0.1482**	**0.1906**	**8.5000e-004**	**0.0535**	**7.8000e-004**	**0.0542**	**0.0143**	**7.3000e-004**	**0.0150**		**87.6932**	**87.6932**	**4.1300e-003**		**87.7964**

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					5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005			0.0000			0.0000
Off-Road	0.5747	4.8711	5.3894	8.5800e-003		0.2976	0.2976		0.2896	0.2896	0.0000	817.3265	817.3265	0.1102		820.0816
Total	**0.5747**	**4.8711**	**5.3894**	**8.5800e-003**	**5.0000e-005**	**0.2976**	**0.2976**	**1.0000e-005**	**0.2896**	**0.2896**	**0.0000**	**817.3265**	**817.3265**	**0.1102**		**820.0816**

3.2 Demolition - 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	3.8000e-003	0.1361	0.0271	3.9000e-004	8.7400e-003	4.4000e-004	9.1800e-003	2.3900e-003	4.2000e-004	2.8100e-003		41.9165	41.9165	2.8100e-003		41.9868
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	0.0181	0.0122	0.1635	4.6000e-004	0.0447	3.4000e-004	0.0451	0.0119	3.1000e-004	0.0122		45.7767	45.7767	1.3200e-003		45.8096
Total	**0.0219**	**0.1482**	**0.1906**	**8.5000e-004**	**0.0535**	**7.8000e-004**	**0.0542**	**0.0143**	**7.3000e-004**	**0.0150**		**87.6932**	**87.6932**	**4.1300e-003**		**87.7964**

3.3 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	0.5664	4.5477	4.1280	6.5100e-003		0.2428	0.2428		0.2285	0.2285		600.5432	600.5432	0.1669		604.7157
Total	**0.5664**	**4.5477**	**4.1280**	**6.5100e-003**		**0.2428**	**0.2428**		**0.2285**	**0.2285**		**600.5432**	**600.5432**	**0.1669**		**604.7157**

3.3 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	3.2800e-003	0.1049	0.0250	2.6000e-004	6.4000e-003	5.2000e-004	6.9200e-003	1.8400e-003	5.0000e-004	2.3400e-003		27.4449	27.4449	1.7200e-003		27.4879
Worker	0.0181	0.0122	0.1635	4.6000e-004	0.0447	3.4000e-004	0.0451	0.0119	3.1000e-004	0.0122		45.7767	45.7767	1.3200e-003		45.8096
Total	**0.0214**	**0.1171**	**0.1885**	**7.2000e-004**	**0.0511**	**8.6000e-004**	**0.0520**	**0.0137**	**8.1000e-004**	**0.0145**		**73.2216**	**73.2216**	**3.0400e-003**		**73.2975**

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	0.5664	4.5477	4.1280	6.5100e-003		0.2428	0.2428		0.2285	0.2285	0.0000	600.5432	600.5432	0.1669		604.7157
Total	**0.5664**	**4.5477**	**4.1280**	**6.5100e-003**		**0.2428**	**0.2428**		**0.2285**	**0.2285**	**0.0000**	**600.5432**	**600.5432**	**0.1669**		**604.7157**

3.3 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	3.2800e-003	0.1049	0.0250	2.6000e-004	6.4000e-003	5.2000e-004	6.9200e-003	1.8400e-003	5.0000e-004	2.3400e-003		27.4449	27.4449	1.7200e-003		27.4879
Worker	0.0181	0.0122	0.1635	4.6000e-004	0.0447	3.4000e-004	0.0451	0.0119	3.1000e-004	0.0122		45.7767	45.7767	1.3200e-003		45.8096
Total	**0.0214**	**0.1171**	**0.1885**	**7.2000e-004**	**0.0511**	**8.6000e-004**	**0.0520**	**0.0137**	**8.1000e-004**	**0.0145**		**73.2216**	**73.2216**	**3.0400e-003**		**73.2975**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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

PAR1110.2_Construction_modify existing SCR or NSCR system

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**	2020
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

PAR1110.2_Construction_modify existing SCR or NSCR system - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - Demolition: 2 days; Building Construction: 10 days

Off-road Equipment - Cranes (1): 2 hours per day; Forklifts (1): 4 hours per day; Welders (1): 6 hours per day; Aerial Lifts (1): 4 hours per day; Tractors/Loaders/Backhoe (1): 4 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Tractors/loaders/backhoes (1): 6 hours per day

Off-road Equipment -

Trips and VMT - Demolition: 4 Worker Trips, 0 Vendor Trips, 1 Hauling Trips
Building Construction: 4 Worker Trips, 1 Vendor Trips, 0 Hauling

Demolition -

Stationary Sources - Emergency Generators and Fire Pumps -

PAR1110.2_Construction_modify existing SCR or NSCR system - South Coast AQMD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	UsageHours	4.00	2.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	15.00	4.00
tblTripsAndVMT	WorkerTripNumber	0.00	4.00

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					
2020	0.5983	5.0222	5.5658	9.3900e-003	0.0535	0.2984	0.3519	0.0143	0.2904	0.3046	0.0000	901.2860	901.2860	0.1700	0.0000	904.1452
Maximum	**0.5983**	**5.0222**	**5.5658**	**9.3900e-003**	**0.0535**	**0.2984**	**0.3519**	**0.0143**	**0.2904**	**0.3046**	**0.0000**	**901.2860**	**901.2860**	**0.1700**	**0.0000**	**904.1452**

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					
2020	0.5983	5.0222	5.5658	9.3900e-003	0.0535	0.2984	0.3519	0.0143	0.2904	0.3046	0.0000	901.2860	901.2860	0.1700	0.0000	904.1452
Maximum	**0.5983**	**5.0222**	**5.5658**	**9.3900e-003**	**0.0535**	**0.2984**	**0.3519**	**0.0143**	**0.2904**	**0.3046**	**0.0000**	**901.2860**	**901.2860**	**0.1700**	**0.0000**	**904.1452**

	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**

	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	1/2/2020	1/3/2020	5	2	
2	Building Construction	Building Construction	1/6/2020	1/17/2020	5	10	

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Welders	1	6.00	46	0.45
Building Construction	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction	Cranes	1	2.00	231	0.29
Building Construction	Forklifts	1	4.00	89	0.20
Building Construction	Aerial Lifts	1	4.00	63	0.31
Demolition	Tractors/Loaders/Backhoes	1	6.00	97	0.37

Trips and VMT

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	4.00	0.00	1.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	4.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 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					
Fugitive Dust					5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005			0.0000			0.0000
Off-Road	0.5747	4.8711	5.3894	8.5800e-003		0.2976	0.2976		0.2896	0.2896		817.3265	817.3265	0.1102		820.0816
Total	**0.5747**	**4.8711**	**5.3894**	**8.5800e-003**	**5.0000e-005**	**0.2976**	**0.2976**	**1.0000e-005**	**0.2896**	**0.2896**		**817.3265**	**817.3265**	**0.1102**		**820.0816**

3.2 Demolition - 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	3.9100e-003	0.1378	0.0292	3.8000e-004	8.7400e-003	4.5000e-004	9.1800e-003	2.3900e-003	4.3000e-004	2.8200e-003		41.1449	41.1449	2.9300e-003		41.2183
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	0.0197	0.0133	0.1472	4.3000e-004	0.0447	3.4000e-004	0.0451	0.0119	3.1000e-004	0.0122		42.8146	42.8146	1.2300e-003		42.8453
Total	**0.0237**	**0.1511**	**0.1764**	**8.1000e-004**	**0.0535**	**7.9000e-004**	**0.0542**	**0.0143**	**7.4000e-004**	**0.0150**		**83.9595**	**83.9595**	**4.1600e-003**		**84.0636**

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					5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005			0.0000			0.0000
Off-Road	0.5747	4.8711	5.3894	8.5800e-003		0.2976	0.2976		0.2896	0.2896	0.0000	817.3265	817.3265	0.1102		820.0816
Total	**0.5747**	**4.8711**	**5.3894**	**8.5800e-003**	**5.0000e-005**	**0.2976**	**0.2976**	**1.0000e-005**	**0.2896**	**0.2896**	**0.0000**	**817.3265**	**817.3265**	**0.1102**		**820.0816**

3.2 Demolition - 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	3.9100e-003	0.1378	0.0292	3.8000e-004	8.7400e-003	4.5000e-004	9.1800e-003	2.3900e-003	4.3000e-004	2.8200e-003		41.1449	41.1449	2.9300e-003		41.2183
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	0.0197	0.0133	0.1472	4.3000e-004	0.0447	3.4000e-004	0.0451	0.0119	3.1000e-004	0.0122		42.8146	42.8146	1.2300e-003		42.8453
Total	**0.0237**	**0.1511**	**0.1764**	**8.1000e-004**	**0.0535**	**7.9000e-004**	**0.0542**	**0.0143**	**7.4000e-004**	**0.0150**		**83.9595**	**83.9595**	**4.1600e-003**		**84.0636**

3.3 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	0.5664	4.5477	4.1280	6.5100e-003		0.2428	0.2428		0.2285	0.2285		600.5432	600.5432	0.1669		604.7157
Total	**0.5664**	**4.5477**	**4.1280**	**6.5100e-003**		**0.2428**	**0.2428**		**0.2285**	**0.2285**		**600.5432**	**600.5432**	**0.1669**		**604.7157**

3.3 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	3.4400e-003	0.1048	0.0279	2.5000e-004	6.4000e-003	5.3000e-004	6.9300e-003	1.8400e-003	5.0000e-004	2.3500e-003		26.6513	26.6513	1.8500e-003		26.6976
Worker	0.0197	0.0133	0.1472	4.3000e-004	0.0447	3.4000e-004	0.0451	0.0119	3.1000e-004	0.0122		42.8146	42.8146	1.2300e-003		42.8453
Total	**0.0232**	**0.1182**	**0.1751**	**6.8000e-004**	**0.0511**	**8.7000e-004**	**0.0520**	**0.0137**	**8.1000e-004**	**0.0145**		**69.4659**	**69.4659**	**3.0800e-003**		**69.5429**

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	0.5664	4.5477	4.1280	6.5100e-003		0.2428	0.2428		0.2285	0.2285	0.0000	600.5432	600.5432	0.1669		604.7157
Total	**0.5664**	**4.5477**	**4.1280**	**6.5100e-003**		**0.2428**	**0.2428**		**0.2285**	**0.2285**	**0.0000**	**600.5432**	**600.5432**	**0.1669**		**604.7157**

3.3 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	3.4400e-003	0.1048	0.0279	2.5000e-004	6.4000e-003	5.3000e-004	6.9300e-003	1.8400e-003	5.0000e-004	2.3500e-003		26.6513	26.6513	1.8500e-003		26.6976
Worker	0.0197	0.0133	0.1472	4.3000e-004	0.0447	3.4000e-004	0.0451	0.0119	3.1000e-004	0.0122		42.8146	42.8146	1.2300e-003		42.8453
Total	**0.0232**	**0.1182**	**0.1751**	**6.8000e-004**	**0.0511**	**8.7000e-004**	**0.0520**	**0.0137**	**8.1000e-004**	**0.0145**		**69.4659**	**69.4659**	**3.0800e-003**		**69.5429**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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

CalEEMod® Files and Assumptions

PAR 1110.2 Construction: SCR System and Associated Ammonia Tank

PAR1110.2_Construction_SCR and NH3 Tank

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**	2020
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

PAR1110.2_Construction_SCR and NH3 Tank - South Coast AQMD Air District, Annual

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - SCR: Demolition: 10 days; Building Construction: 60 days; Paving: 5 days

Off-road Equipment - Cranes (1): 3 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Welders (2): 7 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Cranes (1): 2 hours per day; Forklift (2): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Rollers (1): 4 hours per day; Plate Compactors (1): 4 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: 8 Worker Trips, 0 Vendor Trips, 4 Hauling Trips
Building Construction: 15 Worker Trips, 7 Vendor Trips, 0 Hauling
Paving: 8 Worker Trips, 1 Vendor Trips, 0 Hauling

Demolition -

Stationary Sources - Emergency Generators and Fire Pumps -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	60.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	UsageHours	4.00	3.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripNumber	18.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	13.00	8.00

2.0 Emissions Summary

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					
2020	0.0467	0.3598	0.3472	6.5000e-004	6.9500e-003	0.0181	0.0250	1.8800e-003	0.0175	0.0194	0.0000	55.0142	55.0142	8.5100e-003	0.0000	55.2270
Maximum	**0.0467**	**0.3598**	**0.3472**	**6.5000e-004**	**6.9500e-003**	**0.0181**	**0.0250**	**1.8800e-003**	**0.0175**	**0.0194**	**0.0000**	**55.0142**	**55.0142**	**8.5100e-003**	**0.0000**	**55.2270**

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					
2020	0.0467	0.3598	0.3472	6.5000e-004	6.9500e-003	0.0181	0.0250	1.8800e-003	0.0175	0.0194	0.0000	55.0142	55.0142	8.5100e-003	0.0000	55.2270
Maximum	**0.0467**	**0.3598**	**0.3472**	**6.5000e-004**	**6.9500e-003**	**0.0181**	**0.0250**	**1.8800e-003**	**0.0175**	**0.0194**	**0.0000**	**55.0142**	**55.0142**	**8.5100e-003**	**0.0000**	**55.2270**

	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-2-2020**	**4-1-2020**	0.3307	0.3307
2	**4-2-2020**	**7-1-2020**	0.0755	0.0755
		Highest	0.3307	0.3307

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

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2020	1/15/2020	5	10	
2	Building Construction	Building Construction	1/23/2020	4/15/2020	5	60	
3	Paving	Paving	4/16/2020	4/22/2020	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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	2.00	231	0.29
Demolition	Forklifts	2	8.00	89	0.20
Building Construction	Aerial Lifts	1	8.00	63	0.31
Building Construction	Cranes	1	3.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	7.00	84	0.74
Building Construction	Welders	2	7.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Plate Compactors	1	4.00	8	0.43
Paving	Rollers	1	4.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

PAR1110.2_Construction_SCR and NH3 Tank - 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	7	8.00	0.00	4.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	15.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	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 - 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					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.1000e-003	0.0362	0.0329	5.0000e-005		2.2400e-003	2.2400e-003		2.1400e-003	2.1400e-003	0.0000	4.6649	4.6649	8.1000e-004	0.0000	4.6851
Total	**4.1000e-003**	**0.0362**	**0.0329**	**5.0000e-005**	**0.0000**	**2.2400e-003**	**2.2400e-003**	**0.0000**	**2.1400e-003**	**2.1400e-003**	**0.0000**	**4.6649**	**4.6649**	**8.1000e-004**	**0.0000**	**4.6851**

3.2 Demolition - 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	2.0000e-005	5.6000e-004	1.1000e-004	0.0000	3.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1509	0.1509	1.0000e-005	0.0000	0.1512
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	1.8000e-004	1.4000e-004	1.5100e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3951	0.3951	1.0000e-005	0.0000	0.3954
Total	**2.0000e-004**	**7.0000e-004**	**1.6200e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.5460**	**0.5460**	**2.0000e-005**	**0.0000**	**0.5465**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.1000e-003	0.0362	0.0329	5.0000e-005		2.2400e-003	2.2400e-003		2.1400e-003	2.1400e-003	0.0000	4.6649	4.6649	8.1000e-004	0.0000	4.6851
Total	**4.1000e-003**	**0.0362**	**0.0329**	**5.0000e-005**	**0.0000**	**2.2400e-003**	**2.2400e-003**	**0.0000**	**2.1400e-003**	**2.1400e-003**	**0.0000**	**4.6649**	**4.6649**	**8.1000e-004**	**0.0000**	**4.6851**

3.2 Demolition - 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	2.0000e-005	5.6000e-004	1.1000e-004	0.0000	3.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1509	0.1509	1.0000e-005	0.0000	0.1512
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	1.8000e-004	1.4000e-004	1.5100e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3951	0.3951	1.0000e-005	0.0000	0.3954
Total	**2.0000e-004**	**7.0000e-004**	**1.6200e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.5460**	**0.5460**	**2.0000e-005**	**0.0000**	**0.5465**

3.3 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	0.0380	0.2830	0.2732	4.6000e-004		0.0148	0.0148		0.0144	0.0144	0.0000	37.8685	37.8685	6.5500e-003	0.0000	38.0323
Total	**0.0380**	**0.2830**	**0.2732**	**4.6000e-004**		**0.0148**	**0.0148**		**0.0144**	**0.0144**	**0.0000**	**37.8685**	**37.8685**	**6.5500e-003**	**0.0000**	**38.0323**

3.3 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	7.0000e-004	0.0224	5.5500e-003	5.0000e-005	1.3200e-003	1.1000e-004	1.4300e-003	3.8000e-004	1.1000e-004	4.9000e-004	0.0000	5.1650	5.1650	3.4000e-004	0.0000	5.1735
Worker	2.0100e-003	1.5400e-003	0.0170	5.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	4.0000e-005	1.3500e-003	0.0000	4.4445	4.4445	1.3000e-004	0.0000	4.4477
Total	**2.7100e-003**	**0.0240**	**0.0226**	**1.0000e-004**	**6.2600e-003**	**1.5000e-004**	**6.4100e-003**	**1.6900e-003**	**1.5000e-004**	**1.8400e-003**	**0.0000**	**9.6095**	**9.6095**	**4.7000e-004**	**0.0000**	**9.6212**

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	0.0380	0.2830	0.2732	4.6000e-004		0.0148	0.0148		0.0144	0.0144	0.0000	37.8685	37.8685	6.5500e-003	0.0000	38.0322
Total	**0.0380**	**0.2830**	**0.2732**	**4.6000e-004**		**0.0148**	**0.0148**		**0.0144**	**0.0144**	**0.0000**	**37.8685**	**37.8685**	**6.5500e-003**	**0.0000**	**38.0322**

3.3 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	7.0000e-004	0.0224	5.5500e-003	5.0000e-005	1.3200e-003	1.1000e-004	1.4300e-003	3.8000e-004	1.1000e-004	4.9000e-004	0.0000	5.1650	5.1650	3.4000e-004	0.0000	5.1735
Worker	2.0100e-003	1.5400e-003	0.0170	5.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	4.0000e-005	1.3500e-003	0.0000	4.4445	4.4445	1.3000e-004	0.0000	4.4477
Total	**2.7100e-003**	**0.0240**	**0.0226**	**1.0000e-004**	**6.2600e-003**	**1.5000e-004**	**6.4100e-003**	**1.6900e-003**	**1.5000e-004**	**1.8400e-003**	**0.0000**	**9.6095**	**9.6095**	**4.7000e-004**	**0.0000**	**9.6212**

3.4 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	1.6000e-003	0.0159	0.0162	2.0000e-005		8.8000e-004	8.8000e-004		8.1000e-004	8.1000e-004	0.0000	2.1278	2.1278	6.6000e-004	0.0000	2.1443
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.6000e-003**	**0.0159**	**0.0162**	**2.0000e-005**		**8.8000e-004**	**8.8000e-004**		**8.1000e-004**	**8.1000e-004**	**0.0000**	**2.1278**	**2.1278**	**6.6000e-004**	**0.0000**	**2.1443**

3.4 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	9.0000e-005	7.0000e-005	7.6000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1975	0.1975	1.0000e-005	0.0000	0.1977
Total	**9.0000e-005**	**7.0000e-005**	**7.6000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1975**	**0.1975**	**1.0000e-005**	**0.0000**	**0.1977**

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	1.6000e-003	0.0159	0.0162	2.0000e-005		8.8000e-004	8.8000e-004		8.1000e-004	8.1000e-004	0.0000	2.1278	2.1278	6.6000e-004	0.0000	2.1443
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.6000e-003**	**0.0159**	**0.0162**	**2.0000e-005**		**8.8000e-004**	**8.8000e-004**		**8.1000e-004**	**8.1000e-004**	**0.0000**	**2.1278**	**2.1278**	**6.6000e-004**	**0.0000**	**2.1443**

3.4 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	9.0000e-005	7.0000e-005	7.6000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1975	0.1975	1.0000e-005	0.0000	0.1977
Total	**9.0000e-005**	**7.0000e-005**	**7.6000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1975**	**0.1975**	**1.0000e-005**	**0.0000**	**0.1977**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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

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

PAR1110.2_Construction_SCR and NH3 Tank

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**	2020
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

PAR1110.2_Construction_SCR and NH3 Tank - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - SCR: Demolition: 10 days; Building Construction: 60 days; Paving: 5 days

Off-road Equipment - Cranes (1): 3 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Welders (2): 7 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Cranes (1): 2 hours per day; Forklift (2): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Rollers (1): 4 hours per day; Plate Compactors (1): 4 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: 8 Worker Trips, 0 Vendor Trips, 4 Hauling Trips
Building Construction: 15 Worker Trips, 7 Vendor Trips, 0 Hauling
Paving: 8 Worker Trips, 1 Vendor Trips, 0 Hauling

Demolition -

Stationary Sources - Emergency Generators and Fire Pumps -

PAR1110.2_Construction_SCR and NH3 Tank - South Coast AQMD Air District, Summer

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	60.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	UsageHours	4.00	3.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripNumber	18.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	13.00	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					
2020	1.3563	10.2124	9.8955	0.0187	0.2125	0.4989	0.7113	0.0574	0.4850	0.5423	0.0000	1,755.2069	1,755.2069	0.2940	0.0000	1,761.6478
Maximum	**1.3563**	**10.2124**	**9.8955**	**0.0187**	**0.2125**	**0.4989**	**0.7113**	**0.0574**	**0.4850**	**0.5423**	**0.0000**	**1,755.2069**	**1,755.2069**	**0.2940**	**0.0000**	**1,761.6478**

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					
2020	1.3563	10.2124	9.8955	0.0187	0.2125	0.4989	0.7113	0.0574	0.4850	0.5423	0.0000	1,755.2069	1,755.2069	0.2940	0.0000	1,761.6478
Maximum	**1.3563**	**10.2124**	**9.8955**	**0.0187**	**0.2125**	**0.4989**	**0.7113**	**0.0574**	**0.4850**	**0.5423**	**0.0000**	**1,755.2069**	**1,755.2069**	**0.2940**	**0.0000**	**1,761.6478**

	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**

	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

<u>Construction Phase</u>

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2020	1/15/2020	5	10	
2	Building Construction	Building Construction	1/23/2020	4/15/2020	5	60	
3	Paving	Paving	4/16/2020	4/22/2020	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)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	2.00	231	0.29
Demolition	Forklifts	2	8.00	89	0.20
Building Construction	Aerial Lifts	1	8.00	63	0.31
Building Construction	Cranes	1	3.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	7.00	84	0.74
Building Construction	Welders	2	7.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Plate Compactors	1	4.00	8	0.43
Paving	Rollers	1	4.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

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	7	8.00	0.00	4.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	15.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	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 - 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					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.8196	7.2415	6.5759	0.0108		0.4470	0.4470		0.4271	0.4271		1,028.4237	1,028.4237	0.1785		1,032.8856
Total	**0.8196**	**7.2415**	**6.5759**	**0.0108**	**1.0000e-005**	**0.4470**	**0.4471**	**0.0000**	**0.4271**	**0.4271**		**1,028.4237**	**1,028.4237**	**0.1785**		**1,032.8856**

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	3.0400e-003	0.1089	0.0217	3.1000e-004	6.9900e-003	3.5000e-004	7.3400e-003	1.9200e-003	3.4000e-004	2.2500e-003		33.5332	33.5332	2.2500e-003		33.5894
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	0.0362	0.0243	0.3271	9.2000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		91.5534	91.5534	2.6300e-003		91.6192
Total	**0.0392**	**0.1332**	**0.3487**	**1.2300e-003**	**0.0964**	**1.0300e-003**	**0.0974**	**0.0256**	**9.6000e-004**	**0.0266**		**125.0866**	**125.0866**	**4.8800e-003**		**125.2086**

3.2 Demolition - 2020

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					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.8196	7.2415	6.5759	0.0108		0.4470	0.4470		0.4271	0.4271	0.0000	1,028.4237	1,028.4237	0.1785		1,032.8856
Total	**0.8196**	**7.2415**	**6.5759**	**0.0108**	**1.0000e-005**	**0.4470**	**0.4471**	**0.0000**	**0.4271**	**0.4271**	**0.0000**	**1,028.4237**	**1,028.4237**	**0.1785**		**1,032.8856**

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	3.0400e-003	0.1089	0.0217	3.1000e-004	6.9900e-003	3.5000e-004	7.3400e-003	1.9200e-003	3.4000e-004	2.2500e-003		33.5332	33.5332	2.2500e-003		33.5894
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	0.0362	0.0243	0.3271	9.2000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		91.5534	91.5534	2.6300e-003		91.6192
Total	**0.0392**	**0.1332**	**0.3487**	**1.2300e-003**	**0.0964**	**1.0300e-003**	**0.0974**	**0.0256**	**9.6000e-004**	**0.0266**		**125.0866**	**125.0866**	**4.8800e-003**		**125.2086**

3.3 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	1.2655	9.4322	9.1073	0.0152		0.4939	0.4939		0.4803	0.4803		1,391.4304	1,391.4304	0.2406		1,397.4463
Total	**1.2655**	**9.4322**	**9.1073**	**0.0152**		**0.4939**	**0.4939**		**0.4803**	**0.4803**		**1,391.4304**	**1,391.4304**	**0.2406**		**1,397.4463**

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	0.0679	0.0456	0.6132	1.7200e-003	0.1677	1.2700e-003	0.1689	0.0445	1.1700e-003	0.0456		171.6626	171.6626	4.9400e-003		171.7860
Total	**0.0909**	**0.7802**	**0.7881**	**3.5200e-003**	**0.2125**	**4.9100e-003**	**0.2174**	**0.0574**	**4.6500e-003**	**0.0620**		**363.7765**	**363.7765**	**0.0170**		**364.2015**

3.3 Building Construction - 2020

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	1.2655	9.4322	9.1073	0.0152		0.4939	0.4939		0.4803	0.4803	0.0000	1,391.4304	1,391.4304	0.2406		1,397.4463
Total	**1.2655**	**9.4322**	**9.1073**	**0.0152**		**0.4939**	**0.4939**		**0.4803**	**0.4803**	**0.0000**	**1,391.4304**	**1,391.4304**	**0.2406**		**1,397.4463**

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	0.0679	0.0456	0.6132	1.7200e-003	0.1677	1.2700e-003	0.1689	0.0445	1.1700e-003	0.0456		171.6626	171.6626	4.9400e-003		171.7860
Total	**0.0909**	**0.7802**	**0.7881**	**3.5200e-003**	**0.2125**	**4.9100e-003**	**0.2174**	**0.0574**	**4.6500e-003**	**0.0620**		**363.7765**	**363.7765**	**0.0170**		**364.2015**

3.4 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	0.6404	6.3578	6.4612	9.8900e-003		0.3517	0.3517		0.3248	0.3248		938.2008	938.2008	0.2913		945.4839
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6404**	**6.3578**	**6.4612**	**9.8900e-003**		**0.3517**	**0.3517**		**0.3248**	**0.3248**		**938.2008**	**938.2008**	**0.2913**		**945.4839**

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	0.0362	0.0243	0.3271	9.2000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		91.5534	91.5534	2.6300e-003		91.6192
Total	**0.0362**	**0.0243**	**0.3271**	**9.2000e-004**	**0.0894**	**6.8000e-004**	**0.0901**	**0.0237**	**6.2000e-004**	**0.0243**		**91.5534**	**91.5534**	**2.6300e-003**		**91.6192**

3.4 Paving - 2020

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	0.6404	6.3578	6.4612	9.8900e-003		0.3517	0.3517		0.3248	0.3248	0.0000	938.2008	938.2008	0.2913		945.4839
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6404**	**6.3578**	**6.4612**	**9.8900e-003**		**0.3517**	**0.3517**		**0.3248**	**0.3248**	**0.0000**	**938.2008**	**938.2008**	**0.2913**		**945.4839**

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	0.0362	0.0243	0.3271	9.2000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		91.5534	91.5534	2.6300e-003		91.6192
Total	**0.0362**	**0.0243**	**0.3271**	**9.2000e-004**	**0.0894**	**6.8000e-004**	**0.0901**	**0.0237**	**6.2000e-004**	**0.0243**		**91.5534**	**91.5534**	**2.6300e-003**		**91.6192**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	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
	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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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**

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**

6.2 Area by SubCategory

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

PAR1110.2_Construction_SCR and NH3 Tank

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**	2020
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

PAR1110.2_Construction_SCR and NH3 Tank - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - SCR: Demolition: 10 days; Building Construction: 60 days; Paving: 5 days

Off-road Equipment - Cranes (1): 3 hours per day; Forklifts (1): 6 hours per day; Generator Sets (1): 8 hours per day; Welders (2): 7 hours per day; Aerial Lifts (1): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Cranes (1): 2 hours per day; Forklift (2): 8 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Paving Equipment (1): 8 hours per day; Rollers (1): 4 hours per day; Plate Compactors (1): 4 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: 8 Worker Trips, 0 Vendor Trips, 4 Hauling Trips
Building Construction: 15 Worker Trips, 7 Vendor Trips, 0 Hauling
Paving: 8 Worker Trips, 1 Vendor Trips, 0 Hauling

Demolition -

Stationary Sources - Emergency Generators and Fire Pumps -

PAR1110.2_Construction_SCR and NH3 Tank - South Coast AQMD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	60.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	UsageHours	4.00	3.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripNumber	18.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	13.00	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					
2020	1.3636	10.2159	9.8545	0.0186	0.2125	0.4989	0.7114	0.0574	0.4850	0.5424	0.0000	1,738.5441	1,738.5441	0.2938	0.0000	1,744.9990
Maximum	**1.3636**	**10.2159**	**9.8545**	**0.0186**	**0.2125**	**0.4989**	**0.7114**	**0.0574**	**0.4850**	**0.5424**	**0.0000**	**1,738.5441**	**1,738.5441**	**0.2938**	**0.0000**	**1,744.9990**

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					
2020	1.3636	10.2159	9.8545	0.0186	0.2125	0.4989	0.7114	0.0574	0.4850	0.5424	0.0000	1,738.5441	1,738.5441	0.2938	0.0000	1,744.9990
Maximum	**1.3636**	**10.2159**	**9.8545**	**0.0186**	**0.2125**	**0.4989**	**0.7114**	**0.0574**	**0.4850**	**0.5424**	**0.0000**	**1,738.5441**	**1,738.5441**	**0.2938**	**0.0000**	**1,744.9990**

PAR1110.2_Construction_SCR and NH3 Tank - 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

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**

	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	1/2/2020	1/15/2020	5	10	
2	Building Construction	Building Construction	1/23/2020	4/15/2020	5	60	
3	Paving	Paving	4/16/2020	4/22/2020	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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	2.00	231	0.29
Demolition	Forklifts	2	8.00	89	0.20
Building Construction	Aerial Lifts	1	8.00	63	0.31
Building Construction	Cranes	1	3.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	7.00	84	0.74
Building Construction	Welders	2	7.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Plate Compactors	1	4.00	8	0.43
Paving	Rollers	1	4.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

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	7	8.00	0.00	4.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	15.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	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 - 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					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.8196	7.2415	6.5759	0.0108		0.4470	0.4470		0.4271	0.4271		1,028.4237	1,028.4237	0.1785		1,032.8856
Total	**0.8196**	**7.2415**	**6.5759**	**0.0108**	**1.0000e-005**	**0.4470**	**0.4471**	**0.0000**	**0.4271**	**0.4271**		**1,028.4237**	**1,028.4237**	**0.1785**		**1,032.8856**

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	3.1300e-003	0.1103	0.0233	3.0000e-004	6.9900e-003	3.6000e-004	7.3500e-003	1.9200e-003	3.4000e-004	2.2600e-003		32.9159	32.9159	2.3500e-003		32.9746
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	0.0395	0.0266	0.2945	8.6000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		85.6292	85.6292	2.4600e-003		85.6906
Total	**0.0426**	**0.1369**	**0.3178**	**1.1600e-003**	**0.0964**	**1.0400e-003**	**0.0975**	**0.0256**	**9.6000e-004**	**0.0266**		**118.5451**	**118.5451**	**4.8100e-003**		**118.6652**

3.2 Demolition - 2020

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					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.8196	7.2415	6.5759	0.0108		0.4470	0.4470		0.4271	0.4271	0.0000	1,028.4237	1,028.4237	0.1785		1,032.8856
Total	**0.8196**	**7.2415**	**6.5759**	**0.0108**	**1.0000e-005**	**0.4470**	**0.4471**	**0.0000**	**0.4271**	**0.4271**	**0.0000**	**1,028.4237**	**1,028.4237**	**0.1785**		**1,032.8856**

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	3.1300e-003	0.1103	0.0233	3.0000e-004	6.9900e-003	3.6000e-004	7.3500e-003	1.9200e-003	3.4000e-004	2.2600e-003		32.9159	32.9159	2.3500e-003		32.9746
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	0.0395	0.0266	0.2945	8.6000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		85.6292	85.6292	2.4600e-003		85.6906
Total	**0.0426**	**0.1369**	**0.3178**	**1.1600e-003**	**0.0964**	**1.0400e-003**	**0.0975**	**0.0256**	**9.6000e-004**	**0.0266**		**118.5451**	**118.5451**	**4.8100e-003**		**118.6652**

3.3 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	1.2655	9.4322	9.1073	0.0152		0.4939	0.4939		0.4803	0.4803		1,391.4304	1,391.4304	0.2406		1,397.4463
Total	**1.2655**	**9.4322**	**9.1073**	**0.0152**		**0.4939**	**0.4939**		**0.4803**	**0.4803**		**1,391.4304**	**1,391.4304**	**0.2406**		**1,397.4463**

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	0.0740	0.0500	0.5521	1.6100e-003	0.1677	1.2700e-003	0.1689	0.0445	1.1700e-003	0.0456		160.5547	160.5547	4.6000e-003		160.6699
Total	**0.0981**	**0.7837**	**0.7471**	**3.3600e-003**	**0.2125**	**4.9600e-003**	**0.2174**	**0.0574**	**4.7000e-003**	**0.0621**		**347.1137**	**347.1137**	**0.0176**		**347.5527**

3.3 Building Construction - 2020

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	1.2655	9.4322	9.1073	0.0152		0.4939	0.4939		0.4803	0.4803	0.0000	1,391.4304	1,391.4304	0.2406		1,397.4463
Total	**1.2655**	**9.4322**	**9.1073**	**0.0152**		**0.4939**	**0.4939**		**0.4803**	**0.4803**	**0.0000**	**1,391.4304**	**1,391.4304**	**0.2406**		**1,397.4463**

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	0.0740	0.0500	0.5521	1.6100e-003	0.1677	1.2700e-003	0.1689	0.0445	1.1700e-003	0.0456		160.5547	160.5547	4.6000e-003		160.6699
Total	**0.0981**	**0.7837**	**0.7471**	**3.3600e-003**	**0.2125**	**4.9600e-003**	**0.2174**	**0.0574**	**4.7000e-003**	**0.0621**		**347.1137**	**347.1137**	**0.0176**		**347.5527**

3.4 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	0.6404	6.3578	6.4612	9.8900e-003		0.3517	0.3517		0.3248	0.3248		938.2008	938.2008	0.2913		945.4839
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6404**	**6.3578**	**6.4612**	**9.8900e-003**		**0.3517**	**0.3517**		**0.3248**	**0.3248**		**938.2008**	**938.2008**	**0.2913**		**945.4839**

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	0.0395	0.0266	0.2945	8.6000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		85.6292	85.6292	2.4600e-003		85.6906
Total	**0.0395**	**0.0266**	**0.2945**	**8.6000e-004**	**0.0894**	**6.8000e-004**	**0.0901**	**0.0237**	**6.2000e-004**	**0.0243**		**85.6292**	**85.6292**	**2.4600e-003**		**85.6906**

3.4 Paving - 2020

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	0.6404	6.3578	6.4612	9.8900e-003		0.3517	0.3517		0.3248	0.3248	0.0000	938.2008	938.2008	0.2913		945.4839
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6404**	**6.3578**	**6.4612**	**9.8900e-003**		**0.3517**	**0.3517**		**0.3248**	**0.3248**	**0.0000**	**938.2008**	**938.2008**	**0.2913**		**945.4839**

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	0.0395	0.0266	0.2945	8.6000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		85.6292	85.6292	2.4600e-003		85.6906
Total	**0.0395**	**0.0266**	**0.2945**	**8.6000e-004**	**0.0894**	**6.8000e-004**	**0.0901**	**0.0237**	**6.2000e-004**	**0.0243**		**85.6292**	**85.6292**	**2.4600e-003**		**85.6906**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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**

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**

6.2 Area by SubCategory

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-3

CalEEMod® Files and Assumptions

PAR 1110.2 Construction: Engine Repower and SCR System and Associated Ammonia Tank

PAR1110.2_Construction_Stationary Gas Turbine & New 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**	2020
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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR - South Coast AQMD Air District, Annual

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - Stationary Gas Turbine: Demolition: 20 days; Site Preparation: 5 days; Building Construction: 150 days; Paving: 5 days

Off-road Equipment - Cranes (1): 3 hours per day; Forklifts (2): 6 hours per day; Generator Sets (1): 8 hours per day; Welders (2): 4 hours per day; Aerial Lifts (1): 4 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 4 hours per day; Forklifts (2): 4 hours per day; Cranes (1): 4 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Pavers (1): 5 hours per day; Rollers (1): 4 hours per day; Paving Equipment (1): 4 hours per day; Tractors/Loaders/Backhoes (1): 4 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 4 hours per day; Trenchers (1): 4 hours per day

Trips and VMT - Demolition: 20 Worker Trips, 0 Vendor Trips, 10 Hauling Trips
Site Preparation: 10 Work Trips, 0 Vendor Trips, 0 Hauling Trips
Building Construction: 20 Worker Trips, 5 Vendor Trips, 0 Hauling
Paving: 10 Worker Trips, 1 Vendor Trips, 0 Hauling

Demolition -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	150.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00

tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	1.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	15.00	10.00

2.0 Emissions Summary

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					
2020	0.1182	0.9832	0.8576	1.6400e-003	0.0348	0.0513	0.0862	0.0131	0.0491	0.0621	0.0000	141.2784	141.2784	0.0229	0.0000	141.8506
Maximum	**0.1182**	**0.9832**	**0.8576**	**1.6400e-003**	**0.0348**	**0.0513**	**0.0862**	**0.0131**	**0.0491**	**0.0621**	**0.0000**	**141.2784**	**141.2784**	**0.0229**	**0.0000**	**141.8506**

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					
2020	0.1182	0.9832	0.8576	1.6400e-003	0.0348	0.0513	0.0862	0.0131	0.0491	0.0621	0.0000	141.2782	141.2782	0.0229	0.0000	141.8505
Maximum	**0.1182**	**0.9832**	**0.8576**	**1.6400e-003**	**0.0348**	**0.0513**	**0.0862**	**0.0131**	**0.0491**	**0.0621**	**0.0000**	**141.2782**	**141.2782**	**0.0229**	**0.0000**	**141.8505**

	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-2-2020**	**4-1-2020**	0.4307	0.4307
2	**4-2-2020**	**7-1-2020**	0.3871	0.3871
3	**7-2-2020**	**9-30-2020**	0.2827	0.2827
		Highest	0.4307	0.4307

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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR - 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	1/2/2020	1/29/2020	5	20	
2	Site Preparation	Site Preparation	1/30/2020	2/5/2020	5	5	
3	Building Construction	Building Construction	2/6/2020	9/2/2020	5	150	
4	Paving	Paving	9/3/2020	9/9/2020	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)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	4.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Rubber Tired Dozers	1	4.00	247	0.40
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Aerial Lifts	1	4.00	63	0.31
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Welders	2	4.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	5.00	130	0.42
Paving	Paving Equipment	1	4.00	132	0.36
Paving	Rollers	1	4.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	4.00	97	0.37

Trips and VMT

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	5	20.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	20.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	10.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 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					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0144	0.1393	0.0888	1.6000e-004		7.5600e-003	7.5600e-003		7.1100e-003	7.1100e-003	0.0000	14.0141	14.0141	3.1300e-003	0.0000	14.0924
Total	**0.0144**	**0.1393**	**0.0888**	**1.6000e-004**	**0.0000**	**7.5600e-003**	**7.5600e-003**	**0.0000**	**7.1100e-003**	**7.1100e-003**	**0.0000**	**14.0141**	**14.0141**	**3.1300e-003**	**0.0000**	**14.0924**

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	4.0000e-005	1.4000e-003	2.8000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.3773	0.3773	3.0000e-005	0.0000	0.3780
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	8.9000e-004	6.8000e-004	7.5700e-003	2.0000e-005	2.1900e-003	2.0000e-005	2.2100e-003	5.8000e-004	2.0000e-005	6.0000e-004	0.0000	1.9753	1.9753	6.0000e-005	0.0000	1.9768
Total	**9.3000e-004**	**2.0800e-003**	**7.8500e-003**	**2.0000e-005**	**2.2800e-003**	**2.0000e-005**	**2.3000e-003**	**6.0000e-004**	**2.0000e-005**	**6.3000e-004**	**0.0000**	**2.3527**	**2.3527**	**9.0000e-005**	**0.0000**	**2.3547**

3.2 Demolition - 2020

Mitigated Construction On-Site

Category	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
	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0144	0.1393	0.0888	1.6000e-004		7.5600e-003	7.5600e-003		7.1100e-003	7.1100e-003	0.0000	14.0140	14.0140	3.1300e-003	0.0000	14.0924
Total	**0.0144**	**0.1393**	**0.0888**	**1.6000e-004**	**0.0000**	**7.5600e-003**	**7.5600e-003**	**0.0000**	**7.1100e-003**	**7.1100e-003**	**0.0000**	**14.0140**	**14.0140**	**3.1300e-003**	**0.0000**	**14.0924**

Mitigated Construction Off-Site

Category	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
	tons/yr										MT/yr					
Hauling	4.0000e-005	1.4000e-003	2.8000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.3773	0.3773	3.0000e-005	0.0000	0.3780
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	8.9000e-004	6.8000e-004	7.5700e-003	2.0000e-005	2.1900e-003	2.0000e-005	2.2100e-003	5.8000e-004	2.0000e-005	6.0000e-004	0.0000	1.9753	1.9753	6.0000e-005	0.0000	1.9768
Total	**9.3000e-004**	**2.0800e-003**	**7.8500e-003**	**2.0000e-005**	**2.2800e-003**	**2.0000e-005**	**2.3000e-003**	**6.0000e-004**	**2.0000e-005**	**6.3000e-004**	**0.0000**	**2.3527**	**2.3527**	**9.0000e-005**	**0.0000**	**2.3547**

3.3 Site Preparation - 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					
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	3.1500e-003	0.0322	0.0152	3.0000e-005		1.7400e-003	1.7400e-003		1.6000e-003	1.6000e-003	0.0000	2.3535	2.3535	7.6000e-004	0.0000	2.3725
Total	**3.1500e-003**	**0.0322**	**0.0152**	**3.0000e-005**	**0.0132**	**1.7400e-003**	**0.0149**	**7.2400e-003**	**1.6000e-003**	**8.8400e-003**	**0.0000**	**2.3535**	**2.3535**	**7.6000e-004**	**0.0000**	**2.3725**

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	1.1000e-004	9.0000e-005	9.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2469	0.2469	1.0000e-005	0.0000	0.2471
Total	**1.1000e-004**	**9.0000e-005**	**9.5000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2469**	**0.2469**	**1.0000e-005**	**0.0000**	**0.2471**

3.3 Site Preparation - 2020

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	3.1500e-003	0.0322	0.0152	3.0000e-005		1.7400e-003	1.7400e-003		1.6000e-003	1.6000e-003	0.0000	2.3535	2.3535	7.6000e-004	0.0000	2.3725
Total	**3.1500e-003**	**0.0322**	**0.0152**	**3.0000e-005**	**0.0132**	**1.7400e-003**	**0.0149**	**7.2400e-003**	**1.6000e-003**	**8.8400e-003**	**0.0000**	**2.3535**	**2.3535**	**7.6000e-004**	**0.0000**	**2.3725**

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	1.1000e-004	9.0000e-005	9.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2469	0.2469	1.0000e-005	0.0000	0.2471
Total	**1.1000e-004**	**9.0000e-005**	**9.5000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.2469**	**0.2469**	**1.0000e-005**	**0.0000**	**0.2471**

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	0.0903	0.7510	0.6636	1.1400e-003		0.0410	0.0410		0.0394	0.0394	0.0000	96.1568	96.1568	0.0173	0.0000	96.5892
Total	**0.0903**	**0.7510**	**0.6636**	**1.1400e-003**		**0.0410**	**0.0410**		**0.0394**	**0.0394**	**0.0000**	**96.1568**	**96.1568**	**0.0173**	**0.0000**	**96.5892**

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	1.2600e-003	0.0400	9.9100e-003	1.0000e-004	2.3600e-003	2.0000e-004	2.5600e-003	6.8000e-004	1.9000e-004	8.7000e-004	0.0000	9.2232	9.2232	6.1000e-004	0.0000	9.2383
Worker	6.7000e-003	5.1300e-003	0.0568	1.6000e-004	0.0165	1.3000e-004	0.0166	4.3700e-003	1.2000e-004	4.4900e-003	0.0000	14.8150	14.8150	4.3000e-004	0.0000	14.8256
Total	**7.9600e-003**	**0.0452**	**0.0667**	**2.6000e-004**	**0.0188**	**3.3000e-004**	**0.0191**	**5.0500e-003**	**3.1000e-004**	**5.3600e-003**	**0.0000**	**24.0382**	**24.0382**	**1.0400e-003**	**0.0000**	**24.0640**

3.4 Building Construction - 2020

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	0.0903	0.7510	0.6636	1.1400e-003		0.0410	0.0410		0.0394	0.0394	0.0000	96.1567	96.1567	0.0173	0.0000	96.5891
Total	**0.0903**	**0.7510**	**0.6636**	**1.1400e-003**		**0.0410**	**0.0410**		**0.0394**	**0.0394**	**0.0000**	**96.1567**	**96.1567**	**0.0173**	**0.0000**	**96.5891**

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	1.2600e-003	0.0400	9.9100e-003	1.0000e-004	2.3600e-003	2.0000e-004	2.5600e-003	6.8000e-004	1.9000e-004	8.7000e-004	0.0000	9.2232	9.2232	6.1000e-004	0.0000	9.2383
Worker	6.7000e-003	5.1300e-003	0.0568	1.6000e-004	0.0165	1.3000e-004	0.0166	4.3700e-003	1.2000e-004	4.4900e-003	0.0000	14.8150	14.8150	4.3000e-004	0.0000	14.8256
Total	**7.9600e-003**	**0.0452**	**0.0667**	**2.6000e-004**	**0.0188**	**3.3000e-004**	**0.0191**	**5.0500e-003**	**3.1000e-004**	**5.3600e-003**	**0.0000**	**24.0382**	**24.0382**	**1.0400e-003**	**0.0000**	**24.0640**

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	1.3000e-003	0.0130	0.0135	2.0000e-005		7.1000e-004	7.1000e-004		6.5000e-004	6.5000e-004	0.0000	1.8078	1.8078	5.7000e-004	0.0000	1.8220
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3000e-003**	**0.0130**	**0.0135**	**2.0000e-005**		**7.1000e-004**	**7.1000e-004**		**6.5000e-004**	**6.5000e-004**	**0.0000**	**1.8078**	**1.8078**	**5.7000e-004**	**0.0000**	**1.8220**

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	1.0000e-005	2.7000e-004	7.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0615	0.0615	0.0000	0.0000	0.0616
Worker	1.1000e-004	9.0000e-005	9.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2469	0.2469	1.0000e-005	0.0000	0.2471
Total	**1.2000e-004**	**3.6000e-004**	**1.0200e-003**	**0.0000**	**2.9000e-004**	**0.0000**	**3.0000e-004**	**7.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.3084**	**0.3084**	**1.0000e-005**	**0.0000**	**0.3087**

3.5 Paving - 2020

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	1.3000e-003	0.0130	0.0135	2.0000e-005		7.1000e-004	7.1000e-004		6.5000e-004	6.5000e-004	0.0000	1.8078	1.8078	5.7000e-004	0.0000	1.8220
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3000e-003**	**0.0130**	**0.0135**	**2.0000e-005**		**7.1000e-004**	**7.1000e-004**		**6.5000e-004**	**6.5000e-004**	**0.0000**	**1.8078**	**1.8078**	**5.7000e-004**	**0.0000**	**1.8220**

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	1.0000e-005	2.7000e-004	7.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0615	0.0615	0.0000	0.0000	0.0616
Worker	1.1000e-004	9.0000e-005	9.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2469	0.2469	1.0000e-005	0.0000	0.2471
Total	**1.2000e-004**	**3.6000e-004**	**1.0200e-003**	**0.0000**	**2.9000e-004**	**0.0000**	**3.0000e-004**	**7.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.3084**	**0.3084**	**1.0000e-005**	**0.0000**	**0.3087**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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**

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**

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**

6.2 Area by SubCategory

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

PAR1110.2_Construction_Stationary Gas Turbine & New 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**	2020
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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - Stationary Gas Turbine: Demolition: 20 days; Site Preparation: 5 days; Building Construction: 150 days; Paving: 5 days

Off-road Equipment - Cranes (1): 3 hours per day; Forklifts (2): 6 hours per day; Generator Sets (1): 8 hours per day; Welders (2): 4 hours per day; Aerial Lifts (1): 4 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 4 hours per day; Forklifts (2): 4 hours per day; Cranes (1): 4 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Pavers (1): 5 hours per day; Rollers (1): 4 hours per day; Paving Equipment (1): 4 hours per day; Tractors/Loaders/Backhoes (1): 4 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 4 hours per day; Trenchers (1): 4 hours per day

Trips and VMT - Demolition: 20 Worker Trips, 0 Vendor Trips, 10 Hauling Trips
Site Preparation: 10 Work Trips, 0 Vendor Trips, 0 Hauling Trips
Building Construction: 20 Worker Trips, 5 Vendor Trips, 0 Hauling
Paving: 10 Worker Trips, 1 Vendor Trips, 0 Hauling

Demolition -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	150.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00

tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	1.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	15.00	10.00

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					
2020	1.5309	14.1280	9.7903	0.0188	5.3811	0.7581	6.0762	2.9261	0.7133	3.5656	0.0000	1,815.5846	1,815.5846	0.3549	0.0000	1,824.4564
Maximum	**1.5309**	**14.1280**	**9.7903**	**0.0188**	**5.3811**	**0.7581**	**6.0762**	**2.9261**	**0.7133**	**3.5656**	**0.0000**	**1,815.5846**	**1,815.5846**	**0.3549**	**0.0000**	**1,824.4564**

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					
2020	1.5309	14.1280	9.7903	0.0188	5.3811	0.7581	6.0762	2.9261	0.7133	3.5656	0.0000	1,815.5846	1,815.5846	0.3549	0.0000	1,824.4564
Maximum	**1.5309**	**14.1280**	**9.7903**	**0.0188**	**5.3811**	**0.7581**	**6.0762**	**2.9261**	**0.7133**	**3.5656**	**0.0000**	**1,815.5846**	**1,815.5846**	**0.3549**	**0.0000**	**1,824.4564**

	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**

	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	1/2/2020	1/29/2020	5	20	
2	Site Preparation	Site Preparation	1/30/2020	2/5/2020	5	5	
3	Building Construction	Building Construction	2/6/2020	9/2/2020	5	150	
4	Paving	Paving	9/3/2020	9/9/2020	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

PAR1110.2_Construction_Stationary Gas Turbine & New 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
Demolition	Cranes	1	4.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Rubber Tired Dozers	1	4.00	247	0.40
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Aerial Lifts	1	4.00	63	0.31
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Welders	2	4.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	5.00	130	0.42
Paving	Paving Equipment	1	4.00	132	0.36
Paving	Rollers	1	4.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	4.00	97	0.37

Trips and VMT

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	5	20.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	20.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	10.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 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					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.4367	13.9311	8.8755	0.0161		0.7559	0.7559		0.7113	0.7113		1,544.784 7	1,544.784 7	0.3455		1,553.421 6
Total	**1.4367**	**13.9311**	**8.8755**	**0.0161**	**0.0000**	**0.7559**	**0.7559**	**0.0000**	**0.7113**	**0.7113**		**1,544.784 7**	**1,544.784 7**	**0.3455**		**1,553.421 6**

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	3.8000e-003	0.1361	0.0271	3.9000e-004	8.7400e-003	4.4000e-004	9.1800e-003	2.3900e-003	4.2000e-004	2.8100e-003		41.9165	41.9165	2.8100e-003		41.9868
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	0.0905	0.0608	0.8176	2.3000e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		228.8835	228.8835	6.5800e-003		229.0480
Total	**0.0943**	**0.1969**	**0.8447**	**2.6900e-003**	**0.2323**	**2.1400e-003**	**0.2344**	**0.0617**	**1.9800e-003**	**0.0637**		**270.8000**	**270.8000**	**9.3900e-003**		**271.0348**

3.2 Demolition - 2020

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.4367	13.9311	8.8755	0.0161		0.7559	0.7559		0.7113	0.7113	0.0000	1,544.7847	1,544.7847	0.3455		1,553.4216
Total	**1.4367**	**13.9311**	**8.8755**	**0.0161**	**0.0000**	**0.7559**	**0.7559**	**0.0000**	**0.7113**	**0.7113**	**0.0000**	**1,544.7847**	**1,544.7847**	**0.3455**		**1,553.4216**

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	3.8000e-003	0.1361	0.0271	3.9000e-004	8.7400e-003	4.4000e-004	9.1800e-003	2.3900e-003	4.2000e-004	2.8100e-003		41.9165	41.9165	2.8100e-003		41.9868
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	0.0905	0.0608	0.8176	2.3000e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		228.8835	228.8835	6.5800e-003		229.0480
Total	**0.0943**	**0.1969**	**0.8447**	**2.6900e-003**	**0.2323**	**2.1400e-003**	**0.2344**	**0.0617**	**1.9800e-003**	**0.0637**		**270.8000**	**270.8000**	**9.3900e-003**		**271.0348**

3.3 Site Preparation - 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					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	1.2592	12.8666	6.0732	0.0107		0.6943	0.6943		0.6387	0.6387		1,037.7150	1,037.7150	0.3356		1,046.1054
Total	**1.2592**	**12.8666**	**6.0732**	**0.0107**	**5.2693**	**0.6943**	**5.9636**	**2.8965**	**0.6387**	**3.5352**		**1,037.7150**	**1,037.7150**	**0.3356**		**1,046.1054**

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	0.0452	0.0304	0.4088	1.1500e-003	0.1118	8.5000e-004	0.1126	0.0296	7.8000e-004	0.0304		114.4418	114.4418	3.2900e-003		114.5240
Total	**0.0452**	**0.0304**	**0.4088**	**1.1500e-003**	**0.1118**	**8.5000e-004**	**0.1126**	**0.0296**	**7.8000e-004**	**0.0304**		**114.4418**	**114.4418**	**3.2900e-003**		**114.5240**

3.3 Site Preparation - 2020

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	1.2592	12.8666	6.0732	0.0107		0.6943	0.6943		0.6387	0.6387	0.0000	1,037.7150	1,037.7150	0.3356		1,046.1054
Total	**1.2592**	**12.8666**	**6.0732**	**0.0107**	**5.2693**	**0.6943**	**5.9636**	**2.8965**	**0.6387**	**3.5352**	**0.0000**	**1,037.7150**	**1,037.7150**	**0.3356**		**1,046.1054**

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	0.0452	0.0304	0.4088	1.1500e-003	0.1118	8.5000e-004	0.1126	0.0296	7.8000e-004	0.0304		114.4418	114.4418	3.2900e-003		114.5240
Total	**0.0452**	**0.0304**	**0.4088**	**1.1500e-003**	**0.1118**	**8.5000e-004**	**0.1126**	**0.0296**	**7.8000e-004**	**0.0304**		**114.4418**	**114.4418**	**3.2900e-003**		**114.5240**

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	1.2037	10.0138	8.8478	0.0152		0.5464	0.5464		0.5254	0.5254		1,413.2633	1,413.2633	0.2542		1,419.6189
Total	**1.2037**	**10.0138**	**8.8478**	**0.0152**		**0.5464**	**0.5464**		**0.5254**	**0.5254**		**1,413.2633**	**1,413.2633**	**0.2542**		**1,419.6189**

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	0.0164	0.5247	0.1249	1.2900e-003	0.0320	2.6000e-003	0.0346	9.2100e-003	2.4900e-003	0.0117		137.2242	137.2242	8.6200e-003		137.4396
Worker	0.0905	0.0608	0.8176	2.3000e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		228.8835	228.8835	6.5800e-003		229.0480
Total	**0.1069**	**0.5855**	**0.9426**	**3.5900e-003**	**0.2556**	**4.3000e-003**	**0.2599**	**0.0685**	**4.0500e-003**	**0.0726**		**366.1077**	**366.1077**	**0.0152**		**366.4876**

3.4 Building Construction - 2020

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	1.2037	10.0138	8.8478	0.0152		0.5464	0.5464		0.5254	0.5254	0.0000	1,413.2633	1,413.2633	0.2542		1,419.6189
Total	**1.2037**	**10.0138**	**8.8478**	**0.0152**		**0.5464**	**0.5464**		**0.5254**	**0.5254**	**0.0000**	**1,413.2633**	**1,413.2633**	**0.2542**		**1,419.6189**

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	0.0164	0.5247	0.1249	1.2900e-003	0.0320	2.6000e-003	0.0346	9.2100e-003	2.4900e-003	0.0117		137.2242	137.2242	8.6200e-003		137.4396
Worker	0.0905	0.0608	0.8176	2.3000e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		228.8835	228.8835	6.5800e-003		229.0480
Total	**0.1069**	**0.5855**	**0.9426**	**3.5900e-003**	**0.2556**	**4.3000e-003**	**0.2599**	**0.0685**	**4.0500e-003**	**0.0726**		**366.1077**	**366.1077**	**0.0152**		**366.4876**

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	0.5208	5.1964	5.3965	8.3700e-003		0.2826	0.2826		0.2608	0.2608		797.1139	797.1139	0.2495		803.3509
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5208**	**5.1964**	**5.3965**	**8.3700e-003**		**0.2826**	**0.2826**		**0.2608**	**0.2608**		**797.1139**	**797.1139**	**0.2495**		**803.3509**

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	3.2800e-003	0.1049	0.0250	2.6000e-004	6.4000e-003	5.2000e-004	6.9200e-003	1.8400e-003	5.0000e-004	2.3400e-003		27.4449	27.4449	1.7200e-003		27.4879
Worker	0.0452	0.0304	0.4088	1.1500e-003	0.1118	8.5000e-004	0.1126	0.0296	7.8000e-004	0.0304		114.4418	114.4418	3.2900e-003		114.5240
Total	**0.0485**	**0.1354**	**0.4338**	**1.4100e-003**	**0.1182**	**1.3700e-003**	**0.1195**	**0.0315**	**1.2800e-003**	**0.0328**		**141.8866**	**141.8866**	**5.0100e-003**		**142.0119**

3.5 Paving - 2020

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	0.5208	5.1964	5.3965	8.3700e-003		0.2826	0.2826		0.2608	0.2608	0.0000	797.1139	797.1139	0.2495		803.3509
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5208**	**5.1964**	**5.3965**	**8.3700e-003**		**0.2826**	**0.2826**		**0.2608**	**0.2608**	**0.0000**	**797.1139**	**797.1139**	**0.2495**		**803.3509**

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	3.2800e-003	0.1049	0.0250	2.6000e-004	6.4000e-003	5.2000e-004	6.9200e-003	1.8400e-003	5.0000e-004	2.3400e-003		27.4449	27.4449	1.7200e-003		27.4879
Worker	0.0452	0.0304	0.4088	1.1500e-003	0.1118	8.5000e-004	0.1126	0.0296	7.8000e-004	0.0304		114.4418	114.4418	3.2900e-003		114.5240
Total	**0.0485**	**0.1354**	**0.4338**	**1.4100e-003**	**0.1182**	**1.3700e-003**	**0.1195**	**0.0315**	**1.2800e-003**	**0.0328**		**141.8866**	**141.8866**	**5.0100e-003**		**142.0119**

4.0 Operational Detail - Mobile

PAR1110.2_Construction_Stationary Gas Turbine & New SCR - South Coast AQMD Air District, Summer

4.1 Mitigation Measures Mobile

Category	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
	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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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**

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**

6.2 Area by SubCategory

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

PAR1110.2_Construction_Stationary Gas Turbine & New 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**	2020
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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - Stationary Gas Turbine: Demolition: 20 days; Site Preparation: 5 days; Building Construction: 150 days; Paving: 5 days

Off-road Equipment - Cranes (1): 3 hours per day; Forklifts (2): 6 hours per day; Generator Sets (1): 8 hours per day; Welders (2): 4 hours per day; Aerial Lifts (1): 4 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Rubber Tired Dozers (1): 4 hours per day; Forklifts (2): 4 hours per day; Cranes (1): 4 hours per day

Off-road Equipment - Cement and Mortar Mixers (1): 6 hours per day; Pavers (1): 5 hours per day; Rollers (1): 4 hours per day; Paving Equipment (1): 4 hours per day; Tractors/Loaders/Backhoes (1): 4 hours per day

Off-road Equipment - Rubber Tired Dozers (1): 7 hours per day; Tractors/Loaders/Backhoes (1): 4 hours per day; Trenchers (1): 4 hours per day

Trips and VMT - Demolition: 20 Worker Trips, 0 Vendor Trips, 10 Hauling Trips
Site Preparation: 10 Work Trips, 0 Vendor Trips, 0 Hauling Trips
Building Construction: 20 Worker Trips, 5 Vendor Trips, 0 Hauling
Paving: 10 Worker Trips, 1 Vendor Trips, 0 Hauling

Demolition -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	150.00
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00

tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	1.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	15.00	10.00

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					
2020	1.5393	14.1356	9.7232	0.0186	5.3811	0.7581	6.0762	2.9261	0.7133	3.5656	0.0000	1,800.0026	1,800.0026	0.3546	0.0000	1,808.8664
Maximum	**1.5393**	**14.1356**	**9.7232**	**0.0186**	**5.3811**	**0.7581**	**6.0762**	**2.9261**	**0.7133**	**3.5656**	**0.0000**	**1,800.0026**	**1,800.0026**	**0.3546**	**0.0000**	**1,808.8664**

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					
2020	1.5393	14.1356	9.7232	0.0186	5.3811	0.7581	6.0762	2.9261	0.7133	3.5656	0.0000	1,800.0026	1,800.0026	0.3546	0.0000	1,808.8664
Maximum	**1.5393**	**14.1356**	**9.7232**	**0.0186**	**5.3811**	**0.7581**	**6.0762**	**2.9261**	**0.7133**	**3.5656**	**0.0000**	**1,800.0026**	**1,800.0026**	**0.3546**	**0.0000**	**1,808.8664**

	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**

	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	1/2/2020	1/29/2020	5	20	
2	Site Preparation	Site Preparation	1/30/2020	2/5/2020	5	5	
3	Building Construction	Building Construction	2/6/2020	9/2/2020	5	150	
4	Paving	Paving	9/3/2020	9/9/2020	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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	1	4.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Rubber Tired Dozers	1	4.00	247	0.40
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Aerial Lifts	1	4.00	63	0.31
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Welders	2	4.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	5.00	130	0.42
Paving	Paving Equipment	1	4.00	132	0.36
Paving	Rollers	1	4.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	4.00	97	0.37

Trips and VMT

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	5	20.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	20.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	10.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 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					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.4367	13.9311	8.8755	0.0161		0.7559	0.7559		0.7113	0.7113		1,544.7847	1,544.7847	0.3455		1,553.4216
Total	**1.4367**	**13.9311**	**8.8755**	**0.0161**	**0.0000**	**0.7559**	**0.7559**	**0.0000**	**0.7113**	**0.7113**		**1,544.7847**	**1,544.7847**	**0.3455**		**1,553.4216**

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	3.9100e-003	0.1378	0.0292	3.8000e-004	8.7400e-003	4.5000e-004	9.1800e-003	2.3900e-003	4.3000e-004	2.8200e-003		41.1449	41.1449	2.9300e-003		41.2183
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	0.0987	0.0666	0.7362	2.1500e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		214.0730	214.0730	6.1400e-003		214.2265
Total	**0.1026**	**0.2044**	**0.7653**	**2.5300e-003**	**0.2323**	**2.1500e-003**	**0.2344**	**0.0617**	**1.9900e-003**	**0.0637**		**255.2179**	**255.2179**	**9.0700e-003**		**255.4448**

3.2 Demolition - 2020

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.4367	13.9311	8.8755	0.0161		0.7559	0.7559		0.7113	0.7113	0.0000	1,544.784 7	1,544.784 7	0.3455		1,553.421 6
Total	**1.4367**	**13.9311**	**8.8755**	**0.0161**	**0.0000**	**0.7559**	**0.7559**	**0.0000**	**0.7113**	**0.7113**	**0.0000**	**1,544.784 7**	**1,544.784 7**	**0.3455**		**1,553.421 6**

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	3.9100e-003	0.1378	0.0292	3.8000e-004	8.7400e-003	4.5000e-004	9.1800e-003	2.3900e-003	4.3000e-004	2.8200e-003		41.1449	41.1449	2.9300e-003		41.2183
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	0.0987	0.0666	0.7362	2.1500e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		214.0730	214.0730	6.1400e-003		214.2265
Total	**0.1026**	**0.2044**	**0.7653**	**2.5300e-003**	**0.2323**	**2.1500e-003**	**0.2344**	**0.0617**	**1.9900e-003**	**0.0637**		**255.2179**	**255.2179**	**9.0700e-003**		**255.4448**

3.3 Site Preparation - 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					
Fugitive Dust					5.2693	0.0000	5.2693	2.8965	0.0000	2.8965			0.0000			0.0000
Off-Road	1.2592	12.8666	6.0732	0.0107		0.6943	0.6943		0.6387	0.6387		1,037.715 0	1,037.715 0	0.3356		1,046.105 4
Total	**1.2592**	**12.8666**	**6.0732**	**0.0107**	**5.2693**	**0.6943**	**5.9636**	**2.8965**	**0.6387**	**3.5352**		**1,037.715 0**	**1,037.715 0**	**0.3356**		**1,046.105 4**

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	0.0494	0.0333	0.3681	1.0700e-003	0.1118	8.5000e-004	0.1126	0.0296	7.8000e-004	0.0304		107.0365	107.0365	3.0700e-003		107.1132
Total	**0.0494**	**0.0333**	**0.3681**	**1.0700e-003**	**0.1118**	**8.5000e-004**	**0.1126**	**0.0296**	**7.8000e-004**	**0.0304**		**107.0365**	**107.0365**	**3.0700e-003**		**107.1132**

3.3 Site Preparation - 2020

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	1.2592	12.8666	6.0732	0.0107		0.6943	0.6943		0.6387	0.6387	0.0000	1,037.715 0	1,037.715 0	0.3356		1,046.105 4
Total	**1.2592**	**12.8666**	**6.0732**	**0.0107**	**5.2693**	**0.6943**	**5.9636**	**2.8965**	**0.6387**	**3.5352**	**0.0000**	**1,037.715 0**	**1,037.715 0**	**0.3356**		**1,046.105 4**

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	0.0494	0.0333	0.3681	1.0700e-003	0.1118	8.5000e-004	0.1126	0.0296	7.8000e-004	0.0304		107.0365	107.0365	3.0700e-003		107.1132
Total	**0.0494**	**0.0333**	**0.3681**	**1.0700e-003**	**0.1118**	**8.5000e-004**	**0.1126**	**0.0296**	**7.8000e-004**	**0.0304**		**107.0365**	**107.0365**	**3.0700e-003**		**107.1132**

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	1.2037	10.0138	8.8478	0.0152		0.5464	0.5464		0.5254	0.5254		1,413.2633	1,413.2633	0.2542		1,419.6189
Total	**1.2037**	**10.0138**	**8.8478**	**0.0152**		**0.5464**	**0.5464**		**0.5254**	**0.5254**		**1,413.2633**	**1,413.2633**	**0.2542**		**1,419.6189**

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	0.0172	0.5241	0.1393	1.2500e-003	0.0320	2.6400e-003	0.0346	9.2100e-003	2.5200e-003	0.0117		133.2564	133.2564	9.2500e-003		133.4877
Worker	0.0987	0.0666	0.7362	2.1500e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		214.0730	214.0730	6.1400e-003		214.2265
Total	**0.1159**	**0.5907**	**0.8755**	**3.4000e-003**	**0.2556**	**4.3400e-003**	**0.2599**	**0.0685**	**4.0800e-003**	**0.0726**		**347.3294**	**347.3294**	**0.0154**		**347.7142**

3.4 Building Construction - 2020

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	1.2037	10.0138	8.8478	0.0152		0.5464	0.5464		0.5254	0.5254	0.0000	1,413.2633	1,413.2633	0.2542		1,419.6189
Total	**1.2037**	**10.0138**	**8.8478**	**0.0152**		**0.5464**	**0.5464**		**0.5254**	**0.5254**	**0.0000**	**1,413.2633**	**1,413.2633**	**0.2542**		**1,419.6189**

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	0.0172	0.5241	0.1393	1.2500e-003	0.0320	2.6400e-003	0.0346	9.2100e-003	2.5200e-003	0.0117		133.2564	133.2564	9.2500e-003		133.4877
Worker	0.0987	0.0666	0.7362	2.1500e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		214.0730	214.0730	6.1400e-003		214.2265
Total	**0.1159**	**0.5907**	**0.8755**	**3.4000e-003**	**0.2556**	**4.3400e-003**	**0.2599**	**0.0685**	**4.0800e-003**	**0.0726**		**347.3294**	**347.3294**	**0.0154**		**347.7142**

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	0.5208	5.1964	5.3965	8.3700e-003		0.2826	0.2826		0.2608	0.2608		797.1139	797.1139	0.2495		803.3509
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5208**	**5.1964**	**5.3965**	**8.3700e-003**		**0.2826**	**0.2826**		**0.2608**	**0.2608**		**797.1139**	**797.1139**	**0.2495**		**803.3509**

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	3.4400e-003	0.1048	0.0279	2.5000e-004	6.4000e-003	5.3000e-004	6.9300e-003	1.8400e-003	5.0000e-004	2.3500e-003		26.6513	26.6513	1.8500e-003		26.6976
Worker	0.0494	0.0333	0.3681	1.0700e-003	0.1118	8.5000e-004	0.1126	0.0296	7.8000e-004	0.0304		107.0365	107.0365	3.0700e-003		107.1132
Total	**0.0528**	**0.1381**	**0.3960**	**1.3200e-003**	**0.1182**	**1.3800e-003**	**0.1196**	**0.0315**	**1.2800e-003**	**0.0328**		**133.6878**	**133.6878**	**4.9200e-003**		**133.8108**

3.5 Paving - 2020

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	0.5208	5.1964	5.3965	8.3700e-003		0.2826	0.2826		0.2608	0.2608	0.0000	797.1139	797.1139	0.2495		803.3509
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5208**	**5.1964**	**5.3965**	**8.3700e-003**		**0.2826**	**0.2826**		**0.2608**	**0.2608**	**0.0000**	**797.1139**	**797.1139**	**0.2495**		**803.3509**

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	3.4400e-003	0.1048	0.0279	2.5000e-004	6.4000e-003	5.3000e-004	6.9300e-003	1.8400e-003	5.0000e-004	2.3500e-003		26.6513	26.6513	1.8500e-003		26.6976
Worker	0.0494	0.0333	0.3681	1.0700e-003	0.1118	8.5000e-004	0.1126	0.0296	7.8000e-004	0.0304		107.0365	107.0365	3.0700e-003		107.1132
Total	**0.0528**	**0.1381**	**0.3960**	**1.3200e-003**	**0.1182**	**1.3800e-003**	**0.1196**	**0.0315**	**1.2800e-003**	**0.0328**		**133.6878**	**133.6878**	**4.9200e-003**		**133.8108**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR - South Coast AQMD Air District, Winter

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**

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**

6.2 Area by SubCategory

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

CalEEMod® Files and Assumptions

PAR 1110.2 Construction: Engine Replacement and NSCR System

PAR1110.2_Construction_IC Engine_OCS

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**	2020
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

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - IC Engine: Demolition: 10 days; Building Construction: 60 days

Off-road Equipment - Cranes (2): 4 hours per day; Welders (2): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Cranes (2): 4 hours per day

Off-road Equipment -

Trips and VMT - Demolition: 8 Worker Trips, 0 Vendor Trips, 1 Hauling Trips
Building Construction: 15 Worker Trips, 4 Vendor Trips, 0 Hauling

Demolition -

Stationary Sources - Emergency Generators and Fire Pumps -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	60.00
tblConstructionPhase	NumDays	0.00	10.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Building Construction
tblTripsAndVMT	HaulingTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00

2.0 Emissions Summary

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					
2020	0.0383	0.2806	0.2071	4.4000e-004	6.1400e-003	0.0127	0.0189	1.6500e-003	0.0122	0.0138	0.0000	36.4036	36.4036	6.8900e-003	0.0000	36.5759
Maximum	**0.0383**	**0.2806**	**0.2071**	**4.4000e-004**	**6.1400e-003**	**0.0127**	**0.0189**	**1.6500e-003**	**0.0122**	**0.0138**	**0.0000**	**36.4036**	**36.4036**	**6.8900e-003**	**0.0000**	**36.5759**

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					
2020	0.0383	0.2806	0.2071	4.4000e-004	6.1400e-003	0.0127	0.0189	1.6500e-003	0.0122	0.0138	0.0000	36.4035	36.4035	6.8900e-003	0.0000	36.5759
Maximum	**0.0383**	**0.2806**	**0.2071**	**4.4000e-004**	**6.1400e-003**	**0.0127**	**0.0189**	**1.6500e-003**	**0.0122**	**0.0138**	**0.0000**	**36.4035**	**36.4035**	**6.8900e-003**	**0.0000**	**36.5759**

	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-2-2020**	**4-1-2020**	0.2959	0.2959
2	**4-2-2020**	**7-1-2020**	0.0230	0.0230
		Highest	0.2959	0.2959

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

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/2/2020	1/15/2020	5	10	
2	Building Construction	Building Construction	1/16/2020	4/8/2020	5	60	

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)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	2	4.00	190	0.29
Building Construction	Cranes	2	4.00	190	0.29
Building Construction	Welders	2	8.00	46	0.45

<u>Trips and VMT</u>

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	7	8.00	0.00	1.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	15.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 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					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.9600e-003	0.0387	0.0271	6.0000e-005		1.9000e-003	1.9000e-003		1.8300e-003	1.8300e-003	0.0000	4.7730	4.7730	8.4000e-004	0.0000	4.7942
Total	**3.9600e-003**	**0.0387**	**0.0271**	**6.0000e-005**	**0.0000**	**1.9000e-003**	**1.9000e-003**	**0.0000**	**1.8300e-003**	**1.8300e-003**	**0.0000**	**4.7730**	**4.7730**	**8.4000e-004**	**0.0000**	**4.7942**

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	1.4000e-004	3.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0377	0.0377	0.0000	0.0000	0.0378
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	1.8000e-004	1.4000e-004	1.5100e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3951	0.3951	1.0000e-005	0.0000	0.3954
Total	**1.8000e-004**	**2.8000e-004**	**1.5400e-003**	**0.0000**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.4328**	**0.4328**	**1.0000e-005**	**0.0000**	**0.4332**

3.2 Demolition - 2020

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.9600e-003	0.0387	0.0271	6.0000e-005		1.9000e-003	1.9000e-003		1.8300e-003	1.8300e-003	0.0000	4.7730	4.7730	8.4000e-004	0.0000	4.7942
Total	**3.9600e-003**	**0.0387**	**0.0271**	**6.0000e-005**	**0.0000**	**1.9000e-003**	**1.9000e-003**	**0.0000**	**1.8300e-003**	**1.8300e-003**	**0.0000**	**4.7730**	**4.7730**	**8.4000e-004**	**0.0000**	**4.7942**

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	1.4000e-004	3.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0377	0.0377	0.0000	0.0000	0.0378
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	1.8000e-004	1.4000e-004	1.5100e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3951	0.3951	1.0000e-005	0.0000	0.3954
Total	**1.8000e-004**	**2.8000e-004**	**1.5400e-003**	**0.0000**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.4328**	**0.4328**	**1.0000e-005**	**0.0000**	**0.4332**

3.3 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	0.0317	0.2273	0.1582	3.0000e-004		0.0107	0.0107		0.0103	0.0103	0.0000	23.8018	23.8018	5.7100e-003	0.0000	23.9447
Total	**0.0317**	**0.2273**	**0.1582**	**3.0000e-004**		**0.0107**	**0.0107**		**0.0103**	**0.0103**	**0.0000**	**23.8018**	**23.8018**	**5.7100e-003**	**0.0000**	**23.9447**

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-004	0.0128	3.1700e-003	3.0000e-005	7.6000e-004	6.0000e-005	8.2000e-004	2.2000e-004	6.0000e-005	2.8000e-004	0.0000	2.9514	2.9514	1.9000e-004	0.0000	2.9563
Worker	2.0100e-003	1.5400e-003	0.0170	5.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	4.0000e-005	1.3500e-003	0.0000	4.4445	4.4445	1.3000e-004	0.0000	4.4477
Total	**2.4100e-003**	**0.0144**	**0.0202**	**8.0000e-005**	**5.7000e-003**	**1.0000e-004**	**5.8000e-003**	**1.5300e-003**	**1.0000e-004**	**1.6300e-003**	**0.0000**	**7.3959**	**7.3959**	**3.2000e-004**	**0.0000**	**7.4040**

3.3 Building Construction - 2020

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	0.0317	0.2273	0.1582	3.0000e-004		0.0107	0.0107		0.0103	0.0103	0.0000	23.8018	23.8018	5.7100e-003	0.0000	23.9446
Total	**0.0317**	**0.2273**	**0.1582**	**3.0000e-004**		**0.0107**	**0.0107**		**0.0103**	**0.0103**	**0.0000**	**23.8018**	**23.8018**	**5.7100e-003**	**0.0000**	**23.9446**

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-004	0.0128	3.1700e-003	3.0000e-005	7.6000e-004	6.0000e-005	8.2000e-004	2.2000e-004	6.0000e-005	2.8000e-004	0.0000	2.9514	2.9514	1.9000e-004	0.0000	2.9563
Worker	2.0100e-003	1.5400e-003	0.0170	5.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	4.0000e-005	1.3500e-003	0.0000	4.4445	4.4445	1.3000e-004	0.0000	4.4477
Total	**2.4100e-003**	**0.0144**	**0.0202**	**8.0000e-005**	**5.7000e-003**	**1.0000e-004**	**5.8000e-003**	**1.5300e-003**	**1.0000e-004**	**1.6300e-003**	**0.0000**	**7.3959**	**7.3959**	**3.2000e-004**	**0.0000**	**7.4040**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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**

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**

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**

6.2 Area by SubCategory

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

<u>Unmitigated</u>

	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

PAR1110.2_Construction_IC Engine_OCS

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**	2020
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

PAR1110.2_Construction_IC Engine_OCS - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - IC Engine: Demolition: 10 days; Building Construction: 60 days

Off-road Equipment - Cranes (2): 4 hours per day; Welders (2): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Cranes (2): 4 hours per day

Off-road Equipment -

Trips and VMT - Demolition: 8 Worker Trips, 0 Vendor Trips, 1 Hauling Trips
Building Construction: 15 Worker Trips, 4 Vendor Trips, 0 Hauling

Demolition -

Stationary Sources - Emergency Generators and Fire Pumps -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	60.00
tblConstructionPhase	NumDays	0.00	10.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Building Construction
tblTripsAndVMT	HaulingTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00

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					
2020	1.1381	8.0426	5.9871	0.0126	0.1933	0.3817	0.5532	0.0518	0.3671	0.3970	0.0000	1,156.0080	1,156.0080	0.2218	0.0000	1,161.5532
Maximum	**1.1381**	**8.0426**	**5.9871**	**0.0126**	**0.1933**	**0.3817**	**0.5532**	**0.0518**	**0.3671**	**0.3970**	**0.0000**	**1,156.0080**	**1,156.0080**	**0.2218**	**0.0000**	**1,161.5532**

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					
2020	1.1381	8.0426	5.9871	0.0126	0.1933	0.3817	0.5532	0.0518	0.3671	0.3970	0.0000	1,156.0080	1,156.0080	0.2218	0.0000	1,161.5532
Maximum	**1.1381**	**8.0426**	**5.9871**	**0.0126**	**0.1933**	**0.3817**	**0.5532**	**0.0518**	**0.3671**	**0.3970**	**0.0000**	**1,156.0080**	**1,156.0080**	**0.2218**	**0.0000**	**1,161.5532**

	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**

	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	1/2/2020	1/15/2020	5	10	
2	Building Construction	Building Construction	1/16/2020	4/8/2020	5	60	

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	2	4.00	190	0.29
Building Construction	Cranes	2	4.00	190	0.29
Building Construction	Welders	2	8.00	46	0.45

Trips and VMT

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	7	8.00	0.00	1.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	15.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 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					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.7911	7.7332	5.4265	0.0110		0.3810	0.3810		0.3663	0.3663		1,052.2752	1,052.2752	0.1862		1,056.9299
Total	**0.7911**	**7.7332**	**5.4265**	**0.0110**	**1.0000e-005**	**0.3810**	**0.3810**	**0.0000**	**0.3663**	**0.3663**		**1,052.2752**	**1,052.2752**	**0.1862**		**1,056.9299**

3.2 Demolition - 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	7.6000e-004	0.0272	5.4100e-003	8.0000e-005	1.7500e-003	9.0000e-005	1.8400e-003	4.8000e-004	8.0000e-005	5.6000e-004		8.3833	8.3833	5.6000e-004		8.3974
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	0.0362	0.0243	0.3271	9.2000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		91.5534	91.5534	2.6300e-003		91.6192
Total	**0.0370**	**0.0515**	**0.3325**	**1.0000e-003**	**0.0912**	**7.7000e-004**	**0.0919**	**0.0242**	**7.0000e-004**	**0.0249**		**99.9367**	**99.9367**	**3.1900e-003**		**100.0166**

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					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.7911	7.7332	5.4265	0.0110		0.3810	0.3810		0.3663	0.3663	0.0000	1,052.2752	1,052.2752	0.1862		1,056.9299
Total	**0.7911**	**7.7332**	**5.4265**	**0.0110**	**1.0000e-005**	**0.3810**	**0.3810**	**0.0000**	**0.3663**	**0.3663**	**0.0000**	**1,052.2752**	**1,052.2752**	**0.1862**		**1,056.9299**

3.2 Demolition - 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	7.6000e-004	0.0272	5.4100e-003	8.0000e-005	1.7500e-003	9.0000e-005	1.8400e-003	4.8000e-004	8.0000e-005	5.6000e-004		8.3833	8.3833	5.6000e-004		8.3974
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	0.0362	0.0243	0.3271	9.2000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		91.5534	91.5534	2.6300e-003		91.6192
Total	**0.0370**	**0.0515**	**0.3325**	**1.0000e-003**	**0.0912**	**7.7000e-004**	**0.0919**	**0.0242**	**7.0000e-004**	**0.0249**		**99.9367**	**99.9367**	**3.1900e-003**		**100.0166**

3.3 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	1.0571	7.5773	5.2739	9.8600e-003		0.3566	0.3566		0.3420	0.3420		874.5660	874.5660	0.2100		879.8155
Total	**1.0571**	**7.5773**	**5.2739**	**9.8600e-003**		**0.3566**	**0.3566**		**0.3420**	**0.3420**		**874.5660**	**874.5660**	**0.2100**		**879.8155**

3.3 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	0.0131	0.4197	0.1000	1.0300e-003	0.0256	2.0800e-003	0.0277	7.3700e-003	1.9900e-003	9.3600e-003		109.7794	109.7794	6.8900e-003		109.9517
Worker	0.0679	0.0456	0.6132	1.7200e-003	0.1677	1.2700e-003	0.1689	0.0445	1.1700e-003	0.0456		171.6626	171.6626	4.9400e-003		171.7860
Total	**0.0810**	**0.4654**	**0.7132**	**2.7500e-003**	**0.1933**	**3.3500e-003**	**0.1966**	**0.0518**	**3.1600e-003**	**0.0550**		**281.4420**	**281.4420**	**0.0118**		**281.7377**

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	1.0571	7.5773	5.2739	9.8600e-003		0.3566	0.3566		0.3420	0.3420	0.0000	874.5660	874.5660	0.2100		879.8155
Total	**1.0571**	**7.5773**	**5.2739**	**9.8600e-003**		**0.3566**	**0.3566**		**0.3420**	**0.3420**	**0.0000**	**874.5660**	**874.5660**	**0.2100**		**879.8155**

3.3 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	0.0131	0.4197	0.1000	1.0300e-003	0.0256	2.0800e-003	0.0277	7.3700e-003	1.9900e-003	9.3600e-003		109.7794	109.7794	6.8900e-003		109.9517
Worker	0.0679	0.0456	0.6132	1.7200e-003	0.1677	1.2700e-003	0.1689	0.0445	1.1700e-003	0.0456		171.6626	171.6626	4.9400e-003		171.7860
Total	**0.0810**	**0.4654**	**0.7132**	**2.7500e-003**	**0.1933**	**3.3500e-003**	**0.1966**	**0.0518**	**3.1600e-003**	**0.0550**		**281.4420**	**281.4420**	**0.0118**		**281.7377**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

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

PAR1110.2_Construction_IC Engine_OCS

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**	2020
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

PAR1110.2_Construction_IC Engine_OCS - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use -

Construction Phase - Construction Phase - IC Engine: Demolition: 10 days; Building Construction: 60 days

Off-road Equipment - Cranes (2): 4 hours per day; Welders (2): 8 hours per day

Off-road Equipment - Concrete/Industrial Saws (1): 8 hours per day; Cranes (2): 4 hours per day

Off-road Equipment -

Trips and VMT - Demolition: 8 Worker Trips, 0 Vendor Trips, 1 Hauling Trips
Building Construction: 15 Worker Trips, 4 Vendor Trips, 0 Hauling

Demolition -

Stationary Sources - Emergency Generators and Fire Pumps -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	60.00
tblConstructionPhase	NumDays	0.00	10.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	HorsePower	231.00	190.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Building Construction
tblTripsAndVMT	HaulingTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	15.00

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					
2020	1.1449	8.0465	5.9375	0.0125	0.1933	0.3817	0.5533	0.0518	0.3671	0.3970	0.0000	1,146.1333	1,146.1333	0.2220	0.0000	1,150.8642
Maximum	**1.1449**	**8.0465**	**5.9375**	**0.0125**	**0.1933**	**0.3817**	**0.5533**	**0.0518**	**0.3671**	**0.3970**	**0.0000**	**1,146.1333**	**1,146.1333**	**0.2220**	**0.0000**	**1,150.8642**

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					
2020	1.1449	8.0465	5.9375	0.0125	0.1933	0.3817	0.5533	0.0518	0.3671	0.3970	0.0000	1,146.1333	1,146.1333	0.2220	0.0000	1,150.8642
Maximum	**1.1449**	**8.0465**	**5.9375**	**0.0125**	**0.1933**	**0.3817**	**0.5533**	**0.0518**	**0.3671**	**0.3970**	**0.0000**	**1,146.1333**	**1,146.1333**	**0.2220**	**0.0000**	**1,150.8642**

	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**

	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	1/2/2020	1/15/2020	5	10	
2	Building Construction	Building Construction	1/16/2020	4/8/2020	5	60	

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Cranes	2	4.00	190	0.29
Building Construction	Cranes	2	4.00	190	0.29
Building Construction	Welders	2	8.00	46	0.45

Trips and VMT

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	7	8.00	0.00	1.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	15.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 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					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.7911	7.7332	5.4265	0.0110		0.3810	0.3810		0.3663	0.3663		1,052.2752	1,052.2752	0.1862		1,056.9299
Total	**0.7911**	**7.7332**	**5.4265**	**0.0110**	**1.0000e-005**	**0.3810**	**0.3810**	**0.0000**	**0.3663**	**0.3663**		**1,052.2752**	**1,052.2752**	**0.1862**		**1,056.9299**

3.2 Demolition - 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	7.8000e-004	0.0276	5.8300e-003	8.0000e-005	1.7500e-003	9.0000e-005	1.8400e-003	4.8000e-004	9.0000e-005	5.6000e-004		8.2290	8.2290	5.9000e-004		8.2437
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	0.0395	0.0266	0.2945	8.6000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		85.6292	85.6292	2.4600e-003		85.6906
Total	**0.0403**	**0.0542**	**0.3003**	**9.4000e-004**	**0.0912**	**7.7000e-004**	**0.0919**	**0.0242**	**7.1000e-004**	**0.0249**		**93.8582**	**93.8582**	**3.0500e-003**		**93.9343**

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					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.7911	7.7332	5.4265	0.0110		0.3810	0.3810		0.3663	0.3663	0.0000	1,052.2752	1,052.2752	0.1862		1,056.9299
Total	**0.7911**	**7.7332**	**5.4265**	**0.0110**	**1.0000e-005**	**0.3810**	**0.3810**	**0.0000**	**0.3663**	**0.3663**	**0.0000**	**1,052.2752**	**1,052.2752**	**0.1862**		**1,056.9299**

3.2 Demolition - 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	7.8000e-004	0.0276	5.8300e-003	8.0000e-005	1.7500e-003	9.0000e-005	1.8400e-003	4.8000e-004	9.0000e-005	5.6000e-004		8.2290	8.2290	5.9000e-004		8.2437
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	0.0395	0.0266	0.2945	8.6000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		85.6292	85.6292	2.4600e-003		85.6906
Total	**0.0403**	**0.0542**	**0.3003**	**9.4000e-004**	**0.0912**	**7.7000e-004**	**0.0919**	**0.0242**	**7.1000e-004**	**0.0249**		**93.8582**	**93.8582**	**3.0500e-003**		**93.9343**

3.3 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	1.0571	7.5773	5.2739	9.8600e-003		0.3566	0.3566		0.3420	0.3420		874.5660	874.5660	0.2100		879.8155
Total	**1.0571**	**7.5773**	**5.2739**	**9.8600e-003**		**0.3566**	**0.3566**		**0.3420**	**0.3420**		**874.5660**	**874.5660**	**0.2100**		**879.8155**

3.3 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	0.0138	0.4193	0.1114	1.0000e-003	0.0256	2.1100e-003	0.0277	7.3700e-003	2.0200e-003	9.3900e-003		106.6051	106.6051	7.4000e-003		106.7902
Worker	0.0740	0.0500	0.5521	1.6100e-003	0.1677	1.2700e-003	0.1689	0.0445	1.1700e-003	0.0456		160.5547	160.5547	4.6000e-003		160.6699
Total	**0.0878**	**0.4693**	**0.6636**	**2.6100e-003**	**0.1933**	**3.3800e-003**	**0.1967**	**0.0518**	**3.1900e-003**	**0.0550**		**267.1599**	**267.1599**	**0.0120**		**267.4600**

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	1.0571	7.5773	5.2739	9.8600e-003		0.3566	0.3566		0.3420	0.3420	0.0000	874.5660	874.5660	0.2100		879.8155
Total	**1.0571**	**7.5773**	**5.2739**	**9.8600e-003**		**0.3566**	**0.3566**		**0.3420**	**0.3420**	**0.0000**	**874.5660**	**874.5660**	**0.2100**		**879.8155**

3.3 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	0.0138	0.4193	0.1114	1.0000e-003	0.0256	2.1100e-003	0.0277	7.3700e-003	2.0200e-003	9.3900e-003		106.6051	106.6051	7.4000e-003		106.7902
Worker	0.0740	0.0500	0.5521	1.6100e-003	0.1677	1.2700e-003	0.1689	0.0445	1.1700e-003	0.0456		160.5547	160.5547	4.6000e-003		160.6699
Total	**0.0878**	**0.4693**	**0.6636**	**2.6100e-003**	**0.1933**	**3.3800e-003**	**0.1967**	**0.0518**	**3.1900e-003**	**0.0550**		**267.1599**	**267.1599**	**0.0120**		**267.4600**

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	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	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
	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

Land Use	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
	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

SubCategory	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
	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

SubCategory	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
	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-5

CalEEMod® Files and Assumptions

PAR 1110.2 Construction: Facility-wide Engine Modernization

PAR1110.2_Construction_Facility-wide Engine Modernization

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**	2024
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

Project Characteristics -

Land Use -

Construction Phase - Project specific construction schedule - scaled from SCAQMD DSEA model run based on revised number of equipment.

Off-road Equipment - Project specific equipment mix.

Off-road Equipment - Project specific equipment mix. Water Trucks and Dump Trucks modeled as Off-Highway Trucks.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks. Compactor modeled as Other Construction Equipment.

Trips and VMT - Building construction worker trips increased from SCAQMD DSEA based on the increase in number of equipment. Vendor and hauling trips based on SCAQMD DSEA.

Grading - 100,000 squarefeet of land disturbed during site prep.

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	279.00
tblConstructionPhase	NumDays	0.00	56.00
tblConstructionPhase	NumDays	0.00	12.00
tblConstructionPhase	NumDays	0.00	15.00
tblGrading	AcresOfGrading	0.00	2.30
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

2.0 Emissions Summary

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					
2023	0.3637	3.3928	2.9743	6.7200e-003	0.1898	0.1429	0.3327	0.0877	0.1348	0.2225	0.0000	582.9767	582.9767	0.1257	0.0000	586.1202
2024	0.1822	1.5060	1.4194	3.8600e-003	0.0205	0.0623	0.0828	5.4500e-003	0.0581	0.0636	0.0000	338.1156	338.1156	0.0912	0.0000	340.3957
Maximum	**0.3637**	**3.3928**	**2.9743**	**6.7200e-003**	**0.1898**	**0.1429**	**0.3327**	**0.0877**	**0.1348**	**0.2225**	**0.0000**	**582.9767**	**582.9767**	**0.1257**	**0.0000**	**586.1202**

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					
2023	0.3637	3.3928	2.9743	6.7200e-003	0.1898	0.1429	0.3327	0.0877	0.1348	0.2225	0.0000	582.9761	582.9761	0.1257	0.0000	586.1195
2024	0.1822	1.5060	1.4194	3.8600e-003	0.0205	0.0623	0.0828	5.4500e-003	0.0581	0.0636	0.0000	338.1152	338.1152	0.0912	0.0000	340.3953
Maximum	**0.3637**	**3.3928**	**2.9743**	**6.7200e-003**	**0.1898**	**0.1429**	**0.3327**	**0.0877**	**0.1348**	**0.2225**	**0.0000**	**582.9761**	**582.9761**	**0.1257**	**0.0000**	**586.1195**

	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-2-2023**	**4-1-2023**	0.9289	0.9289
2	**4-2-2023**	**7-1-2023**	0.9388	0.9388
3	**7-2-2023**	**10-1-2023**	0.9491	0.9491
4	**10-2-2023**	**1-1-2024**	0.9491	0.9491
5	**1-2-2024**	**4-1-2024**	0.7452	0.7452
6	**4-2-2024**	**7-1-2024**	0.9197	0.9197
		Highest	0.9491	0.9491

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

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/2/2023	1/20/2023	5	15	
2	Building Construction	Building Construction	1/21/2023	2/15/2024	5	279	
3	Paving	Paving	2/16/2024	3/4/2024	5	12	
4	Demolition	Demolition	3/19/2024	6/4/2024	5	56	

Acres of Grading (Site Preparation Phase): 2.3

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)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Off-Highway Trucks	2	6.00	402	0.38
Site Preparation	Other Construction Equipment	1	8.00	172	0.42
Site Preparation	Rubber Tired Dozers	2	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Aerial Lifts	3	7.00	63	0.31
Building Construction	Cranes	4	8.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Welders	2	6.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Off-Highway Trucks	2	6.00	402	0.38
Paving	Pavers	1	5.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	3	6.00	97	0.37
Demolition	Concrete/Industrial Saws	2	6.00	81	0.73
Demolition	Cranes	1	6.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Off-Highway Trucks	3	8.00	402	0.38
Demolition	Off-Highway Trucks	2	6.00	402	0.38
Demolition	Rubber Tired Dozers	2	6.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

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
Site Preparation	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	13	38.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	30.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	14	35.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2023

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					0.1330	0.0000	0.1330	0.0725	0.0000	0.0725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1946	0.1510	3.7000e-004		8.9800e-003	8.9800e-003		8.2700e-003	8.2700e-003	0.0000	32.1967	32.1967	0.0104	0.0000	32.4570
Total	**0.0208**	**0.1946**	**0.1510**	**3.7000e-004**	**0.1330**	**8.9800e-003**	**0.1419**	**0.0725**	**8.2700e-003**	**0.0808**	**0.0000**	**32.1967**	**32.1967**	**0.0104**	**0.0000**	**32.4570**

3.2 Site Preparation - 2023

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	6.4000e-004	4.3000e-004	5.1200e-003	2.0000e-005	1.8900e-003	1.0000e-005	1.9100e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5301	1.5301	4.0000e-005	0.0000	1.5310
Total	**6.4000e-004**	**4.3000e-004**	**5.1200e-003**	**2.0000e-005**	**1.8900e-003**	**1.0000e-005**	**1.9100e-003**	**5.0000e-004**	**1.0000e-005**	**5.1000e-004**	**0.0000**	**1.5301**	**1.5301**	**4.0000e-005**	**0.0000**	**1.5310**

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					0.1330	0.0000	0.1330	0.0725	0.0000	0.0725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1946	0.1510	3.7000e-004		8.9800e-003	8.9800e-003		8.2700e-003	8.2700e-003	0.0000	32.1966	32.1966	0.0104	0.0000	32.4569
Total	**0.0208**	**0.1946**	**0.1510**	**3.7000e-004**	**0.1330**	**8.9800e-003**	**0.1419**	**0.0725**	**8.2700e-003**	**0.0808**	**0.0000**	**32.1966**	**32.1966**	**0.0104**	**0.0000**	**32.4569**

3.2 Site Preparation - 2023

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	6.4000e-004	4.3000e-004	5.1200e-003	2.0000e-005	1.8900e-003	1.0000e-005	1.9100e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5301	1.5301	4.0000e-005	0.0000	1.5310
Total	**6.4000e-004**	**4.3000e-004**	**5.1200e-003**	**2.0000e-005**	**1.8900e-003**	**1.0000e-005**	**1.9100e-003**	**5.0000e-004**	**1.0000e-005**	**5.1000e-004**	**0.0000**	**1.5301**	**1.5301**	**4.0000e-005**	**0.0000**	**1.5310**

3.3 Building Construction - 2023

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	0.3239	3.1438	2.6677	5.7300e-003		0.1335	0.1335		0.1261	0.1261	0.0000	493.5829	493.5829	0.1135	0.0000	496.4211
Total	**0.3239**	**3.1438**	**2.6677**	**5.7300e-003**		**0.1335**	**0.1335**		**0.1261**	**0.1261**	**0.0000**	**493.5829**	**493.5829**	**0.1135**	**0.0000**	**496.4211**

3.3 Building Construction - 2023

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	1.2200e-003	0.0423	0.0124	1.5000e-004	3.8600e-003	5.0000e-005	3.9100e-003	1.1100e-003	5.0000e-005	1.1600e-003	0.0000	14.3755	14.3755	7.9000e-004	0.0000	14.3953
Worker	0.0172	0.0117	0.1381	4.6000e-004	0.0511	3.6000e-004	0.0514	0.0136	3.3000e-004	0.0139	0.0000	41.2914	41.2914	9.7000e-004	0.0000	41.3157
Total	**0.0184**	**0.0540**	**0.1505**	**6.1000e-004**	**0.0549**	**4.1000e-004**	**0.0553**	**0.0147**	**3.8000e-004**	**0.0151**	**0.0000**	**55.6670**	**55.6670**	**1.7600e-003**	**0.0000**	**55.7110**

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	0.3239	3.1438	2.6677	5.7300e-003		0.1335	0.1335		0.1261	0.1261	0.0000	493.5823	493.5823	0.1135	0.0000	496.4205
Total	**0.3239**	**3.1438**	**2.6677**	**5.7300e-003**		**0.1335**	**0.1335**		**0.1261**	**0.1261**	**0.0000**	**493.5823**	**493.5823**	**0.1135**	**0.0000**	**496.4205**

3.3 Building Construction - 2023

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	1.2200e-003	0.0423	0.0124	1.5000e-004	3.8600e-003	5.0000e-005	3.9100e-003	1.1100e-003	5.0000e-005	1.1600e-003	0.0000	14.3755	14.3755	7.9000e-004	0.0000	14.3953
Worker	0.0172	0.0117	0.1381	4.6000e-004	0.0511	3.6000e-004	0.0514	0.0136	3.3000e-004	0.0139	0.0000	41.2914	41.2914	9.7000e-004	0.0000	41.3157
Total	**0.0184**	**0.0540**	**0.1505**	**6.1000e-004**	**0.0549**	**4.1000e-004**	**0.0553**	**0.0147**	**3.8000e-004**	**0.0151**	**0.0000**	**55.6670**	**55.6670**	**1.7600e-003**	**0.0000**	**55.7110**

3.3 Building Construction - 2024

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	0.0422	0.4060	0.3655	8.0000e-004		0.0166	0.0166		0.0157	0.0157	0.0000	68.4965	68.4965	0.0157	0.0000	68.8878
Total	**0.0422**	**0.4060**	**0.3655**	**8.0000e-004**		**0.0166**	**0.0166**		**0.0157**	**0.0157**	**0.0000**	**68.4965**	**68.4965**	**0.0157**	**0.0000**	**68.8878**

3.3 Building Construction - 2024

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	1.7000e-004	5.8500e-003	1.6700e-003	2.0000e-005	5.4000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.6000e-004	0.0000	1.9879	1.9879	1.1000e-004	0.0000	1.9906
Worker	2.2600e-003	1.4800e-003	0.0179	6.0000e-005	7.0900e-003	5.0000e-005	7.1400e-003	1.8800e-003	5.0000e-005	1.9300e-003	0.0000	5.5417	5.5417	1.2000e-004	0.0000	5.5448
Total	**2.4300e-003**	**7.3300e-003**	**0.0196**	**8.0000e-005**	**7.6300e-003**	**6.0000e-005**	**7.6800e-003**	**2.0300e-003**	**6.0000e-005**	**2.0900e-003**	**0.0000**	**7.5296**	**7.5296**	**2.3000e-004**	**0.0000**	**7.5354**

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	0.0422	0.4060	0.3655	8.0000e-004		0.0166	0.0166		0.0157	0.0157	0.0000	68.4964	68.4964	0.0157	0.0000	68.8877
Total	**0.0422**	**0.4060**	**0.3655**	**8.0000e-004**		**0.0166**	**0.0166**		**0.0157**	**0.0157**	**0.0000**	**68.4964**	**68.4964**	**0.0157**	**0.0000**	**68.8877**

3.3 Building Construction - 2024

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	1.7000e-004	5.8500e-003	1.6700e-003	2.0000e-005	5.4000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.6000e-004	0.0000	1.9879	1.9879	1.1000e-004	0.0000	1.9906
Worker	2.2600e-003	1.4800e-003	0.0179	6.0000e-005	7.0900e-003	5.0000e-005	7.1400e-003	1.8800e-003	5.0000e-005	1.9300e-003	0.0000	5.5417	5.5417	1.2000e-004	0.0000	5.5448
Total	**2.4300e-003**	**7.3300e-003**	**0.0196**	**8.0000e-005**	**7.6300e-003**	**6.0000e-005**	**7.6800e-003**	**2.0300e-003**	**6.0000e-005**	**2.0900e-003**	**0.0000**	**7.5296**	**7.5296**	**2.3000e-004**	**0.0000**	**7.5354**

3.4 Paving - 2024

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	0.0109	0.0910	0.1206	2.6000e-004		4.0000e-003	4.0000e-003		3.6900e-003	3.6900e-003	0.0000	22.4795	22.4795	7.1800e-003	0.0000	22.6590
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0109**	**0.0910**	**0.1206**	**2.6000e-004**		**4.0000e-003**	**4.0000e-003**		**3.6900e-003**	**3.6900e-003**	**0.0000**	**22.4795**	**22.4795**	**7.1800e-003**	**0.0000**	**22.6590**

3.4 Paving - 2024

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	1.0000e-005	4.1000e-004	1.2000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1403	0.1403	1.0000e-005	0.0000	0.1405
Worker	6.3000e-004	4.1000e-004	4.9800e-003	2.0000e-005	1.9700e-003	1.0000e-005	1.9900e-003	5.2000e-004	1.0000e-005	5.4000e-004	0.0000	1.5441	1.5441	3.0000e-005	0.0000	1.5450
Total	**6.4000e-004**	**8.2000e-004**	**5.1000e-003**	**2.0000e-005**	**2.0100e-003**	**1.0000e-005**	**2.0300e-003**	**5.3000e-004**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**1.6844**	**1.6844**	**4.0000e-005**	**0.0000**	**1.6855**

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	0.0109	0.0910	0.1206	2.6000e-004		4.0000e-003	4.0000e-003		3.6900e-003	3.6900e-003	0.0000	22.4795	22.4795	7.1800e-003	0.0000	22.6590
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0109**	**0.0910**	**0.1206**	**2.6000e-004**		**4.0000e-003**	**4.0000e-003**		**3.6900e-003**	**3.6900e-003**	**0.0000**	**22.4795**	**22.4795**	**7.1800e-003**	**0.0000**	**22.6590**

3.4 Paving - 2024

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	1.0000e-005	4.1000e-004	1.2000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1403	0.1403	1.0000e-005	0.0000	0.1405
Worker	6.3000e-004	4.1000e-004	4.9800e-003	2.0000e-005	1.9700e-003	1.0000e-005	1.9900e-003	5.2000e-004	1.0000e-005	5.4000e-004	0.0000	1.5441	1.5441	3.0000e-005	0.0000	1.5450
Total	**6.4000e-004**	**8.2000e-004**	**5.1000e-003**	**2.0000e-005**	**2.0100e-003**	**1.0000e-005**	**2.0300e-003**	**5.3000e-004**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**1.6844**	**1.6844**	**4.0000e-005**	**0.0000**	**1.6855**

3.5 Demolition - 2024

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	0.1226	0.9978	0.8813	2.6200e-003		0.0416	0.0416		0.0386	0.0386	0.0000	229.1657	229.1657	0.0679	0.0000	230.8629
Total	**0.1226**	**0.9978**	**0.8813**	**2.6200e-003**		**0.0416**	**0.0416**		**0.0386**	**0.0386**	**0.0000**	**229.1657**	**229.1657**	**0.0679**	**0.0000**	**230.8629**

3.5 Demolition - 2024

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	7.7000e-004	2.5000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.3530	0.3530	2.0000e-005	0.0000	0.3536
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	3.4200e-003	2.2500e-003	0.0271	9.0000e-005	0.0108	8.0000e-005	0.0108	2.8600e-003	7.0000e-005	2.9200e-003	0.0000	8.4069	8.4069	1.9000e-004	0.0000	8.4115
Total	**3.4400e-003**	**3.0200e-003**	**0.0274**	**9.0000e-005**	**0.0108**	**8.0000e-005**	**0.0109**	**2.8800e-003**	**7.0000e-005**	**2.9400e-003**	**0.0000**	**8.7599**	**8.7599**	**2.1000e-004**	**0.0000**	**8.7652**

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	0.1226	0.9978	0.8813	2.6200e-003		0.0416	0.0416		0.0386	0.0386	0.0000	229.1654	229.1654	0.0679	0.0000	230.8626
Total	**0.1226**	**0.9978**	**0.8813**	**2.6200e-003**		**0.0416**	**0.0416**		**0.0386**	**0.0386**	**0.0000**	**229.1654**	**229.1654**	**0.0679**	**0.0000**	**230.8626**

3.5 Demolition - 2024

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	7.7000e-004	2.5000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.3530	0.3530	2.0000e-005	0.0000	0.3536
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	3.4200e-003	2.2500e-003	0.0271	9.0000e-005	0.0108	8.0000e-005	0.0108	2.8600e-003	7.0000e-005	2.9200e-003	0.0000	8.4069	8.4069	1.9000e-004	0.0000	8.4115
Total	**3.4400e-003**	**3.0200e-003**	**0.0274**	**9.0000e-005**	**0.0108**	**8.0000e-005**	**0.0109**	**2.8800e-003**	**7.0000e-005**	**2.9400e-003**	**0.0000**	**8.7599**	**8.7599**	**2.1000e-004**	**0.0000**	**8.7652**

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	0.550809	0.042355	0.203399	0.115606	0.014562	0.005806	0.021810	0.035336	0.002134	0.001736	0.004891	0.000712	0.000845

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

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

PAR1110.2_Construction_Facility-wide Engine Modernization

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**	2024
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

Project Characteristics -

Land Use -

Construction Phase - Project specific construction schedule - scaled from SCAQMD DSEA model run based on revised number of equipment.

Off-road Equipment - Project specific equipment mix.

Off-road Equipment - Project specific equipment mix. Water Trucks and Dump Trucks modeled as Off-Highway Trucks.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks. Compactor modeled as Other Construction Equipment.

Trips and VMT - Building construction worker trips increased from SCAQMD DSEA based on the increase in number of equipment. Vendor and hauling trips based on SCAQMD DSEA.

Grading - 100,000 squarefeet of land disturbed during site prep.

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	279.00
tblConstructionPhase	NumDays	0.00	56.00
tblConstructionPhase	NumDays	0.00	12.00
tblConstructionPhase	NumDays	0.00	15.00
tblGrading	AcresOfGrading	0.00	2.30
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

PAR1110.2_Construction_Facility-wide Engine Modernization - South Coast AQMD Air District, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

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					
2023	2.8641	26.0906	23.0958	0.0519	17.9841	1.1997	19.1838	9.7406	1.1037	10.8443	0.0000	4,968.5225	4,968.5225	1.5360	0.0000	5,006.9235
2024	4.5022	35.7332	32.5365	0.0970	0.4568	1.4878	1.8822	0.1219	1.3821	1.4867	0.0000	9,383.8344	9,383.8344	2.6813	0.0000	9,450.8656
Maximum	**4.5022**	**35.7332**	**32.5365**	**0.0970**	**17.9841**	**1.4878**	**19.1838**	**9.7406**	**1.3821**	**10.8443**	**0.0000**	**9,383.8344**	**9,383.8344**	**2.6813**	**0.0000**	**9,450.8656**

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					
2023	2.8641	26.0906	23.0958	0.0519	17.9841	1.1997	19.1838	9.7406	1.1037	10.8443	0.0000	4,968.5225	4,968.5225	1.5360	0.0000	5,006.9235
2024	4.5022	35.7332	32.5365	0.0970	0.4568	1.4878	1.8822	0.1219	1.3821	1.4867	0.0000	9,383.8344	9,383.8344	2.6813	0.0000	9,450.8656
Maximum	**4.5022**	**35.7332**	**32.5365**	**0.0970**	**17.9841**	**1.4878**	**19.1838**	**9.7406**	**1.3821**	**10.8443**	**0.0000**	**9,383.8344**	**9,383.8344**	**2.6813**	**0.0000**	**9,450.8656**

	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**

PAR1110.2_Construction_Facility-wide Engine Modernization - 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	Site Preparation	Site Preparation	1/2/2023	1/20/2023	5	15	
2	Building Construction	Building Construction	1/21/2023	2/15/2024	5	279	
3	Paving	Paving	2/16/2024	3/4/2024	5	12	
4	Demolition	Demolition	3/19/2024	6/4/2024	5	56	

Acres of Grading (Site Preparation Phase): 2.3

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Off-Highway Trucks	2	6.00	402	0.38
Site Preparation	Other Construction Equipment	1	8.00	172	0.42
Site Preparation	Rubber Tired Dozers	2	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Aerial Lifts	3	7.00	63	0.31
Building Construction	Cranes	4	8.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Welders	2	6.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Off-Highway Trucks	2	6.00	402	0.38
Paving	Pavers	1	5.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	3	6.00	97	0.37
Demolition	Concrete/Industrial Saws	2	6.00	81	0.73
Demolition	Cranes	1	6.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Off-Highway Trucks	3	8.00	402	0.38
Demolition	Off-Highway Trucks	2	6.00	402	0.38
Demolition	Rubber Tired Dozers	2	6.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

PAR1110.2_Construction_Facility-wide Engine Modernization - 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
Site Preparation	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	13	38.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	30.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	14	35.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2023

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					17.7270	0.0000	17.7270	9.6724	0.0000	9.6724			0.0000			0.0000
Off-Road	2.7785	25.9501	20.1301	0.0489		1.1979	1.1979		1.1020	1.1020		4,732.0986	4,732.0986	1.5305		4,770.3600
Total	**2.7785**	**25.9501**	**20.1301**	**0.0489**	**17.7270**	**1.1979**	**18.9249**	**9.6724**	**1.1020**	**10.7744**		**4,732.0986**	**4,732.0986**	**1.5305**		**4,770.3600**

3.2 Site Preparation - 2023

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	0.0856	0.0515	0.7399	2.3700e-003	0.2571	1.7900e-003	0.2589	0.0682	1.6500e-003	0.0698		236.4239	236.4239	5.5800e-003		236.5635
Total	**0.0856**	**0.0515**	**0.7399**	**2.3700e-003**	**0.2571**	**1.7900e-003**	**0.2589**	**0.0682**	**1.6500e-003**	**0.0698**		**236.4239**	**236.4239**	**5.5800e-003**		**236.5635**

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					17.7270	0.0000	17.7270	9.6724	0.0000	9.6724			0.0000			0.0000
Off-Road	2.7785	25.9501	20.1301	0.0489		1.1979	1.1979		1.1020	1.1020	0.0000	4,732.0986	4,732.0986	1.5305		4,770.3600
Total	**2.7785**	**25.9501**	**20.1301**	**0.0489**	**17.7270**	**1.1979**	**18.9249**	**9.6724**	**1.1020**	**10.7744**	**0.0000**	**4,732.0986**	**4,732.0986**	**1.5305**		**4,770.3600**

3.2 Site Preparation - 2023

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	0.0856	0.0515	0.7399	2.3700e-003	0.2571	1.7900e-003	0.2589	0.0682	1.6500e-003	0.0698		236.4239	236.4239	5.5800e-003		236.5635
Total	**0.0856**	**0.0515**	**0.7399**	**2.3700e-003**	**0.2571**	**1.7900e-003**	**0.2589**	**0.0682**	**1.6500e-003**	**0.0698**		**236.4239**	**236.4239**	**5.5800e-003**		**236.5635**

3.3 Building Construction - 2023

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	2.6438	25.6633	21.7770	0.0468		1.0897	1.0897		1.0297	1.0297		4,441.4861	4,441.4861	1.0216		4,467.0255
Total	**2.6438**	**25.6633**	**21.7770**	**0.0468**		**1.0897**	**1.0897**		**1.0297**	**1.0297**		**4,441.4861**	**4,441.4861**	**1.0216**		**4,467.0255**

3.3 Building Construction - 2023

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	9.7300e-003	0.3422	0.0964	1.2200e-003	0.0320	3.8000e-004	0.0324	9.2100e-003	3.7000e-004	9.5800e-003		130.9339	130.9339	6.9200e-003		131.1068
Worker	0.1415	0.0850	1.2224	3.9200e-003	0.4248	2.9600e-003	0.4277	0.1127	2.7200e-003	0.1154		390.6135	390.6135	9.2200e-003		390.8441
Total	**0.1512**	**0.4273**	**1.3188**	**5.1400e-003**	**0.4568**	**3.3400e-003**	**0.4601**	**0.1219**	**3.0900e-003**	**0.1250**		**521.5473**	**521.5473**	**0.0161**		**521.9509**

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	2.6438	25.6633	21.7770	0.0468		1.0897	1.0897		1.0297	1.0297	0.0000	4,441.4861	4,441.4861	1.0216		4,467.0255
Total	**2.6438**	**25.6633**	**21.7770**	**0.0468**		**1.0897**	**1.0897**		**1.0297**	**1.0297**	**0.0000**	**4,441.4861**	**4,441.4861**	**1.0216**		**4,467.0255**

3.3 Building Construction - 2023

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	9.7300e-003	0.3422	0.0964	1.2200e-003	0.0320	3.8000e-004	0.0324	9.2100e-003	3.7000e-004	9.5800e-003		130.9339	130.9339	6.9200e-003		131.1068
Worker	0.1415	0.0850	1.2224	3.9200e-003	0.4248	2.9600e-003	0.4277	0.1127	2.7200e-003	0.1154		390.6135	390.6135	9.2200e-003		390.8441
Total	**0.1512**	**0.4273**	**1.3188**	**5.1400e-003**	**0.4568**	**3.3400e-003**	**0.4601**	**0.1219**	**3.0900e-003**	**0.1250**		**521.5473**	**521.5473**	**0.0161**		**521.9509**

3.3 Building Construction - 2024

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	2.4830	23.8842	21.4997	0.0468		0.9764	0.9764		0.9217	0.9217		4,441.4384	4,441.4384	1.0150		4,466.8131
Total	**2.4830**	**23.8842**	**21.4997**	**0.0468**		**0.9764**	**0.9764**		**0.9217**	**0.9217**		**4,441.4384**	**4,441.4384**	**1.0150**		**4,466.8131**

3.3 Building Construction - 2024

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	9.5300e-003	0.3414	0.0936	1.2200e-003	0.0320	3.8000e-004	0.0324	9.2100e-003	3.6000e-004	9.5800e-003		130.4591	130.4591	6.8100e-003		130.6294
Worker	0.1339	0.0775	1.1419	3.7900e-003	0.4248	2.9200e-003	0.4277	0.1127	2.6900e-003	0.1153		377.7994	377.7994	8.4600e-003		378.0108
Total	**0.1434**	**0.4189**	**1.2355**	**5.0100e-003**	**0.4568**	**3.3000e-003**	**0.4601**	**0.1219**	**3.0500e-003**	**0.1249**		**508.2585**	**508.2585**	**0.0153**		**508.6402**

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	2.4830	23.8842	21.4997	0.0468		0.9764	0.9764		0.9217	0.9217	0.0000	4,441.4384	4,441.4384	1.0150		4,466.8131
Total	**2.4830**	**23.8842**	**21.4997**	**0.0468**		**0.9764**	**0.9764**		**0.9217**	**0.9217**	**0.0000**	**4,441.4384**	**4,441.4384**	**1.0150**		**4,466.8131**

3.3 Building Construction - 2024

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	9.5300e-003	0.3414	0.0936	1.2200e-003	0.0320	3.8000e-004	0.0324	9.2100e-003	3.6000e-004	9.5800e-003		130.4591	130.4591	6.8100e-003		130.6294
Worker	0.1339	0.0775	1.1419	3.7900e-003	0.4248	2.9200e-003	0.4277	0.1127	2.6900e-003	0.1153		377.7994	377.7994	8.4600e-003		378.0108
Total	**0.1434**	**0.4189**	**1.2355**	**5.0100e-003**	**0.4568**	**3.3000e-003**	**0.4601**	**0.1219**	**3.0500e-003**	**0.1249**		**508.2585**	**508.2585**	**0.0153**		**508.6402**

3.4 Paving - 2024

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	1.8203	15.1700	20.0909	0.0430		0.6671	0.6671		0.6154	0.6154		4,129.9016	4,129.9016	1.3191		4,162.8780
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8203**	**15.1700**	**20.0909**	**0.0430**		**0.6671**	**0.6671**		**0.6154**	**0.6154**		**4,129.9016**	**4,129.9016**	**1.3191**		**4,162.8780**

3.4 Paving - 2024

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	1.9100e-003	0.0683	0.0187	2.4000e-004	6.4000e-003	8.0000e-005	6.4800e-003	1.8400e-003	7.0000e-005	1.9200e-003		26.0918	26.0918	1.3600e-003		26.1259
Worker	0.1057	0.0612	0.9015	2.9900e-003	0.3353	2.3000e-003	0.3376	0.0889	2.1200e-003	0.0911		298.2627	298.2627	6.6800e-003		298.4296
Total	**0.1076**	**0.1295**	**0.9202**	**3.2300e-003**	**0.3417**	**2.3800e-003**	**0.3441**	**0.0908**	**2.1900e-003**	**0.0930**		**324.3545**	**324.3545**	**8.0400e-003**		**324.5555**

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	1.8203	15.1700	20.0909	0.0430		0.6671	0.6671		0.6154	0.6154	0.0000	4,129.9016	4,129.9016	1.3191		4,162.8780
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8203**	**15.1700**	**20.0909**	**0.0430**		**0.6671**	**0.6671**		**0.6154**	**0.6154**	**0.0000**	**4,129.9016**	**4,129.9016**	**1.3191**		**4,162.8780**

3.4 Paving - 2024

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	1.9100e-003	0.0683	0.0187	2.4000e-004	6.4000e-003	8.0000e-005	6.4800e-003	1.8400e-003	7.0000e-005	1.9200e-003		26.0918	26.0918	1.3600e-003		26.1259
Worker	0.1057	0.0612	0.9015	2.9900e-003	0.3353	2.3000e-003	0.3376	0.0889	2.1200e-003	0.0911		298.2627	298.2627	6.6800e-003		298.4296
Total	**0.1076**	**0.1295**	**0.9202**	**3.2300e-003**	**0.3417**	**2.3800e-003**	**0.3441**	**0.0908**	**2.1900e-003**	**0.0930**		**324.3545**	**324.3545**	**8.0400e-003**		**324.5555**

3.5 Demolition - 2024

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	4.3780	35.6350	31.4759	0.0934		1.4851	1.4851		1.3796	1.3796		9,021.8550	9,021.8550	2.6726		9,088.6691
Total	**4.3780**	**35.6350**	**31.4759**	**0.0934**		**1.4851**	**1.4851**		**1.3796**	**1.3796**		**9,021.8550**	**9,021.8550**	**2.6726**		**9,088.6691**

3.5 Demolition - 2024

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	8.2000e-004	0.0269	8.7500e-003	1.3000e-004	3.1200e-003	5.0000e-005	3.1700e-003	8.6000e-004	5.0000e-005	9.0000e-004		14.0063	14.0063	8.9000e-004		14.0286
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	0.1233	0.0714	1.0518	3.4900e-003	0.3912	2.6900e-003	0.3939	0.1038	2.4700e-003	0.1062		347.9731	347.9731	7.7900e-003		348.1678
Total	**0.1241**	**0.0982**	**1.0605**	**3.6200e-003**	**0.3943**	**2.7400e-003**	**0.3971**	**0.1046**	**2.5200e-003**	**0.1071**		**361.9794**	**361.9794**	**8.6800e-003**		**362.1964**

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	4.3780	35.6350	31.4759	0.0934		1.4851	1.4851		1.3796	1.3796	0.0000	9,021.8550	9,021.8550	2.6726		9,088.6691
Total	**4.3780**	**35.6350**	**31.4759**	**0.0934**		**1.4851**	**1.4851**		**1.3796**	**1.3796**	**0.0000**	**9,021.8550**	**9,021.8550**	**2.6726**		**9,088.6691**

3.5 Demolition - 2024

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	8.2000e-004	0.0269	8.7500e-003	1.3000e-004	3.1200e-003	5.0000e-005	3.1700e-003	8.6000e-004	5.0000e-005	9.0000e-004		14.0063	14.0063	8.9000e-004		14.0286
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	0.1233	0.0714	1.0518	3.4900e-003	0.3912	2.6900e-003	0.3939	0.1038	2.4700e-003	0.1062		347.9731	347.9731	7.7900e-003		348.1678
Total	**0.1241**	**0.0982**	**1.0605**	**3.6200e-003**	**0.3943**	**2.7400e-003**	**0.3971**	**0.1046**	**2.5200e-003**	**0.1071**		**361.9794**	**361.9794**	**8.6800e-003**		**362.1964**

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	0.550809	0.042355	0.203399	0.115606	0.014562	0.005806	0.021810	0.035336	0.002134	0.001736	0.004891	0.000712	0.000845

5.0 Energy Detail

Historical Energy Use: N

PAR1110.2_Construction_Facility-wide Engine Modernization - South Coast AQMD Air District, Summer

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

PAR1110.2_Construction_Facility-wide Engine Modernization

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**	2024
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

PAR1110.2_Construction_Facility-wide Engine Modernization - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use -

Construction Phase - Project specific construction schedule - scaled from SCAQMD DSEA model run based on revised number of equipment.

Off-road Equipment - Project specific equipment mix.

Off-road Equipment - Project specific equipment mix. Water Trucks and Dump Trucks modeled as Off-Highway Trucks.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks. Compactor modeled as Other Construction Equipment.

Trips and VMT - Building construction worker trips increased from SCAQMD DSEA based on the increase in number of equipment. Vendor and hauling trips based on SCAQMD DSEA.

Grading - 100,000 squarefeet of land disturbed during site prep.

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	279.00
tblConstructionPhase	NumDays	0.00	56.00
tblConstructionPhase	NumDays	0.00	12.00
tblConstructionPhase	NumDays	0.00	15.00
tblGrading	AcresOfGrading	0.00	2.30
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

PAR1110.2_Construction_Facility-wide Engine Modernization - South Coast AQMD Air District, Winter

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

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					
2023	2.8725	26.0964	22.9773	0.0516	17.9841	1.1997	19.1838	9.7406	1.1037	10.8443	0.0000	4,953.1968	4,953.1968	1.5357	0.0000	4,991.5880
2024	4.5148	35.7400	32.4249	0.0968	0.4568	1.4878	1.8822	0.1219	1.3821	1.4867	0.0000	9,360.9719	9,360.9719	2.6807	0.0000	9,427.9900
Maximum	**4.5148**	**35.7400**	**32.4249**	**0.0968**	**17.9841**	**1.4878**	**19.1838**	**9.7406**	**1.3821**	**10.8443**	**0.0000**	**9,360.9719**	**9,360.9719**	**2.6807**	**0.0000**	**9,427.9900**

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					
2023	2.8725	26.0964	22.9773	0.0516	17.9841	1.1997	19.1838	9.7406	1.1037	10.8443	0.0000	4,953.1968	4,953.1968	1.5357	0.0000	4,991.5880
2024	4.5148	35.7400	32.4249	0.0968	0.4568	1.4878	1.8822	0.1219	1.3821	1.4867	0.0000	9,360.9718	9,360.9718	2.6807	0.0000	9,427.9900
Maximum	**4.5148**	**35.7400**	**32.4249**	**0.0968**	**17.9841**	**1.4878**	**19.1838**	**9.7406**	**1.3821**	**10.8443**	**0.0000**	**9,360.9718**	**9,360.9718**	**2.6807**	**0.0000**	**9,427.9900**

	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**

	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	Site Preparation	Site Preparation	1/2/2023	1/20/2023	5	15	
2	Building Construction	Building Construction	1/21/2023	2/15/2024	5	279	
3	Paving	Paving	2/16/2024	3/4/2024	5	12	
4	Demolition	Demolition	3/19/2024	6/4/2024	5	56	

Acres of Grading (Site Preparation Phase): 2.3

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Off-Highway Trucks	2	6.00	402	0.38
Site Preparation	Other Construction Equipment	1	8.00	172	0.42
Site Preparation	Rubber Tired Dozers	2	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Aerial Lifts	3	7.00	63	0.31
Building Construction	Cranes	4	8.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Welders	2	6.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Off-Highway Trucks	2	6.00	402	0.38
Paving	Pavers	1	5.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	3	6.00	97	0.37
Demolition	Concrete/Industrial Saws	2	6.00	81	0.73
Demolition	Cranes	1	6.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Off-Highway Trucks	3	8.00	402	0.38
Demolition	Off-Highway Trucks	2	6.00	402	0.38
Demolition	Rubber Tired Dozers	2	6.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

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
Site Preparation	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	13	38.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	30.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	14	35.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2023

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					17.7270	0.0000	17.7270	9.6724	0.0000	9.6724			0.0000			0.0000
Off-Road	2.7785	25.9501	20.1301	0.0489		1.1979	1.1979		1.1020	1.1020		4,732.0986	4,732.0986	1.5305		4,770.3600
Total	**2.7785**	**25.9501**	**20.1301**	**0.0489**	**17.7270**	**1.1979**	**18.9249**	**9.6724**	**1.1020**	**10.7744**		**4,732.0986**	**4,732.0986**	**1.5305**		**4,770.3600**

3.2 Site Preparation - 2023

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	0.0941	0.0563	0.6624	2.2200e-003	0.2571	1.7900e-003	0.2589	0.0682	1.6500e-003	0.0698		221.0982	221.0982	5.1900e-003		221.2280
Total	**0.0941**	**0.0563**	**0.6624**	**2.2200e-003**	**0.2571**	**1.7900e-003**	**0.2589**	**0.0682**	**1.6500e-003**	**0.0698**		**221.0982**	**221.0982**	**5.1900e-003**		**221.2280**

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					17.7270	0.0000	17.7270	9.6724	0.0000	9.6724			0.0000			0.0000
Off-Road	2.7785	25.9501	20.1301	0.0489		1.1979	1.1979		1.1020	1.1020	0.0000	4,732.0986	4,732.0986	1.5305		4,770.3600
Total	**2.7785**	**25.9501**	**20.1301**	**0.0489**	**17.7270**	**1.1979**	**18.9249**	**9.6724**	**1.1020**	**10.7744**	**0.0000**	**4,732.0986**	**4,732.0986**	**1.5305**		**4,770.3600**

3.2 Site Preparation - 2023

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	0.0941	0.0563	0.6624	2.2200e-003	0.2571	1.7900e-003	0.2589	0.0682	1.6500e-003	0.0698		221.0982	221.0982	5.1900e-003		221.2280
Total	**0.0941**	**0.0563**	**0.6624**	**2.2200e-003**	**0.2571**	**1.7900e-003**	**0.2589**	**0.0682**	**1.6500e-003**	**0.0698**		**221.0982**	**221.0982**	**5.1900e-003**		**221.2280**

3.3 Building Construction - 2023

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	2.6438	25.6633	21.7770	0.0468		1.0897	1.0897		1.0297	1.0297		4,441.4861	4,441.4861	1.0216		4,467.0255
Total	**2.6438**	**25.6633**	**21.7770**	**0.0468**		**1.0897**	**1.0897**		**1.0297**	**1.0297**		**4,441.4861**	**4,441.4861**	**1.0216**		**4,467.0255**

3.3 Building Construction - 2023

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	0.0103	0.3400	0.1059	1.1900e-003	0.0320	4.0000e-004	0.0324	9.2100e-003	3.9000e-004	9.6000e-003		127.1808	127.1808	7.3700e-003		127.3651
Worker	0.1554	0.0930	1.0944	3.6600e-003	0.4248	2.9600e-003	0.4277	0.1127	2.7200e-003	0.1154		365.2926	365.2926	8.5800e-003		365.5072
Total	**0.1657**	**0.4330**	**1.2003**	**4.8500e-003**	**0.4568**	**3.3600e-003**	**0.4601**	**0.1219**	**3.1100e-003**	**0.1250**		**492.4735**	**492.4735**	**0.0160**		**492.8723**

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	2.6438	25.6633	21.7770	0.0468		1.0897	1.0897		1.0297	1.0297	0.0000	4,441.4861	4,441.4861	1.0216		4,467.0255
Total	**2.6438**	**25.6633**	**21.7770**	**0.0468**		**1.0897**	**1.0897**		**1.0297**	**1.0297**	**0.0000**	**4,441.4861**	**4,441.4861**	**1.0216**		**4,467.0255**

3.3 Building Construction - 2023

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	0.0103	0.3400	0.1059	1.1900e-003	0.0320	4.0000e-004	0.0324	9.2100e-003	3.9000e-004	9.6000e-003		127.1808	127.1808	7.3700e-003		127.3651
Worker	0.1554	0.0930	1.0944	3.6600e-003	0.4248	2.9600e-003	0.4277	0.1127	2.7200e-003	0.1154		365.2926	365.2926	8.5800e-003		365.5072
Total	**0.1657**	**0.4330**	**1.2003**	**4.8500e-003**	**0.4568**	**3.3600e-003**	**0.4601**	**0.1219**	**3.1100e-003**	**0.1250**		**492.4735**	**492.4735**	**0.0160**		**492.8723**

3.3 Building Construction - 2024

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	2.4830	23.8842	21.4997	0.0468		0.9764	0.9764		0.9217	0.9217		4,441.4384	4,441.4384	1.0150		4,466.8131
Total	**2.4830**	**23.8842**	**21.4997**	**0.0468**		**0.9764**	**0.9764**		**0.9217**	**0.9217**		**4,441.4384**	**4,441.4384**	**1.0150**		**4,466.8131**

3.3 Building Construction - 2024

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	0.0100	0.3393	0.1029	1.1800e-003	0.0320	4.0000e-004	0.0324	9.2100e-003	3.8000e-004	9.5900e-003		126.7483	126.7483	7.2500e-003		126.9295
Worker	0.1476	0.0847	1.0203	3.5400e-003	0.4248	2.9200e-003	0.4277	0.1127	2.6900e-003	0.1153		353.2566	353.2566	7.8600e-003		353.4530
Total	**0.1576**	**0.4240**	**1.1232**	**4.7200e-003**	**0.4568**	**3.3200e-003**	**0.4601**	**0.1219**	**3.0700e-003**	**0.1249**		**480.0048**	**480.0048**	**0.0151**		**480.3825**

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	2.4830	23.8842	21.4997	0.0468		0.9764	0.9764		0.9217	0.9217	0.0000	4,441.4384	4,441.4384	1.0150		4,466.8131
Total	**2.4830**	**23.8842**	**21.4997**	**0.0468**		**0.9764**	**0.9764**		**0.9217**	**0.9217**	**0.0000**	**4,441.4384**	**4,441.4384**	**1.0150**		**4,466.8131**

3.3 Building Construction - 2024

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	0.0100	0.3393	0.1029	1.1800e-003	0.0320	4.0000e-004	0.0324	9.2100e-003	3.8000e-004	9.5900e-003		126.7483	126.7483	7.2500e-003		126.9295
Worker	0.1476	0.0847	1.0203	3.5400e-003	0.4248	2.9200e-003	0.4277	0.1127	2.6900e-003	0.1153		353.2566	353.2566	7.8600e-003		353.4530
Total	**0.1576**	**0.4240**	**1.1232**	**4.7200e-003**	**0.4568**	**3.3200e-003**	**0.4601**	**0.1219**	**3.0700e-003**	**0.1249**		**480.0048**	**480.0048**	**0.0151**		**480.3825**

3.4 Paving - 2024

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	1.8203	15.1700	20.0909	0.0430		0.6671	0.6671		0.6154	0.6154		4,129.9016	4,129.9016	1.3191		4,162.8780
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8203**	**15.1700**	**20.0909**	**0.0430**		**0.6671**	**0.6671**		**0.6154**	**0.6154**		**4,129.9016**	**4,129.9016**	**1.3191**		**4,162.8780**

3.4 Paving - 2024

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	2.0100e-003	0.0679	0.0206	2.4000e-004	6.4000e-003	8.0000e-005	6.4800e-003	1.8400e-003	8.0000e-005	1.9200e-003		25.3497	25.3497	1.4500e-003		25.3859
Worker	0.1165	0.0669	0.8055	2.8000e-003	0.3353	2.3000e-003	0.3376	0.0889	2.1200e-003	0.0911		278.8868	278.8868	6.2000e-003		279.0418
Total	**0.1185**	**0.1348**	**0.8261**	**3.0400e-003**	**0.3417**	**2.3800e-003**	**0.3441**	**0.0908**	**2.2000e-003**	**0.0930**		**304.2364**	**304.2364**	**7.6500e-003**		**304.4277**

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	1.8203	15.1700	20.0909	0.0430		0.6671	0.6671		0.6154	0.6154	0.0000	4,129.9016	4,129.9016	1.3191		4,162.8780
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8203**	**15.1700**	**20.0909**	**0.0430**		**0.6671**	**0.6671**		**0.6154**	**0.6154**	**0.0000**	**4,129.9016**	**4,129.9016**	**1.3191**		**4,162.8780**

3.4 Paving - 2024

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	2.0100e-003	0.0679	0.0206	2.4000e-004	6.4000e-003	8.0000e-005	6.4800e-003	1.8400e-003	8.0000e-005	1.9200e-003		25.3497	25.3497	1.4500e-003		25.3859
Worker	0.1165	0.0669	0.8055	2.8000e-003	0.3353	2.3000e-003	0.3376	0.0889	2.1200e-003	0.0911		278.8868	278.8868	6.2000e-003		279.0418
Total	**0.1185**	**0.1348**	**0.8261**	**3.0400e-003**	**0.3417**	**2.3800e-003**	**0.3441**	**0.0908**	**2.2000e-003**	**0.0930**		**304.2364**	**304.2364**	**7.6500e-003**		**304.4277**

3.5 Demolition - 2024

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	4.3780	35.6350	31.4759	0.0934		1.4851	1.4851		1.3796	1.3796		9,021.8550	9,021.8550	2.6726		9,088.6691
Total	**4.3780**	**35.6350**	**31.4759**	**0.0934**		**1.4851**	**1.4851**		**1.3796**	**1.3796**		**9,021.8550**	**9,021.8550**	**2.6726**		**9,088.6691**

3.5 Demolition - 2024

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	8.4000e-004	0.0270	9.1900e-003	1.3000e-004	3.1200e-003	5.0000e-005	3.1700e-003	8.6000e-004	5.0000e-005	9.0000e-004		13.7490	13.7490	9.2000e-004		13.7721
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	0.1359	0.0781	0.9398	3.2600e-003	0.3912	2.6900e-003	0.3939	0.1038	2.4700e-003	0.1062		325.3679	325.3679	7.2400e-003		325.5488
Total	**0.1367**	**0.1050**	**0.9490**	**3.3900e-003**	**0.3943**	**2.7400e-003**	**0.3971**	**0.1046**	**2.5200e-003**	**0.1071**		**339.1169**	**339.1169**	**8.1600e-003**		**339.3209**

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	4.3780	35.6350	31.4759	0.0934		1.4851	1.4851		1.3796	1.3796	0.0000	9,021.855 0	9,021.855 0	2.6726		9,088.669 1
Total	**4.3780**	**35.6350**	**31.4759**	**0.0934**		**1.4851**	**1.4851**		**1.3796**	**1.3796**	**0.0000**	**9,021.855 0**	**9,021.855 0**	**2.6726**		**9,088.669 1**

3.5 Demolition - 2024

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	8.4000e-004	0.0270	9.1900e-003	1.3000e-004	3.1200e-003	5.0000e-005	3.1700e-003	8.6000e-004	5.0000e-005	9.0000e-004		13.7490	13.7490	9.2000e-004		13.7721
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	0.1359	0.0781	0.9398	3.2600e-003	0.3912	2.6900e-003	0.3939	0.1038	2.4700e-003	0.1062		325.3679	325.3679	7.2400e-003		325.5488
Total	**0.1367**	**0.1050**	**0.9490**	**3.3900e-003**	**0.3943**	**2.7400e-003**	**0.3971**	**0.1046**	**2.5200e-003**	**0.1071**		**339.1169**	**339.1169**	**8.1600e-003**		**339.3209**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

PAR1110.2_Construction_Facility-wide Engine Modernization - 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	0.550809	0.042355	0.203399	0.115606	0.014562	0.005806	0.021810	0.035336	0.002134	0.001736	0.004891	0.000712	0.000845

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	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
	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

Land Use	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
	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 C

CEQA Impact Evaluations – Assumptions and Calculations

APPENDIX C-1

CEQA Impact Evaluations – Assumptions and Calculations

Construction Summary

Appendix C-1

CEQA Construction Impact Evaluations - Summary

Criteria Pollutant Emissions Summary

PAR 1110.2 Requirement	VOC (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
1 Facilities Installing 1 SCR Systems	1.36	10.22	9.90	0.02	0.71	0.54
2 Facilities Repowering 1 I.C. Engines with 1 Stationary Gas Turbine	3.08	28.27	19.58	0.04	12.15	7.13
Peak Day - Worst Case Construction Emissions	4.44	38.49	29.48	0.06	12.86	7.67
SIGNIFICACNE THRESHOLD FOR CONSTRUCTION	75	100	550	150	150	55

Notes:

1. The emissions are estimated using CalEEMod.
2. Construction activities are expected to occur on different days in multiple stages.

GHG Emissions Summary

PAR 1110.2 Requirement	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr	Amortized CO2e (MT/yr)	
Installing SCR Systems	825.21	0.13	0.00	828.41		
Repowering I.C. Engine with a Stationary Gas Turbine and NSCR Installation	1130.23	0.18	0.00	1134.80		
Replacing Engines and SCR installation	388.00	0.05	0.00	389.61		
Modifying Existing SCR or NSCR system	61.81	0.01	0.00	62.16		
Facility-wide Engine Modernization	921.09	0.22	0.00	926.52		
Total Emissions During Construction	3326	0.59	0.00	3341	**111.4**	Total GHG Emissions Amortized over 30 Years

Notes:

1. The emissions are estimated using CalEEMod.

APPENDIX C-2

CEQA Impact Evaluations – Assumptions and Calculations

Operations Summary

Appendix C-2
CEQA Operational Impact Evaluations - Summary

Emissions Summary - Operations

PAR 1110.2 Requirement	VOC, lb/day	NOx, lb/day	CO, lb/day	SOx, lb/day	PM10, lb/day	PM2.5, lb/day
Increased Ammonia Deliveries for 2 Facilities	0.15	1.04	0.68	0.00	0.07	0.04
Increased Catalyst Delivery and Spent Catalyst Haul for 1 Facility in the OCS	1.34	6.16	11.21	0.09	0.33	0.18
Daily Peak Operational Emissions	**1.49**	**7.20**	**11.88**	**0.09**	**0.40**	**0.22**
SIGNIFICACNE THRESHOLD FOR OPERATION	55	55	550	150	150	55

Note
1. Replacing an engine is assumed to not create any new operational impacts.
2. Catalyst delivery to the OCS facility includes round trip of catalyst manufacturer to port and round trip of barge from the port to the platform.

PAR 1110.2 Requirement	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr
Total From Ammonia Delivery Truck	8.56	0.00	0.00	8.57
Total From Catalyst Delivery and Spent Catalyst Haul Trucks	5.17	0.00	-	5.18
Total From Barge Delivery Trips to Facility in the OCS	77.20	0.00	-	77.47
Total Annual Operational GHG Emissions	**90.94**	**0.00**	**0.00**	**91.21**

Note
1. Based on an increase of 96 ammonia delivery trips per year, 29 new catalyst deliveries per year , 29 haul trips for spent catalyst.
2. Up to 6 catalysts deliveries via barge per year for a total of 12 trips.

APPENDIX C-3

CEQA Impact Evaluations – Assumptions and Calculations

SCR or NSCR Modification

Appendix C-3
CEQA Construction Impact Evaluations

Emissions Summary - Modification of Existing SCR or NSCR System

PAR 1110.2 Requirement	VOC (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Modification of Existing SCR or NSCR System	0.6	5.0	5.6	0.0	0.4	0.3
Daily Peak Construction Emissions	0.6	5.0	5.6	0.0	0.4	0.3
SIGNIFICACNE THRESHOLD FOR CONSTRUCTION	75	100	550	150	150	55

Notes:
1. The emissions are estimated using CalEEMod.
2. Equipment demolition and installation is expected to occur on different days in multiple stages.

GHG Emissions Summary

PAR 1110.2 Requirement	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr		
Modification of Existing SCR or NSCR System	4	0.0	0.0	3.9		
Total Emissions During Construction	4	0.0	0.0	**4**	0.130	Amortized over 30 Years

Notes:
1. The emissions are estimated using CalEEMod.

APPENDIX C-4

CEQA Impact Evaluations – Assumptions and Calculations

New SCR and Ammonia Tank Installation

Appendix C-4
CEQA Construction Impact Evaluations

Criteria Pollutant Emissions - Installation of 1 SCR System and Aqueous Ammonia Tank

PAR 1110.2 Requirement	VOC (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
1 SCR and Ammonia Tank	**1.4**	**10.2**	**9.9**	**0.0**	**0.7**	**0.5**
Daily Peak Construction Emissions	1.4	10.2	9.9	0.0	0.7	0.5
SIGNIFICANCE THRESHOLD FOR CONSTRUCTION	75	100	550	150	150	55

Notes:
1. The emissions are estimated using CalEEMod.
2. SCR replacement is expected to occur on different days in multiple stages.

GHG Emissions Summary - 1 SCR and Aqueous Ammonia Tank

PAR 1110.2 Requirement	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr		
1 SCR and Aqueous Ammonia Tank	55.0	0.01	0.0	55.2		
Total Emissions During Construction	55.0	0.0	0.0	55.2	1.84	Amortized Over 30 Years

Notes:
1. The emissions are estimated using CalEEMod.

APPENDIX C-5

CEQA Impact Evaluations – Assumptions and Calculations

Engine Repower and SCR System and Ammonia Tank Installation

Appendix C-5
CEQA Construction Impact Evaluations

Emissions Summary - Repower IC Engine with New Stationary Gas Turbine and SCR

PAR 1110.2 Requirement	VOC (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Repower IC Engine with New Stationary Gas Turbine and SCR	1.5	14.1	9.8	0.0	6.1	3.6
Daily Peak Construction Emissions	1.5	14.1	9.8	0.0	6.1	3.6
SIGNIFICACNE THRESHOLD FOR CONSTRUCTION	75	100	550	150	150	55

Notes:

1. The emissions are estimated using CalEEMod.
2. Equipment demolition and installation is expected to occur on different days in multiple stages.

GHG Emissions Summary

PAR 1110.2 Requirement	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr		
Replacement IC Engine and New 3-Way Catalyst	141	0.0	0.0	141.9		
Total Emissions During Construction	141	0.0	0.0	**142**	4.728	Amortized over 30 Years

Notes:

1. The emissions are estimated using CalEEMod.

APPENDIX C-6

CEQA Impact Evaluations – Assumptions and Calculations

Engine Replacement and NSCR System Installation in the OCS

Appendix C-6
CEQA Construction Impact Evaluations

Emissions Summary - Replacement IC Engine and New 3-Way Catalyst - OCS

PAR 1110.2 Requirement	VOC (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Replacement IC Engine and New 3-Way Catalyst	1.14	8.05	5.99	0.01	0.55	0.40
Replacement IC Engine and New 3-Way Catalyst - Barge	0.66	5.13	11.14	0.05	0.18	0.18
Daily Peak Construction Emissions	1.81	13.17	17.13	0.06	0.73	0.57
SIGNIFICACNE THRESHOLD FOR CONSTRUCTION	75	100	550	150	150	55

Notes:
1. The emissions are estimated using CalEEMod.
2. Equipment demolition and installation is expected to occur on different days in multiple stages.

GHG Emissions Summary

PAR 1110.2 Requirement	CO_2, MT/yr	CH_4, MT/yr	N_2O, MT/yr	CO_2e, MT/yr	
Replacement IC Engine and New 3-Way Catalyst	36	0.0	0.0	36.6	
Replacement IC Engine and New 3-Way Catalyst - Barge	28	0	0	28	
Total Emissions During Construction	65	0	0	65	2.165 Amortized over 30 Years

Notes:
1. The emissions are estimated using CalEEMod.

Appendix C-6
CEQA Construction Impact Evaluations

Emissions Summary - Barge Emissions

by Engine Type	VOC (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Main Engine	0.6	4.8	7.1	0.04	0.17	0.17
Auxiliary Engines (2)	0.1	0.4	4.1	0.01	0.01	0.01
Daily Peak Operational Emissions	0.7	5.1	11	0.05	0.18	0.18
SIGNIFICACNE THRESHOLD FOR CONSTRUCTION	55	55	550	150	150	55

Hours/Day
4

Notes:

1. The main and auxiliary engine emissions for VOC, NOx, and PM10 are estimated using The Carl Moyer Program Guidelines 2017 Revisions: Appendix C: Cost-Effectiveness Calculation Methodology: Formula C-6 Estimated Annual Emissions Based on Hours of Operation (tons/yr)
2. The main and auxiliary engine emissions for CO and SOxare estimated using the SMAQMD Harbor craft, Dredge and Barge Emission Factor Calculator.
3. Peak daily trips assume one round trip between the Port of Los Angeles and OCS Facility, approximately a distance of 22 miles each way or two hours per trip.
4. Both engines use diesel fuel.
5. PM2.5 is conservatively assumed to be equal to PM10

GHG Emissions Summary: Barge Emissions

PAR 1110.2 Requirement	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr	
Main Engine	1.93	0.00	0.00	1.94	
Auxiliary Engines (2)	0.42	0.00	0.00	0.42	
Total Emissions During Construction	2.36	0.00	0.00	2.36	0.07877598 Amortized over 30 Years

Notes:

1. The main and auxiliary engine emissions for CO2, CH4, N2O, and CO2e are estimated using the SMAQMD Harbor craft, Dredge and Barge Emission Factor Calculator
2. Equipment delivery is expected to take 1 trip.

APPENDIX C-7

CEQA Impact Evaluations – Assumptions and Calculations

Operational Calculations

Appendix C-7
CEQA Impact Evaluations - Assumptions and Calculations

Operational Emissions Summary - Increased Delivery of Aqueous Ammonia at 1 Facility and Increased Delivery/Haul of SCR Catalyst at 1 Facility on a Peak Day

PAR 1110.2	CO, lb/day	NOx, lb/day	PM10, lb/day	PM2.5, lb/day	VOC, lb/day	SOX, lb/day
Increased Delivery Trucks for Ammonia	0.34	0.52	0.03	0.02	0.08	0.002
Increased Truck Trips for New Catalyst Delivery and Spent Catalyst Haul Trip	0.68	1.04	0.07	0.04	0.15	0.004
Total	**1.01**	**1.56**	**0.10**	**0.06**	**0.23**	**0.01**

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
Diesel Delivery Trucks (T6 Construction Truck)	0.34	0.52	0.03	0.02	0.08	0.00	8.56	0.00	0.00	8.57
Diesel Delivery Trucks (T6 Construction Truck)	0.68	1.04	0.07	0.04	0.15	0.00	5.17	0.00	0.00	5.18
Total	**1.01**	**1.56**	**0.10**	**0.06**	**0.23**	**0.01**	**13.73**	**0.00**	**0.00**	**13.74**

All sites	
Max. # used/day	**Max. # used/yr**
1	96
2	58

Note:
1. Peak daily trips assume one new ammonia delivery. Truck trip distances to deliver ammonia are assumed to be 100 miles round-trip
2. No additional employees are anticipated to be needed as a result to the increased ammonia usage. As such, no workers' travel emissions are anticipated from the operation of the replaced SCR catalyst.
3. It is assumed medium-heavy duty diesel instate construction trucks would be used to deliver ammonia and catalyst.

Delivery Trucks (Ammonia and Catalyst) - T6 instate construction heavy (T6) - each

	CO	NOx	PM10	PM2.5	VOC	SOX	CO2	CH4	N2O	CO2e
lb/mile	0.0034	0.0052	0.0003	0.0002	0.0008	0.00002	1.97	0.00		1.97
lb/day, MT/day for GHG	0.34	0.52	0.03	0.02	0.08	0.002	0.09	0.00	0.00	0.09

VMT, mile/day
100.0

Emission Factors: from EMFAC2017, EPA AP-42 .

Appendix C-7
CEQA Impact Evaluations - Assumptions and Calculations

Emissions Summary - Barge Emissions

by Engine Type	VOC (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Main Engine	0.6	4.8	7.1	0.04	0.17	0.17
Auxiliary Engines (2)	0.1	0.4	4.1	0.01	0.01	0.01
Daily Peak Operational Emissions	0.7	5.1	11	0.05	0.18	0.18
SIGNIFICACNE THRESHOLD FOR CONSTRUCTION	55	55	550	150	150	55

Hours/Day
4

Notes:

1. The main and auxiliary engine emissions for VOC, NOx, and PM10 are estimated using The Carl Moyer Program Guidelines 2017 Revisions: Appendix C: Cost-Effectiveness Calculation Methodology: Formula C-6 Estimated Annual Emissions Based on Hours of Operation (tons/yr)
2. The main and auxiliary engine emissions for CO and SOxare estimated using the SMAQMD Harbor craft, Dredge and Barge Emission Factor Calculator.
3. Peak daily trips assume one round trip between the Port of Los Angeles and OCS Facility, approximately a distance of 22 miles each way or two hours per trip.
4. Both engines use diesel fuel.
5. PM2.5 is conservatively assumed to be equal to PM10

GHG Emissions Summary - Barge Emissions

PAR 1110.2 Requirement	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr
Main Engine	11.60	0.00	0.00	11.64
Auxiliary Engines (2)	1.26	0.00	0.00	1.27
Total Emissions	12.87	0.00	0.00	12.91

Notes:

1. The main and auxiliary engine emissions for CO2, CH4, N2O, and CO2e are estimated using the SMAQMD Harbor craft, Dredge and Barge Emission Factor Calculator
2. Equipment delivery is expected to take 1 trip.
3. Assume up to 6 trips per year for catalyst replacement.

APPENDIX C-8

CEQA Impact Evaluations – Assumptions and Calculations

Facility-wide Engine Modernization Construction Calculations

Appendix C-8
CEQA Construction Impact Evaluations

Emissions Summary - Facility-wide Engine Modernizatoin

PAR 1110.2 Requirement	VOC (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Facility-wide Engine Modernization of 5 engines at one faclility	4.5	35.7	32.5	0.1	19.2	10.8
Daily Peak Construction Emissions	4.5	35.7	32.5	0.1	19.2	10.8
SIGNIFICACNE THRESHOLD FOR CONSTRUCTION	75	100	550	150	150	55

Notes:
1. The emissions are estimated using CalEEMod.
2. Equipment demolition and installation is expected to occur on different days in multiple stages.

GHG Emissions Summary

PAR 1110.2 Requirement	CO2, MT/yr	CH4, MT/yr	N2O, MT/yr	CO2e, MT/yr		
Facility-wide Engine Modernization of 5 engines at one faclility	921	0.2	0.0	927		
Total Emissions During Construction	921	0.2	0.0	**927**	30.884	Amortized over 30 Years

Notes:
1. The emissions are estimated using CalEEMod.

APPENDIX D

PAR 1110.2 List of Affected Facilities

Appendix D: PAR 1110.2 List of Affected Facilities

Facility ID	Facility Name	Facility Address	On List per Government Code Section 65962.5 (Envirostor)?	Distance from School (meters)	Distance from Sensitive Receptor (meters)	Located within Two Miles of an Airport?
4242	San Diego Gas & Electric	14601 Virginia St, Moreno Valley, 92555	No	4492	26	No
5973	So Cal Gas Co.	25205 Rye Canyon, Valencia, 91355	No	882	724	No
8547	Quemetco Inc.	720 7th Ave, City of Industry, 91746	Yes	904	306	No
8582	So Cal Gas Co/Playa del Rey Storage Fac	8141 Gulana Ave, Playa Del Rey, 90293	No	726	0	Yes
9755	United Airlines Inc.	6010 Avion Dr, Los Angeles, 90045	Yes	1376	776	Yes
18931	Tamco	12459 Arrow Rte, Rancho Cucamonga, 91739	No	1035	853	No
43201	Snow Summit Inc.	880 Summit Blvd, Big Bear Lake, 92315	No	1614	35	No
61962	LA City, Harbor Dept	500 Pier A St, Wilmington, 90744	No	426	0	No
62548	The Newark Group, Inc.	6001 S Eastern Ave, Commerce, 90040	No	1053	369	No
68118	Tidelands Oil Production Company Etal	230 S Pico Ave, Long Beach, 90802	No	1115	533	No
124723	Greka Oil & Gas	1920 E Orchard Dr, Placentia, 92870	No	848	0	No
143740	DCOR LLC	Offshore Platform Esther, Seal Beach, 90740	No	1651	0	No
143741	DCOR LLC	Offshore Platform Edith, Huntington Beach, 92649	No	916	0	No
150201	Breitburn Operating LP	10735 S Shoemaker Ave, Santa Fe Springs, 90670	No	866	621	No
155877	Millercoors, LLC	15801 E 1st St, Irwindale, 91706	No	1988	1469	No
166073	Beta Offshore	OCS Lease Parcels P300/P301, Huntington Beach, 92648	No	1106	3	No
169754	So Cal Holding, LLC	20101 Goldenwest St, Huntington Beach, 92468	No	771	6	No
173904	Lapeyre Industrial Sands, Inc.	31302 Ortega Hwy, San Juan Capistrano, 92675	No	3325	0	No
174544	Breitburn Operating LP	11100 Constitution Ave, Los Angeles, 90025	No	1447	301	No
800128	So Cal Gas Co	12801 Tampa Ave, Northridge, 91326	No	454	10	No
800189	Disneyland Resort	1313 S Harbor Blvd, Anaheim, 92802	No	674	383	No

Note: Distances between facilities and sensitive receptors were estimated using ArcGIS from facility center point to receptor parcel boundary. Distances between facilities and schools or airports were estimated using ArcGIS from facility center point to school or airport center point.

APPENDIX E

Hazards Analysis

Appendix E: Hazards Analysis for PAR 1110.2 - Ammonia/Urea Usage

Estimated Ammonia/Urea Usage Increase

Facility	Increased Ammonia/Urea Needed per Year (gal/year)	Increased Ammonia/Urea Solution Needed per Year (lbs/year)	Increased Ammonia/Urea Solution Needed per day (lbs/day)	Increased Ammonia/Urea Solution Needed per day (tons/day)
A	10,333	80062	219	0.11
B	89	693	2	9.49E-04
C	2,045	15847	43	0.02
D	38	292	1	4.00E-04
E	7,147	55378	152	0.08
F	24,044	186297	510	0.26
G	6,850	63412	174	0.09
H	940	8700	24	0.01
			Total Usage	**0.56**

1. All facilities except Facilities G and H will be using 19% aqueous ammonia. Facilities G and H will be using aqueous urea which is assumed to be 40% urea by weight.
2. Facility H currently has an 10 ppmv ammonia slip limit for the existing SCR systems. If Facility H modifies the exisitng SCR system, they will be subject to a 5 ppmv ammonia slip limit.

Hazards Assessment for PAR 1110.2 - New Ammonia/Urea Tanks

Facility	Total Ammonia Needed per Month, gals/month	Tank Size Needed	Typical Tank Size	Deliveries per Month	Maximum Quantity Released, gallons	RMP Value (in miles)	Distance (feet)	Distance of closest receptor (feet)	Significant?
A	861	1292	1,500	1	1005	0.5	2640	84	Yes
B	7	11	250	1	167.5	0.1	528	0	Yes
C	170	256	500	1	335	0.1	528	4821	No
D	3	5	250	1	167.5	0.1	528	21	Yes
E	596	893	1,000	1	670	0.2	1056	32	Yes
F	2004	3006	5,000	1	3350	0.3	1584	2376	No
G	571	856	1,000	1	670	0.2	1056	0	Yes

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: https://ammoniatanks.com/
3. RMP*Comp run at 77 degrees F.
4. Maximum size of ammonia tank is typically 10,000 gallons.
5. Maximum quantity release is assumed to be equal to 67% the capacity of the tank (see Note 1).
6. Facility A is located in a rural area with terrain that is generally flat and unobstructed.
7. Due to the low use of ammonia or urea needed, Facility B and D will not likely install a storage tank but a tank of 250 gallons will be included in the analysis as the worst case. Totes of ammonia/urea may be delivered as needed.
8. Facility G will be using urea; however, it is assumed that ammonia in the solution (about 30% by weight) will be released.

Facility A - Ammonia Usage

Engine	Engine size, hp	Fuel	Current NOx Limit, ppm	Proposed NOx Limit, ppm	Current Emissions, lbs/day	Emissions after Modification, lbs/day	Emissions Reduction, lbs/day	Moles reduction per day	Moles ammonia needed per day	Ammonia slip, lbs/day	Ammonia slip, mols/day	Ammonia needed (19% solution), gal/month
A1	995	NG	150	11	7.78	0.57	7.21	0.16	0.16	0.41	0.02	66
A2	995	NG	150	11	6.91	0.51	6.40	0.14	0.15	0.41	0.02	59
A3	995	NG	150	11	7.17	0.53	6.65	0.14	0.15	0.41	0.02	61
A4	3000	NG	101	11	7.68	0.83	6.85	0.15	0.16	1.25	0.07	80
A5	3000	NG	85	11	9.65	1.24	8.41	0.18	0.19	1.25	0.07	92
A6	3200	NG	194	11	63.51	3.59	59.92	1.30	1.37	1.33	0.08	503
											Total gallons of ammonia required per month =	**861**

Notes:

1. Proposed ammonia slip is 5 ppm @ 15% O2
2. lbs/hr NH3 = Ammonia Slip (ppm) x Molecular Weight of Ammonia x Dry Fuel Factor /(Molar Volume at 68F x 1000000) x (%O2 in air/(%O2 in air - %O2 in stack))
   where,
   Ammonia Slip = 5 ppm
   Molecular Weight of Ammonia = 17 lbs/lb-mol
   Dry Fuel Factor = 8710 dscf/MMBTU for Natural Gas, Propane, and Butane, 9190 dscf/MMBTU for Diesel and Fuel Oil
   Molar Volume @ 68F = 385 cf/lb-mol
   1000000 = ppm conversion factor
   % O2 in air = 20.9%
   % O2 correction = 3% or 15 %
3. Aqueous ammonia is 19% ammonia by weight.

Facility B - Ammonia Usage

Engine	Engine size, hp	Fuel	Current NOx Limit, ppm	Proposed NOx Limit, ppm	Current Emissions, lbs/day	Emissions after Modification, lbs/day	Emissions Reduction, lbs/day	Moles reduction per day	Moles ammonia needed per day	Ammonia slip, lbs/day	Ammonia slip, mols/day	Ammonia needed (19% solution), gal/month
B1	450	Diesel	344	11	0.44	0.01	0.43	0.01	0.01	0.20	0.01	7
										Total gallons of ammonia required per month =		**7**

Notes:

1. Proposed ammonia slip is 5 ppm @ 15% O2
2. lbs/hr NH3 = Ammonia Slip (ppm) x Molecular Weight of Ammonia x Dry Fuel Factor /(Molar Volume at 68F x 1000000) x (%O2 in air/(%O2 in air - %O2 in stack))
   where,
   Ammonia Slip = 5 ppm
   Molecular Weight of Ammonia = 17 lbs/lb-mol
   Dry Fuel Factor = 8710 dscf/MMBTU for Natural Gas, Propane, and Butane, 9190 dscf/MMBTU for Diesel and Fuel Oil
   Molar Volume @ 68F = 385 cf/lb-mol
   1000000 = ppm conversion factor
   % O2 in air = 20.9%
   % O2 correction = 3% or 15 %
3. Aqueous ammonia is 19% ammonia by weight.

Facility C - Ammonia Usage

Engine	Engine size, hp	Fuel	Current NOx Limit, ppm	Proposed NOx Limit, ppm	Current Emissions, lbs/day	Emissions after Modification, lbs/day	Emissions Reduction, lbs/day	Moles reduction per day	Moles ammonia needed per day	Ammonia slip, lbs/day	Ammonia slip, mols/day	Ammonia needed (19% solution), gal/month
C1	881	Digester Gas	36	11	13.22	4.04	9.18	0.20	0.21	0.37	0.02	80
C2	881	Digester Gas	36	11	1.50E+01	4.58E+00	1.04E+01	0.23	0.24	0.37	0.02	90
								Total gallons of ammonia required per month =				**170**

Notes:

1. Proposed ammonia slip is 5 ppm @ 15% O2
2. lbs/hr NH3 = Ammonia Slip (ppm) x Molecular Weight of Ammonia x Dry Fuel Factor /(Molar Volume at 68F x 1000000) x (%O2 in air/(%O2 in air - %O2 in stack))
   where,
   Ammonia Slip = 5 ppm
   Molecular Weight of Ammonia = 17 lbs/lb-mol
   Dry Fuel Factor = 8710 dscf/MMBTU for Natural Gas, Propane, and Butane, 9190 dscf/MMBTU for Diesel and Fuel Oil
   Molar Volume @ 68F = 385 cf/lb-mol
   1000000 = ppm conversion factor
   % O2 in air = 20.9%
   % O2 correction = 3% or 15 %
3. Aqueous ammonia is 19% ammonia by weight.

Facility D - Ammonia Usage

Engine	Engine size, hp	Fuel	Current NOx Limit, ppm	Proposed NOx Limit, ppm	Current Emissions, lbs/day	Emissions after Modification, lbs/day	Emissions Reduction, lbs/day	Moles reduction per day	Moles ammonia needed per day	Ammonia slip, lbs/day	Ammonia slip, mols/day	Ammonia needed (19% solution), gal/month
D1	131	Diesel	208	11	0.26	0.01	0.25	0.01	0.01	0.06	3.38E-03	3
											Total gallons of ammonia required per month =	**3**

Notes:

1. Proposed ammonia slip is 5 ppm @ 15% O2
2. lbs/hr NH3 = Ammonia Slip (ppm) x Molecular Weight of Ammonia x Dry Fuel Factor /(Molar Volume at 68F x 1000000) x (%O2 in air/(%O2 in air - %O2 in stack))
   where,
   Ammonia Slip = 5 ppm
   Molecular Weight of Ammonia = 17 lbs/lb-mol
   Dry Fuel Factor = 8710 dscf/MMBTU for Natural Gas, Propane, and Butane, 9190 dscf/MMBTU for Diesel and Fuel Oil
   Molar Volume @ 68F = 385 cf/lb-mol
   1000000 = ppm conversion factor
   % O2 in air = 20.9%
   % O2 correction = 3% or 15 %
3. Aqueous ammonia is 19% ammonia by weight.

Facility E- Ammonia Usage

Engine	Engine size, hp	Fuel	Current NOx Limit, ppm	Proposed NOx Limit, ppm	Current Emissions, lbs/day	Emissions after Modification, lbs/day	Emissions Reduction, lbs/day	Moles reduction per day	Moles ammonia needed per day	Ammonia slip, lbs/day	Ammonia slip, mols/day	Ammonia needed (19% solution), gal/month
E1	2000	NG	37	11	18.63	5.60	13.04	0.28	0.30	0.83	0.05	120
E2	2000	NG	21	11	11.34	5.90	5.44	0.12	0.12	0.83	0.05	60
E3	2000	NG	40	11	24.86	6.82	18.04	0.39	0.41	0.83	0.05	160
E4	2000	NG	53	11	20.85	4.35	16.51	0.36	0.38	0.83	0.05	148
E5	2000	NG	31	11	17.58	6.28	11.30	0.25	0.26	0.83	0.05	107
									Total gallons of ammonia required per month =			**596**

Notes:

1. Proposed ammonia slip is 5 ppm @ 15% O2
2. lbs/hr NH3 = Ammonia Slip (ppm) x Molecular Weight of Ammonia x Dry Fuel Factor /(Molar Volume at 68F x 1000000) x (%O2 in air/(%O2 in air - %O2 in stack))
   where,
   Ammonia Slip = 5 ppm
   Molecular Weight of Ammonia = 17 lbs/lb-mol
   Dry Fuel Factor = 8710 dscf/MMBTU for Natural Gas, Propane, and Butane, 9190 dscf/MMBTU for Diesel and Fuel Oil
   Molar Volume @ 68F = 385 cf/lb-mol
   1000000 = ppm conversion factor
   % O2 in air = 20.9%
   % O2 correction = 3% or 15 %
3. Aqueous ammonia is 19% ammonia by weight.

Facility F - Ammonia Usage

Engine	Engine size, hp	Fuel	Current NOx Limit, ppm	Proposed NOx Limit, ppm	Current Emissions, lbs/day	Emissions after Modification, lbs/day	Emissions Reduction, lbs/day	Moles reduction per day	Moles ammonia needed per day	Ammonia slip, lbs/day	Ammonia slip, mols/day	Ammonia needed (19% solution), gal/month
F1	5500	NG	90	11	65.27	8.00	57.28	1.25	1.31	2.29	0.13	501
F2	5500	NG	71	11	27.79	4.29	23.50	0.51	0.54	2.29	0.13	233
F3	5500	NG	93	11	56.50	6.68	49.81	1.08	1.14	2.29	0.13	442
F4	5500	NG	91	11	56.39	6.79	49.60	1.08	1.13	2.29	0.13	440
F5	5500	NG	78	11	49.82	7.03	42.79	0.93	0.98	2.29	0.13	386
								Total gallons of ammonia required per month =				**2004**

Notes:

1. Proposed ammonia slip is 5 ppm @ 15% O2
2. lbs/hr NH3 = Ammonia Slip (ppm) x Molecular Weight of Ammonia x Dry Fuel Factor /(Molar Volume at 68F x 1000000) x (%O2 in air/(%O2 in air - %O2 in stack))

   where,

   Ammonia Slip = 5 ppm

   Molecular Weight of Ammonia = 17 lbs/lb-mol

   Dry Fuel Factor = 8710 dscf/MMBTU for Natural Gas, Propane, and Butane, 9190 dscf/MMBTU for Diesel and Fuel Oil

   Molar Volume @ 68F = 385 cf/lb-mol

   1000000 = ppm conversion factor

   % O2 in air = 20.9%

   % O2 correction = 3% or 15 %
3. Aqueous ammonia is 19% ammonia by weight.

Facility G- Urea Usage

Engine	Engine size, hp	Fuel	Current NOx Limit, ppm	Proposed NOx Limit, ppm	Current Emissions, lbs/day	Emissions after Modification, lbs/day	Emissions Reduction, lbs/day	Moles reduction per day	Moles ammonia needed per day	Ammonia slip, lbs/day	Ammonia slip, mols/day	Urea needed (28.1% ammonia by wt solution), gal/month
G1	2000	NG	225	11	51.22	2.50	48.71	1.06	1.11	0.83	0.05	225
G2	2000	NG	225	11	24.84	1.21	23.63	0.51	0.54	0.83	0.05	114
G3	2000	NG	225	11	52.72	2.58	50.14	1.09	1.14	0.83	0.05	232
										Total gallons of urea required per month =		**571**

Notes:

1. Proposed ammonia slip is 5 ppm @ 15% O2
2. lbs/hr NH3 = Ammonia Slip (ppm) x Molecular Weight of Ammonia x Dry Fuel Factor /(Molar Volume at 68F x 1000000) x (%O2 in air/(%O2 in air - %O2 in stack))
   where,
   Ammonia Slip = 5 ppm
   Molecular Weight of Ammonia = 17 lbs/lb-mol
   Dry Fuel Factor = 8710 dscf/MMBTU for Natural Gas, Propane, and Butane, 9190 dscf/MMBTU for Diesel and Fuel Oil
   Molar Volume @ 68F = 385 cf/lb-mol
   1000000 = ppm conversion factor
   % O2 in air = 20.9%
   % O2 correction = 3% or 15 %
3. 40% aqueous urea contains about 28.4% ammonia by weight.

APPENDIX F

Estimated NOx Emission Reductions per Engine

Appendix F: NOx EMISSION REDUCTIONS AFTER IMPLEMENTING PAR 1110.2

Facility	Unit	Engine size, hp	Existing NOx Control Techology	Expected Modification	Current NOx Limit, ppm	Proposed NOx Limit, ppm	Current Emissions, lbs/day	Emissions after Modification, lbs/day	NOx reduction, lbs/day
A	A1	995	Oxidation Cat	Repower with stationary gas turbine equipped with SCR system	150	11	7.78	0.57	7.21
A	A2	995	Oxidation Cat	Repower with stationary gas turbine equipped with SCR system	150	11	6.91	0.51	6.40
A	A3	995	Oxidation Cat	Repower with stationary gas turbine equipped with SCR system	150	11	7.17	0.53	6.65
A	A4	3000	Oxidation Cat	SCR and Oxi-cat	101	11	7.68	0.83	6.85
A	A5	3000	Oxidation Cat	SCR and Oxi-cat	85	11	9.65	1.24	8.41
A	A6	3200	Oxidation Cat	SCR and Oxi-cat	194	11	63.51	3.59	59.92
B	B1	5500	Oxidation Cat	Repower with stationary gas turbine equipped with SCR system	90	11	65.27	8.00	57.28
B	B2	5500	Oxidation Cat	Repower with stationary gas turbine equipped with SCR system	71	11	27.79	4.29	23.50
B	B3	5500	Oxidation Cat	Repower with stationary gas turbine equipped with SCR system	93	11	56.50	6.68	49.81
B	B4	5500	Oxidation Cat	Repower with stationary gas turbine equipped with SCR system	91	11	56.39	6.79	49.60
B	B5	5500	Oxidation Cat	Repower with stationary gas turbine equipped with SCR system	78	11	49.82	7.03	42.79
B	B6	818	3-way Cat	new AFRC/re-tuning	20	11	3.42	1.88	1.54
B	B7	818	3-way Cat	new AFRC/re-tuning	20	11	4.96	2.73	2.23
B	B8	738	3-way Cat	new AFRC/re-tuning	20	11	1.74	0.97	0.77
B	B9	738	3-way Cat	new AFRC/re-tuning	20	11	1.27	0.71	0.56
B	B10	818	3-way Cat	Retrofit with new AFRC	20	11	2.46	1.35	1.11
C	C1	2000	Oxidation Cat	SCR and Oxi-cat	225	11	51.22	2.50	48.71
C	C2	2000	Oxidation Cat	SCR and Oxi-cat	225	11	24.84	1.21	23.63
C	C3	2000	Oxidation Cat	SCR and Oxi-cat	225	11	52.72	2.58	50.14
D	D1	3043	Oxidation Cat w/ SCR and DPF	SCR Retrofits	50	11	3.63	0.80	2.83
D	D2	3043	Oxidation Cat w/ SCR and DPF	SCR Retrofits	50	11	4.22	0.93	3.29
D	D3	3043	Oxidation Cat w/ SCR and DPF	SCR Retrofits	50	11	1.99	0.44	1.55

Facility	Unit	Engine size, hp	Existing NOx Control Techology	Expected Modification	Current NOx Limit, ppm	Proposed NOx Limit, ppm	Current Emissions, lbs/day	Emissions after Modification, lbs/day	NOx reduction, lbs/day
D	D4	3043	Oxidation Cat w/ SCR and DPF	SCR Retrofits	50	11	4.79	1.05	3.74
D	D5	3043	Oxidation Cat w/ SCR and DPF	SCR Retrofits	50	11	3.83	0.84	2.99
D	D6	3043	Oxidation Cat w/ SCR and DPF	SCR Retrofits	50	11	4.21	0.93	3.29
E	E1	450	FGR	SCR and Oxi-cat	344	11	0.44	0.01	0.43
F	F1	881	Oxidation Cat	SCR and Oxi-cat	36	11	13.22	4.04	9.18
F	F2	881	Oxidation Cat	SCR and Oxi-cat	36	11	14.99	4.58	10.41
G	G1	853	Oxidation Cat	Replace with new engine with 3-way catalyst	450	11	8.21	0.20	8.01
G	G2	853	Oxidation Cat	Replace with new engine with 3-way catalyst	450	11	9.36	0.23	9.13
G	G3	853	Oxidation Cat	Replace with new engine with 3-way catalyst	450	11	3.70	0.09	3.61
G	G4	853	Oxidation Cat	Replace with new engine with 3-way catalyst	450	11	3.84	0.09	3.75
G	G5	853	Oxidation Cat	Replace with new engine with 3-way catalyst	450	11	2.25	0.05	2.19
G	G6	853	Oxidation Cat	Replace with new engine with 3-way catalyst	450	11	0.18	0.0045	0.18
H	H1	131	None	SCR	208	11	0.26	0.01	0.25
I	I1	845	3-way Cat	New 3-way Catalyst	28	11	8.20	3.18	5.02
J	J1	2000	Oxidation Cat	SCR and Oxi-cat	37	11	18.63	5.60	13.04
J	J2	2000	Oxidation Cat	SCR and Oxi-cat	21	11	11.34	5.90	5.44
J	J3	2000	Oxidation Cat	SCR and Oxi-cat	40	11	24.86	6.82	18.04
J	J4	2000	Oxidation Cat	SCR and Oxi-cat	53	11	20.85	4.35	16.51
J	J5	2000	Oxidation Cat	SCR and Oxi-cat	31	11	17.58	6.28	11.30
J	J6	818	3-way Cat	new AFRC/re-tuning	20	11	4.76	2.62	2.14
J	J7	818	3-way Cat	new AFRC/re-tuning	20	11	4.33	2.38	1.95
J	J8	818	3-way Cat	new AFRC/re-tuning	20	11	3.47	1.91	1.56
J	J9	818	3-way Cat	new AFRC/re-tuning	20	11	3.46	1.90	1.56
							Total NOx Reductions, lbs/day		**588.5**

APPENDIX G

Comment Letters Received on the Draft SEA and Responses to Comments

Comment Letter #1 - Pala Band of Mission Indians

Comment Letter #2 - Department of Transportation – District 7

Comment Letter #3 - Augustine Band of Cahuilla Indians

Comment Letter #4 – Montauk Energy

Comment Letter #5 – Southern California Gas Company and San Diego Gas and Electric Company

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

July 29, 2019

South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178
Attention: Ms. Tracy Tang (c/o CEQA)

Re: Recipient of CEQA Notices/Documents

Dear Ms. Tang,

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 the Pala Band currently has no objections to receiving more information from SCAQMD. Please keep us on your contacts list. 1-1

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

THINK GLOBALLY | ACT TRIBALLY

Response to Comment Letter #1

Response 1-1:
This comment requests to remain on the mailing list for receiving notices pertaining to CEQA. The South Coast AQMD provides a notice of all proposed projects to all California Native American Tribes that either request to be on the Native American Heritage Commission's notification list or South Coast AQMD's mailing list per Public Resources Code §21080.3.1 (b)(1). As requested, for future projects where the South Coast AQMD is lead agency, South Coast AQMD staff will continue to send CEQA notifications to this California Native American Tribe.

Comment Letter #2

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY Gavin Newsom, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 7 – Office of Regional Planning
100 S. MAIN STREET, SUITE 100
LOS ANGELES, CA 90012
PHONE (213) 897-6536
FAX (213) 897-1337
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

August 6, 2019

Barbara Radlein
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

RE: Proposed Amended Rule 1110.2 – Emissions from Gaseous and Liquid-Fueled Engines and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities – Draft Subsequent EIR
SCH # 2016071006
GTS # 07-LA-2019-02729

Dear Ms. Radlein:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for this Draft Subsequent EIR. Proposed Amended Rule (PAR) 1110.2 applies to stationary and portable engines, rated greater than 50 brake horsepower, and proposes to: 1) include internal combustion engines operated at current and former RECLAIM facilities which were not previously subject to Rule 1110.2 and require them to comply with Best Available Retrofit Control Technology; 2) establish ammonia slip limits and require ammonia emissions monitoring; and 3) exempt non-emergency engines operated at remote two-way radio transmission towers. PAR 1100 proposes to require: 1) two- and four-stroke lean-bum compressor gas engines to comply with the NOx emission limits in PAR 1110.2 within 24 months after a permit to construct is issued, or 36 months after a permit to construct is issued if the application is submitted by July 1, 2021; and 2) all other qualifying engines to meet the NOx emission limits by December 31, 2023. The proposed project is estimated to reduce NOx emissions by 0.29 ton per day. The Draft Subsequent Environmental Assessment (SEA) identifies potentially significant adverse hazards and hazardous materials impacts. Some sites affected by the proposed project may be identified on lists compiled by the California Department of Toxic Substances Control per Government Code §65962.5. 2-1

After reviewing the ND, Caltrans does not expect project approval to result in a direct adverse impact to the existing State transportation facilities.

If you have any questions, please contact project coordinator David Calkins, at david.calkins@dot.ca.gov, and refer to GTS # 07-LA-2019-02729.

Sincerely,

MIYA EDMONSON
IGR/CEQA Branch Chief
cc: Scott Morgan, State Clearinghouse

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

Response to Comment Letter #2

Response 2-1:
This comment opens with a summary of the proposed project including the project objectives and potential environmental impacts. Further, the commenter concluded that the proposed project will not likely result in a direct adverse impact to existing State transportation facilities; no response to this comment is necessary.

Comment Letter #3

AUGUSTINE BAND OF CAHUILLA INDIANS
PO Box 846 84-481 Avenue 54 Coachella CA 92236
Telephone: (760) 398-4722
Fax (760) 369-7161
Tribal Chairperson: Amanda Vance
Tribal Vice-Chairperson: William Vance
Tribal Secretary: Victoria Martin

August 29, 2019

Tracy Tang
South Coast AQMD
21865 Copley Drive
Diamond Bar, CA 91765

RE: Notice of Completion of a Draft Subsequent Environmental Assessment and Opportunity For Public Comment.
Project Title: Proposed Amended Rule 1110.2- Emissions from Gaseous- and Liquid-Fueled Engines, and Proposed Amended Rule1100- Implementation Schedule for Nox Facilities

Dear Sir or Madam-

Thank you for the opportunity to offer input concerning the development of the above-identified project. We appreciate your sensitivity to the cultural resources that may be impacted by your project, and the importance of these cultural resources to the Native American peoples that have occupied the land surrounding the area of your project for thousands of years. Unfortunately, increased development and lack of sensitivity to cultural resources has resulted in many **3-1**
significant cultural resources being destroyed or substantially altered and impacted. Your invitation to consult on this project is greatly appreciated.

At this time, we are unaware of specific cultural resources that may be affected by the proposed project, however in the event you should discover any cultural resources during the development of this project please contact our office immediately for further evaluation.

Very truly yours,

Augustine Band of Cahuilla Indians

Victoria Martin
Tribal Secretary

Response to Comment Letter #3

Response 3-1:
The South Coast AQMD provides a notice of all proposed projects to all California Native American Tribes that either request to be on the Native American Heritage Commission's notification list or South Coast AQMD's mailing list per Public Resources Code §21080.3.1 (b)(1) and a notice for the proposed project was provided to the commenter. These notices provide an opportunity for California Native American Tribes to request a consultation with the South Coast AQMD if potentially significant adverse impacts to Tribal cultural resources are identified. The Final SEA for this project did not identify any potentially significant adverse impacts to Tribal cultural resources and the commenter agrees with this conclusion. Further, the South Coast AQMD did not receive any consultation requests from any California Native American Tribes, including the commenter, relative to the proposed project.

Comment Letter #4

Tracy Tang

From:	Sharon Frank <sfrank@montaukenergy.com>
Sent:	Tuesday, September 10, 2019 3:44 PM
To:	Tracy Hang
Subject:	[EXTERNAL]Comments on Proposed amended rule 1110.2
Importance:	High

Dear Sir/ Madam:
Montauk Energy is submitting the following comments on the proposed amended rule 1110.2:

1.Section(d)(I) Suggest adding........"If during any four month period, the engine is not achieving the emissions criteria contained in this paragraph, the engine shall revert to 15-minute averaging, but can resume 24 hour averaging if the engine can demonstrate the aforementioned emissions criteria **within the next subsequent** four month **rolling** period."...

2.Section (f)(1)(C)(iii) – This section for conducting ammonia source tests is not clear. First tests are required quarterly for the first year of operation. Then tests are required annually (after four consecutive source tests demonstrating compliance with the ammonia limit). Will all facilities have to conduct four (4) quarterly tests to demonstrate compliance in order to revert to annual testing? Even if these facilities have been in operation for four (4) years or more?

3. Section (f)(1)(D) Suggest adding...."Facilities with biogas engines using longer averaging times for compliance using 4-1
CEMS are required to submit an I & M plan, **per Attachment I (Section G only) . The I & M plan shall include all items listed in Attachment I for other sources without CEMS"**

Most of the items in Attachment I are related to engines that do Not have CEMS and must use portable NOx, CO and oxygen analyzers to establish set points. The only section of Attachment I relevant to units with CEMS is Section G. Also, why would a facility with a CEMS unit that must meet all of the Data Acquisition and Handling System (DAHS) requirements contained in Rule 218 and 218.1 have to supply an I & M Plan? The DAHS and CEMS requirements for reporting are more stringent. Further this requirement can be spelled out in a permit or even in the CEMS QA/QC Plan. Sources must first submit a permit modification application to even apply for the 24-hour averaging period. This modification has proven to take approximately 1 year in the case of our facility. Would we then have to submit an I & M Plan for approval also?

Sincerely,

Sharon Frank
Manager, Environmental Compliance
680 Andersen Drive
Foster Plaza 10, 5th floor
Pittsburgh, PA 15220
(412) 747-8722 (office)
(412) 327-2360 (cell)

Montauk energy®

Response to Comment Letter #4

Response 4-1:
The comments in this letter refer to a previous version of PARs 1110.2 and 1100 and do not raise any CEQA issues. Revisions have been made to the proposed amended rules subsequent to the release of the Draft SEA, such that the commenter's concerns, requested clarifications, and suggested edits are no longer applicable, as explained below:.

- PAR 1110.2 has been modified such that the four-month period previously proposed in paragraph (d)(1) has been removed. Subsequent averaging, where applicable, is set on a fixed-interval basis and not on a rolling average.

- PAR 1110.2 no longer has a proposed ammonia limit or requirements to conduct ammonia source testing in clause (f)(1)(C)(iii). Instead, any ammonia limit will be assigned through the permitting process and any associated BACT evaluation.

- While reference to a plan had been initially proposed in subparagraph (f)(1)(D) as a means to track when a facility may opt to use alternate averaging provision, PAR 1110.2 has been modified such that facilities with biogas engines are not required to submit an I&M plan.

Comment Letter #5

SoCalGas
A Sempra Energy utility

Deanna Haines
Director
Environmental Policy

Tel: 213-244-3010
dhaines@socalgas.com

September 9, 2019

Ms. Tracy Tang
Air Quality Specialist
Planning, Rule Development & Area Sources
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Submitted via email

RE: Comments on the Draft Subsequent Environmental Assessment (DSEA) for Proposed Amended Rule (PAR) 1110.2 (Emissions from Gaseous- and Liquid-Fueled Engines) and PAR 1100 (Implementation Schedule for NOx Facilities)

Dear Ms. Tang:

Southern California Gas Company and San Diego Gas and Electric Company (referred to herein as "the Utilities") appreciate the opportunity to comment on the South Coast Air Quality Management District's (SCAQMD's) Draft Subsequent Environmental Assessment (DSEA) for Proposed Amended Rule (PAR) 1110.2, "Emissions from Gaseous- and Liquid-Fueled Engines" and PAR 1100, "Implementation Schedule for NOx Facilities."

The Utilities provide services to over 25 million customers in California and operate a complex natural gas distribution, transmission, and storage system spanning thirteen counties in California. Within the South Coast Air Basin, the Utilities operate three natural gas storage facilities and one gas transmission station. Our facilities play a key role in supplying energy services to our customers, thereby ensuring a reliable and safe gas supply to residential, commercial, and industrial operations, while also supporting one of the most important economic regions in the country. 5-1

We are driven by our desire to be the cleanest natural gas utilities in the country. As part of our forward-looking operational asset planning, the Utilities are evaluating innovative compression and generator technologies that create synergies with electricity and hydrogen production. These pathways are anticipated to reduce oxides of nitrogen (NOx) emissions at our facilities.

Comment Letter #5 (continued)

Page 2

Over the last year and a half, the Utilities have met with SCAQMD staff to highlight the operational significance and complexity of our facilities, including providing tours of each facility subject to PAR 1110.2. During this time, the Utilities have provided detailed information about the unique nature of gas compressor engines including operational and physical challenges that exist at each facility. The Utilities have also shared proposed emission control retrofit and equipment replacement plans and the associated time lines to reasonably achieve our plans. 5-1 cont'd

We appreciate SCAQMD staff's continued commitment to meet with our team and discuss our unique set of issues. The current versions of the proposed amended rules reflect a collective understanding of the importance natural gas facility modernization projects can play in providing both energy reliability and emission reduction benefits to the residents of the South Coast Air Basin.

Since the release of the DSEA, SCAQMD has proposed changes to PAR 1110.2 and PAR 1100, which were released for the August 20, 2019 Working Group meeting (herein denoted accordingly).[1] These proposed revisions include additional compliance time and interim/alternative standards for the retrofitting and/or repowering of compressor gas lean-burn engines that provide vital natural gas service to residential, commercial, and industrial customers (including power generation) throughout Southern California.

The Utilities do not believe that these revisions will affect the conclusions of the DSEA, but request that the Project Description and portions of the environmental analysis be updated to reflect the proposed rule changes. In addition, we are providing comments on other portions of the DSEA. Our comments are presented by topic below. We respectfully request your consideration of the proposed revisions included in **Attachment A** of this letter when preparing the Final Subsequent Environmental Assessment (FSEA). 5-2

I. Extended Compliance Schedule and Interim/Alternative Emission Limits

The Utilities are recommending that the FSEA be revised to update the Project Description with the August 20, 2019 (or any subsequent) PAR 1110.2 and PAR 1100 revisions (see **Attachment A**) and that the environmental analysis and conclusions be reviewed and, as necessary, be confirmed and/or revised. 5-3

II. Ammonia Use in Selective Catalytic Reduction (SCR) Systems

The latest version of PAR 1100 allows an interim ammonia emission limit of 20 ppm over a period of 60 consecutive minutes for facilities with approved time extensions [c.f., August 20, 2019 PAR 1100(d)(4)(C)]. The Utilities recommend that ammonia usage in Appendix E be revised to reflect the potential greater use of ammonia for the RECLAIM and former RECLAIM facilities with compressor gas lean-burn engine(s) and an approved time extension (see **Attachment A** for details). 5-4

[1] August 20, 2019 Revised PAR 1110.2 at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1110.2/par1110-2_wgm6_final.pdf?sfvrsn=6. August 20, 2019 Revised PAR 1110 at: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1110.2/par1100_wgm6_final.pdf?sfvrsn=6.

Comment Letter #5 (continued)

Page 3

III. Facility-Wide Engine Modernization

Since the release of the DSEA, SCAQMD's proposed changes to PAR 1100 include provisions for facility-wide engine modernization. The facility-wide engine modernization portions of the August 20, 2019 version of PAR 1100 provide the time necessary to analyze, prepare, and submit a plan to potentially replace an existing gas compression lean-burn engine with innovative low to zero-emitting equipment. Accordingly, we are requesting that the FSEA Project Description be revised to include these new PAR 1100 facility-wide engine modernization provisions (see **Attachment A**) and that the environmental analysis and conclusions be reviewed and, as necessary, be confirmed and/or revised. 5-5

IV. Construction Analysis Scenarios

The Utilities appreciate the level of detail SCAQMD has provided in the DSEA. For gas compression lean-burn engines, we have reviewed the construction scenario assumptions and inputs for "Repowering of an Existing Engine with a Stationary Gas Turbine Utilizing SCR Technology" [DSEA pp 4-10 through 4-12; DSEA Appendix B]. For our unique facilities, the engine repowers and/or facility-wide engine modernization may require the construction of new equipment on a separate footprint because of the need to maintain gas compression for serving residential, commercial, and industrial customers with the existing engines until the new equipment is constructed and tested. We respectfully request that SCAQMD consider our construction scenario as reasonably foreseeable for facility-wide engine modernizations subject to the requirements of PAR 1110.2 and 1100. 5-6

For a single engine repower and/or facility-wide engine modernization, site preparation and new construction on a separate area of up to 20,000 square feet per engine (including grading and new foundation/structure building) may be required, and demolition of existing engines and related infrastructure would occur after new equipment/structure construction. **Attachment A** includes a description of this construction scenario for "Repowering of an Existing Engine with a Stationary Gas Turbine Utilizing SCR Technology." This proposed worst case scenario could also account for other potential engine modernization scenarios that would use similar construction equipment and require a footprint for electric compressor equipment as well as associated electrical infrastructure.

V. Other Comments

Our review of the DSEA also identified text that may need minor corrections or clarifying revisions. We are recommending that the FSEA be revised to reflect these minor corrections and revisions provided in **Attachment A**. 5-7

Respectfully submitted,

Deanna Haines
Director, Environmental Policy

Comment Letter #5 (continued)

Page 4

Attachment A – The Utilities' Requested Revisions for the Final SEA

This attachment includes the Utilities' requested revisions for the Final Subsequent Environmental Assessment (FSEA) for Proposed Amended Rule (PAR) 1110.2 (Emissions from Gaseous- and Liquid-Fueled Engines) and PAR 1100 (Implementation Schedule for NOx Facilities). We have grouped the requested revisions by topic. 5-7 cont'd

I. Project Description Revisions Related to Extended Compliance Schedule and Interim/Alternative Emission Limits

The Utilities recommend that the Project Description be revised to reflect the latest changes to PAR 1110.2 and PAR 1100, including those released by SCAQMD for the August 20, 2019 Working Group meeting and any subsequent changes. Specifically, the Project Description portion of Chapter should be revised to include those revised PAR 1110.2 and PAR 1100 provisions related to compressor gas lean-burn engines and facility-wide engine modernization. The effects of these revisions and related comments on the environmental analyses are discussed in greater detail below. The revisions that we are requesting in the Project Description include, but are not limited to: 5-8

- PAR 1110.2
  - New definition for compressor gas lean-burn engine [Revised PAR 1110.2(c)(5)]
- PAR 1100
  - Time extension for compressor gas lean-burn engines with related interim emission limits [Revised PAR 1100(d)(4)]
  - Alternative emission limits for compressor gas lean-burn engines [PAR 1100(d)(5)]
  - Facility-wide engine modernization [PAR 1100(d)(6)]

The Utilities also suggest that Appendix A be revised to include the latest versions of PAR 1110.2 and PAR 1100.

II. Ammonia

The Utilities recommend that the Project Description and Environmental Impacts sections be revised to reflect the latest changes to PAR 1100 related to ammonia slip and ammonia storage. The August 20, 2019 version of PAR 1100 allows an interim ammonia emission limit of 20 ppm over a period of 60 consecutive minutes for facilities with approved time extensions [c.f., August 20, 2019 PAR 1100(d)(4)(C)]. Our rationale for this request is that the DSEA already notes that some stationary compressor gas turbines have an ammonia slip limit of 10 ppmv [DSEA p. 4-19] and revised PAR 1100 establishes an interim ammonia slip limit of 20 ppm [August 20, 2019 PAR 1100(d)(4)(C)(ii)] Specific revisions requested related to ammonia slip include, but are not limited to: 5-9

- **Chapter 2; page 2-13:** "Depending on the type of combustion equipment utilizing SCR technology, the typical amount of ammonia slip is typically zero to ~~five~~ twenty ppmv."

Comment Letter #5 (continued)

Page 5

- **Chapter 4; page 4-18 to 4-19:** "Table 4-15 summarizes the calculated non-carcinogenic chronic and acute hazard indices for ammonia and compared these values to the respective significance thresholds for engines with an ammonia slip limit of five ppmv and stationary compressor gas turbines with an ammonia slip limit of 10 ppmv and compressor gas lean-burn engines with a PAR 1100 interim ammonia slip limit of 20 ppmv; ~~both~~ all were shown to be less than significant."
- **Chapter 4, page 4-19:** The Utilities recommend that a row should be added to Table 4-15 for the 20 ppmv ammonia slip concentration at the exit of the stack and related revisions for peak concentration at a receptor 25 meters from the stack, acute hazard index, and chronic hazard index. 5-9 cont'd
- **Appendix E, pages E-1, E-2, E-3, E-7 and E-8:** We suggests that the ammonia usage calculations for facilities eligible for an interim ammonia slip limit of 20 ppm and the summary usage table on E-1 be updated.

III. Facility-Wide Engine Modernization

The Utilities are concerned that the DSEA does not reflect the latest changes related to facility-wide engine modernization in PAR 1100, including those released by SCAQMD for the August 20, 2019 Working Group meeting and subsequent changes. The Utilities have noted the following specific revisions, and additional, corresponding changes may be necessary elsewhere in the FSEA. 5-10

- **Chapter 2; pages 2-11 to 2-13** [Technology Overview]: We recommend the inclusion of a new item at the end of the section, entitled "**Facility-wide Engine Modernization.**"
  Other emission reduction /control technologies contemplated in PAR 1100(d)(6) for RECLAIM or former RECLAIM facilities with compressor gas lean-burn engine(s) could include electric-driven compressors and associated electrical infrastructure. 5-11
- **Chapter 4; page 4-5:** "There are also eight lean burn engines operated at two facilities which may be repowered with stationary gas turbines equipped with SCR technology and/or other equipment as part of a facility-wide engine modernization." 5-12
- **Chapter 4; page 4-21:** "In addition, engines that ~~will~~ may be replaced or repowered are expected to be replaced with equipment of similar rating. Therefore, an increase in GHG emissions from combustion of fuel ~~is not expected to~~ may occur from affected engines that are retrofitted, replaced, or repowered." 5-13
  - **Note:** Based on information previously provided to SCAQMD staff, the Utilities are evaluating scenarios that may increase horsepower at some of our facilities.

Comment Letter #5 (continued)

Page 6

IV. Construction

Pursuant to the updated provisions in the latest versions of PAR 1110.2 and PAR 1100, the Utilities have evaluated the construction impacts of reasonably foreseeable facility-wide engine modernizations at our facilities. We respectfully request that the SCAQMD incorporate this relevant information in a new section that complements the "Repowering of Existing Engine with a Stationary Gas Turbine Utilizing SCR Technology" discussion (pages 4-10 through 4-12).

As described in the main letter, when undertaking engine repowers, the Utilities may need to construct new equipment on a separate footprint to ensure compressor operation for system reliability. For each engine repower or replacement at these facilities, site preparation and new construction on a separate area of up to 20,000 square feet per compressor unit (including grading as well as new foundation and structure building) may be required, and demolition of existing engines and related infrastructure, if necessary, would occur after new equipment and structure construction is completed. 5-14

We have prepared an analysis of construction emissions associated with facility-wide engine modernization projects and/or repower projects using CalEEMod version 2016.3.2. As a worst-case scenario, it was conservatively assumed the construction of a new building for the affected stationary lean-burn engines at one facility would occur concurrently (although with sequential construction phases). The conservative construction scenario of repowering and/or replacement of five engines at one building and installation of the SCR systems and associated ammonia or urea storage tank(s) was analyzed.

The following assumptions were made in this analysis regarding combustion emissions from construction activities associated with repowering or replacement of five engines at one building and installation of SCR systems and associated ammonia or urea storage tank(s):

- The conservative off-road construction equipment mix for each construction phase needed at one facility is presented in Table 1. Construction phases include demolition, site preparation, building construction, and paving. A new building would be constructed for repowering/replacement of engines and the previous building would be demolished once the project is complete. 5-15

- The total number of days in each construction phase was estimated based on the increase from the equipment mix presented in Table 4-7 of the *Draft Subsequent Environmental Assessment for Proposed Amended Rules 1110.2 - Emissions from Gaseous-and Liquid-Fueled Engines and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities* (DSEA)[2] compared to the construction equipment mix presented in Table 1. 5-16

- The number of worker (on-road) trips for the building construction phase was estimated based on the number of worker trips in the "Repowering of Existing Engine 5-17

[2] SCAQMD, 2019. Draft Subsequent Environmental Assessment for Proposed Amended Rules 1110.2 - Emissions from Gaseous-and Liquid-Fueled Engines and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities. July.

Comment Letter #5 (continued)

Page 7

with a Stationary Gas Turbine Utilizing SCR Technology" section of the constructions emissions in the DSEA (i.e., 20 workers would be needed to dismantle the existing engine and install the new stationary gas turbine) and the proportional increase in the number of construction equipment provided in Table 4-7 of the DSEA compared to Table 1. The number of worker trips for the demolition, site preparation, and paving phases were based on CalEEMod default assumptions. Also, the vendor and hauling trips were unchanged from DSEA assumptions. 5-17 cont'd

- In addition to the existing engine footprints, an additional 100,000 square feet for facility modernization would be required during the construction phase. This grading area of 2.3 acres is included in the site preparation phase. 5-18

- The Land Usage and Other Project Characteristics were unchanged in this facility modernization construction analysis from those in Appendix B-3 of the DSEA. 5-19

Comment Letter #5 (continued)

Page 8

Table 1. Construction Equipment by Construction Phase [1]			
Construction Phase	**Off-Road Equipment Type**	**Quantity**	**Daily Usage Hours**
Site Preparation	Tractors/Loaders/Backhoes	2	6
Site Preparation	Water Truck	2	6
Site Preparation	Rubber Tired Dozers	2	7
Site Preparation	Compactor	1	8
Site Preparation	Tractors/Loaders/Backhoes	1	4
Site Preparation	Trenchers	1	4
Building Construction	Aerial Lifts	3	7
Building Construction	Cranes	4	8
Building Construction	Forklifts	2	6
Building Construction	Generator Sets	2	8
Building Construction	Welders	2	6
Paving	Cement and Mortar Mixers	2	6
Paving	Pavers	1	5
Paving	Paving Equipment	2	8
Paving	Rollers	2	6
Paving	Tractors/Loaders/Backhoes	3	6
Paving	Water Truck	2	6
Demolition	Concrete/Industrial Saws	2	6
Demolition	Cranes	1	6
Demolition	Rubber Tired Dozers	2	6
Demolition	Forklifts	2	7
Demolition	Dump Truck	3	8

5-20

Note:
[1]Off-road equipment mix that may be needed to repower/replace five engines with SCR systems and ammonia or urea tanks at one facility.

The peak daily construction emissions from facility-wide engine modernization projects are presented in Table 2 (CalEEMod files are available upon request). The calculated peak daily construction emissions from facility modernization are below the significance thresholds for construction. 5-21

Comment Letter #5 (continued)

Page 9

Table 2. Construction Emissions (pounds/day)									
Construction Emissions	**Construction Phase**	**Category**	**ROG**	**NOX**	**CO**	**SO2**	**Total PM_{10}**	**Total $PM_{2.5}$**
Repowering of Five Engines with SCR systems and Ammonia or Urea Tanks [1]	Site Preparation	On-Site	4.5	47.0	24.8	0.1	12.9	7.8
		Off-Site	0.1	0.1	0.9	0.0	0.3	0.1
	Building Construction	On-Site	3.9	38.7	27.7	0.1	1.9	1.8
		Off-Site	0.2	0.7	1.7	0.0	0.5	0.1
	Paving	On-Site	2.2	21.1	20.7	0.0	1.0	0.9
		Off-Site	0.1	0.2	1.2	0.0	0.3	0.1
	Demolition	On-Site	4.8	45.4	29.4	0.1	2.1	2.0
		Off-Site	0.1	0.1	1.0	0.0	0.3	0.1
	Peak Daily Phase Construction Emissions		**5**	**47**	**30**	**0.08**	**13**	**8**
Significance Threshold for Construction[2]			75	100	550	150	150	55
Exceed Significance Threshold?			**No**	**No**	**No**	**No**	**No**	**No**

5-21 cont'd

Notes:
[1]Emissions as estimated by Ramboll with CalEEMod version 2016.3.2.
[2]South Coast Air Quality Management District's air quality significance thresholds for construction. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf.

The potential overlap of construction and operational activities at multiple facilities is presented in Table 3. The peak daily construction emissions were from a facility-wide engine modernization project at one facility occurring at the same time as operational emissions from three facilities receiving ammonia deliveries and one facility receiving new catalyst and hauling off spent catalyst (Table 4-13 of DSEA). The peak daily emissions from construction and operation activities shown in Table 3 are below the significance thresholds for operations (SCAQMD policy states in the event of overlap of construction and operation phases, the summed emissions will be compared to the SCAQMD air quality significance thresholds for operation since these thresholds are more stringent than construction thresholds). 5-22

Comment Letter #5 (continued)

Page 10

Table 3. Peak Daily Construction and Operational Emissions (pounds/day)							
Phase	**Activity**	**ROG**	**NOX**	**CO**	**SO2**	**Total PM_{10}**	**Total $PM_{2.5}$**
Construction	Facility Modernization and/or Repowering of Five Engines and Installation of SCR Systems and Associated Storage Tank(s)[1]	4.9	47.1	30.3	0.1	13.2	7.9
Operation	Increased Truck Trips for Ammonia Delivery for Two Facilities[2]	0.2	1.0	0.7	0.0	0.1	0.0
Operation	Increased Truck Trips for New Catalyst Delivery and Hauling Spent Catalyst at One Facility in the OCS[2]	1.3	6.2	11.2	0.1	0.3	0.2
Peak Daily Overlapping Construction and Operational Emissions		**6.4**	**54.3**	**42.2**	**0.2**	**13.6**	**8.1**
Significance Thresholds for Operations[3]		55	55	550	150	150	55
Exceed Significance Thresholds?		**No**	**No**	**No**	**No**	**No**	**No**

Notes:

[1]Emissions as estimated by CalEEMod version 2016.3.2.

[2]Referenced from Table 4-14 of *Draft Subsequent Environmental Assessment for Proposed Amended Rules 1110.2 - Emissions from Gaseous-and Liquid-Fueled Engines and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities* (SCAQMD, July 2019).

[3]South Coast Air Quality Management District's air quality significance thresholds. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf.

5-22 cont'd

The Utilities respectfully request that the SCAQMD incorporate this relevant and reasonably foreseeable information in addition to the "Repowering of Existing Engine with a Stationary Gas Turbine Utilizing SCR Technology" discussion (pages 4-10 through 4-12) and revise and/or supplement the overlapping construction and/or combined construction and operational emissions tables and discussions accordingly. As noted above, the CalEEMod files for the above analysis are available upon request. 5-23

V. Other Revisions

Our review of the DSEA identified additional text that may need minor correction and/or clarifying revisions. The Utilities are recommending that the FSEA be revised to reflect these minor corrections and revisions listed below: 5-24

Comment Letter #5 (continued)

Page 11

- **Table of Contents; page i:** Chapter 2 – Executive Summary Project Description
- **Chapter 1; page 1-1 header:** Chapter 1 – Project Description Executive Summary 5-24 cont'd
- **Chapter 2; Table 2-1:**
  Row for NAICS code 486210 "Pipeline Transportation of Natural Gas" should reflect The Utilities' 28 units at 4 facilities.

Additionally, we are suggesting that revisions throughout the DSEA would help to clarify that replacing or tuning of air-to-fuel ratio controller (AFRC) or replacing NSCR catalysts are not "modifications" or "minor modifications" as referred to in new source review permitting definitions of modifications. Rather, we suggest that the FSEA replace "modification" with the word "alteration" or similar language. For example:

- **Chapter 2; p 2-9 (with similar edits needed throughout DSEA):**
  "Table 2-2 identifies the number of internal combustion engines that would require alterations (and/or retrofits/replacements/repowers) to comply with BARCT for the 10 affected facilities. The following list describes internal combustion engines that would require alterations (and/or retrofits/replacements/repowers) in order to meet the updated BARCT NOx and ammonia concentration limits in PAR 1110.2:

  1) Engines with existing SCR or NSCR systems: There are six lean burn engines with existing SCR systems that may need modifications to comply with PAR 1110.2 if they continue operating. Compliance with PAR 1110.2 would require modifications to the existing SCR systems or additional ammonia deliveries. There are currently ten engines equipped with NSCR systems. Since low NOx emissions can be achieved with this technology, minimal alterations such as replacing or tuning the air-to-fuel ratio controller and/or replacing the catalysts are expected. Since replacing the existing catalyst will require more construction, for this analysis, it is assumed that 16 SCR or NSCR systems will need to have catalyst replacements…" 5-25

- **Chapter 4; page 4-3:**

  "The environmental analysis assumes that installation of NOx air pollution control equipment (e.g., SCR systems) for the affected sources will reduce NOx emissions overall, but construction activities associated with both the installation of new air pollution control devices and the repowering or replacement of existing gas turbines and modification and/or alteration of existing control devices will create secondary air quality impacts (e.g., emissions), which can adversely affect local and regional air quality. An affected facility may generate emissions both during the construction period and through ongoing daily operations. During installation of SCR systems or the repowering or replacement of existing engines or modification/alteration of existing NOx control devices, emissions may be generated by onsite construction equipment and by offsite vehicles used for worker commuting."

  "To comply with the proposed emission limits of PAR 1110.2, a facility has the following options: 1) ~~modify~~ tune the existing ~~NSCR system for~~ rich-burn engines with NSCR systems; 2) modify the existing SCR system(s); 3) install an SCR system 5-26

Comment Letter #5 (concluded)

Page 12

and associated ammonia storage tank for lean-burn engines; 4) repower their existing engine and install air pollution controls, as necessary; or 5) replace their existing engine and install air pollution controls, as necessary. 5-26 cont'd

- **Chapter 4; page 4-5:**

  Among the 21 RECLAIM facilities subject to PAR 1110.2, a total of 10 facilities that are expected to require modifications and/or alterations to comply with the proposed emission limits. The remaining facilities operate engines that either currently meet the proposed emission limits or are eligible for exemptions from the emission limits in PAR 1110.2. Amongst the 10 facilities that will require modifications and/or alterations to comply with PAR 1110.2, 45 engines are expected to be replaced, repowered, or retrofitted with air pollution control equipment in order to comply with the NOx limits in PAR 1110.2.

- **Chapter 4; p 4-6:** 5-27

  Table 4-2, 2nd row: "Modification and/or alteration of existing SCR or NSCR systems"

  Section header: "**Existing SCR or NSCR System Modifications and/or Alterations**"

  "Therefore, minor alterations such as replacing and tuning the air-to-fuel ratio controller and/or replacing the NSCR catalyst are expected to reach BARCT NOx limits of 11 ppm.
- Apply globally for all references to the NSCR rule provisions.

The Utilities are also recommending that the FSEA the following additional revisions:

- **Chapter 5:** Check headers on pages (some have "Executive Summary" rather than "Alternatives" 5-28
- **Appendices fly sheet:** Add Appendix F: Estimated NOx Reduction per Engine
- **Appendix D:** Please update the table with actual distances from facilities to sensitive receptors. The DSEA currently lists distances from some of the Utilities facilities as zero. 5-29

Supplemental Information to Comment Letter #5 Submitted on October 1, 2019

Supplemental Information to Comment Letter #5
Submitted on October 1, 2019

Table 1. Construction Equipment by Construction Phase [1]			
Construction Phase	**Off-Road Equipment Type**	**Quantity**	**Daily Usage Hours**
Site Preparation	Tractors/Loaders/Backhoes	2	6
Site Preparation	Water Truck	2	6
Site Preparation	Rubber Tired Dozers	2	7
Site Preparation	Compactor	1	8
Site Preparation	Tractors/Loaders/Backhoes	1	4
Site Preparation	Trenchers	1	4
Building Construction	Aerial Lifts	3	7
Building Construction	Cranes	4	8
Building Construction	Forklifts	2	6
Building Construction	Generator Sets	2	8
Building Construction	Welders	2	6
Paving	Cement and Mortar Mixers	2	6
Paving	Pavers	1	5
Paving	Paving Equipment	2	8
Paving	Rollers	2	6
Paving	Tractors/Loaders/Backhoes	3	6
Paving	Water Truck	2	6
Demolition	Concrete/Industrial Saws	2	6
Demolition	Cranes	1	6
Demolition	Rubber Tired Dozers	2	6
Demolition	Tractors/Loaders/Backhoes	2	6
Demolition	Forklifts	2	7
Demolition	Water Truck	2	6
Demolition	Dump Truck	3	8

5-30

Note:
[1]Off-road equipment mix that may be needed to repower five engines with SCR systems and ammonia tanks at one facility and/or implement a facility engine modernization.

Supplemental Information to Comment Letter #5 Submitted on October 1, 2019 (continued)

Table 2. Construction Emissions (pounds/day)

Construction Emissions	Construction Phase	Category	ROG	NOX	CO	SO2	Total PM_{10}	Total $PM_{2.5}$
Facility Engine Modernization or Repowering of Five Engines with SCR systems and Ammonia Tanks [1]	Site Preparation	On-Site	2.8	26.0	20.1	0.0	11.9	6.9
		Off-Site	0.1	0.1	0.7	0.0	0.3	0.1
	Building Construction	On-Site	2.6	25.7	21.8	0.0	1.1	1.0
		Off-Site	0.2	0.4	1.3	0.0	0.5	0.1
	Paving	On-Site	1.8	15.2	20.1	0.0	0.7	0.6
		Off-Site	0.1	0.1	0.9	0.0	0.3	0.1
	Demolition	On-Site	4.4	35.6	31.5	0.1	1.5	1.4
		Off-Site	0.1	0.1	1.1	0.0	0.4	0.1
	Peak Daily Phase Construction Emissions		**5**	**36**	**33**	**0.10**	**12**	**7**
Significance Threshold for Construction[2]			75	100	550	150	150	55
Exceed Significance?			**No**	**No**	**No**	**No**	**No**	**No**

5-31

Notes:

[1]Emissions as estimated by Ramboll with CalEEMod version 2016.3.2.

[2]South Coast Air Quality Management District's air quality significance thresholds for construction. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf.

Supplemental Information to Comment Letter #5
Submitted on October 1, 2019 (concluded)

Table 3. Peak Daily Construction and Operational Emissions (pounds/day)							
Phase	**Activity**	**ROG**	**NOX**	**CO**	**SO2**	**Total PM_{10}**	**Total $PM_{2.5}$**
Construction	Facility Engine Modernization or Repowering of Five Engines and Installation of SCR Systems and Associated Storage Tank(s)[1]	4.5	35.7	32.5	0.1	12.2	7.0
Operation	Increased Truck Trips for Ammonia Delivery for Two Facilities[2]	0.2	1.0	0.7	0.0	0.1	0.0
Operation	Increased Truck Trips for New Catalyst Delivery and Hauling Spent Catalyst at One Facility in the OCS[2]	1.3	6.2	11.2	0.1	0.3	0.2
Peak Daily Overlapping Construction and Operational Emissions		**6.0**	**42.9**	**44.4**	**0.2**	**12.6**	**7.2**
Significance Threshold for Operation[3]		55	55	550	150	150	55
Exceed Significance?		**No**	**No**	**No**	**No**	**No**	**No**

5-32

Notes:

[1]Emissions as estimated by CalEEMod version 2016.3.2.

[2]Referenced from Table 4-14 of *Draft Subsequent Environmental Assessment for Proposed Amended Rules 1110.2 - Emissions from Gaseous-and Liquid-Fueled Engines and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities* (SCAQMD, July 2019).

[3]South Coast Air Quality Management District's air quality significance thresholds for construction. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf.

Original CalEEMod® Output Files Referenced in Comment Letter #5 September 9, 2019

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2)

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**	2021
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

Project Characteristics -

Land Use -

Construction Phase - Project specific construction schedule - scaled from SCAQMD DSEA model run based on revised number of equipment.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks. Compactor modeled as Other Construction Equipment.

Off-road Equipment - Project specific equipment mix.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks

Off-road Equipment - Project specific equipment mix. Dump Trucks modeled as Off-Highway Trucks.

Grading - 100,000 squarefeet of land disturbed during site prep.

Trips and VMT - Building construction worker trips increased from SCAQMD DSEA based on the increase in number of equipment. Vendor and hauling trips based on SCAQMD DSEA.

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Summer

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	279.00
tblConstructionPhase	NumDays	0.00	12.00
tblConstructionPhase	NumDays	0.00	15.00
tblConstructionPhase	NumDays	0.00	40.00
tblConstructionPhase	PhaseEndDate	1/1/2020	2/16/2021
tblConstructionPhase	PhaseEndDate	1/1/2020	3/4/2021
tblConstructionPhase	PhaseEndDate	1/1/2020	1/22/2020
tblConstructionPhase	PhaseStartDate	1/2/2020	1/23/2020
tblConstructionPhase	PhaseStartDate	1/2/2020	2/17/2021
tblGrading	AcresOfGrading	7.50	2.30
tblOffRoadEquipment	LoadFactor	0.29	0.29
tblOffRoadEquipment	LoadFactor	0.20	0.20
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	30.00	25.00
tblTripsAndVMT	WorkerTripNumber	25.00	23.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

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					
2020	4.5865	47.0587	29.4037	0.0586	10.9584	2.2057	13.1641	5.8786	2.0293	7.9079	0.0000	5,635.4642	5,635.4642	1.7451	0.0000	5,679.0908
2021	4.8969	45.5452	30.3118	0.0766	0.4568	2.1042	2.3881	0.1219	1.9567	2.0320	0.0000	7,410.3693	7,410.3693	2.0733	0.0000	7,462.2030
Maximum	**4.8969**	**47.0587**	**30.3118**	**0.0766**	**10.9584**	**2.2057**	**13.1641**	**5.8786**	**2.0293**	**7.9079**	**0.0000**	**7,410.3693**	**7,410.3693**	**2.0733**	**0.0000**	**7,462.2030**

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					
2020	4.5865	47.0587	29.4037	0.0586	10.9584	2.2057	13.1641	5.8786	2.0293	7.9079	0.0000	5,635.4642	5,635.4642	1.7451	0.0000	5,679.0908
2021	4.8969	45.5452	30.3118	0.0766	0.4568	2.1042	2.3881	0.1219	1.9567	2.0320	0.0000	7,410.3693	7,410.3693	2.0733	0.0000	7,462.2030
Maximum	**4.8969**	**47.0587**	**30.3118**	**0.0766**	**10.9584**	**2.2057**	**13.1641**	**5.8786**	**2.0293**	**7.9079**	**0.0000**	**7,410.3693**	**7,410.3693**	**2.0733**	**0.0000**	**7,462.2030**

	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**

	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	Site Preparation	Site Preparation	1/2/2020	1/22/2020	5	15	
2	Building Construction	Building Construction	1/23/2020	2/16/2021	5	279	
3	Paving	Paving	2/17/2021	3/4/2021	5	12	
4	Demolition	Demolition	3/5/2021	4/29/2021	5	40	

Acres of Grading (Site Preparation Phase): 2.3

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Off-Highway Trucks	2	6.00	402	0.38
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	2	6.00	81	0.73
Site Preparation	Rubber Tired Dozers	2	7.00	247	0.40
Building Construction	Cranes	4	8.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Aerial Lifts	3	7.00	63	0.31
Paving	Pavers	1	5.00	130	0.42
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	6.00	247	0.40
Site Preparation	Other Construction Equipment	1	8.00	172	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Paving	Tractors/Loaders/Backhoes	3	6.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Welders	2	6.00	46	0.45
Paving	Off-Highway Trucks	2	6.00	402	0.38
Demolition	Cranes	1	6.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Off-Highway Trucks	3	8.00	402	0.38
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

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	12	25.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	15	38.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	30.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

<u>Unmitigated Construction On-Site</u>

	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					10.7013	0.0000	10.7013	5.8105	0.0000	5.8105			0.0000			0.0000
Off-Road	4.4825	46.9888	24.7595	0.0555		2.2038	2.2038		2.0275	2.0275		5,372.248 2	5,372.248 2	1.7375		5,415.685 6
Total	**4.4825**	**46.9888**	**24.7595**	**0.0555**	**10.7013**	**2.2038**	**12.9050**	**5.8105**	**2.0275**	**7.8379**		**5,372.248 2**	**5,372.248 2**	**1.7375**		**5,415.685 6**

3.2 Site Preparation - 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	0.1041	0.0700	0.9403	2.6400e-003	0.2571	1.9500e-003	0.2590	0.0682	1.8000e-003	0.0700		263.2160	263.2160	7.5700e-003		263.4052
Total	**0.1041**	**0.0700**	**0.9403**	**2.6400e-003**	**0.2571**	**1.9500e-003**	**0.2590**	**0.0682**	**1.8000e-003**	**0.0700**		**263.2160**	**263.2160**	**7.5700e-003**		**263.4052**

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					10.7013	0.0000	10.7013	5.8105	0.0000	5.8105			0.0000			0.0000
Off-Road	4.4825	46.9888	24.7595	0.0555		2.2038	2.2038		2.0275	2.0275	0.0000	5,372.2482	5,372.2482	1.7375		5,415.6855
Total	**4.4825**	**46.9888**	**24.7595**	**0.0555**	**10.7013**	**2.2038**	**12.9050**	**5.8105**	**2.0275**	**7.8379**	**0.0000**	**5,372.2482**	**5,372.2482**	**1.7375**		**5,415.6855**

3.2 Site Preparation - 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	0.1041	0.0700	0.9403	2.6400e-003	0.2571	1.9500e-003	0.2590	0.0682	1.8000e-003	0.0700		263.2160	263.2160	7.5700e-003		263.4052
Total	**0.1041**	**0.0700**	**0.9403**	**2.6400e-003**	**0.2571**	**1.9500e-003**	**0.2590**	**0.0682**	**1.8000e-003**	**0.0700**		**263.2160**	**263.2160**	**7.5700e-003**		**263.4052**

3.3 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	3.8638	38.7264	27.7253	0.0530		1.8607	1.8607		1.7537	1.7537		5,042.9046	5,042.9046	1.2435		5,073.9917
Total	**3.8638**	**38.7264**	**27.7253**	**0.0530**		**1.8607**	**1.8607**		**1.7537**	**1.7537**		**5,042.9046**	**5,042.9046**	**1.2435**		**5,073.9917**

3.3 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	0.0164	0.5247	0.1249	1.2900e-003	0.0320	2.6000e-003	0.0346	9.2100e-003	2.4900e-003	0.0117		137.2242	137.2242	8.6200e-003		137.4396
Worker	0.1719	0.1156	1.5535	4.3700e-003	0.4248	3.2200e-003	0.4280	0.1127	2.9700e-003	0.1156		434.8786	434.8786	0.0125		435.1912
Total	**0.1884**	**0.6403**	**1.6785**	**5.6600e-003**	**0.4568**	**5.8200e-003**	**0.4626**	**0.1219**	**5.4600e-003**	**0.1273**		**572.1029**	**572.1029**	**0.0211**		**572.6308**

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	3.8638	38.7264	27.7253	0.0530		1.8607	1.8607		1.7537	1.7537	0.0000	5,042.9046	5,042.9046	1.2435		5,073.9917
Total	**3.8638**	**38.7264**	**27.7253**	**0.0530**		**1.8607**	**1.8607**		**1.7537**	**1.7537**	**0.0000**	**5,042.9046**	**5,042.9046**	**1.2435**		**5,073.9917**

3.3 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	0.0164	0.5247	0.1249	1.2900e-003	0.0320	2.6000e-003	0.0346	9.2100e-003	2.4900e-003	0.0117		137.2242	137.2242	8.6200e-003		137.4396
Worker	0.1719	0.1156	1.5535	4.3700e-003	0.4248	3.2200e-003	0.4280	0.1127	2.9700e-003	0.1156		434.8786	434.8786	0.0125		435.1912
Total	**0.1884**	**0.6403**	**1.6785**	**5.6600e-003**	**0.4568**	**5.8200e-003**	**0.4626**	**0.1219**	**5.4600e-003**	**0.1273**		**572.1029**	**572.1029**	**0.0211**		**572.6308**

3.3 Building Construction - 2021

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	3.4873	35.1299	27.0232	0.0530		1.6133	1.6133		1.5200	1.5200		5,042.9643	5,042.9643	1.2315		5,073.7505
Total	**3.4873**	**35.1299**	**27.0232**	**0.0530**		**1.6133**	**1.6133**		**1.5200**	**1.5200**		**5,042.9643**	**5,042.9643**	**1.2315**		**5,073.7505**

3.3 Building Construction - 2021

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	0.0139	0.4769	0.1132	1.2800e-003	0.0320	9.6000e-004	0.0330	9.2100e-003	9.2000e-004	0.0101		136.2192	136.2192	8.2400e-003		136.4252
Worker	0.1604	0.1040	1.4316	4.2200e-003	0.4248	3.1300e-003	0.4279	0.1127	2.8800e-003	0.1155		420.8133	420.8133	0.0113		421.0962
Total	**0.1743**	**0.5809**	**1.5447**	**5.5000e-003**	**0.4568**	**4.0900e-003**	**0.4608**	**0.1219**	**3.8000e-003**	**0.1257**		**557.0325**	**557.0325**	**0.0196**		**557.5214**

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	3.4873	35.1299	27.0232	0.0530		1.6133	1.6133		1.5200	1.5200	0.0000	5,042.9643	5,042.9643	1.2315		5,073.7505
Total	**3.4873**	**35.1299**	**27.0232**	**0.0530**		**1.6133**	**1.6133**		**1.5200**	**1.5200**	**0.0000**	**5,042.9643**	**5,042.9643**	**1.2315**		**5,073.7505**

3.3 Building Construction - 2021

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	0.0139	0.4769	0.1132	1.2800e-003	0.0320	9.6000e-004	0.0330	9.2100e-003	9.2000e-004	0.0101		136.2192	136.2192	8.2400e-003		136.4252
Worker	0.1604	0.1040	1.4316	4.2200e-003	0.4248	3.1300e-003	0.4279	0.1127	2.8800e-003	0.1155		420.8133	420.8133	0.0113		421.0962
Total	**0.1743**	**0.5809**	**1.5447**	**5.5000e-003**	**0.4568**	**4.0900e-003**	**0.4608**	**0.1219**	**3.8000e-003**	**0.1257**		**557.0325**	**557.0325**	**0.0196**		**557.5214**

3.4 Paving - 2021

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	2.2406	21.1017	20.6735	0.0429		1.0090	1.0090		0.9300	0.9300		4,125.0419	4,125.0419	1.3175		4,157.9790
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.2406**	**21.1017**	**20.6735**	**0.0429**		**1.0090**	**1.0090**		**0.9300**	**0.9300**		**4,125.0419**	**4,125.0419**	**1.3175**		**4,157.9790**

3.4 Paving - 2021

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	2.7800e-003	0.0954	0.0226	2.6000e-004	6.4000e-003	1.9000e-004	6.5900e-003	1.8400e-003	1.8000e-004	2.0300e-003		27.2439	27.2439	1.6500e-003		27.2851
Worker	0.1266	0.0821	1.1302	3.3300e-003	0.3353	2.4700e-003	0.3378	0.0889	2.2700e-003	0.0912		332.2210	332.2210	8.9300e-003		332.4443
Total	**0.1294**	**0.1775**	**1.1528**	**3.5900e-003**	**0.3417**	**2.6600e-003**	**0.3444**	**0.0908**	**2.4500e-003**	**0.0932**		**359.4648**	**359.4648**	**0.0106**		**359.7294**

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	2.2406	21.1017	20.6735	0.0429		1.0090	1.0090		0.9300	0.9300	0.0000	4,125.0419	4,125.0419	1.3175		4,157.9789
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.2406**	**21.1017**	**20.6735**	**0.0429**		**1.0090**	**1.0090**		**0.9300**	**0.9300**	**0.0000**	**4,125.0419**	**4,125.0419**	**1.3175**		**4,157.9789**

3.4 Paving - 2021

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	2.7800e-003	0.0954	0.0226	2.6000e-004	6.4000e-003	1.9000e-004	6.5900e-003	1.8400e-003	1.8000e-004	2.0300e-003		27.2439	27.2439	1.6500e-003		27.2851
Worker	0.1266	0.0821	1.1302	3.3300e-003	0.3353	2.4700e-003	0.3378	0.0889	2.2700e-003	0.0912		332.2210	332.2210	8.9300e-003		332.4443
Total	**0.1294**	**0.1775**	**1.1528**	**3.5900e-003**	**0.3417**	**2.6600e-003**	**0.3444**	**0.0908**	**2.4500e-003**	**0.0932**		**359.4648**	**359.4648**	**0.0106**		**359.7294**

3.5 Demolition - 2021

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	4.7896	45.4135	29.3566	0.0737		2.1020	2.1020		1.9546	1.9546		7,112.7800	7,112.7800	2.0645		7,164.3930
Total	**4.7896**	**45.4135**	**29.3566**	**0.0737**		**2.1020**	**2.1020**		**1.9546**	**1.9546**		**7,112.7800**	**7,112.7800**	**2.0645**		**7,164.3930**

3.5 Demolition - 2021

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	1.8100e-003	0.0633	0.0134	1.9000e-004	4.3700e-003	2.0000e-004	4.5600e-003	1.2000e-003	1.9000e-004	1.3800e-003		20.7385	20.7385	1.3800e-003		20.7731
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	0.1055	0.0684	0.9418	2.7800e-003	0.2794	2.0600e-003	0.2815	0.0741	1.8900e-003	0.0760		276.8508	276.8508	7.4400e-003		277.0370
Total	**0.1073**	**0.1317**	**0.9552**	**2.9700e-003**	**0.2838**	**2.2600e-003**	**0.2861**	**0.0753**	**2.0800e-003**	**0.0774**		**297.5893**	**297.5893**	**8.8200e-003**		**297.8100**

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	4.7896	45.4135	29.3566	0.0737		2.1020	2.1020		1.9546	1.9546	0.0000	7,112.7800	7,112.7800	2.0645		7,164.3930
Total	**4.7896**	**45.4135**	**29.3566**	**0.0737**		**2.1020**	**2.1020**		**1.9546**	**1.9546**	**0.0000**	**7,112.7800**	**7,112.7800**	**2.0645**		**7,164.3930**

3.5 Demolition - 2021

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	1.8100e-003	0.0633	0.0134	1.9000e-004	4.3700e-003	2.0000e-004	4.5600e-003	1.2000e-003	1.9000e-004	1.3800e-003		20.7385	20.7385	1.3800e-003		20.7731
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	0.1055	0.0684	0.9418	2.7800e-003	0.2794	2.0600e-003	0.2815	0.0741	1.8900e-003	0.0760		276.8508	276.8508	7.4400e-003		277.0370
Total	**0.1073**	**0.1317**	**0.9552**	**2.9700e-003**	**0.2838**	**2.2600e-003**	**0.2861**	**0.0753**	**2.0800e-003**	**0.0774**		**297.5893**	**297.5893**	**8.8200e-003**		**297.8100**

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	0.548858	0.043235	0.200706	0.120309	0.016131	0.005851	0.021034	0.033479	0.002070	0.001877	0.004817	0.000707	0.000925

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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2)

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**	2021
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

Project Characteristics -

Land Use -

Construction Phase - Project specific construction schedule - scaled from SCAQMD DSEA model run based on revised number of equipment.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks. Compactor modeled as Other Construction Equipment.

Off-road Equipment - Project specific equipment mix.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks

Off-road Equipment - Project specific equipment mix. Dump Trucks modeled as Off-Highway Trucks.

Grading - 100,000 squarefeet of land disturbed during site prep.

Trips and VMT - Building construction worker trips increased from SCAQMD DSEA based on the increase in number of equipment. Vendor and hauling trips based on SCAQMD DSEA.

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	279.00
tblConstructionPhase	NumDays	0.00	12.00
tblConstructionPhase	NumDays	0.00	15.00
tblConstructionPhase	NumDays	0.00	40.00
tblConstructionPhase	PhaseEndDate	1/1/2020	2/16/2021
tblConstructionPhase	PhaseEndDate	1/1/2020	3/4/2021
tblConstructionPhase	PhaseEndDate	1/1/2020	1/22/2020
tblConstructionPhase	PhaseStartDate	1/2/2020	1/23/2020
tblConstructionPhase	PhaseStartDate	1/2/2020	2/17/2021
tblGrading	AcresOfGrading	7.50	2.30
tblOffRoadEquipment	LoadFactor	0.29	0.29
tblOffRoadEquipment	LoadFactor	0.20	0.20
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	30.00	25.00
tblTripsAndVMT	WorkerTripNumber	25.00	23.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

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					
2020	4.5960	47.0654	29.2633	0.0583	10.9584	2.2057	13.1641	5.8786	2.0293	7.9079	0.0000	5,618.4321	5,618.4321	1.7446	0.0000	5,662.0460
2021	4.9068	45.5524	30.2173	0.0764	0.4568	2.1042	2.3881	0.1219	1.9567	2.0320	0.0000	7,392.0518	7,392.0518	2.0729	0.0000	7,443.8743
Maximum	**4.9068**	**47.0654**	**30.2173**	**0.0764**	**10.9584**	**2.2057**	**13.1641**	**5.8786**	**2.0293**	**7.9079**	**0.0000**	**7,392.0518**	**7,392.0518**	**2.0729**	**0.0000**	**7,443.8743**

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					
2020	4.5960	47.0654	29.2633	0.0583	10.9584	2.2057	13.1641	5.8786	2.0293	7.9079	0.0000	5,618.4321	5,618.4321	1.7446	0.0000	5,662.0460
2021	4.9068	45.5524	30.2173	0.0764	0.4568	2.1042	2.3881	0.1219	1.9567	2.0320	0.0000	7,392.0518	7,392.0518	2.0729	0.0000	7,443.8743
Maximum	**4.9068**	**47.0654**	**30.2173**	**0.0764**	**10.9584**	**2.2057**	**13.1641**	**5.8786**	**2.0293**	**7.9079**	**0.0000**	**7,392.0518**	**7,392.0518**	**2.0729**	**0.0000**	**7,443.8743**

	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**

	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	Site Preparation	Site Preparation	1/2/2020	1/22/2020	5	15	
2	Building Construction	Building Construction	1/23/2020	2/16/2021	5	279	
3	Paving	Paving	2/17/2021	3/4/2021	5	12	
4	Demolition	Demolition	3/5/2021	4/29/2021	5	40	

Acres of Grading (Site Preparation Phase): 2.3

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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Off-Highway Trucks	2	6.00	402	0.38
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	2	6.00	81	0.73
Site Preparation	Rubber Tired Dozers	2	7.00	247	0.40
Building Construction	Cranes	4	8.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Aerial Lifts	3	7.00	63	0.31
Paving	Pavers	1	5.00	130	0.42
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	6.00	247	0.40
Site Preparation	Other Construction Equipment	1	8.00	172	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Paving	Tractors/Loaders/Backhoes	3	6.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Welders	2	6.00	46	0.45
Paving	Off-Highway Trucks	2	6.00	402	0.38
Demolition	Cranes	1	6.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Off-Highway Trucks	3	8.00	402	0.38
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

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	12	25.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	15	38.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	30.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 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					
Fugitive Dust					10.7013	0.0000	10.7013	5.8105	0.0000	5.8105			0.0000			0.0000
Off-Road	4.4825	46.9888	24.7595	0.0555		2.2038	2.2038		2.0275	2.0275		5,372.2482	5,372.2482	1.7375		5,415.6856
Total	**4.4825**	**46.9888**	**24.7595**	**0.0555**	**10.7013**	**2.2038**	**12.9050**	**5.8105**	**2.0275**	**7.8379**		**5,372.2482**	**5,372.2482**	**1.7375**		**5,415.6856**

3.2 Site Preparation - 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	0.1135	0.0766	0.8466	2.4700e-003	0.2571	1.9500e-003	0.2590	0.0682	1.8000e-003	0.0700		246.1839	246.1839	7.0600e-003		246.3605
Total	**0.1135**	**0.0766**	**0.8466**	**2.4700e-003**	**0.2571**	**1.9500e-003**	**0.2590**	**0.0682**	**1.8000e-003**	**0.0700**		**246.1839**	**246.1839**	**7.0600e-003**		**246.3605**

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					10.7013	0.0000	10.7013	5.8105	0.0000	5.8105			0.0000			0.0000
Off-Road	4.4825	46.9888	24.7595	0.0555		2.2038	2.2038		2.0275	2.0275	0.0000	5,372.2482	5,372.2482	1.7375		5,415.6855
Total	**4.4825**	**46.9888**	**24.7595**	**0.0555**	**10.7013**	**2.2038**	**12.9050**	**5.8105**	**2.0275**	**7.8379**	**0.0000**	**5,372.2482**	**5,372.2482**	**1.7375**		**5,415.6855**

3.2 Site Preparation - 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	0.1135	0.0766	0.8466	2.4700e-003	0.2571	1.9500e-003	0.2590	0.0682	1.8000e-003	0.0700		246.1839	246.1839	7.0600e-003		246.3605
Total	**0.1135**	**0.0766**	**0.8466**	**2.4700e-003**	**0.2571**	**1.9500e-003**	**0.2590**	**0.0682**	**1.8000e-003**	**0.0700**		**246.1839**	**246.1839**	**7.0600e-003**		**246.3605**

3.3 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	3.8638	38.7264	27.7253	0.0530		1.8607	1.8607		1.7537	1.7537		5,042.9046	5,042.9046	1.2435		5,073.9917
Total	**3.8638**	**38.7264**	**27.7253**	**0.0530**		**1.8607**	**1.8607**		**1.7537**	**1.7537**		**5,042.9046**	**5,042.9046**	**1.2435**		**5,073.9917**

3.3 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	0.0172	0.5241	0.1393	1.2500e-003	0.0320	2.6400e-003	0.0346	9.2100e-003	2.5200e-003	0.0117		133.2564	133.2564	9.2500e-003		133.4877
Worker	0.1875	0.1265	1.3987	4.0800e-003	0.4248	3.2200e-003	0.4280	0.1127	2.9700e-003	0.1156		406.7387	406.7387	0.0117		407.0303
Total	**0.2047**	**0.6507**	**1.5380**	**5.3300e-003**	**0.4568**	**5.8600e-003**	**0.4626**	**0.1219**	**5.4900e-003**	**0.1274**		**539.9951**	**539.9951**	**0.0209**		**540.5180**

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	3.8638	38.7264	27.7253	0.0530		1.8607	1.8607		1.7537	1.7537	0.0000	5,042.9046	5,042.9046	1.2435		5,073.9917
Total	**3.8638**	**38.7264**	**27.7253**	**0.0530**		**1.8607**	**1.8607**		**1.7537**	**1.7537**	**0.0000**	**5,042.9046**	**5,042.9046**	**1.2435**		**5,073.9917**

3.3 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	0.0172	0.5241	0.1393	1.2500e-003	0.0320	2.6400e-003	0.0346	9.2100e-003	2.5200e-003	0.0117		133.2564	133.2564	9.2500e-003		133.4877
Worker	0.1875	0.1265	1.3987	4.0800e-003	0.4248	3.2200e-003	0.4280	0.1127	2.9700e-003	0.1156		406.7387	406.7387	0.0117		407.0303
Total	**0.2047**	**0.6507**	**1.5380**	**5.3300e-003**	**0.4568**	**5.8600e-003**	**0.4626**	**0.1219**	**5.4900e-003**	**0.1274**		**539.9951**	**539.9951**	**0.0209**		**540.5180**

3.3 Building Construction - 2021

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	3.4873	35.1299	27.0232	0.0530		1.6133	1.6133		1.5200	1.5200		5,042.9643	5,042.9643	1.2315		5,073.7505
Total	**3.4873**	**35.1299**	**27.0232**	**0.0530**		**1.6133**	**1.6133**		**1.5200**	**1.5200**		**5,042.9643**	**5,042.9643**	**1.2315**		**5,073.7505**

3.3 Building Construction - 2021

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	0.0147	0.4754	0.1266	1.2400e-003	0.0320	9.9000e-004	0.0330	9.2100e-003	9.5000e-004	0.0102		132.2751	132.2751	8.8500e-003		132.4964
Worker	0.1753	0.1139	1.2865	3.9500e-003	0.4248	3.1300e-003	0.4279	0.1127	2.8800e-003	0.1155		393.5538	393.5538	0.0106		393.8175
Total	**0.1899**	**0.5893**	**1.4131**	**5.1900e-003**	**0.4568**	**4.1200e-003**	**0.4609**	**0.1219**	**3.8300e-003**	**0.1257**		**525.8289**	**525.8289**	**0.0194**		**526.3138**

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	3.4873	35.1299	27.0232	0.0530		1.6133	1.6133		1.5200	1.5200	0.0000	5,042.9643	5,042.9643	1.2315		5,073.7505
Total	**3.4873**	**35.1299**	**27.0232**	**0.0530**		**1.6133**	**1.6133**		**1.5200**	**1.5200**	**0.0000**	**5,042.9643**	**5,042.9643**	**1.2315**		**5,073.7505**

3.3 Building Construction - 2021

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	0.0147	0.4754	0.1266	1.2400e-003	0.0320	9.9000e-004	0.0330	9.2100e-003	9.5000e-004	0.0102		132.2751	132.2751	8.8500e-003		132.4964
Worker	0.1753	0.1139	1.2865	3.9500e-003	0.4248	3.1300e-003	0.4279	0.1127	2.8800e-003	0.1155		393.5538	393.5538	0.0106		393.8175
Total	**0.1899**	**0.5893**	**1.4131**	**5.1900e-003**	**0.4568**	**4.1200e-003**	**0.4609**	**0.1219**	**3.8300e-003**	**0.1257**		**525.8289**	**525.8289**	**0.0194**		**526.3138**

3.4 Paving - 2021

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	2.2406	21.1017	20.6735	0.0429		1.0090	1.0090		0.9300	0.9300		4,125.0419	4,125.0419	1.3175		4,157.9790
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.2406**	**21.1017**	**20.6735**	**0.0429**		**1.0090**	**1.0090**		**0.9300**	**0.9300**		**4,125.0419**	**4,125.0419**	**1.3175**		**4,157.9790**

3.4 Paving - 2021

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	2.9300e-003	0.0951	0.0253	2.5000e-004	6.4000e-003	2.0000e-004	6.6000e-003	1.8400e-003	1.9000e-004	2.0300e-003		26.4550	26.4550	1.7700e-003		26.4993
Worker	0.1384	0.0899	1.0156	3.1200e-003	0.3353	2.4700e-003	0.3378	0.0889	2.2700e-003	0.0912		310.7004	310.7004	8.3300e-003		310.9085
Total	**0.1413**	**0.1850**	**1.0410**	**3.3700e-003**	**0.3417**	**2.6700e-003**	**0.3444**	**0.0908**	**2.4600e-003**	**0.0932**		**337.1554**	**337.1554**	**0.0101**		**337.4078**

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	2.2406	21.1017	20.6735	0.0429		1.0090	1.0090		0.9300	0.9300	0.0000	4,125.0419	4,125.0419	1.3175		4,157.9789
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.2406**	**21.1017**	**20.6735**	**0.0429**		**1.0090**	**1.0090**		**0.9300**	**0.9300**	**0.0000**	**4,125.0419**	**4,125.0419**	**1.3175**		**4,157.9789**

3.4 Paving - 2021

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	2.9300e-003	0.0951	0.0253	2.5000e-004	6.4000e-003	2.0000e-004	6.6000e-003	1.8400e-003	1.9000e-004	2.0300e-003		26.4550	26.4550	1.7700e-003		26.4993
Worker	0.1384	0.0899	1.0156	3.1200e-003	0.3353	2.4700e-003	0.3378	0.0889	2.2700e-003	0.0912		310.7004	310.7004	8.3300e-003		310.9085
Total	**0.1413**	**0.1850**	**1.0410**	**3.3700e-003**	**0.3417**	**2.6700e-003**	**0.3444**	**0.0908**	**2.4600e-003**	**0.0932**		**337.1554**	**337.1554**	**0.0101**		**337.4078**

3.5 Demolition - 2021

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	4.7896	45.4135	29.3566	0.0737		2.1020	2.1020		1.9546	1.9546		7,112.7800	7,112.7800	2.0645		7,164.3930
Total	**4.7896**	**45.4135**	**29.3566**	**0.0737**		**2.1020**	**2.1020**		**1.9546**	**1.9546**		**7,112.7800**	**7,112.7800**	**2.0645**		**7,164.3930**

3.5 Demolition - 2021

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	1.8700e-003	0.0640	0.0144	1.9000e-004	4.3700e-003	2.0000e-004	4.5700e-003	1.2000e-003	1.9000e-004	1.3900e-003		20.3549	20.3549	1.4400e-003		20.3909
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	0.1153	0.0749	0.8464	2.6000e-003	0.2794	2.0600e-003	0.2815	0.0741	1.8900e-003	0.0760		258.9170	258.9170	6.9400e-003		259.0904
Total	**0.1172**	**0.1389**	**0.8607**	**2.7900e-003**	**0.2838**	**2.2600e-003**	**0.2861**	**0.0753**	**2.0800e-003**	**0.0774**		**279.2719**	**279.2719**	**8.3800e-003**		**279.4814**

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	4.7896	45.4135	29.3566	0.0737		2.1020	2.1020		1.9546	1.9546	0.0000	7,112.7800	7,112.7800	2.0645		7,164.3930
Total	**4.7896**	**45.4135**	**29.3566**	**0.0737**		**2.1020**	**2.1020**		**1.9546**	**1.9546**	**0.0000**	**7,112.7800**	**7,112.7800**	**2.0645**		**7,164.3930**

3.5 Demolition - 2021

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	1.8700e-003	0.0640	0.0144	1.9000e-004	4.3700e-003	2.0000e-004	4.5700e-003	1.2000e-003	1.9000e-004	1.3900e-003		20.3549	20.3549	1.4400e-003		20.3909
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	0.1153	0.0749	0.8464	2.6000e-003	0.2794	2.0600e-003	0.2815	0.0741	1.8900e-003	0.0760		258.9170	258.9170	6.9400e-003		259.0904
Total	**0.1172**	**0.1389**	**0.8607**	**2.7900e-003**	**0.2838**	**2.2600e-003**	**0.2861**	**0.0753**	**2.0800e-003**	**0.0774**		**279.2719**	**279.2719**	**8.3800e-003**		**279.4814**

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	0.548858	0.043235	0.200706	0.120309	0.016131	0.005851	0.021034	0.033479	0.002070	0.001877	0.004817	0.000707	0.000925

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

Revised CalEEMod® Output Files Provided with Supplemental Information to Comment Letter #5 Submitted on October 1, 2019

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2)

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** 2024

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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Annual

Project Characteristics -

Land Use -

Construction Phase - Project specific construction schedule - scaled from SCAQMD DSEA model run based on revised number of equipment.

Off-road Equipment - Project specific equipment mix.

Off-road Equipment - Project specific equipment mix. Water Trucks and Dump Trucks modeled as Off-Highway Trucks.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks. Compactor modeled as Other Construction Equipment.

Trips and VMT - Building construction worker trips increased from SCAQMD DSEA based on the increase in number of equipment. Vendor and hauling trips based on SCAQMD DSEA.

Grading - 100,000 squarefeet of land disturbed during site prep.

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Annual

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	279.00
tblConstructionPhase	NumDays	0.00	56.00
tblConstructionPhase	NumDays	0.00	12.00
tblConstructionPhase	NumDays	0.00	15.00
tblGrading	AcresOfGrading	0.00	2.30
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

2.0 Emissions Summary

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					
2023	0.3637	3.3928	2.9743	6.7200e-003	0.1371	0.1429	0.2800	0.0588	0.1348	0.1936	0.0000	582.9767	582.9767	0.1257	0.0000	586.1202
2024	0.1822	1.5060	1.4194	3.8600e-003	0.0205	0.0623	0.0828	5.4500e-003	0.0581	0.0636	0.0000	338.1156	338.1156	0.0912	0.0000	340.3957
Maximum	**0.3637**	**3.3928**	**2.9743**	**6.7200e-003**	**0.1371**	**0.1429**	**0.2800**	**0.0588**	**0.1348**	**0.1936**	**0.0000**	**582.9767**	**582.9767**	**0.1257**	**0.0000**	**586.1202**

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					
2023	0.3637	3.3928	2.9743	6.7200e-003	0.1371	0.1429	0.2800	0.0588	0.1348	0.1936	0.0000	582.9761	582.9761	0.1257	0.0000	586.1195
2024	0.1822	1.5060	1.4194	3.8600e-003	0.0205	0.0623	0.0828	5.4500e-003	0.0581	0.0636	0.0000	338.1152	338.1152	0.0912	0.0000	340.3953
Maximum	**0.3637**	**3.3928**	**2.9743**	**6.7200e-003**	**0.1371**	**0.1429**	**0.2800**	**0.0588**	**0.1348**	**0.1936**	**0.0000**	**582.9761**	**582.9761**	**0.1257**	**0.0000**	**586.1195**

	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**

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-2-2023	4-1-2023	0.9289	0.9289
2	4-2-2023	7-1-2023	0.9388	0.9388
3	7-2-2023	10-1-2023	0.9491	0.9491
4	10-2-2023	1-1-2024	0.9491	0.9491
5	1-2-2024	4-1-2024	0.9465	0.9465
6	4-2-2024	7-1-2024	0.7185	0.7185
		Highest	0.9491	0.9491

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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/2/2023	1/22/2023	5	15	
2	Building Construction	Building Construction	1/23/2023	2/15/2024	5	279	
3	Paving	Paving	2/16/2024	3/4/2024	5	12	
4	Demolition	Demolition	3/5/2024	5/21/2024	5	56	

Acres of Grading (Site Preparation Phase): 2.3

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)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Off-Highway Trucks	2	6.00	402	0.38
Site Preparation	Other Construction Equipment	1	8.00	172	0.42
Site Preparation	Rubber Tired Dozers	2	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Aerial Lifts	3	7.00	63	0.31
Building Construction	Cranes	4	8.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Welders	2	6.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Off-Highway Trucks	2	6.00	402	0.38
Paving	Pavers	1	5.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	3	6.00	97	0.37
Demolition	Concrete/Industrial Saws	2	6.00	81	0.73
Demolition	Cranes	1	6.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Off-Highway Trucks	3	8.00	402	0.38
Demolition	Off-Highway Trucks	2	6.00	402	0.38
Demolition	Rubber Tired Dozers	2	6.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - 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
Site Preparation	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	13	38.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	30.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	14	35.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2023

<u>Unmitigated Construction On-Site</u>

	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					0.0803	0.0000	0.0803	0.0436	0.0000	0.0436	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1946	0.1510	3.7000e-004		8.9800e-003	8.9800e-003		8.2700e-003	8.2700e-003	0.0000	32.1967	32.1967	0.0104	0.0000	32.4570
Total	**0.0208**	**0.1946**	**0.1510**	**3.7000e-004**	**0.0803**	**8.9800e-003**	**0.0892**	**0.0436**	**8.2700e-003**	**0.0519**	**0.0000**	**32.1967**	**32.1967**	**0.0104**	**0.0000**	**32.4570**

3.2 Site Preparation - 2023

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	6.4000e-004	4.3000e-004	5.1200e-003	2.0000e-005	1.8900e-003	1.0000e-005	1.9100e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5301	1.5301	4.0000e-005	0.0000	1.5310
Total	**6.4000e-004**	**4.3000e-004**	**5.1200e-003**	**2.0000e-005**	**1.8900e-003**	**1.0000e-005**	**1.9100e-003**	**5.0000e-004**	**1.0000e-005**	**5.1000e-004**	**0.0000**	**1.5301**	**1.5301**	**4.0000e-005**	**0.0000**	**1.5310**

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					0.0803	0.0000	0.0803	0.0436	0.0000	0.0436	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0208	0.1946	0.1510	3.7000e-004		8.9800e-003	8.9800e-003		8.2700e-003	8.2700e-003	0.0000	32.1966	32.1966	0.0104	0.0000	32.4569
Total	**0.0208**	**0.1946**	**0.1510**	**3.7000e-004**	**0.0803**	**8.9800e-003**	**0.0892**	**0.0436**	**8.2700e-003**	**0.0519**	**0.0000**	**32.1966**	**32.1966**	**0.0104**	**0.0000**	**32.4569**

3.2 Site Preparation - 2023

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	6.4000e-004	4.3000e-004	5.1200e-003	2.0000e-005	1.8900e-003	1.0000e-005	1.9100e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5301	1.5301	4.0000e-005	0.0000	1.5310
Total	**6.4000e-004**	**4.3000e-004**	**5.1200e-003**	**2.0000e-005**	**1.8900e-003**	**1.0000e-005**	**1.9100e-003**	**5.0000e-004**	**1.0000e-005**	**5.1000e-004**	**0.0000**	**1.5301**	**1.5301**	**4.0000e-005**	**0.0000**	**1.5310**

3.3 Building Construction - 2023

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	0.3239	3.1438	2.6677	5.7300e-003		0.1335	0.1335		0.1261	0.1261	0.0000	493.5829	493.5829	0.1135	0.0000	496.4211
Total	**0.3239**	**3.1438**	**2.6677**	**5.7300e-003**		**0.1335**	**0.1335**		**0.1261**	**0.1261**	**0.0000**	**493.5829**	**493.5829**	**0.1135**	**0.0000**	**496.4211**

3.3 Building Construction - 2023

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	1.2200e-003	0.0423	0.0124	1.5000e-004	3.8600e-003	5.0000e-005	3.9100e-003	1.1100e-003	5.0000e-005	1.1600e-003	0.0000	14.3755	14.3755	7.9000e-004	0.0000	14.3953
Worker	0.0172	0.0117	0.1381	4.6000e-004	0.0511	3.6000e-004	0.0514	0.0136	3.3000e-004	0.0139	0.0000	41.2914	41.2914	9.7000e-004	0.0000	41.3157
Total	**0.0184**	**0.0540**	**0.1505**	**6.1000e-004**	**0.0549**	**4.1000e-004**	**0.0553**	**0.0147**	**3.8000e-004**	**0.0151**	**0.0000**	**55.6670**	**55.6670**	**1.7600e-003**	**0.0000**	**55.7110**

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	0.3239	3.1438	2.6677	5.7300e-003		0.1335	0.1335		0.1261	0.1261	0.0000	493.5823	493.5823	0.1135	0.0000	496.4205
Total	**0.3239**	**3.1438**	**2.6677**	**5.7300e-003**		**0.1335**	**0.1335**		**0.1261**	**0.1261**	**0.0000**	**493.5823**	**493.5823**	**0.1135**	**0.0000**	**496.4205**

3.3 Building Construction - 2023

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	1.2200e-003	0.0423	0.0124	1.5000e-004	3.8600e-003	5.0000e-005	3.9100e-003	1.1100e-003	5.0000e-005	1.1600e-003	0.0000	14.3755	14.3755	7.9000e-004	0.0000	14.3953
Worker	0.0172	0.0117	0.1381	4.6000e-004	0.0511	3.6000e-004	0.0514	0.0136	3.3000e-004	0.0139	0.0000	41.2914	41.2914	9.7000e-004	0.0000	41.3157
Total	**0.0184**	**0.0540**	**0.1505**	**6.1000e-004**	**0.0549**	**4.1000e-004**	**0.0553**	**0.0147**	**3.8000e-004**	**0.0151**	**0.0000**	**55.6670**	**55.6670**	**1.7600e-003**	**0.0000**	**55.7110**

3.3 Building Construction - 2024

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	0.0422	0.4060	0.3655	8.0000e-004		0.0166	0.0166		0.0157	0.0157	0.0000	68.4965	68.4965	0.0157	0.0000	68.8878
Total	**0.0422**	**0.4060**	**0.3655**	**8.0000e-004**		**0.0166**	**0.0166**		**0.0157**	**0.0157**	**0.0000**	**68.4965**	**68.4965**	**0.0157**	**0.0000**	**68.8878**

3.3 Building Construction - 2024

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	1.7000e-004	5.8500e-003	1.6700e-003	2.0000e-005	5.4000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.6000e-004	0.0000	1.9879	1.9879	1.1000e-004	0.0000	1.9906
Worker	2.2600e-003	1.4800e-003	0.0179	6.0000e-005	7.0900e-003	5.0000e-005	7.1400e-003	1.8800e-003	5.0000e-005	1.9300e-003	0.0000	5.5417	5.5417	1.2000e-004	0.0000	5.5448
Total	**2.4300e-003**	**7.3300e-003**	**0.0196**	**8.0000e-005**	**7.6300e-003**	**6.0000e-005**	**7.6800e-003**	**2.0300e-003**	**6.0000e-005**	**2.0900e-003**	**0.0000**	**7.5296**	**7.5296**	**2.3000e-004**	**0.0000**	**7.5354**

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	0.0422	0.4060	0.3655	8.0000e-004		0.0166	0.0166		0.0157	0.0157	0.0000	68.4964	68.4964	0.0157	0.0000	68.8877
Total	**0.0422**	**0.4060**	**0.3655**	**8.0000e-004**		**0.0166**	**0.0166**		**0.0157**	**0.0157**	**0.0000**	**68.4964**	**68.4964**	**0.0157**	**0.0000**	**68.8877**

3.3 Building Construction - 2024

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	1.7000e-004	5.8500e-003	1.6700e-003	2.0000e-005	5.4000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.6000e-004	0.0000	1.9879	1.9879	1.1000e-004	0.0000	1.9906
Worker	2.2600e-003	1.4800e-003	0.0179	6.0000e-005	7.0900e-003	5.0000e-005	7.1400e-003	1.8800e-003	5.0000e-005	1.9300e-003	0.0000	5.5417	5.5417	1.2000e-004	0.0000	5.5448
Total	**2.4300e-003**	**7.3300e-003**	**0.0196**	**8.0000e-005**	**7.6300e-003**	**6.0000e-005**	**7.6800e-003**	**2.0300e-003**	**6.0000e-005**	**2.0900e-003**	**0.0000**	**7.5296**	**7.5296**	**2.3000e-004**	**0.0000**	**7.5354**

3.4 Paving - 2024

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	0.0109	0.0910	0.1206	2.6000e-004		4.0000e-003	4.0000e-003		3.6900e-003	3.6900e-003	0.0000	22.4795	22.4795	7.1800e-003	0.0000	22.6590
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0109**	**0.0910**	**0.1206**	**2.6000e-004**		**4.0000e-003**	**4.0000e-003**		**3.6900e-003**	**3.6900e-003**	**0.0000**	**22.4795**	**22.4795**	**7.1800e-003**	**0.0000**	**22.6590**

3.4 Paving - 2024

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	1.0000e-005	4.1000e-004	1.2000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1403	0.1403	1.0000e-005	0.0000	0.1405
Worker	6.3000e-004	4.1000e-004	4.9800e-003	2.0000e-005	1.9700e-003	1.0000e-005	1.9900e-003	5.2000e-004	1.0000e-005	5.4000e-004	0.0000	1.5441	1.5441	3.0000e-005	0.0000	1.5450
Total	**6.4000e-004**	**8.2000e-004**	**5.1000e-003**	**2.0000e-005**	**2.0100e-003**	**1.0000e-005**	**2.0300e-003**	**5.3000e-004**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**1.6844**	**1.6844**	**4.0000e-005**	**0.0000**	**1.6855**

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	0.0109	0.0910	0.1206	2.6000e-004		4.0000e-003	4.0000e-003		3.6900e-003	3.6900e-003	0.0000	22.4795	22.4795	7.1800e-003	0.0000	22.6590
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0109**	**0.0910**	**0.1206**	**2.6000e-004**		**4.0000e-003**	**4.0000e-003**		**3.6900e-003**	**3.6900e-003**	**0.0000**	**22.4795**	**22.4795**	**7.1800e-003**	**0.0000**	**22.6590**

3.4 Paving - 2024

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	1.0000e-005	4.1000e-004	1.2000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1403	0.1403	1.0000e-005	0.0000	0.1405
Worker	6.3000e-004	4.1000e-004	4.9800e-003	2.0000e-005	1.9700e-003	1.0000e-005	1.9900e-003	5.2000e-004	1.0000e-005	5.4000e-004	0.0000	1.5441	1.5441	3.0000e-005	0.0000	1.5450
Total	**6.4000e-004**	**8.2000e-004**	**5.1000e-003**	**2.0000e-005**	**2.0100e-003**	**1.0000e-005**	**2.0300e-003**	**5.3000e-004**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**1.6844**	**1.6844**	**4.0000e-005**	**0.0000**	**1.6855**

3.5 Demolition - 2024

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	0.1226	0.9978	0.8813	2.6200e-003		0.0416	0.0416		0.0386	0.0386	0.0000	229.1657	229.1657	0.0679	0.0000	230.8629
Total	**0.1226**	**0.9978**	**0.8813**	**2.6200e-003**		**0.0416**	**0.0416**		**0.0386**	**0.0386**	**0.0000**	**229.1657**	**229.1657**	**0.0679**	**0.0000**	**230.8629**

3.5 Demolition - 2024

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	7.7000e-004	2.5000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.3530	0.3530	2.0000e-005	0.0000	0.3536
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	3.4200e-003	2.2500e-003	0.0271	9.0000e-005	0.0108	8.0000e-005	0.0108	2.8600e-003	7.0000e-005	2.9200e-003	0.0000	8.4069	8.4069	1.9000e-004	0.0000	8.4115
Total	**3.4400e-003**	**3.0200e-003**	**0.0274**	**9.0000e-005**	**0.0108**	**8.0000e-005**	**0.0109**	**2.8800e-003**	**7.0000e-005**	**2.9400e-003**	**0.0000**	**8.7599**	**8.7599**	**2.1000e-004**	**0.0000**	**8.7652**

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	0.1226	0.9978	0.8813	2.6200e-003		0.0416	0.0416		0.0386	0.0386	0.0000	229.1654	229.1654	0.0679	0.0000	230.8626
Total	**0.1226**	**0.9978**	**0.8813**	**2.6200e-003**		**0.0416**	**0.0416**		**0.0386**	**0.0386**	**0.0000**	**229.1654**	**229.1654**	**0.0679**	**0.0000**	**230.8626**

3.5 Demolition - 2024

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	7.7000e-004	2.5000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.3530	0.3530	2.0000e-005	0.0000	0.3536
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	3.4200e-003	2.2500e-003	0.0271	9.0000e-005	0.0108	8.0000e-005	0.0108	2.8600e-003	7.0000e-005	2.9200e-003	0.0000	8.4069	8.4069	1.9000e-004	0.0000	8.4115
Total	**3.4400e-003**	**3.0200e-003**	**0.0274**	**9.0000e-005**	**0.0108**	**8.0000e-005**	**0.0109**	**2.8800e-003**	**7.0000e-005**	**2.9400e-003**	**0.0000**	**8.7599**	**8.7599**	**2.1000e-004**	**0.0000**	**8.7652**

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	0.550809	0.042355	0.203399	0.115606	0.014562	0.005806	0.021810	0.035336	0.002134	0.001736	0.004891	0.000712	0.000845

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

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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2)

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**	2024
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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use -

Construction Phase - Project specific construction schedule - scaled from SCAQMD DSEA model run based on revised number of equipment.

Off-road Equipment - Project specific equipment mix.

Off-road Equipment - Project specific equipment mix. Water Trucks and Dump Trucks modeled as Off-Highway Trucks.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks. Compactor modeled as Other Construction Equipment.

Trips and VMT - Building construction worker trips increased from SCAQMD DSEA based on the increase in number of equipment. Vendor and hauling trips based on SCAQMD DSEA.

Grading - 100,000 squarefeet of land disturbed during site prep.

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	279.00
tblConstructionPhase	NumDays	0.00	56.00
tblConstructionPhase	NumDays	0.00	12.00
tblConstructionPhase	NumDays	0.00	15.00
tblGrading	AcresOfGrading	0.00	2.30
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

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					
2023	2.8641	26.0906	23.0958	0.0519	10.9584	1.1997	12.1580	5.8786	1.1037	6.9823	0.0000	4,968.5225	4,968.5225	1.5360	0.0000	5,006.9235
2024	4.5022	35.7332	32.5365	0.0970	0.4568	1.4878	1.8822	0.1219	1.3821	1.4867	0.0000	9,383.8344	9,383.8344	2.6813	0.0000	9,450.8656
Maximum	**4.5022**	**35.7332**	**32.5365**	**0.0970**	**10.9584**	**1.4878**	**12.1580**	**5.8786**	**1.3821**	**6.9823**	**0.0000**	**9,383.8344**	**9,383.8344**	**2.6813**	**0.0000**	**9,450.8656**

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					
2023	2.8641	26.0906	23.0958	0.0519	10.9584	1.1997	12.1580	5.8786	1.1037	6.9823	0.0000	4,968.5225	4,968.5225	1.5360	0.0000	5,006.9235
2024	4.5022	35.7332	32.5365	0.0970	0.4568	1.4878	1.8822	0.1219	1.3821	1.4867	0.0000	9,383.8344	9,383.8344	2.6813	0.0000	9,450.8656
Maximum	**4.5022**	**35.7332**	**32.5365**	**0.0970**	**10.9584**	**1.4878**	**12.1580**	**5.8786**	**1.3821**	**6.9823**	**0.0000**	**9,383.8344**	**9,383.8344**	**2.6813**	**0.0000**	**9,450.8656**

	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**

	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	Site Preparation	Site Preparation	1/2/2023	1/22/2023	5	15	
2	Building Construction	Building Construction	1/23/2023	2/15/2024	5	279	
3	Paving	Paving	2/16/2024	3/4/2024	5	12	
4	Demolition	Demolition	3/5/2024	5/21/2024	5	56	

Acres of Grading (Site Preparation Phase): 2.3

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Off-Highway Trucks	2	6.00	402	0.38
Site Preparation	Other Construction Equipment	1	8.00	172	0.42
Site Preparation	Rubber Tired Dozers	2	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Aerial Lifts	3	7.00	63	0.31
Building Construction	Cranes	4	8.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Welders	2	6.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Off-Highway Trucks	2	6.00	402	0.38
Paving	Pavers	1	5.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	3	6.00	97	0.37
Demolition	Concrete/Industrial Saws	2	6.00	81	0.73
Demolition	Cranes	1	6.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Off-Highway Trucks	3	8.00	402	0.38
Demolition	Off-Highway Trucks	2	6.00	402	0.38
Demolition	Rubber Tired Dozers	2	6.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - 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
Site Preparation	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	13	38.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	30.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	14	35.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2023

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					10.7013	0.0000	10.7013	5.8105	0.0000	5.8105			0.0000			0.0000
Off-Road	2.7785	25.9501	20.1301	0.0489		1.1979	1.1979		1.1020	1.1020		4,732.098 6	4,732.098 6	1.5305		4,770.360 0
Total	**2.7785**	**25.9501**	**20.1301**	**0.0489**	**10.7013**	**1.1979**	**11.8991**	**5.8105**	**1.1020**	**6.9125**		**4,732.098 6**	**4,732.098 6**	**1.5305**		**4,770.360 0**

3.2 Site Preparation - 2023

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	0.0856	0.0515	0.7399	2.3700e-003	0.2571	1.7900e-003	0.2589	0.0682	1.6500e-003	0.0698		236.4239	236.4239	5.5800e-003		236.5635
Total	**0.0856**	**0.0515**	**0.7399**	**2.3700e-003**	**0.2571**	**1.7900e-003**	**0.2589**	**0.0682**	**1.6500e-003**	**0.0698**		**236.4239**	**236.4239**	**5.5800e-003**		**236.5635**

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					10.7013	0.0000	10.7013	5.8105	0.0000	5.8105			0.0000			0.0000
Off-Road	2.7785	25.9501	20.1301	0.0489		1.1979	1.1979		1.1020	1.1020	0.0000	4,732.0986	4,732.0986	1.5305		4,770.3600
Total	**2.7785**	**25.9501**	**20.1301**	**0.0489**	**10.7013**	**1.1979**	**11.8991**	**5.8105**	**1.1020**	**6.9125**	**0.0000**	**4,732.0986**	**4,732.0986**	**1.5305**		**4,770.3600**

3.2 Site Preparation - 2023

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	0.0856	0.0515	0.7399	2.3700e-003	0.2571	1.7900e-003	0.2589	0.0682	1.6500e-003	0.0698		236.4239	236.4239	5.5800e-003		236.5635
Total	**0.0856**	**0.0515**	**0.7399**	**2.3700e-003**	**0.2571**	**1.7900e-003**	**0.2589**	**0.0682**	**1.6500e-003**	**0.0698**		**236.4239**	**236.4239**	**5.5800e-003**		**236.5635**

3.3 Building Construction - 2023

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	2.6438	25.6633	21.7770	0.0468		1.0897	1.0897		1.0297	1.0297		4,441.4861	4,441.4861	1.0216		4,467.0255
Total	**2.6438**	**25.6633**	**21.7770**	**0.0468**		**1.0897**	**1.0897**		**1.0297**	**1.0297**		**4,441.4861**	**4,441.4861**	**1.0216**		**4,467.0255**

3.3 Building Construction - 2023

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	9.7300e-003	0.3422	0.0964	1.2200e-003	0.0320	3.8000e-004	0.0324	9.2100e-003	3.7000e-004	9.5800e-003		130.9339	130.9339	6.9200e-003		131.1068
Worker	0.1415	0.0850	1.2224	3.9200e-003	0.4248	2.9600e-003	0.4277	0.1127	2.7200e-003	0.1154		390.6135	390.6135	9.2200e-003		390.8441
Total	**0.1512**	**0.4273**	**1.3188**	**5.1400e-003**	**0.4568**	**3.3400e-003**	**0.4601**	**0.1219**	**3.0900e-003**	**0.1250**		**521.5473**	**521.5473**	**0.0161**		**521.9509**

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	2.6438	25.6633	21.7770	0.0468		1.0897	1.0897		1.0297	1.0297	0.0000	4,441.4861	4,441.4861	1.0216		4,467.0255
Total	**2.6438**	**25.6633**	**21.7770**	**0.0468**		**1.0897**	**1.0897**		**1.0297**	**1.0297**	**0.0000**	**4,441.4861**	**4,441.4861**	**1.0216**		**4,467.0255**

3.3 Building Construction - 2023

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	9.7300e-003	0.3422	0.0964	1.2200e-003	0.0320	3.8000e-004	0.0324	9.2100e-003	3.7000e-004	9.5800e-003		130.9339	130.9339	6.9200e-003		131.1068
Worker	0.1415	0.0850	1.2224	3.9200e-003	0.4248	2.9600e-003	0.4277	0.1127	2.7200e-003	0.1154		390.6135	390.6135	9.2200e-003		390.8441
Total	**0.1512**	**0.4273**	**1.3188**	**5.1400e-003**	**0.4568**	**3.3400e-003**	**0.4601**	**0.1219**	**3.0900e-003**	**0.1250**		**521.5473**	**521.5473**	**0.0161**		**521.9509**

3.3 Building Construction - 2024

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	2.4830	23.8842	21.4997	0.0468		0.9764	0.9764		0.9217	0.9217		4,441.4384	4,441.4384	1.0150		4,466.8131
Total	**2.4830**	**23.8842**	**21.4997**	**0.0468**		**0.9764**	**0.9764**		**0.9217**	**0.9217**		**4,441.4384**	**4,441.4384**	**1.0150**		**4,466.8131**

3.3 Building Construction - 2024

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	9.5300e-003	0.3414	0.0936	1.2200e-003	0.0320	3.8000e-004	0.0324	9.2100e-003	3.6000e-004	9.5800e-003		130.4591	130.4591	6.8100e-003		130.6294
Worker	0.1339	0.0775	1.1419	3.7900e-003	0.4248	2.9200e-003	0.4277	0.1127	2.6900e-003	0.1153		377.7994	377.7994	8.4600e-003		378.0108
Total	**0.1434**	**0.4189**	**1.2355**	**5.0100e-003**	**0.4568**	**3.3000e-003**	**0.4601**	**0.1219**	**3.0500e-003**	**0.1249**		**508.2585**	**508.2585**	**0.0153**		**508.6402**

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	2.4830	23.8842	21.4997	0.0468		0.9764	0.9764		0.9217	0.9217	0.0000	4,441.438 4	4,441.438 4	1.0150		4,466.813 1
Total	**2.4830**	**23.8842**	**21.4997**	**0.0468**		**0.9764**	**0.9764**		**0.9217**	**0.9217**	**0.0000**	**4,441.438 4**	**4,441.438 4**	**1.0150**		**4,466.813 1**

3.3 Building Construction - 2024

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	9.5300e-003	0.3414	0.0936	1.2200e-003	0.0320	3.8000e-004	0.0324	9.2100e-003	3.6000e-004	9.5800e-003		130.4591	130.4591	6.8100e-003		130.6294
Worker	0.1339	0.0775	1.1419	3.7900e-003	0.4248	2.9200e-003	0.4277	0.1127	2.6900e-003	0.1153		377.7994	377.7994	8.4600e-003		378.0108
Total	**0.1434**	**0.4189**	**1.2355**	**5.0100e-003**	**0.4568**	**3.3000e-003**	**0.4601**	**0.1219**	**3.0500e-003**	**0.1249**		**508.2585**	**508.2585**	**0.0153**		**508.6402**

3.4 Paving - 2024

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	1.8203	15.1700	20.0909	0.0430		0.6671	0.6671		0.6154	0.6154		4,129.9016	4,129.9016	1.3191		4,162.8780
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8203**	**15.1700**	**20.0909**	**0.0430**		**0.6671**	**0.6671**		**0.6154**	**0.6154**		**4,129.9016**	**4,129.9016**	**1.3191**		**4,162.8780**

3.4 Paving - 2024

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	1.9100e-003	0.0683	0.0187	2.4000e-004	6.4000e-003	8.0000e-005	6.4800e-003	1.8400e-003	7.0000e-005	1.9200e-003		26.0918	26.0918	1.3600e-003		26.1259
Worker	0.1057	0.0612	0.9015	2.9900e-003	0.3353	2.3000e-003	0.3376	0.0889	2.1200e-003	0.0911		298.2627	298.2627	6.6800e-003		298.4296
Total	**0.1076**	**0.1295**	**0.9202**	**3.2300e-003**	**0.3417**	**2.3800e-003**	**0.3441**	**0.0908**	**2.1900e-003**	**0.0930**		**324.3545**	**324.3545**	**8.0400e-003**		**324.5555**

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	1.8203	15.1700	20.0909	0.0430		0.6671	0.6671		0.6154	0.6154	0.0000	4,129.9016	4,129.9016	1.3191		4,162.8780
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8203**	**15.1700**	**20.0909**	**0.0430**		**0.6671**	**0.6671**		**0.6154**	**0.6154**	**0.0000**	**4,129.9016**	**4,129.9016**	**1.3191**		**4,162.8780**

3.4 Paving - 2024

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	1.9100e-003	0.0683	0.0187	2.4000e-004	6.4000e-003	8.0000e-005	6.4800e-003	1.8400e-003	7.0000e-005	1.9200e-003		26.0918	26.0918	1.3600e-003		26.1259
Worker	0.1057	0.0612	0.9015	2.9900e-003	0.3353	2.3000e-003	0.3376	0.0889	2.1200e-003	0.0911		298.2627	298.2627	6.6800e-003		298.4296
Total	**0.1076**	**0.1295**	**0.9202**	**3.2300e-003**	**0.3417**	**2.3800e-003**	**0.3441**	**0.0908**	**2.1900e-003**	**0.0930**		**324.3545**	**324.3545**	**8.0400e-003**		**324.5555**

3.5 Demolition - 2024

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	4.3780	35.6350	31.4759	0.0934		1.4851	1.4851		1.3796	1.3796		9,021.8550	9,021.8550	2.6726		9,088.6691
Total	**4.3780**	**35.6350**	**31.4759**	**0.0934**		**1.4851**	**1.4851**		**1.3796**	**1.3796**		**9,021.8550**	**9,021.8550**	**2.6726**		**9,088.6691**

3.5 Demolition - 2024

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	8.2000e-004	0.0269	8.7500e-003	1.3000e-004	3.1200e-003	5.0000e-005	3.1700e-003	8.6000e-004	5.0000e-005	9.0000e-004		14.0063	14.0063	8.9000e-004		14.0286
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	0.1233	0.0714	1.0518	3.4900e-003	0.3912	2.6900e-003	0.3939	0.1038	2.4700e-003	0.1062		347.9731	347.9731	7.7900e-003		348.1678
Total	**0.1241**	**0.0982**	**1.0605**	**3.6200e-003**	**0.3943**	**2.7400e-003**	**0.3971**	**0.1046**	**2.5200e-003**	**0.1071**		**361.9794**	**361.9794**	**8.6800e-003**		**362.1964**

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	4.3780	35.6350	31.4759	0.0934		1.4851	1.4851		1.3796	1.3796	0.0000	9,021.855 0	9,021.855 0	2.6726		9,088.669 1
Total	**4.3780**	**35.6350**	**31.4759**	**0.0934**		**1.4851**	**1.4851**		**1.3796**	**1.3796**	**0.0000**	**9,021.855 0**	**9,021.855 0**	**2.6726**		**9,088.669 1**

3.5 Demolition - 2024

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	8.2000e-004	0.0269	8.7500e-003	1.3000e-004	3.1200e-003	5.0000e-005	3.1700e-003	8.6000e-004	5.0000e-005	9.0000e-004		14.0063	14.0063	8.9000e-004		14.0286
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	0.1233	0.0714	1.0518	3.4900e-003	0.3912	2.6900e-003	0.3939	0.1038	2.4700e-003	0.1062		347.9731	347.9731	7.7900e-003		348.1678
Total	**0.1241**	**0.0982**	**1.0605**	**3.6200e-003**	**0.3943**	**2.7400e-003**	**0.3971**	**0.1046**	**2.5200e-003**	**0.1071**		**361.9794**	**361.9794**	**8.6800e-003**		**362.1964**

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	0.550809	0.042355	0.203399	0.115606	0.014562	0.005806	0.021810	0.035336	0.002134	0.001736	0.004891	0.000712	0.000845

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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2)

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**	2024
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

PAR1110.2_Construction_Stationary Gas Turbine & New SCR (Revised Scenario 2) - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use -

Construction Phase - Project specific construction schedule - scaled from SCAQMD DSEA model run based on revised number of equipment.

Off-road Equipment - Project specific equipment mix.

Off-road Equipment - Project specific equipment mix. Water Trucks and Dump Trucks modeled as Off-Highway Trucks.

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks

Off-road Equipment - Project specific equipment mix. Water Trucks modeled as Off-Highway Trucks. Compactor modeled as Other Construction Equipment.

Trips and VMT - Building construction worker trips increased from SCAQMD DSEA based on the increase in number of equipment. Vendor and hauling trips based on SCAQMD DSEA.

Grading - 100,000 squarefeet of land disturbed during site prep.

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	279.00
tblConstructionPhase	NumDays	0.00	56.00
tblConstructionPhase	NumDays	0.00	12.00
tblConstructionPhase	NumDays	0.00	15.00
tblGrading	AcresOfGrading	0.00	2.30
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	4.00	8.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	38.00

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					
2023	2.8725	26.0964	22.9773	0.0516	10.9584	1.1997	12.1580	5.8786	1.1037	6.9823	0.0000	4,953.1968	4,953.1968	1.5357	0.0000	4,991.5880
2024	4.5148	35.7400	32.4249	0.0968	0.4568	1.4878	1.8822	0.1219	1.3821	1.4867	0.0000	9,360.9719	9,360.9719	2.6807	0.0000	9,427.9900
Maximum	**4.5148**	**35.7400**	**32.4249**	**0.0968**	**10.9584**	**1.4878**	**12.1580**	**5.8786**	**1.3821**	**6.9823**	**0.0000**	**9,360.9719**	**9,360.9719**	**2.6807**	**0.0000**	**9,427.9900**

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					
2023	2.8725	26.0964	22.9773	0.0516	10.9584	1.1997	12.1580	5.8786	1.1037	6.9823	0.0000	4,953.1968	4,953.1968	1.5357	0.0000	4,991.5880
2024	4.5148	35.7400	32.4249	0.0968	0.4568	1.4878	1.8822	0.1219	1.3821	1.4867	0.0000	9,360.9718	9,360.9718	2.6807	0.0000	9,427.9900
Maximum	**4.5148**	**35.7400**	**32.4249**	**0.0968**	**10.9584**	**1.4878**	**12.1580**	**5.8786**	**1.3821**	**6.9823**	**0.0000**	**9,360.9718**	**9,360.9718**	**2.6807**	**0.0000**	**9,427.9900**

	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**

	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	Site Preparation	Site Preparation	1/2/2023	1/22/2023	5	15	
2	Building Construction	Building Construction	1/23/2023	2/15/2024	5	279	
3	Paving	Paving	2/16/2024	3/4/2024	5	12	
4	Demolition	Demolition	3/5/2024	5/21/2024	5	56	

Acres of Grading (Site Preparation Phase): 2.3

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Off-Highway Trucks	2	6.00	402	0.38
Site Preparation	Other Construction Equipment	1	8.00	172	0.42
Site Preparation	Rubber Tired Dozers	2	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation	Trenchers	1	4.00	78	0.50
Building Construction	Aerial Lifts	3	7.00	63	0.31
Building Construction	Cranes	4	8.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Welders	2	6.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Off-Highway Trucks	2	6.00	402	0.38
Paving	Pavers	1	5.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	3	6.00	97	0.37
Demolition	Concrete/Industrial Saws	2	6.00	81	0.73
Demolition	Cranes	1	6.00	231	0.29
Demolition	Forklifts	2	7.00	89	0.20
Demolition	Off-Highway Trucks	3	8.00	402	0.38
Demolition	Off-Highway Trucks	2	6.00	402	0.38
Demolition	Rubber Tired Dozers	2	6.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

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
Site Preparation	9	23.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	13	38.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	30.00	1.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	14	35.00	0.00	10.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2023

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					10.7013	0.0000	10.7013	5.8105	0.0000	5.8105			0.0000			0.0000
Off-Road	2.7785	25.9501	20.1301	0.0489		1.1979	1.1979		1.1020	1.1020		4,732.0986	4,732.0986	1.5305		4,770.3600
Total	**2.7785**	**25.9501**	**20.1301**	**0.0489**	**10.7013**	**1.1979**	**11.8991**	**5.8105**	**1.1020**	**6.9125**		**4,732.0986**	**4,732.0986**	**1.5305**		**4,770.3600**

3.2 Site Preparation - 2023

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	0.0941	0.0563	0.6624	2.2200e-003	0.2571	1.7900e-003	0.2589	0.0682	1.6500e-003	0.0698		221.0982	221.0982	5.1900e-003		221.2280
Total	**0.0941**	**0.0563**	**0.6624**	**2.2200e-003**	**0.2571**	**1.7900e-003**	**0.2589**	**0.0682**	**1.6500e-003**	**0.0698**		**221.0982**	**221.0982**	**5.1900e-003**		**221.2280**

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					10.7013	0.0000	10.7013	5.8105	0.0000	5.8105			0.0000			0.0000
Off-Road	2.7785	25.9501	20.1301	0.0489		1.1979	1.1979		1.1020	1.1020	0.0000	4,732.0986	4,732.0986	1.5305		4,770.3600
Total	**2.7785**	**25.9501**	**20.1301**	**0.0489**	**10.7013**	**1.1979**	**11.8991**	**5.8105**	**1.1020**	**6.9125**	**0.0000**	**4,732.0986**	**4,732.0986**	**1.5305**		**4,770.3600**

3.2 Site Preparation - 2023

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	0.0941	0.0563	0.6624	2.2200e-003	0.2571	1.7900e-003	0.2589	0.0682	1.6500e-003	0.0698		221.0982	221.0982	5.1900e-003		221.2280
Total	**0.0941**	**0.0563**	**0.6624**	**2.2200e-003**	**0.2571**	**1.7900e-003**	**0.2589**	**0.0682**	**1.6500e-003**	**0.0698**		**221.0982**	**221.0982**	**5.1900e-003**		**221.2280**

3.3 Building Construction - 2023

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	2.6438	25.6633	21.7770	0.0468		1.0897	1.0897		1.0297	1.0297		4,441.4861	4,441.4861	1.0216		4,467.0255
Total	**2.6438**	**25.6633**	**21.7770**	**0.0468**		**1.0897**	**1.0897**		**1.0297**	**1.0297**		**4,441.4861**	**4,441.4861**	**1.0216**		**4,467.0255**

3.3 Building Construction - 2023

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	0.0103	0.3400	0.1059	1.1900e-003	0.0320	4.0000e-004	0.0324	9.2100e-003	3.9000e-004	9.6000e-003		127.1808	127.1808	7.3700e-003		127.3651
Worker	0.1554	0.0930	1.0944	3.6600e-003	0.4248	2.9600e-003	0.4277	0.1127	2.7200e-003	0.1154		365.2926	365.2926	8.5800e-003		365.5072
Total	**0.1657**	**0.4330**	**1.2003**	**4.8500e-003**	**0.4568**	**3.3600e-003**	**0.4601**	**0.1219**	**3.1100e-003**	**0.1250**		**492.4735**	**492.4735**	**0.0160**		**492.8723**

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	2.6438	25.6633	21.7770	0.0468		1.0897	1.0897		1.0297	1.0297	0.0000	4,441.4861	4,441.4861	1.0216		4,467.0255
Total	**2.6438**	**25.6633**	**21.7770**	**0.0468**		**1.0897**	**1.0897**		**1.0297**	**1.0297**	**0.0000**	**4,441.4861**	**4,441.4861**	**1.0216**		**4,467.0255**

3.3 Building Construction - 2023

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	0.0103	0.3400	0.1059	1.1900e-003	0.0320	4.0000e-004	0.0324	9.2100e-003	3.9000e-004	9.6000e-003		127.1808	127.1808	7.3700e-003		127.3651
Worker	0.1554	0.0930	1.0944	3.6600e-003	0.4248	2.9600e-003	0.4277	0.1127	2.7200e-003	0.1154		365.2926	365.2926	8.5800e-003		365.5072
Total	**0.1657**	**0.4330**	**1.2003**	**4.8500e-003**	**0.4568**	**3.3600e-003**	**0.4601**	**0.1219**	**3.1100e-003**	**0.1250**		**492.4735**	**492.4735**	**0.0160**		**492.8723**

3.3 Building Construction - 2024

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	2.4830	23.8842	21.4997	0.0468		0.9764	0.9764		0.9217	0.9217		4,441.4384	4,441.4384	1.0150		4,466.8131
Total	**2.4830**	**23.8842**	**21.4997**	**0.0468**		**0.9764**	**0.9764**		**0.9217**	**0.9217**		**4,441.4384**	**4,441.4384**	**1.0150**		**4,466.8131**

3.3 Building Construction - 2024

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	0.0100	0.3393	0.1029	1.1800e-003	0.0320	4.0000e-004	0.0324	9.2100e-003	3.8000e-004	9.5900e-003		126.7483	126.7483	7.2500e-003		126.9295
Worker	0.1476	0.0847	1.0203	3.5400e-003	0.4248	2.9200e-003	0.4277	0.1127	2.6900e-003	0.1153		353.2566	353.2566	7.8600e-003		353.4530
Total	**0.1576**	**0.4240**	**1.1232**	**4.7200e-003**	**0.4568**	**3.3200e-003**	**0.4601**	**0.1219**	**3.0700e-003**	**0.1249**		**480.0048**	**480.0048**	**0.0151**		**480.3825**

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	2.4830	23.8842	21.4997	0.0468		0.9764	0.9764		0.9217	0.9217	0.0000	4,441.4384	4,441.4384	1.0150		4,466.8131
Total	**2.4830**	**23.8842**	**21.4997**	**0.0468**		**0.9764**	**0.9764**		**0.9217**	**0.9217**	**0.0000**	**4,441.4384**	**4,441.4384**	**1.0150**		**4,466.8131**

3.3 Building Construction - 2024

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	0.0100	0.3393	0.1029	1.1800e-003	0.0320	4.0000e-004	0.0324	9.2100e-003	3.8000e-004	9.5900e-003		126.7483	126.7483	7.2500e-003		126.9295
Worker	0.1476	0.0847	1.0203	3.5400e-003	0.4248	2.9200e-003	0.4277	0.1127	2.6900e-003	0.1153		353.2566	353.2566	7.8600e-003		353.4530
Total	**0.1576**	**0.4240**	**1.1232**	**4.7200e-003**	**0.4568**	**3.3200e-003**	**0.4601**	**0.1219**	**3.0700e-003**	**0.1249**		**480.0048**	**480.0048**	**0.0151**		**480.3825**

3.4 Paving - 2024

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	1.8203	15.1700	20.0909	0.0430		0.6671	0.6671		0.6154	0.6154		4,129.9016	4,129.9016	1.3191		4,162.8780
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8203**	**15.1700**	**20.0909**	**0.0430**		**0.6671**	**0.6671**		**0.6154**	**0.6154**		**4,129.9016**	**4,129.9016**	**1.3191**		**4,162.8780**

3.4 Paving - 2024

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	2.0100e-003	0.0679	0.0206	2.4000e-004	6.4000e-003	8.0000e-005	6.4800e-003	1.8400e-003	8.0000e-005	1.9200e-003		25.3497	25.3497	1.4500e-003		25.3859
Worker	0.1165	0.0669	0.8055	2.8000e-003	0.3353	2.3000e-003	0.3376	0.0889	2.1200e-003	0.0911		278.8868	278.8868	6.2000e-003		279.0418
Total	**0.1185**	**0.1348**	**0.8261**	**3.0400e-003**	**0.3417**	**2.3800e-003**	**0.3441**	**0.0908**	**2.2000e-003**	**0.0930**		**304.2364**	**304.2364**	**7.6500e-003**		**304.4277**

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	1.8203	15.1700	20.0909	0.0430		0.6671	0.6671		0.6154	0.6154	0.0000	4,129.9016	4,129.9016	1.3191		4,162.8780
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8203**	**15.1700**	**20.0909**	**0.0430**		**0.6671**	**0.6671**		**0.6154**	**0.6154**	**0.0000**	**4,129.9016**	**4,129.9016**	**1.3191**		**4,162.8780**

3.4 Paving - 2024

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	2.0100e-003	0.0679	0.0206	2.4000e-004	6.4000e-003	8.0000e-005	6.4800e-003	1.8400e-003	8.0000e-005	1.9200e-003		25.3497	25.3497	1.4500e-003		25.3859
Worker	0.1165	0.0669	0.8055	2.8000e-003	0.3353	2.3000e-003	0.3376	0.0889	2.1200e-003	0.0911		278.8868	278.8868	6.2000e-003		279.0418
Total	**0.1185**	**0.1348**	**0.8261**	**3.0400e-003**	**0.3417**	**2.3800e-003**	**0.3441**	**0.0908**	**2.2000e-003**	**0.0930**		**304.2364**	**304.2364**	**7.6500e-003**		**304.4277**

3.5 Demolition - 2024

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	4.3780	35.6350	31.4759	0.0934		1.4851	1.4851		1.3796	1.3796		9,021.855 0	9,021.855 0	2.6726		9,088.669 1
Total	**4.3780**	**35.6350**	**31.4759**	**0.0934**		**1.4851**	**1.4851**		**1.3796**	**1.3796**		**9,021.855 0**	**9,021.855 0**	**2.6726**		**9,088.669 1**

3.5 Demolition - 2024

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	8.4000e-004	0.0270	9.1900e-003	1.3000e-004	3.1200e-003	5.0000e-005	3.1700e-003	8.6000e-004	5.0000e-005	9.0000e-004		13.7490	13.7490	9.2000e-004		13.7721
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	0.1359	0.0781	0.9398	3.2600e-003	0.3912	2.6900e-003	0.3939	0.1038	2.4700e-003	0.1062		325.3679	325.3679	7.2400e-003		325.5488
Total	**0.1367**	**0.1050**	**0.9490**	**3.3900e-003**	**0.3943**	**2.7400e-003**	**0.3971**	**0.1046**	**2.5200e-003**	**0.1071**		**339.1169**	**339.1169**	**8.1600e-003**		**339.3209**

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	4.3780	35.6350	31.4759	0.0934		1.4851	1.4851		1.3796	1.3796	0.0000	9,021.855 0	9,021.855 0	2.6726		9,088.669 1
Total	**4.3780**	**35.6350**	**31.4759**	**0.0934**		**1.4851**	**1.4851**		**1.3796**	**1.3796**	**0.0000**	**9,021.855 0**	**9,021.855 0**	**2.6726**		**9,088.669 1**

3.5 Demolition - 2024

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	8.4000e-004	0.0270	9.1900e-003	1.3000e-004	3.1200e-003	5.0000e-005	3.1700e-003	8.6000e-004	5.0000e-005	9.0000e-004		13.7490	13.7490	9.2000e-004		13.7721
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	0.1359	0.0781	0.9398	3.2600e-003	0.3912	2.6900e-003	0.3939	0.1038	2.4700e-003	0.1062		325.3679	325.3679	7.2400e-003		325.5488
Total	**0.1367**	**0.1050**	**0.9490**	**3.3900e-003**	**0.3943**	**2.7400e-003**	**0.3971**	**0.1046**	**2.5200e-003**	**0.1071**		**339.1169**	**339.1169**	**8.1600e-003**		**339.3209**

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	0.550809	0.042355	0.203399	0.115606	0.014562	0.005806	0.021810	0.035336	0.002134	0.001736	0.004891	0.000712	0.000845

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

Responses to Comment Letter #5

Response 5-1:
This comment introduces the parties represented by the letter and summarizes their operations as well as their involvement in the rule development process. South Coast AQMD staff appreciates the commenter's participation with the rule development process. The Final SEA reflects the facility-wide engine modernization concept which was added to the rule language after the Draft SEA was released for public review and comment.

Response 5-2:
The commenter is correct that after the release of the Draft SEA for public review and comment, modifications were made to PARs 1110.2 and 1100. The commenter summarizes the types of changes to PARs 1110.2 and 1100 which were presented at the August 20, 2019 Working Group meeting and requests the Project Description section of the Draft SEA be updated accordingly. Additional revisions to PARs 1110.2 and 1100 have been made since the August 20, 2019 Working Group meeting. Changes to PAR 1110.2 include adding a new definition for compressor gas lean-burn engine. Changes to PAR 1100 include provisions for time extensions for compressor gas lean-burn engines, interim emission limit if a time extension is granted, alternative emission provisions, and facility-wide engine modernization.

South Coast AQMD staff has reviewed the modifications to PARs 1110.2 and 1100 and changes reflected in the final proposed amended rule language have been incorporated into the Project Description and applicable portions of the environmental analysis in the Final SEA. Peak daily emissions estimated in the Draft SEA were based on the assumption that all affected engines will be retrofitted, replaced, or repowered by December 31, 2023 to meet the emission limits of PAR 1110.2. However, since the release of the Draft SEA, PAR 1100 was revised to allow compressor gas engines more time to comply with the emission limits of Rule 1110.2. Thus, the peak daily emissions analyzed in the Draft SEA present a more conservative analysis because the environmental impacts were evaluated based on a more compressed compliance schedule which would result in having more overlapping construction activities occur on a peak day than with an extended compliance schedule. Nonetheless, South Coast AQMD staff agrees with the commenter that revisions to PARs 1110.2 and 1100 that were made after the release of the Draft SEA will not change the conclusions in the Draft SEA for any environmental topic area.

The final versions of PARs 1110.2 and 1100 to be considered by the Governing Board are located in the Governing Board Package (meeting date November 1, 2019). To facilitate identification of the changes that are reflected in the Final SEA, modifications to the document are presented as <u>underlined text</u> and text removed from the document is indicated by ~~strikethrough~~.

Lastly, the commenter's suggested revisions were presented and organized by topic. South Coast AQMD staff bracketed each suggested revision and prepared individualized responses specific to the content/topic area addressed in each bracket.

Response 5-3:
This comment is addressed in Response 5-2.

Response 5-4:
Since the release of the Draft SEA, PARs 1110.2 and 1100 have been revised such that all of the ammonia limits have been removed, including the interim ammonia limit of 20 ppm. Any compressor gas lean-burn engine that is retrofitted with SCR technology will be required to meet Best Available Control Technology (BACT) and the emission limits will be enforced as a permit condition. Five ppm is BACT for ammonia emissions from SCR technology and the ammonia usage in the Draft SEA was estimated based on an ammonia limit of five ppm. Thus, the ammonia usage estimates in Appendix E and the conclusions for the topic areas of air quality and hazards and hazardous materials waste do not need to be revised.

Response 5-5:
Subsequent to the release of the Draft SEA for public comment and review, revisions to PAR 1100 were made which allow for a potential extension in the compliance timing for RECLAIM or former RECLAIM facilities operating compressor gas lean burn engines undergoing facility-wide engine modernization. The project description and environmental analysis in the Final SEA has been updated to reflect the proposed facility-wide engine modernization provisions in PAR 1100 which specifically address compressor gas lean burn engines that may undergo facility-wide engine modernization. The details of these updates are explained in the following Response to Comment 5-6.

Response 5-6:
South Coast AQMD staff recognizes the need for the commenter to maintain gas compression services at certain facilities and may need to construct new equipment on a separate footprint. The Final SEA includes an additional scenario that addresses the potential construction of new engines at a facility undergoing facility-wide engine modernization and the demolition of existing engines after the new engines are constructed and operational.

South Coast AQMD staff has reviewed the construction scenario described as well as the accompanying calculations and accompanying CalEEMod® files upon which Comments 5-14 through 5-23 are based. It is important to note that the commenter provided updated calculations and CalEEMod® files on October 1, 2019 as a supplement to this comment letter (see Comments 5-31 and 5-32). The commenter indicated that the updated calculations and revised CalEEMod® files supersede Comments 5-14 through 5-23. Response 5-14 explains the key differences between the initial calculations and initial CalEEMod® analysis versus the updated calculations and revised CalEEMod® analysis.

Response 5-7:
In general, minor corrections and revisions are reflected throughout the Final SEA. The commenter's suggested edits described in Attachment A have been bracketed as Comments 5-8 through 5-29 and are individually addressed in Responses 5-8 through 5-29.

Response 5-8:
This comment repeats the sentiments previously expressed in Comment 5-3. See Response 5-3.

Response 5-9:

This comment reiterates the same suggestion previously made in Comment 5-4. See Response 5-4.

Response 5-10:
The latest changes to PARs 1110.2 and 1100, including those related to facility-wide engine modernization, have been incorporated in the Final SEA. See also Responses 5-2 and 5-6.

Response 5-11:
The Final SEA has been updated to include facility-wide engine modernization in the proposed project. Staff does not believe a new item needs to be included under the Technology Overview specifically for facility-wide engine modernization because electrification or use of other zero-emission technology to comply with the rule is not limited to facilities undergoing facility-wide engine modernization. In response to this suggestion that other technologies used to comply with the rule should be acknowledged in the Final SEA, the referenced section in the Draft SEA has been updated in the Final SEA (see page 2-16), to include the following:

> *"Facilities may choose to electrify their engines or use other zero-emission technologies, if available. However, based on information available to staff at the time of writing this SEA, the analysis assumes that facilities will mainly use post-combustion technology to comply with PAR 1110.2."*

Response 5-12:
The referenced section in the Draft SEA has been updated in the Final SEA (see page 4-5), as follows:

> *"There are also eight lean burn engines operated at two facilities which may be repowered with stationary gas turbines equipped with SCR technology. Further, some facilities may undergo a facility-wide engine modernization where some or all engines are replaced with zero-emission technology such as electrification or fuel cell technology."*

Response 5-13:
As suggested, the referenced section has been revised to clarify that engines "may" be replaced or repowered are expected to be replaced with equipment having an identical or similar rating. Relative to the comment that there may be an increase in greenhouse gas (GHG) emissions, South Coast AQMD staff disagrees with the assertion that there would be an increase in GHG emissions from combustion of fuel from affected engines that are retrofitted, replaced, or repowered. The analysis originally presented in the Draft SEA and updated in the Final SEA is based on a key assumption that a "like-for-like" replacement will occur to avoid having to obtain offsets or Emission Reduction Credits (ERCs) to offset an increase in emissions pursuant to South Coast AQMD Regulation XIII – New Source Review (NSR), Rule 1303 - Requirements. Further, newer equipment of an identical or similar rating would be expected to be more efficient than the equipment being replaced such that GHG emissions would be about the same or fewer relative to the existing setting. Otherwise, if a facility elects to replace or repower an engine with equipment that is rated greater than the existing equipment, there may be an increase in criteria pollutants that may require offsets as well as a potential increase in GHGs. If this occurs, these changes in emissions will be analyzed during the permit application review process.

Response 5-14:
South Coast AQMD staff recognizes that an analysis of the facility-wide engine modernization scenario may be necessary to address the potential for constructing new engines on a separate footprint to avoid disruption to gas compression and distribution services. As such, a separate section has been added to Chapter 4 of the Final SEA which explains the need for the suggested additional analysis as well as a description of the scenario presented in the comment. As mentioned in Response 5-6, the commenter also provided the CalEEMod® files (see pp. G-25 through G-71) which are referenced in the comment letter.

The commenter's CalEEMod® input files initially assumed that the operating year of the new engines will occur in year 2021 and that construction of a proposed facility-wide engine modernization project will take over one year to complete. However, since PAR 1100 requires a permit application to be submitted before July 1, 2022 for facilities undergoing facility-wide engine modernization, as a practical matter, it is unlikely that the commenter will be able to plan and design for a facility-wide engine modernization, complete construction, and have everything operating by 2021. After following up with the commenter on the timing assumptions relative to the timing of PAR 1100, the commenter provided revised CalEEMod® files (see pp. G-72 through G-146) on October 1, 2019 which reflected a facility-wide engine modernization scenario based on an operational year of 2024.

South Coast AQMD staff's review of the commenter's CalEEMod® files identified that 20,000 square feet per engine replacement or repower would be needed (e.g., a total footprint of 100,000 square feet for five engines) even though the current total footprint of the existing structure housing the five existing engines and compressors to be replaced at one of the commenter's facilities only has a total footprint of approximately 21,000 square feet, approximately five times smaller than the assumptions in the CalEEMod® analysis. After following up with the commenter, South Coast AQMD staff learned that the facility under consideration wants to build the housing, with five new engines and compressors on a new location within the property prior to shutting down and dismantling the existing equipment. While allocating 100,000 square feet for equipment that previously occupied approximately 21,000 square feet is much larger than typical projects of a similar nature, South Coast AQMD staff agreed to conduct a revised analysis based on the larger, requested footprint of 100,000 square feet. For reference, the original and revised CalEEMod® files provided by the commenter have been included at the end of Comment Letter #5. A discussion and summary of the results of this analysis has been included in Chapter 4 of this Final SEA (see pp. 4-16, Table 4-13). South Coast AQMD staff also revised the input file of the CalEEMod® analysis to reflect an updated site preparation phase duration. Appendix B-5 of this Final SEA contains the output results of the revised CalEEMod® analysis that was prepared by South Coast AQMD staff.

Response 5-15:
South Coast AQMD staff reviewed the commenter's equipment mix assumptions entered into CalEEMod® for each construction phase presented in the original Table 1, which is identified as Comment 5-20, as well as the revised Table 1, which is identified as Comment 5-30. South Coast AQMD staff agrees that the equipment mix presented in revised Table 1 is an improvement to the original analysis and is more appropriate for the facility-wide engine modernization scenario

because the commenter has included additional equipment that may be needed for the demolition phase including water trucks and tractors/backhoes/loaders.

Response 5-16:
South Coast AQMD staff reviewed the originally proposed construction phase schedule and confirmed that the proposed schedule is appropriate for all phases except for site preparation. Because the commenter indicated in Comment 5-14 that the size of the area that may be disturbed is large (e.g., 100,000 square feet), South Coast AQMD staff was concerned that 15 days may not be sufficient to complete this task and would cause the site preparation impacts to be underestimated. The commenter did not revise the site preparation phase in the revised CalEEMod® run. However, a compressed schedule would result in higher peak daily emissions due to more construction activities occurring on a peak day. Therefore, staff has accepted the assumption of a 15 day site preparation phase.

Response 5-17:
South Coast AQMD staff reviewed the number of assumed worker trips entered into the original CalEEMod® analysis for the facility-wide engine modernization scenario and found that the number of workers used in the analysis is appropriate. However, the original CalEEMod® analysis did not account for the amount of material or soil that may need to be imported or exported from the site, given that the commenter indicated in Comment 5-14 that 100,000 square feet would be disturbed. Because CalEEMod® relies on this information to calculate the number of hauling trips, and in turn, estimate the emissions from haul trucks, South Coast AQMD Staff was concerned that there could potentially be a substantial quantity of material that would need to be exported off-site and that the emissions of criteria pollutants and GHG as a result of hauling trips in addition PM from material movement were not analyzed. On a follow-up call with the commenter on September 27, 2019, the commenter indicated that there would be no material imported to the site or exported from the site.

Response 5-18:
See Responses 5-14 and 5-17.

Response 5-19:
South Coast AQMD staff included a demolition phase in the CalEEMod® analysis that was relied upon for the Draft SEA. The commenter's original CalEEMod® analysis, however, did not include an estimate relative to the quantity of debris that may be generated in their analysis of the facility-wide engine modernization scenario. The quantity of debris is used to calculate fugitive dust from demolition and also hauling trips. The commenter included 10 hauling trips for the demolition phase. Since fugitive PM emissions from demolition is minimal compared to exhaust PM emissions from hauling trips, South Coast AQMD staff does not believe excluding the quantity of debris from the analysis will not have a substantial impact on the total PM emissions from the demolition phase.

Response 5-20:
This comment refers to the original Table 1, which is associated with Comment 5-15 and lists the off-road equipment and daily usage hours by construction phase. Original Table 1 has been

replaced and superseded by Revised Table 1 which was provided by the commenter on October 1, 2019 and is identified as Comment 5-30. See Response 5-30.

Response 5-21:
This comment refers to the original Table 2 which has been superseded by Revised Table 2 as provided by the commenter on October 1, 2019. The revised Table 2 is identified as Comment 5-31. See Response 5-31.

Response 5-22:
This comment refers to the original Table 3 which has been superseded by Revised Table 3 as provided by the commenter on October 1, 2019. The revised Table 3 is identified as Comment 5-32. See Response 5-32.

Response 5-23:
As requested, South Coast AQMD staff has included an analysis of a facility-wide engine modernization scenario in Chapter 4 of the Final SEA on pages 4-14 to 4-16. As explained in Responses 5-31 and 5-32, South Coast AQMD staff has conducted an independent analysis and modeled the analysis in CalEEMod® to estimate emissions from the facility-wide engine modernization scenario. The results of South Coast AQMD staff's CalEEMod® analysis can be found in Table 4-12 of the Final SEA. Please also see Response 5-14.

Response 5-24:
All of the suggested changes in this comment have been incorporated into the Final SEA.

Response 5-25:
South Coast AQMD staff has considered the suggested edits, but the word "alteration" as it refers to retrofits/replacements/repowers has the same meaning as the word "modification." Further, it is important to note that the term "modification" in the context of the Draft SEA does not refer to a action or event that would be subject to South Coast AQMD Regulation XIII – New Source Review (NSR) (e.g., require offsets). In lieu of altering the various text per the commenter's suggested edits, a footnote has been added in Chapter 2 of the Final SEA which makes the clarification that the word modification does not refer to an activity subject to New Source Review. Therefore, South Coast AQMD staff has not incorporated the suggested revisions into the Final SEA. Further, tuning of the air-to-fuel ratio (AFR) controller does not constitute a physical change to the affected engine. However, physical changes to an affected engine or associated air pollution control equipment such as replacing the AFR controller or replacing NSCR catalysts may require a new permit or permit revision depending on the nature of the proposed physical changes.

Response 5-26:
As indicated in Response 5-25, tuning an AFR controller for a NSCR system does not result in a physical change and is therefore not considered a modification of the NSCR system. Other facilities may need to modify an existing NSCR system beyond tuning the AFR controller such as replacing the existing catalyst with new, more efficient catalyst. Depending on the replacement catalyst, the catalyst housing may also need to be modified or replaced. Also, since the referenced paragraph presents options that a facility may select to comply with PAR 1110.2, South Coast

AQMD staff believes that adding the phrase “as necessary” does not provide any helpful clarity. Therefore, the suggested edits have not been incorporated into the Final SEA.

Response 5-27:
The suggested edits in this comment are similar to those contained in Response 5-25. See Response 5-25.

Response 5-28:
As requested, South Coast AQMD staff has incorporated the suggested changes to the header and appendices in the Final SEA.

Response 5-29:
The distances shown in Appendix D were estimated using ArcGIS. A footnote has been added to Appendix D which explains that the distances were estimated based on each parcel’s configuration and proximity to sensitive receptors, if known. For some facilities, the proximity of the nearby offsite sensitive receptors was unable to be determined. For this reason, some entries are shown as zeros. Since the hazards and hazardous materials analysis was based on the distances presented in Appendix D and a distance of zero is the most conservative estimate, in absence of actual distance data. Thus, the analysis of the environmental impacts relative to sensitive receptors are based on the worst case. Further, the comment does not indicate what the actual distances should be. As a result, South Coast AQMD staff is unable to update the distances in Appendix D.

Response 5-30:
As part of revising their emission estimates, the commenter provided a Revised Table 1 - Construction Equipment by Construction Phase on October 1, 2019 to supersede the construction equipment assumptions presented in the original Table 1 referenced in Comment 5-20. The commenter has included additional equipment that may be needed for the demolition phase including water trucks and tractors/backhoes/loaders in the Revised Table 1.

Response 5-31:
As part of revising the CalEEMod® analysis, the commenter provided Revised Table 2 which summarizes the construction emissions results from the revised calculations that were submitted by the commenter on October 1, 2019. Revised Table 2 supersedes the original Table 2 that is presented in Comment 5-21.

South Coast AQMD staff reviewed the commenter’s revised CalEEMod® analysis and revised Table 2. As explained in Response 5-14, the commenter’s proposed footprint for each engine for a facility-wide engine modernization project is much larger than typical projects of a similar nature. Nonetheless, South Coast AQMD staff agreed to conduct a revised analysis based on the larger, requested footprint of 100,000 square feet, to be conservative. In reviewing the revised calculations, South Coast AQMD staff identified some minor inconsistencies between the emissions results in the revised CalEEMod® output files and the emissions summary presented in Revised Table 2. South Coast AQMD staff was able to confirm, however, that the revised construction activities will result in emissions that are less than the South Coast AQMD air quality significance thresholds. Further, South Coast AQMD staff was able to confirm that the minor inconsistencies would not change the conclusion of less than significant air quality impacts since the emissions are less than the South Coast AQMD air quality significance thresholds.

South Coast AQMD staff conducted an independent analysis of a facility-wide engine modernization scenario which also assumes that five engines will be replaced and SCR systems with ammonia tanks will be installed. The analysis includes peak daily emissions from constructing the facility-wide engine modernization scenario which is presented below and included in Chapter 4 of this Final SEA as Table 4-12.

Table 4-12
Peak Daily Construction Emissions from Repowering an Engine

Construction Emissions	**VOC (lb/day)**	**NOx (lb/day)**	**CO (lb/day)**	**SOx (lb/day**	**PM10 (lb/day)**	**PM2.5 (lb/day)**
Facility-wide Engine Modernization of Five Engines at One Facility	4.51	35.74	32.54	0.10	12.16	6.98
Significance Threshold for Construction	75	100	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Though the results in Table 4-12 are slightly different than the commenter's analysis in Revised Table 2, South Coast AQMD staff was able to confirm that the air quality impacts during construction of the facility-wide engine modernization scenario would also be less than the South Coast AQMD air quality significance thresholds. Thus, no significant adverse air quality impacts during construction of the facility-wide engine modernization scenario would be expected.

Response 5-32:
As part of revising the CalEEMod® analysis, the commenter provided Revised Table 3 which summarizes the peak daily construction and operational emissions results from the revised calculations that were submitted by the commenter on October 1, 2019. Revised Table 3 supersedes the original Table 3 that is presented in Comment 5-22.

South Coast AQMD staff reviewed the commenter's revised CalEEMod® analysis and Revised Table 3. In reviewing the revised calculations, South Coast AQMD staff identified some minor inconsistencies between the emissions results in the revised CalEEMod® output files and the emissions summary presented in Revised Table 3. South Coast AQMD staff was able to confirm, however, that the revised construction activities will result in emissions that are less than the South Coast AQMD air quality significance thresholds. Further, South Coast AQMD staff was able to confirm that the minor inconsistencies would not change the conclusion of less than significant air quality impacts since the emissions are less than the South Coast AQMD air quality significance thresholds.

South Coast AQMD staff conducted an independent analysis of a facility-wide engine modernization scenario which also assumes that five engines will be replace and SCR systems with ammonia tanks will be installed. The analysis includes peak daily emissions from constructing the facility-wide engine modernization scenario and overlapping these emissions with operational activities that are expected to occur at other facilities, as presented below and included in Chapter 4 of this Final SEA as Table 4-17.

Table 4-17
Peak Daily Overlapping Construction and Operational Emissions

Operational Activity	**VOC (lb/day)**	**NOx (lb/day)**	**CO (lb/day)**	**SOx (lb/day)**	**PM10 (lb/day)**	**PM2.5 (lb/day)**
Facility-wide Engine Modernization of Five Engines at One Facility	4.51	35.74	32.54	0.10	12.16	6.98
Increased Truck Trips for ammonia delivery for 2 facilities (operation)	0.15	1.04	0.68	0.00	0.07	0.04
Increased Truck Trips for New Catalyst Delivery and Hauling Spent Catalyst at 1 Facility in the OCS	1.34	6.16	11.21	0.09	0.33	0.18
Linear Generators	45	-	-	-	-	-
Total	50.87	42.94	44.43	0.19	12.56	7.20
Significance Threshold for Operation*	55	55	550	150	150	55
Exceed Significance?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Though the results in Table 4-17 are slightly different than the commenter's analysis in Revised Table 3, South Coast AQMD staff was able to confirm that the air quality impacts during the overlapping construction of the facility-wide engine modernization scenario with operational impacts would also be less than the South Coast AQMD air quality significance thresholds. Thus, no significant adverse air quality impacts during construction of the facility-wide engine modernization scenario overlapping with operational impacts would be expected.

ATTACHMENT L

Proposed Amended Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines and Proposed Amended Rule 1100 – Implementation Schedule for NOx Facilities

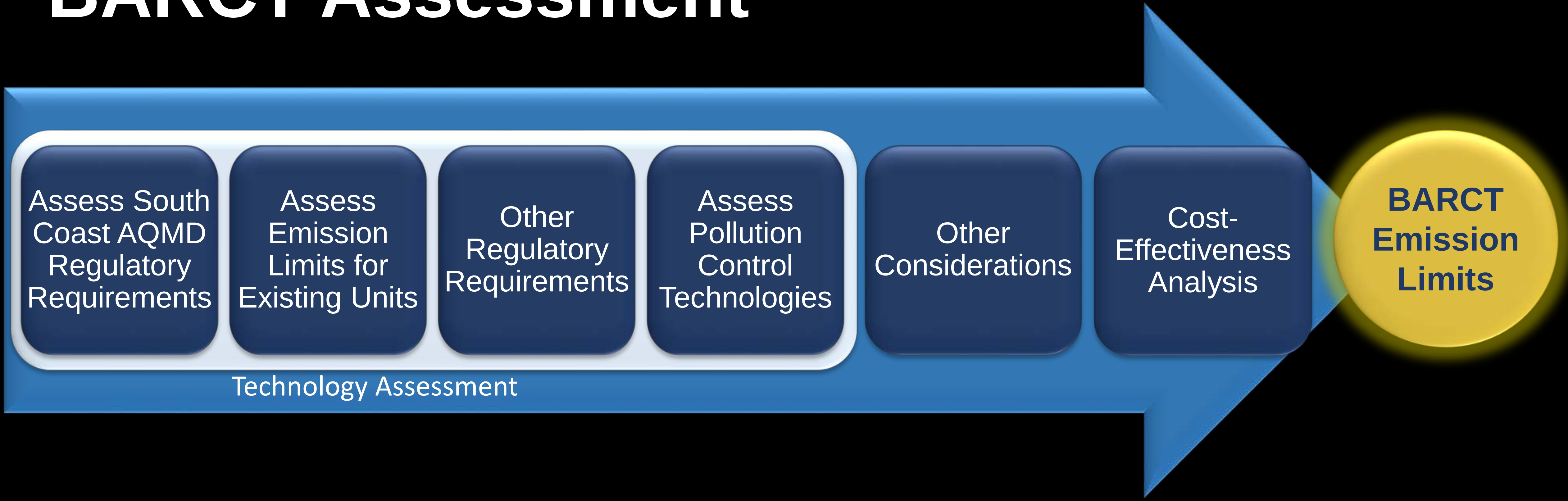
Governing Board Meeting

November 1, 2019

Background

- Rule 1110.2 establishes NOx, VOC, and CO emission limits for engines greater than 50 bhp
- Proposed Amended Rule 1110.2
  - ❖ Removes the exemption for NOx RECLAIM facilities
  - ❖ Partially implements the 2016 AQMP Control Measure CMB-05
  - ❖ Implements AB 617 Best Available Retrofit Control Technology (BARCT) requirements
- Proposed Amended Rule 1100 establishes the implementation schedule for NOx RECLAIM facilities

BARCT Assessment



- Conducted technology assessment and concluded that existing NOx emission limit is still representative of BARCT
  - Submit permit application by July 1, 2021
  - Meet NOx limits by December 31, 2023

BARCT Emission Limits

	NOx	VOC	CO
Emission Limit for Most Engines	11 ppmvd	30 ppmvd	250 ppmvd
Low-Use Engines*	45 ppmvd	250 ppmvd	2000 ppmvd
New Electrical Generation	0.07 lb/MW-hr	0.20 lb/MW-hr	0.10 lb/MW-hr

* Low-use engines operate less than 500 hours per year or use less than 1×10^9 BTUs per year

Applicability to RECLAIM Engines

- RECLAIM facilities are currently subject to VOC and CO emission limits
- 21 RECLAIM facilities with 76 engines subject to Rule 1110.2
  - 11 facilities with 47 engines do not meet NOx concentration limit
  - 6 facilities with 23 engines require Continuous Emissions Monitoring Systems (CEMS)

Lean Burn (2-stroke)	Lean Burn (4-stroke)	Rich Burn
Engines Requiring BARCT	Engines Requiring BARCT	Engines Requiring BARCT
11	26	10

Stakeholder Issues Addressed While Maintaining NOx Emission Limit

Maintained NOx Emission Limit

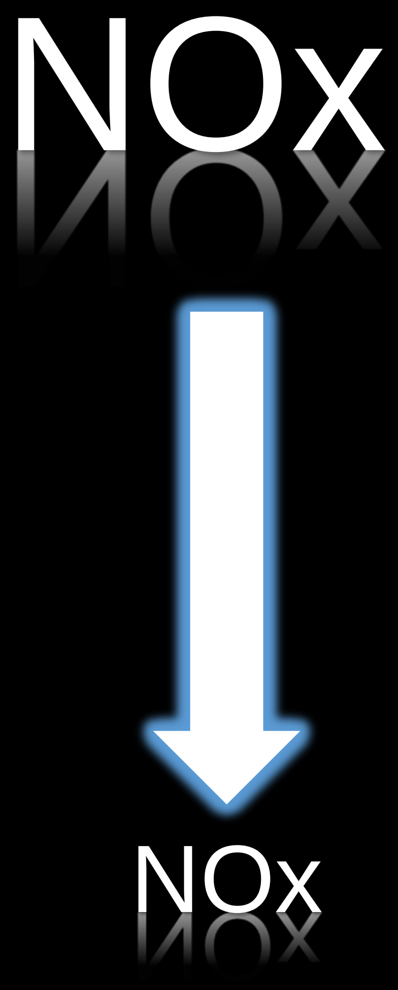
- Alternative averaging times for all engines to minimize startup and shutdown emissions
- Additional averaging times for biogas engines, provided lower NOx emission limits met
- Revised CEMS requirements for essential public services, if alternative monitoring technique is used
- Added interim VOC emission limit for linear generators provided other emission criteria are met
- Harmonized requirements for engines used at remote two-way radio transmission towers
- Alternative compliance schedule for lean-burn engines and incentive for facility-wide engine modernization

Considerations for Offshore Crane Engines

- At Stationary Source Committee Beta Offshore commented on the challenges of source testing engines powering a crane due to the intermittent operating schedule
- PAR 1110.2 revised to add a provision that exempts offshore crane engines from the emission limits and source testing provided:
  - Engine is a Tier 4 Final diesel – cleanest certification level for diesel engines
  - Engine is operated per manufacturer specifications
  - An Inspection and Monitoring Plan is developed and implemented to ensure engines operate properly

Emission Reductions and Cost Effectiveness

- Implementation of PAR 1110.2 is expected to reduce NOx emissions by 0.29 tons per day (~80% Reduction)
- Overall cost effectiveness is $33,800 per ton of NOx reduced



Category	NOx Emissions Reductions (ton/day)	Cost Effectiveness (cost per ton of NOx reduced)
(a) Lean-burn, 2-Stroke	**0.11**	**$28,100**
(b) Lean-burn, 4-Stroke	**0.17**	**$35,500**
(c) Rich-Burn	**0.01**	**$71,400 ($19,000 w/out CEMS)**
Total	**0.29**	**$33,800**

Recommended Actions

- Adopt Resolution:
  - Certifying the Final Subsequent Environmental Assessment
  - Amending Rules 1110.2 and 1100