A P P E N D I X D (of the ~~Draft~~Final EA)

N O T I C E O F P R E P A R A T I O N A N D I N I T I A L S T U D Y

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • http://www.aqmd.gov

SUBJECT: **NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL ASSESSMENT**

PROJECT TITLE: **PROPOSED AMENDED RULE 1110.2 – EMISSIONS FROM GASEOUS- AND LIQUID-FUELED INTERNAL COMBUSTION ENGINES (ICES)**

In accordance with the California Environmental Quality Act (CEQA), the South Coast Air Quality Management District (SCAQMD), as the Lead Agency, has prepared this Notice of Preparation (NOP) and Initial Study (IS). This NOP serves two purposes: 1) to solicit information on the scope of the environmental analysis for the proposed project, and 2) to notify the public that the SCAQMD will prepare a Draft Environmental Assessment (EA) to further assess potential environmental impacts that may result from implementing the proposed project.

This letter, NOP and the attached IS are not SCAQMD applications or forms requiring a response from you. Their purpose is simply to provide information to you on the above project. If the proposed project has no bearing on you or your organization, no action on your part is necessary.

The SCAQMD has also prepared an Initial Study (IS) for the proposed project, which includes a project description and an environmental checklist. The IS and other relevant documents may be obtained by calling the SCAQMD Public Information Center at (909) 396-2039 or by accessing the SCAQMD's CEQA website at http://www.aqmd.gov/ceqa/aqmd.html. Comments can also be sent via facsimile to (909) 396-3324 or e-mail at jkoizumi@aqmd.gov. Mr. Koizumi can be reached by calling (909) 396-3234. Comments must be received no later than 5:00 PM on May 25, 2007. Please include the name and phone number of the contact person for your agency. Questions regarding the proposed rule language should be directed to Mr. Martin Kay at (909) 396-3115.

A Public Workshop for the proposed amended rule was held February 6, 2007. The Public Hearing for the proposed project is scheduled for September 7, 2007. (Note: This public meeting date is subject to change.)

Date: April 20, 2007

Signature: Steve Smith

Title: Steve Smith, Ph.D.
Program Supervisor

Telephone: (909) 396-3054

Reference: California Code of Regulations, Title 14, §§15082(a), 15103, and 15375

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, CA 91765-4182

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL ASSESSMENT

Project Title:
Initial Study (IS) for Proposed Amended Rule (PAR) 1110.2 – Emissions from Gaseous- and Liquid-Fueled Internal Combustion Engines (ICEs)

Project Location:
South Coast Air Quality Management District: 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 and the Mojave Desert Air Basin.

Description of Nature, Purpose, and Beneficiaries of Project:
The purpose of PAR 1110.2 is to reduce oxides of nitrogen (NOx), volatile organic compounds (VOCs) and carbon monoxide (CO) emissions from gaseous and liquid-fueled ICEs. The proposed amendments would affect stationary, non-emergency engines and would increase monitoring requirements; require engines to meet emission standards equivalent to Best Available Control Technology (BACT); require new electrical generating engines to meet the same requirements as large central power plants, and clarify portable engine requirements.

Lead Agency:	**Division:**
South Coast Air Quality Management District	Planning, Rule Development and Area Sources

Initial Study and all supporting documentation are available at:	**or by calling:**	**Initial Study is available online by accessing the SCAQMD's website at:**
SCAQMD Headquarters 21865 Copley Drive Diamond Bar, CA 91765	(909) 396-2039	http://www.aqmd.gov/ceqa/aqmd.html

The Public Notice of Preparation is provided through the following:
☑ Los Angeles Times (April 26, 2007) ☑ SCAQMD Website ☑ SCAQMD Mailing List

Initial Study Review Period (30-day):
April 26, 2007 – May 25, 2007

Scheduled Public Meeting Dates (subject to change):
SCAQMD Governing Board Hearing: September 7, 2007, 9:00 a.m.; SCAQMD Headquarters

CEQA Scoping Meeting:
February 6, 2007, 10:00 am; SCAQMD Headquarters

Send CEQA Comments to:	**Phone:**	**Email:**	**Fax:**
Mr. James Koizumi	(909) 396-3234	jkoizumi@aqmd.gov	(909) 396-3324

Direct Questions on the Rules:	**Phone:**	**Email:**	**Fax Number:**
Mr. Martin Kay	(909) 396-3115	mkay@aqmd.gov	(909) 396-3252

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Initial Study for:

Proposed Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Internal Combustion Engines

April 2007

SCAQMD No. 280307JK

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EXECUTIVE OFFICER:
BARRY R. WALLERSTEIN, D.Env.

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Table of Acronyms and Abbreviations

Acronym/Abbreviation	Description
ACWA	Association of California Water Agencies
AFRC	Air-to-fuel ratio controller
AQMP	Air quality management plan
ASME	American Society Of Mechanical Engineers
ATCM	Airborne Toxic Control Measures
BACT	Best Available Control Technology
BARCT	Best available retrofit control technology
bph	Brake horsepower
BTU	British thermal unit
CARB	California Air Resources Board
Catox	Catalytic oxidation
CEMS	Continuous emission monitoring system
CEQA	California Environmental Quality Act
CI	Compression-ignition
CNG	Compressed natural gas
CO	Carbon monoxide
dBA	Decibels
EA	Environmental Assessment
EEF	electrical energy factor
EGR	Exhaust gas recirculation
ERPG	Emergency Response Planning Guideline
FY	Fiscal year
g	Gram
HHV	High heating value
I&M	Inspection and monitoring
ICE	Internal combustion engine
in	Inches
IS	Initial Study
k	Kilo
kW	Kilowatt
L	Concentration limit
LA DWP	Los Angeles Department of Water and Power
lb	Pound
LPG	liquefied petroleum gas
m	Meter
MDAB	Mojave Desert Air Basin
µg	Micrograms

Table of Acronyms and Abbreviations (continued)

Acronym/Abbreviation	Description
MM	Million
MMBtu	Million British thermal units
MMSCF	Million standard cubic feet
MTA	Los Angeles Metropolitan Transportation Agency
MWD	Metropolitan Water District
MW_e	Electrical megawatt-hours
MW_{th}-hours	Thermal megawatt-hours
NG	natural gas
NMHC	Non-methane hydrocarbon
NOx	Oxides of nitrogen
NSCR	Non-selective catalytic reduction
NSPS	New Source Performance Standards
O2	Oxygen
OSHA	Occupational Safety and Health Administration
Ox Cat	Catalytic oxidation
PAR	Proposed amended rule
PERP	Portable Equipment Registration Program
PM	Particulate matter
PM10	Particulate matter less than 10 microns in diameter
PM2.5	Particulate matter less than 2.5microns in diameter
ppm	Parts per million
ppmdv	Parts per million, dry volume
ppmv	Parts per million by volume
PSC	Pre-stratified charge
R	Ratio
RACT	Retrofit available control technology
RECLAIM	Regional CLean Air Incentives Market
RICE	Reciprocating Internal Combustion Engines
ROG	Reactive organic gas
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
scf	Standard cubic feet
SCR	Selective catalytic reduction
SI	Spark-ignited
SSAB	Salton Sea Air Basin
TAC	Toxic Air Contaminant
TWC	Three-way catalyst

Table of Acronyms and Abbreviations (continued)

Acronym/Abbreviation	Description
VOC	Volatile organic compound
W	Watt
WD	Water District
wt	Weight

CHAPTER 1 - PROJECT DESCRIPTION

Introduction

California Environmental Quality Act

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INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977[1] as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin) and portions of the Salton Sea Air Basin and Mojave Desert Air Basin referred to herein as the district. By statute, the SCAQMD is required to adopt an air quality management plan (AQMP) demonstrating compliance with all federal and state ambient air quality standards for the district[2]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP[3]. The 2003 AQMP concluded that major reductions in emissions of volatile organic compounds (VOCs) and oxides of nitrogen (NOx) are necessary to attain the air quality standards for ozone and particulate matter (PM10 and PM2.5).

Rule 1110.2 was adopted in August 1990 to control NOx, carbon monoxide (CO), and VOC from gaseous and liquid-fueled internal combustion engines (ICEs). For all stationary and portable engines over 50 brake horsepower (bhp), it required that either 1) NOx emissions be reduced over 90 percent to one of two compliance limits specified by the rule, or; 2) the engines be permanently removed from service or replaced with electric motors. It was amended in September 1990 to clarify rule language. It was then amended in August and December of 1994 to modify the CO monitoring requirements and to clarify rule language. The amendment of November 1997 eliminated the requirement for continuous monitoring of CO, reduced the source testing requirement from once every year to once every three years, and exempted nonroad engines, including portable engines, from most requirements. The last amendment in June 2005 made the previously exempt agricultural engines subject to the rule.

The objective of proposed amended rule (PAR) 1110.2 is to reduce NOx, VOC and CO emissions from gaseous and liquid-fueled ICE. PAR 1110.2 would partially implement the 2007 AQMP Control Measure MCS-01 – Facility Modernization, which requires facilities to retrofit or replace their equipment to achieve Best Available Control Technology (BACT); emission levels. The proposed amendments would affect stationary, non-emergency engines and would increase monitoring requirements; require to meet emission standards equivalent to BACT; require new electrical generating engines to meet the same requirements as large central power plants, and clarify portable engine requirements. The proposed project would also remove obsolete portable engine requirements from the existing rule.

This Initial Study (IS), prepared pursuant to the California Environmental Quality Act (CEQA), identifies only aesthetics and operational related air pollutant emissions as a potentially significant adverse impact from implementing the proposed project. A Draft Environmental Assessment (EA) will be prepared to analyze whether the potential hazard and hazardous impacts are significant. Any other potentially significant environmental impacts identified through this Notice of Preparation/Initial Study process will also be evaluated and may be considered for further analysis in the Draft EA.

[1] The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., ch 324 (codified at Health & Safety Code, §§40400-40540).
[2] Health & Safety Code, §40460 (a).
[3] Health & Safety Code, §40440 (a).

Throughout this document, references to the proposed project or PAR 1110.2 are used interchangeably.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

PAR 1110.2 is a "project" as defined by the CEQA. CEQA requires that the potential adverse environmental impacts of proposed projects be evaluated and that methods to reduce or avoid identified significant adverse environmental impacts of these projects be implemented if feasible. The purpose of the CEQA process is to inform the SCAQMD's 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 when an impact is significant.

California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written documents in lieu of an environmental impact report once the Secretary of the Resources Agency has certified the regulatory program. The SCAQMD's regulatory program was certified by the Secretary of Resources Agency on March 1, 1989 and is codified as SCAQMD Rule 110. Pursuant to Rule 110 (the rule which implements the SCAQMD's certified regulatory program), SCAQMD is preparing a Draft Environmental Assessment (EA) to evaluate potential adverse impacts from PAR 1110.2.

The SCAQMD as Lead Agency for the proposed project has prepared this IS (which includes an Environmental Checklist). The Environmental Checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. The Initial Study is also intended to provide information about the proposed project to other public agencies and interested parties prior to the release of the Draft EA. Written comments on the scope of the environmental analysis and possible project alternatives received by the SCAQMD during the 30-day review and comment period will be considered when preparing the Draft EA.

PROJECT LOCATION

The SCAQMD has jurisdiction over an area of 10,473 square miles (referred to hereafter as the district), consisting of the four-county South Coast Air Basin (Basin) and the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB and MDAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of both Riverside County and the SSAB and is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 1-1).

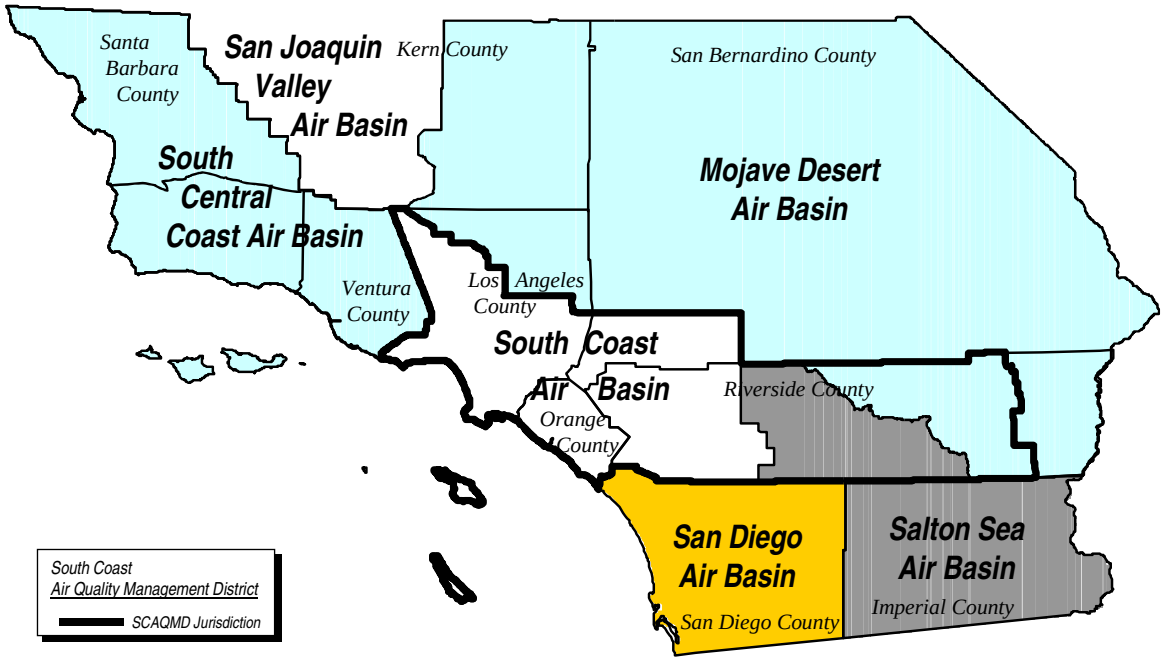


Figure 1-1
South Coast Air Quality Management District

PROJECT OBJECTIVES

The objective of the project is to partially implement 2007 AQMP Control Measure MSC–01 – Facility Modernization, which requires facilities not participating in the NOx Regional CLean Air Incentives Market (RECLAIM) Program to retrofit or replace existing equipment with NOx BACT at the end of a predetermined life span. PAR 1110.2 would also increase engine compliance by better monitoring, recordkeeping and reporting. PAR 1110.2 would implement SB 1298 distributed generation emission standards for new electrical generating engines, as well as, address issues EPA has with the current Rule 1110.2.

The purpose of the proposed amendments are to: 1) improve the compliance record of engines with better monitoring, recordkeeping and reporting; and 2) achieve further emission reduction based on the cleanest available technologies.

PROJECT DESCRIPTION

A summary of the proposed amendments follows:

Applicability

PAR 1110.2 applies to all stationary and portable engines over 50 rated bhp.

Definitions

This subdivision lists keywords related to gaseous- and liquid fueled engines and defines them for clarity and to enhance enforceability. A new definition for "oxides of nitrogen" and revised definition of "approved emission control plan" are proposed to simply clarify the intent of the rule. New definitions for "net electrical energy", "rich-burn engine with a three-way catalyst", and "useful heat recovered" were developed to support the new requirements previously discussed.

Requirements

Operators of affected operations would be required to comply with the following requirements by September 7, 2007 unless otherwise stated.

Stationary Engines

Reduction of the Emission Concentration Limits

Subparagraph (d)(1)(B) currently limits NOx, VOC and CO concentrations to produced by non-biogas (landfill or digestor gas)-fired engines 36, 250 and 2000 parts per million, dry volume (ppmvd) respectively. The proposed amendments will reduce these limits by 2010 or 2011 to levels comparable to current BACT.

Table 1-1
Proposed Concentration Limits

CONCENTRATION LIMITS FOR NON- BIOGAS-FIRED ENGINES		
NO_x (ppm)[1]	VOC (ppm)[2]	CO (ppm)[1]
bhp ≥ 500: 36 bhp < 500: 45	250	2000
CONCENTRATION LIMITS EFFECTIVE JULY 1, 2010		
NO_x (ppm)[1]	VOC (ppm)[2]	CO (ppm)[1]
bhp ≥ 500: 11 bhp < 500: 45	bhp ≥ 500: 30 bhp < 500: 250	bhp ≥ 500: 70 bhp < 500: 2000
CONCENTRATION LIMITS EFFECTIVE JULY 1, 2011		
NO_x (ppm)[1]	VOC (ppm)[2]	CO (ppm)[1]
11	30	70

[1] Corrected to 15 percent oxygen on a dry basis and averaged over 15 minutes.

[2] Measured as carbon, corrected to 15 percent oxygen on a dry basis and averaged over 30 minutes.

Revisions to the Efficiency Correction for Stationary Engines

The current rule in subparagraph (d)(1)(C) allows most stationary engines to upwardly adjust the NOx and VOC ppmvd emission limits in Table III based on the actual engine efficiency or the manufacturer's rated efficiency. More efficient engines are allowed higher ppmvd limits.

The proposed amended subparagraph (d)(1)(C) limits the efficiency correction to biogas-fired engines, requires that the correction be based on actual efficiency from (American Society Of Mechanical Engineers) ASME test procedures, requires the engines to use at least 90 percent biogas on an annual basis, and requires the corrected emission limits to be stated on the operating permit.

Emission Standards for Biogas Engines

In addition to allowing biogas engines to continue to use an efficiency correction factor, the following emission concentration limits are proposed for biogas-fired engines:

Table 1-2
Proposed Concentration Limits for Biogas Engines

Concentration Limits For Biogas Gas-Fired Engines		
NO_x (ppm)[1]	VOC (ppm)[2]	CO (ppm)[1]
bhp ≥ 500: 36 x ECF[3] bhp < 500: 45 x ECF[3]	Landfill Gas: 40 Digestor Gas: 250 x ECF[3]	2000
Concentration Limits Effective July 1, 2012		
NO_x (ppm)[1]	VOC (ppm)[2]	CO (ppm)[1]
11	30	70

[1] Corrected to 15 percent oxygen on a dry basis and averaged over 15 minutes.
[2] Measured as carbon, corrected to 15 percent oxygen on a dry basis and averaged over 30 minutes.
[3] ECF is the efficiency correction factor.

Initially, only the VOC limit for landfill gas-fired engines would change, to be consistent with other current requirements. In 2012, the emissions limits would drop to BACT levels, just as is proposed for other engines.

Air-to-Fuel Ratio Controllers

The current rule doesn't require an air-to-fuel ratio controller for ICEs. The proposed amendments require ICEs without a CEMS to install an air-to-fuel ratio controller (AFRC) with an oxygen sensor and feedback control.

Emission Standards for New Non-Emergency Electrical Generation Engines

New non-emergency electrical generation engines are proposed in subparagraph (d)(1)(F) to be subject to the emission standards in the following table.

Table 1-3
Proposed Emission Limits for New Electrical Generation Engines

Emission Standards for New Electrical Generation Engines	
Pollutant	**Emission Standard (lbs/MW-hr)**
NOx	0.07
CO	0.10
VOC	0.02

These emission standards do not apply to biogas-fired engines or engines installed or issued a permit to construct before September 7, 2007.

For engines that do not produce combined heat and power (CHP), the emission standards are based on the net electrical megawatt-hours (MW_e-hours) produced. CHP (also know as cogeneration) engines may also take credit for the thermal megawatt-hours (MW_{th}-hours) of useful heat produced, with one MW_{th}-hour for each 3.4 million British thermal units (Btus). The thermal energy could take the form of hot water, steam or other medium.

For CHP engines, the operator will choose short-term emission limits in pounds per MW_e-hours that the engine must meet at all times. The operator will also choose an annual electrical energy factor (EEF), such that when the short-term emission limit is multiplied by the annual EEF, the result does not exceed the values in the Table 1-3. The EEF is the annual net electrical energy produced divided by the sum of the electrical and thermal energy produced. The operator will have to also meet the annual EEF limit.

Portable Engines

Staff proposes to remove the emission limits and related requirements for portable engines in subparagraph (d)(2)(A) and add a reference to the California Air Resources Board (CARB)-adopted, portable diesel (Airborne Toxic Control Measures) ATCM and the Large Spark-Ignition Fleet Requirements, to which some portable engines are subject.

Compliance

The unnecessary existing paragraphs (e)(1) and (e)(3) are proposed for deletion. New paragraphs (e)(3) through (e)(5) propose compliance schedules for non-agricultural engines required to meet the future emission limits, the stationary engine continuous emission monitoring system (CEMS) requirements, and the inspection and monitoring (I&M) plans. The schedules will allow time for review and approval of applications for permits to construct, CEMS application, and I&M plan applications.

New engines will be required to comply with the new CEMS and I&M requirements when they begin operation.

Monitoring, Testing and Recordkeeping

The primary focus of the proposed amendments in this subdivision is to improve the poor compliance record of stationary engines.

Additional CEMS Requirements

The existing subparagraph (f)(1)(A) requires 1000 bhp engines and larger, that produce two million bhp-hours per year or more to have a NOx CEMS. The proposed amendments, effective on July 1, 2008, add CO emission monitoring back into the rule in subparagraph (f)(1)(A), as it was before the 1997 amendment. In addition, the CEMS requirement will be extended to stationary engines at facilities with multiple engines at the same location (within 75 feet of each other) that have a cumulative stationary engine horsepower rating of 1,000 bhp or more. To reduce the cost, the CEMS can be time-shared between all engines less than 1,000 bhp.

Source Testing for Stationary Engines

The current requirement of subparagraph (f)(1)(C) is that emission testing be done once every three years. The proposed amendments increase the frequency of source testing every two years, or 8,760 operating hours, whichever occurs first.

In addition, the following source testing reforms are proposed:

- Emissions must be tested at for at least 15 minutes at peak load and for at least 30 minutes during normal operation. The source test can no longer at one load under steady state conditions, unless that is the typical duty cycle. In addition NOx and CO must be tested for at least 15 minutes at actual peak load and actual minimum load.
- Pretests to determine if the engine needs repairs will not be allowed.
- The test must be conducted at least 40 operating hours or one week after any engine tuning or maintenance.
- If a test is started and shows non-compliance, it may not be aborted to allow engine tuning or repairs. The test must be completed and reported.
- A source testing contractor approved by SCAQMD must be used.
- A source test protocol must be submitted and approved by the District at least 60 days before the test is conducted. The protocol will also identify the critical parameters that will be measured during the test, as required by the Inspection and Maintenance Plan (discussed later).
- SCAQMD must be notified of the test date.
- The test report must be submitted to SCAQMD within 45 days of the test date. This will assure that noncompliance will be reported.
- The operator must provide source testing facilities including sampling ports in the stack, safe sampling platforms, safe access to sampling platforms, and utilities for test equipment.

Inspection and Monitoring (I&M) Plan for Stationary Engines

An I&M Plan will be added to the rule in subparagraph (f)(1)(D). Except for engines monitored by a CEMS, stationary engine operators will submit to SCAQMD for approval an I&M Plan to assure continued compliance of the engines between source tests. The I&M Plan will include procedures for:

- Establishing acceptable ranges for control equipment parameters and engine operating parameters that source testing or portable analyzer monitoring has shown result in pollutant concentrations within the rule limits. The required parameters include, but are not limited to: engine load; oxygen sensor voltage output or equivalence ratio (AFRC may use either); for rich-burn engines with three-way catalyst systems (TWCs), catalyst inlet and outlet temperatures and the temperature change across the catalyst; and for lean-burn engines with selective catalytic reduction, the reactant flow rate (ammonia or urea).
- Procedures for a diagnosing emission control malfunctions alerting the owner/operator to the malfunction. A malfunction indicator light and audible alarm is required.
- Weekly, or every 150 operating hours, emissions checks by a portable NOx, CO and oxygen (O2) analyzer. The schedule can be reduced to monthly, or every 750 operating hours if three consecutive weekly tests show compliance. If the monthly test is non-compliant or the oxygen sensor is replaced, then weekly tests must be resumed. In order to representative of actual operation, the test will be conducted at least 72 hours after any engine or control system maintenance or tuning. The portable analyzer will be calibrated, maintained and operated in accordance with the manufacturer's specifications and recommendations and the SCAQMD's "Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Sources Subject to South Coast Air Quality Management District Rule 1110.2"

- At least daily recordkeeping of monitoring data and actions required by the plan, including formats of the recordkeeping;
- Preventive and corrective maintenance, and their schedules;
- For rich-burn engines with TWCs, an emission check will be required when an oxygen sensor set point must be readjusted, or within 24 hours after a new oxygen sensor is installed, to establish new set points at minimum, maximum and midpoint loads.
- Reporting noncompliance to the Executive Officer. If an engine owner/operator finds an engine to be operating outside the acceptable range for control equipment parameters, engine operating parameters, engine exhaust NOx, CO, VOC or oxygen concentrations, the owner/operator will: report the noncompliance within one hour in the same manner required by paragraph (b)(1) of Rule 430 – Breakdowns; immediately correct the noncompliance or shut down the engine within 24 hours or the end of an operating cycle, in the same manner as required by subparagraph (b)(3)(iv) of Rule 430; and comply with all requirements of Rule 430 if there was a breakdown.
- Recordkeeping, including formats of the recordkeeping.
- Plan revisions. Before any change in I&M plan operations can be implemented, the revised I&M plan will have to be submitted to and approved by the Executive Officer.

Portable Analyzer Training

In order to assure that persons conducting the portable analyzer testing are properly trained to understand the equipment and the procedures for conducting testing, maintenance and calibration, subparagraph (f)(1)(G) requires persons to take a District-approved training program and obtain a certification issued by the District. SCAQMD intends to conduct the training.

Operating Log

Because dual-fuel engines may consume both liquid and gaseous fuels, proposed paragraph (F)(1)(E) is proposed to require fuel use of both fuels to be logged, instead of either fuel.

New Non-Emergency Electrical Generating Engines

New monitoring procedures are required for the proposed emission standards for new, non-emergency, electrical generating engines. All such engines will be required to monitor: the net electrical output (MW_e-hours) 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 and heat recovery equipment; and the useful heat recovered (MW_{th}-hours), which is the thermal energy recovered and put to an actual useful purpose.

Emissions in pounds per MW_e-hour must be calculated based on CEMS data, source tests, and weekly emission checks. Mass emissions will be calculated using an F factor method from EPA 40 CFR 60, Appendix A, Method 19, or other approved method. Because Method 19 does not directly address VOC and CO, necessary conversion factors are provided in the rule. An annual report is required to verify compliance with the annual EEF.

Exemptions

Emergency, Flood Control and Fire Fighting Engines

The current rule exempts several types of engines from the subdivision (d) emission limits. Paragraph (h)(2) exempts emergency engines while paragraph (h)(3) exempts fire fighting and

flood control engines. The proposed amendments do the following: combine the exemptions into paragraph (h)(2); require all of these engines to operate less than 200 hours per year; and require that permits conditions specifically limit the annual operating hours.

Start up Exemption
The current rule has no exemption during engine startups. The proposed amendments in paragraph (h)(12) will provide an exemption from complying with the emission limits in the rule until emission controls reach operating temperature, but not longer than 15 minutes.

PROJECT BACKGROUND

Current Rule 1110.2
Rule 1110.2 was adopted in August 1990 to control NOx, CO, and VOC from gaseous and liquid-fueled ICEs. For all stationary and portable engines over 50 bhp, it required that either 1) NOx emissions be reduced over 90 percent to one of two compliance limits specified by the rule, or; 2) the engines be permanently removed from service or replaced with electric motors. It was amended in September 1990 to clarify rule language. It was then amended in August and December of 1994 to modify the CO monitoring requirements and to clarify rule language. The amendment of November 1997 eliminated the requirement for continuous monitoring of CO, reduced the source testing requirement from once every year to once every three years, and exempted nonroad engines, including portable engines, from most requirements. The last amendment in June 2005 made the previously exempt agricultural engines subject to the rule.

Regulation XX – RECLAIM
In 1993 SCAQMD adopted Regulation XX – RECLAIM. This regulation established NOx and SOx trading market emission reduction program that required over 300 of the largest NOx and SOx sources in SCAQMD's jurisdiction to meet the requirements of that program rather than the NOx requirements of other SCAQMD Rules. Therefore, while some engines in the SCAQMD's jurisdiction are not subject to the NOx requirements of Rule 1110.2; they are still subject to the VOC and CO requirements of Rule 1110.2.

Affected Sources
PAR 1110.2 applies to stationary and portable reciprocating ICEs over 50 bhp. ICEs generate power by combustion of an air/fuel mixture. In the case of SI engines, a spark plug ignites the air/fuel mixture while a diesel engine relies on heating of the inducted air during the compression stroke to ignite the injected diesel fuel. Most stationary and portable ICEs are used to power pumps, compressors, or electrical generators.

SI engines come in a wide variety of designs such as: two-stroke and four-stroke, rich-burn and lean-burn, turbocharged and naturally-aspirated. SI engines can use one or more fuels, such as natural gas, oil field gas, digester gas, landfill gas, propane, butane, liquefied petroleum gas (LPG), gasoline, methanol and ethanol. ICEs can be used in a wide variety of operating modes such as: emergency operation (i.e. used only during testing, maintenance, and emergencies), seasonal operation, continuous operation, continuous power output, and cyclical power output.

The diesel engine is another type of ICE: specifically, a CI engine, in which the diesel fuel is ignited solely by the high temperature created by compression of the air-fuel mixture, rather than

by a separate source of ignition, such as a spark plug, as is the case with SI engines. Similarly to SI engines, there are both two-stroke and four-stroke diesel engines. Most diesel engines are four-stroke, with larger diesels often two-stroke, mainly the large engines in ships and locomotives.

Diesel engines are most commonly used for portable equipment and emergency stationary generators, fire pumps and water pumps. Stationary diesel engines are also used for more routine use at a few locations that have been exempted from complying with Rule 1110.2. These include engines operated by the US Navy on San Clemente Island, and engines at ski resorts. Some diesel engines at RECLAIM facilities also continue to operate because they were exempted from the NOx emission requirements of Rule 1110.2.

Uncontrolled ICEs, even when burning a clean fuel such as natural gas, have extremely high emissions of NOx, CO and HC. Diesel engines not only have significant NOx emissions but also emit PM which has been identified as a Toxic Air Contaminant (TAC) by the CARB. Once a substance is identified as a TAC, the CARB is required by law to determine if there is a need for further control. CARB has adopted ATCM for stationary and portable diesel engines.

SCAQMD BACT Guidelines

NOx, CO and VOC emission levels for stationary engines that are required by SCAQMD's non-major source BACT guidelines are shown in Table 1-4. These limits are typically met by rich-burn engines with larger three-way catalyst (TWC), along with the air-to-fuel ratio controller (AFRC). Lean-burn engines generally come with low-NOx combustion modifications built into the engine by the manufacturer to reduce the emissions part way, and then use SCR plus oxidation catalyst to reduce emissions to BACT levels.

Table 1-4
SCAQMD BACT Guidelines for Stationary Engines at Non-Major Polluting Facilities

	PPMVD, corrected to 15% O2				Apparent Reduction by Control Technology	
	Uncontrolled Emission		BACT			
Criteria Pollutant	**Rich-Burn**	**Lean-Burn**	**Rich-Burn (NSCR)***	**Lean-Burn (SCR + CatOx)**	**Rich-Burn (NSCR), %**	**Lean-Burn (SCR + CatOx), %**
NOx	590	1090	10	9	98+	99+
CO	1629	136	69	33	95+	75+
VOC	23	91	29	25	---	73+

*Assuming engine is 30 percent efficient (HHV basis).

Compliance Issues with Stationary Engines

SCAQMD Compliance Testing

For engine used continuously, it is typical to require an oil change once a month, and tune-ups every two months, including new spark plugs and O2 sensors. The current rule requires no checking of emissions during these numerous engine maintenance operations.

Aside from normal maintenance, engines or emission control systems can fail which can cause excess emissions. The following is list of possible engine or emission control system failures:

- A bad spark plug
- A faulty spark plug wire
- A failed O2 sensor
- A O2 sensor for which the mV signal has drifted
- A catalyst that has plugged due to ash from lubrication oil blowby
- A catalyst that has become deactivated due to poisoning from ash blowby or excess exhaust temperature
- A catalyst that degrades from vibration allowing bypassing of the catalyst
- A failed AFRC
- A AFRC that is not properly recalibrated after an O2 sensor replacement

In recent years, SCAQMD enforcement personnel acquired portable analyzers capable of measuring NOx, CO and O2 concentrations in the exhaust of combustion equipment. These analyzers are not expected to be as accurate as a Method 100.1 source test, but they are easier and faster to set up and use, and can detect emissions and compliance problems. SCAQMD inspectors use the portable analyzers to conduct unannounced emission tests and compliance verification on various types of combustion equipment.

These emission tests have shown that rich-burn ICEs, have very high non-compliance rates and very high excess emissions. The Preliminary Staff Report PAR 1110.2 states that more than half of all engines tested were not in compliance with both NOx and CO emission limits. Rich-burn engines had significantly higher non-compliance rates than lean-burn engines. Extrapolating the results for the tested engines to the entire stationary, non-emergency engine inventory of nearly 1,000 engines results in estimated excess emissions of 1.2 tons per day of NOx and 39.9 tons per day of CO.

To verify that the emission violations had been corrected 37 engines were retested. The compliance rate, however, only improved from 44 percent of all first tests to 65 percent of all retests.

Compliance Demonstration

Current regulations require ICEs to demonstrate emission compliance by an emission source test only once every three years. If the tests show non-compliance, only major sources (Title V) are required to report the results to SCAQMD. Based on SCAQMD enforcement compliance testing the three year period between compliance demonstrations does not appear to ensure compliance.

EPA Guidance

EPA proposed the disapproval of Rule 1110.2 and recommended the following changes to enable approval of the rule:[4]

- An inspection and monitoring plan similar to CARB' RACT/BARCT document;
- Source testing every two years or 8,760 hours;
- Source testing at peak load as well as at under typical duty cycles; and
- A removal of the exemptions for engines at ski resorts, the far eastern portion of Riverside County, and San Clemente Island.

Senate Bill 1298

Senate Bill 1298[5] was adopted in 2000 by the California state legislature to close a loophole for small electric generators that were exempt from local district permits and not required to have emission controls. In accordance with the law, CARB adopted the Distributed Generation Certification Program[6] for small generators that are exempt from local district permitting requirements. In SCAQMD, this includes ICE generators of 50 hp or less, microturbines, and fuel cells. As of January 1, 2007 these electrical generation technologies may only be sold in California if they are certified by CARB to have emissions equivalent or better than large central generating stations equipped with BACT.

SB 1298 also established a goal to have local districts require permitted distributed generation (DG) equipment to meet the same emissions levels by the earliest practicable date.

DG Technologies that Meet CARB 2007 DG Standards

CARB has certified that the following DG equipment meet the 2007 standards.

Table 1-5
Certified Technologies to CARB 2007 DG Standards

Company Name	Technology
United Technologies Corporation Fuel Cells	200 kW, Phosphoric Acid Fuel Cell
FuelCell Energy, Inc.	250 kW, DFC300A Fuel Cell
Plug Power Inc.	5 kW, GenSys^{TM} 5C Fuel Cell
FuelCell Energy, Inc.	1 MW, DFC1500 Fuel Cell
Ingersoll-Rand Energy Systems	250 kW, 250SM Microturbine
FuelCell Energy, Inc.	250 kW, DFC300MA Fuel Cell
ReliOn, Inc.	2 kW, T-2000 hydrogen-fueled fuel cell
ReliOn, Inc.	1.2 kW, T-1000 hydrogen-fueled fuel cell

The following DG technologies don't require CARB certification, because they normally get SCAQMD permits, but they can also meet CARB's 2007 emission standards:

[4] Memorandum from Andrew Steckel of USEPA to Laki Tisopulos of SCAQMD dated March 31, 2005.
[5] Sections 41514.9 and 41514.10 of the California State Health and Safety Code
[6] Sections 94200-94214, in Article 3, Subchapter 8, Chapter 1, Division 3 of Title 17, California Code of Regulations

- Kawasaki GPB15X Gas Turbine--1.423 gross MW at ISO conditions (sea level, 59^{o}F), guaranteed emission limits of 2.5 ppm NOx, six ppm CO and two ppm VOC, all dry basis, corrected to 15 percent O2, down to 70 percent of rated load. These emission limits together with heat input of 20.7 MMBtu/hr (LHV) and 53.7 percent waste heat recovery specified by the manufacturer meet the CARB 2007 standards.
- Large combustion gas turbines with combined heat and power (CHP). These are very similar to the central station combined-cycle power plants that are the basis of the 2007 CARB DG standards.

In addition, facilities may install other DG technologies such as: zero-emission solar or wind DG. All of the above technologies are either inherently low-emission, or will have CEMS to assure proper operation of their add-on emission controls.

EMISSIONS INVENTORY

Portable Engines

CARB estimates that in 2000 17,500 portable diesel engines in California emitted 67.1 tons per day of NOx, 6.7 tons per day of reactive organic gas (ROG) and 4.2 tons per day of PM. Emissions in SCAQMD would be about 45 percent of this amount. These emissions should gradually decline as newer CARB-certified portable engines replace older, higher emitting engines.

Stationary Non-Agricultural Engines

The 1990 staff report for proposed Rule 1110.2 estimated that Rule 1110.2 would reduce NOx emissions of 1,289 stationary, non-emergency engines from 28.0 tons per day to 2.9 tons per day. Exemptions in 1997 for ski resorts and San Clemente Island increased the allowable emissions by 1.35 tons per day to an estimated 4.25 tons per day.

Stationary Engine Survey

To update this information as well as gather other key information for non-agricultural engines that are affected by the rule, staff conducted a survey in 2005 of non-agricultural, stationary, non-emergency engines. A total of 580 facilities were contacted, and 313 of those facilities responded (54 percent facility response rate). The survey collected data for 631 out of a total of 907 active engines (70 percent response rate based on number of engines).

Emissions were calculated based on fuel consumption data gathered via the survey, Rule 1110.2 or BACT emission limits, and source test data fro non-BACT engines. The resulting calculated total emissions for all survey engines were scaled up to account for the 70 percent response rate. The resulting total calculated emissions for all stationary, non-emergency engines in the district, in tons per day, are 2.84 NOx, 1.19 VOC and 10.35 CO. The calculated current NOx emissions indicate that substantial progress has been made since 1990, and the calculated NOx emissions are probably less than the 4.25 tons per day level that was expected.

As mentioned earlier in the report, a program of unannounced compliance testing conducted by SCAQMD's Compliance department revealed that, although engines can generally meet emission limits when emission control systems are properly maintained and adjusted as is generally the case at the time of source testing; emissions during normal operation frequently exceed the emission limits. The tendency for an engine to have excess emissions will differ

depending upon whether it is a rich-burn or lean-burn engine, what emission limits it must meet (BACT or Rule 1110.2) and whether or not it has a CEMS. Table 1-6 shows the average ratio of measured emissions to allowed emissions found in the testing program with engines categorized based on these three parameters.

Regulation XX - RECLAIM

In 1993 SCAQMD adopted Regulation XX – RECLAIM. This regulation established NOx and SOx trading market emission reduction program that required over 300 of the largest sources in SCAQMD to meet the requirements of that program rather than the NOx requirements of other SCAQMD Rules. Therefore, while some engines in SCAQMD are not subject to the NOx requirements of Rule 1110.2; they are still subject to the VOC and CO requirements of Rule 1110.2.

Table 1-6
Average Ratio of Measured Emission to Allowed Emission Found in Unannounced Testing

Rich/Lean	Limits	CEMS	Tests	NOx	CO
Lean	BACT	No	3	1.81	0.33
Lean	BACT	Yes	7	0.76	0.39
Lean	Rule	No	1	0.89	0.10
Rich	BACT	No	169	5.19	5.21
Rich	BACT	Yes	8	0.11	37.76
Rich	Rule	No	39	2.12	0.70

Excess emissions of both NOx and CO were clearly evident from rich-burn engines with BACT limits not having CEMS. Excess emissions of CO were evident from rich-burn engines with BACT limits having CEMS and of NOx from rich-burn engines with Rule 1110.2 limits not having CEMS. Although there was some suggestion of excess NOx emissions from lean-burn engines with BACT limits not having CEMS, the number of tests was considered too small to be conclusive, and lean-burn engines are less likely to have large exceedances. There were no tests on rich-burn engines with Rule 1110.2 limits having CEMS.

To estimate the extent of excess emissions from the engine population in the district, staff applied factors to the allowed emissions from each engine for which survey data were available. These factors were based on the results of unannounced testing summarized in Table 1-6. To eliminate excess VOC emission from each engine, the CO factor was also applied to VOC based on the general observation that these pollutants generally trend together. Again, scaling the results based on the 70 percent survey response rate, the estimated excess emissions in tons per day are 1.20 NOx, 7.01 VOC and 39.9 CO.

Table 1-7 summarizes the calculated emissions based on the survey data, the estimated excess emissions based on the average exceedance factors found in compliance testing and the resulting total calculated/estimated emissions from stationary, non-emergency engines.

Table 1-7
Emissions from Stationary, Non-Emergency Engines (tons per day)

Description	NOx	CO	VOC
Calculated Based on Limits and Source Tests	2.84	10.35	1.19
Estimated Excess Emissions	1.20	39.9	7.01
Totals	4.04	50.24	8.20

CONTROL TECHNOLOGY

Without any emission controls, ICEs have the highest emissions of all combustion equipment in terms of emissions per unit of fuel use. Fortunately, there are emission controls for ICEs. They include combustion modifications and add-on control technologies. The types of controls that are used depend on the fuel used and whether the ICE is rich-burn or lean-burn.

Spark-Ignition (SI) Engine Emissions and Emission Control Technologies

SI Engines and Uncontrolled Emissions

SI engines fall into two major design categories. Four-stroke, rich-burn engines are designed to operate close to stoichiometric conditions. In other words, just the necessary amount of air is drawn to combust the fuel and little, if any, more. These engines operate with exhaust gas oxygen content very near zero. The other category is lean-burn engines, which are designed to draw substantially more air than is required for combustion and operate with a high level of exhaust gas oxygen, typically over five percent. Larger engines tend to be lean-burn, and smaller engines tend to be rich-burn. Typical emissions of NOx, CO and VOC from uncontrolled natural gas-fired engines are listed in Table 1-8. The emission factors in the table are from U.S. EPA's AP-42[7] NOx emissions from engines operating on landfill or digester gas should be significantly lower due to the thermal diluent effect of CO2 present in these types of waste gas.

Table 1-8
Uncontrolled Emissions from Natural Gas-Fired SI Engines *

Description	Rich-Burn, $lbs/MMBtu_{HHV}$	Lean-Burn, $lbs/MMBtu_{HHV}$
NOx	2.21	4.08
CO	3.72	0.317
VOC	0.0296	0.118
Description	**Rich-Burn, ppmvd at 15% O_2**	**Lean-Burn, ppmvd at 15% O_2**
NOx	590	1090
CO	1629	139
VOC	23	91

*g/Bhp-hr = lb/MMBtu x 1.15 / (%EFF_{HHV}/100)
ppmvdat15%O2 = lb/MMBtu x F (F = 267 for NOx, 438 for CO, 767 for VOC as methane)

[7] U.S. EPA AP-42 Compilation of Air Pollution Emission Factors, Tables 3.2-2 and 3.2-3.

CARB RACT/BARCT Determination

In November 2001, CARB published a (retrofit available control technology) RACT/(best available retrofit control technology) BARCT determination[8] for stationary SI engines. This determination, while not aggressive for CO or VOC, identified a number of NOx control technologies that are effective for stationary SI engines (Table 1-9) and recommended significant reductions in NOx (Table 1-10). Lean-burn SI engines that are subject only to Rule 1110.2, and not to BACT, will generally be equipped with low-emission combustion improvements, whereas rich-burn SI engines will have a TWC, also known as non-selective catalytic reduction (NSCR), which along with accurate control of the air/fuel ratio to near stoichiometric conditions, simultaneously reduces the three pollutants NOx, CO and VOC.

Table 1-9
NOx Control Technologies for Stationary SI Engines

Technology	NOx Reduction Capability, %	Comments
Ignition Timing Retard	15-30	Reduces efficiency by up to five percent
Pre-Stratified Charge (PSC)	80+	Not suitable for lean-burn engines
Low-Emission Combustion Modifications	80+	Pre-combustion chamber, leaning, ignition system improvement, turbocharger, air/fuel ratio control system. Retrofit kits are available for some engines.
Turbocharger with Aftercooler	3-35	
Exhaust Gas Recirculation (EGR)	30	
Non-selective Catalytic Reduction (NSCR)	90+	Three-way catalyst—reduces NOx, CO and VOC. Not suitable for lean-burn engines.
Selective Catalytic Reduction (SCR)	80+	Requires injection of urea or ammonia to react with NOx. Unreacted ammonia is emitted. Oxidation catalyst is normally included to reduce CO and VOC emissions.

Table 1-10
CARB NOx RACT/BARCT Determination for Stationary SI Engines
(ppmvd corrected to 15 percent O2)

Control	Rich-Burn	Lean-Burn
RACT	90% control or 50 ppm NSCR, PSC for waste gases	80% control or 125 ppm Low-Emission Combustion or SCR
BARCT	96% control or 25 ppm NSCR, Inspection & Maintenance Program Waste Gases: 90% control or 50 ppm PSC	90% control or 65 ppm Low-Emission Combustion Mod's or SCR

[8] CARB, "Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Stationary Spark-Ignited Internal Combustion Engines", November 2001.

Rich-Burn Engine Control Technology Issues
When a rich-burn engine with a TWC and AFRC is properly tuned and source tested, excellent emission reductions are achieved. It is the job of AFRC and O2 sensor to maintain the engine air to fuel ratio at the right point.

Before the once every three year source test is conducted, engines operators assure that engines are in good operating condition and properly tuned to the correct air-to-fuel ratio.

The oxygen sensor is a critical component of the emission control system. Based on information from several sources, it appears that the O2 sensor set point that works upon initial startup will not be the proper set point as the O2 sensor ages[9]. The emissions must be periodically measured and the oxygen sensor set point readjusted.

Rich-Burn Engine Demonstration Projects
The Rule 1110.2 Industry Stakeholder Work Group, in cooperation with SCAQMD, conducted some projects to demonstrate that modern AFRCs could: control rich-burn engines to comply with Rule 1110.2 and BACT emission limits; and alarm operators when there are excess emissions. The projects did not achieve the desired results. They demonstrated that modern AFRCs are not adequate and that additional periodic monitoring is needed.

Biogas Engine Emissions and Control Technologies
Biogas (digestor or landfill gas) engines are a special case. The engines are generally larger four-stroke, lean-burn engines very similar to natural gas engines. Because the facilities have argued that contaminants in the fuel, like siloxane, are incompatible with catalytic after-treatment devices, biogas engines have generally not been required to install oxidation catalysts and SCR units that natural gas engines use. As a result, biogas engine emissions are the highest of all engines, even higher that a diesel engine with BACT.

Figure 1-2 demonstrates that the emissions from biogas engines, even when complying with BACT, far exceed natural gas (NG) engines and large central generating stations.

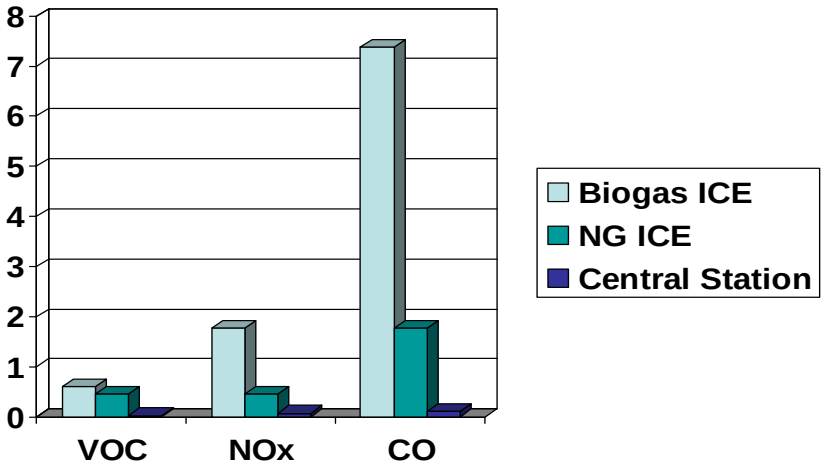
However, recent developments indicated that new technologies may allow emissions as low as with natural gas engines. Landfills in City of Industry and Brea have installed fuel gas treatment equipment to remove the contaminants and allow catalytic controls. Both have oxidation catalysts, while the City of Industry has also installed SCR for NOx control. There are also non-catalytic controls available. A selective non-catalytic NOx/VOC and CO control device by NOxTech has been installed on a landfill gas engine in Woodville, California. Landfills in Italy have installed engines with CL.AIR® non-catalytic VOC/CO control devices, both available from Jenbacher, part of GE Energy.

Diesel Engine Emissions and Emission Control Technologies
U.S. EPA's AP-42[10] lists uncontrolled industrial diesel engine emissions in terms of grams per bhp-hour as 14.0 NOx, 3.03 CO, and 1.12 VOC. Since 1996, nonroad diesel engines have been regulated at the federal and state levels through a certification program requiring that the

[9] Eastwood, Chapter Six for a discussion of oxygen sensor aging.
[10] U.S. EPA AP-42 Compilation of Air Pollution Emission Factors, Table 3.3-1.

manufacturers certify their engine models to meet certain emission standards, which become progressively more stringent over time. California's nonroad emission standards are the same as the federal nonroad standards. The nonroad emission standards for gaseous pollutants are shown in Table 1-11. The Tier 4 engines over 75 bhp would comply with Rule 1110.2, but they will not be available until 2014.

Figure 1-2. BACT for Biogas ICEs, NG ICEs vs. Central Generating Station BACT (lbs/MW-hr)



Add-on control technologies that are suitable for diesel engines include SCR for NOx and oxidation catalysts for reduction of CO and VOC. Both of these technologies have been successfully applied to diesel engines. SCR involves injection of urea or ammonia into the flue gas upstream of the catalyst and results in emissions of small amounts of unreacted ammonia. Application of these technologies to a large Tier 1 diesel engine located at a ski resort in the SCAQMD achieved the NOx, CO and VOC emissions shown in Table 1-12. Assuming that the engine was designed for emissions to be approximately 20 percent below the Tier 1 standards, the apparent emission reductions achieved by the technologies are 90 percent for NOx, 99 percent for CO and 74 percent for VOC. Because of the high costs of the add-on control equipment for a diesel engine, compared to a SI engine, few diesels were retrofitted to comply with Rule 1110.2. Some became subject to the RECLAIM program, some were exempted from Rule 1110.2 and others were removed from service.

Emulsified fuel is another technology that can be applied to a stationary diesel engine. Emulsified fuel contains water, which has been blended into the fuel using appropriate blending equipment and an additive to create a stable mixture. Separation of the water can, however, occur if the fuel is in storage for too long. Presence of water in the fuel improves combustion while also lowering the flame temperature. It has been applied primarily to on-road and nonroad

diesel engines and primarily for reduction of particulate emissions. However, it reduces NOx by only 10 to 20 percent[11].

Although SOx and PM emissions are not addressed by Rule 1110.2, SOx emissions are now well controlled with ultra low sulfur diesel fuel (less than 15 ppm by weight) required by Rule 431.2. PM is also well controlled by diesel particulate filters.

Table 1-11
U.S. EPA Nonroad Diesel Gaseous Emission Standards—NOx or (NOx+NMHC)/NMHC/CO (g/Bhp-hr)

Engine Power, bhp	Tier 1	Tier 2	Tier 3	Tier 4 Interim	Tier 4 Final
50 to <75	1998 6.9 -- --	2004 (5.6) -- 3.7	2008 (3.5) -- 3.7		2012 (3.5) 3.7
75 to <100	1998 6.9 -- --	2004 (5.6) -- 3.7	2008 (3.5) -- 3.7	2012 2.6 0.14 3.7	2015 0.3 0.14 3.7
100 to <175	1997 6.9 -- --	2003 (4.9) -- 3.7	2007 (3.0) -- 3.7	2012 2.6 0.14 3.7	2015 0.3 0.14 3.7
175 to <300	1996 6.9 1.0 8.5	2003 (4.9) -- 2.6	2006 (3.0) -- 2.6	2011 1.5 0.14 2.6	2014 0.3 0.14 2.6
300 to <600	1996 6.9 1.0 8.5	2001 (4.8) -- 2.6	2005 (3.0) -- 2.6	2011 1.5 0.14 2.6	2014 0.3 0.14 2.6
600 to <750	1996 6.9 1.0 8.5	2002 (4.8) -- 2.6	2005 (3.0) -- 2.6	2011 1.5 0.14 2.6	2014 0.3 0.14 2.6
≥750	2000 6.9 1.0 8.5	2006 (4.8) -- 2.6		2011 2.6 0.3 2.6	2015 2.6 0.14 2.6

Note: ppmvdat15%O2 = g/Bhp-hr x (%EFF_{HHV}/100) / 1.15 x F (F= 253 for NOx, 415 for CO, 727 for VOC as methane)

[11] http://www.epa.gov/region1/eco/diesel/retrofits.html#doc

Table 1-12
Emission from Diesel Engine at a Ski Resort

Pollutant	Concentration in Exhaust Gas, ppmvd at 15% O2	Emission Rate, g/Bhp-hr	Tier 1 Emission Standard, g/Bhp-hr	Apparent Reduction Based on Uncontrolled Level = Tier 1 Less 20%, %
NOx	45	0.546	6.9	90
CO	5	0.037	8.5	99
VOC	49	0.21	1.0	74
Ammonia	0.6	--	--	--

Other Technology Options
For some stationary engines affected by the proposed Rule 1110.2 amendments, other options may be better than adding control equipment to the existing engine to bring the engine into compliance with the rule. One option for engines that drive pumps or compressors is to replace the engine with an electric motor. Most operators that choose an engine instead of an electric motor did so because of the lower energy cost of natural gas versus electricity. However, due to recent increases in natural gas costs, and the additional costs for engines such as maintenance, permits and source testing, and emission fees, electric motors are now a more attractive option.

For ICE electrical generators, operators may choose to replace the engines with cleaner technologies such as fuel cells, solar photovoltaic systems, or gas turbines. Or they could simply decide to buy the clean electric power available from their electric utility.

ALTERNATIVES
The Draft EA will discuss and compare alternatives to the proposed project as required by CEQA and by SCAQMD Rule 110. Alternatives must include realistic measures for attaining the basic objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. In addition, the range of alternatives must be sufficient to permit a reasoned choice and it need not include every conceivable project alternative. The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation. A CEQA document need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. Suggestions on alternatives submitted by the public will be evaluated for inclusion in the Draft EA.

SCAQMD Rule 110 does not impose any greater requirements for a discussion of project alternatives in an environmental assessment than is required for an Environmental Impact Report under CEQA. Alternatives will be developed based in part on the major components of the proposed amended rule. The rationale for selecting alternatives rests on CEQA's requirement to present "realistic" alternatives; that is alternatives that can actually be implemented. CEQA requires an evaluation of a "No Project Alternative." SCAQMD's policy document Environmental Justice Program Enhancements for fiscal year (FY) 2002-03, Enhancement II-1 recommends that all SCAQMD CEQA assessments include 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 air emissions.

The Governing Board may choose to adopt any portion or all of any alternative presented in the EA. The Governing Board is able to adopt any portion or all of any of the alternatives 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 Initial Study will be considered when preparing the Draft EA.

CHAPTER 2 - ENVIRONMENTAL CHECKLIST

Introduction

General Information

Environmental Factors Potentially Affected

Determination

Environmental Checklist and Discussion

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's potential adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	Proposed Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines
Lead Agency Name:	South Coast Air Quality Management District
Lead Agency Address:	21865 Copley Drive Diamond Bar, CA 91765
CEQA Contact Person:	Mr. James Koizumi (909) 396-3234
Rule 1110.2 Contact People	Mr. Alfonzo Baez (909) 396-2516 Dr. Howard Lange (909) 396-3658 Mr. Martin Kay (909) 396-3115
Project Sponsor's Name:	South Coast Air Quality Management District
Project Sponsor's Address:	21865 Copley Drive Diamond Bar, CA 91765
General Plan Designation:	Not applicable
Zoning:	Not applicable
Description of Project:	PAR 1110.2 would partially implement 2007 AQMP Control Measure MSC–01 – Facility Modernization. PAR 1110.2 would also increase engine compliance by better monitoring, recordkeeping and reporting. PAR 1110.2 would implement SB 1298 distributed generation emission standards for new electrical generating engines, as well as, address issues EPA has with the current Rule 1110.2. The implementation of PAR 1101.1 is expected to reduce NOx emissions by 5,520 pounds per day, VOCs by 14,762 pounds per day and CO emissions by 93,256 pounds per day.
Surrounding Land Uses and Setting:	Not applicable
Other Public Agencies Whose Approval is Required:	Not applicable

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. As indicated by the checklist on the following pages, environmental topics marked with an "✓" may be adversely affected by the proposed project. An explanation relative to the determination of impacts can be found following the checklist for each area.

☐ Aesthetics	☐ Agriculture Resources	☑ Air Quality
☐ Biological Resources	☐ Cultural Resources	☑ Energy
☐ Geology/Soils	☑ Hazards & Hazardous Materials	☐ Hydrology/ Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☐ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☑ Solid/Hazardous Waste	☐ Transportation/ Traffic	☑ Mandatory Findings of Significance

DETERMINATION

On the basis of this initial evaluation:

☐ I find the proposed project, in accordance with those findings made pursuant to CEQA Guideline §15252, COULD NOT have a significant effect on the environment, and that an ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will NOT be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. An ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☑ I find that the proposed project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL ASSESSMENT will be prepared.

☐ I find that the proposed project MAY have a "potentially significant impact" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL ASSESSMENT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL ASSESSMENT pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL ASSESSMENT, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Date: April 20, 2007 **Signature:** Steve Smith

Steve Smith, Ph.D.
Program Supervisor

ENVIRONMENTAL CHECKLIST AND DISCUSSION

As discussed in Chapter 1, the main focus of the proposed rule is to reduce NOx, VOC and CO emissions from gaseous- and liquid-fueled ICE. The proposed amendments would increase monitoring requirements; require stationary, non-emergency engineers to meet emission standards equivalent to BACT; require new electrical generating engines to meet the same requirements as large central power plants, and clarify portable engine requirements.

Compliance with PAR 1110.2 may require oxidation catalyst, SCR, and replacement of two-stroke engines with electric motors. Facility operators may need to install CEMS, CO analyzers, AFRC and oxygen sensor, and infrastructure to facilitate monitoring and source testing (sampling ports, platforms, ladders, etc.).

Construction

New Gaseous- and Liquid Fueled Engines

PAR 1110.2 would not cause new development. Therefore, PAR 1110.2 is not expected to require the installation of any new engines. PAR 1110.2 may impact the choice of engine installed, BACT installed and monitoring equipment required at new facilities. The number and impact of new engines is speculative and therefore will not be evaluated in this CEQA analysis. However, new engines would be required to enter the permit process before construction. All permitted equipment is required to have a CEQA evaluation. Impacts from the construction of new engines would be evaluated at that time. No change in fuel type is expected.

Existing Gaseous- and Liquid Fueled Engines

PAR 1110.2 has a variety of requirements that compliance dates from 2007 to 2012. Most of the construction would occur within the first two years after adoption of the amended rule. Based on a survey of facilities with gaseous- and liquid-fuel engines, SCAQMD staff estimates that 412 engines would require additional source testing (one additional test every six years) staffing in 2007; 620 engine systems would require minor construction to install infrastructure (sampling ports, platforms, safe access and utilities) and air/fuel ratio controllers by June 2008; 490 engines require installation of CO analyzers and/or NOx-CO CEMS by July 2008; 22 engines would need replacement with electric motors by July 1, 2010; 30 engines would need oxidation catalyst by July 2011; 300 facilities would need modification of three-way catalyst by July 2011; and 78 would need SCR by July 2012. The Landfill Gas to Energy Coalition is concerned that the cost of install in SCR would make flaring an economical alternative to installing SCR. The possibility replacing engines with flares will be examined in the Draft EIR.

Construction or modification of control technologies, engine replacement with electric motor or installation of infrastructure may require cranes, loaders, forklifts, welders and generator sets. Installation of controllers, analyzers, and CEMS systems are likely to require less heavy equipment. All construction would require delivery truck and worker trips. Based on the above, SCAQMD staff assumes that construction would occur at approximately 15 facilities per day beginning in 2007 through 2008. Between 2009 to 2012, construction would occur at one or two facilities per day.

Operations
Emission reductions associated with compliant gaseous- and liquid-fueled engines are presented in Chapter 1. The operations of compliant gaseous- and liquid-fueled engines would result in reductions in all criteria and toxic emissions.

PAR 1110.2 compliant gaseous- and liquid-fueled engines control emissions by burning fuel more efficiently because engine improvements, better operation and maintenance; and/or by control technology.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
I.	**AESTHETICS.** Would the project:			
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☑
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☑
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☑

Significance Criteria
The proposed project impacts on aesthetics will be considered significant if:
- The project will block views from a scenic highway or corridor.
- The project will adversely affect the visual continuity of the surrounding area.
- The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

Discussion
I.a), b), c) & d) PAR 1110.2 would reduce NOx, VOCs and CO from gaseous- and liquid-fueled ICE. Compliance includes retrofit or replacement of equipment to achieve BACT emission levels and improving monitoring, recordkeeping and reporting for better compliance.

PA 1110.2 would not require any new development, but may require minor modifications to buildings or other structures for retrofit or replacement of existing engines; and new, retrofit, or replacement control equipment and monitoring equipment to comply with the proposed rule. PAR 1110.2 may require replacing or altering existing equipment.

Staff estimates that commercial and industrial facilities may install new, retrofit or replace existing ICE, control technology, and/or monitoring equipment. The retrofitted, replaced or new equipment would be located within the boundaries of existing commercial or industrial facilities near to existing ICE systems. And therefore, would not be substantially different in physical appearance than other existing commercial or industrial equipment at these facilities, it is not expected that the retrofitted, replaced and/or new equipment would obstruct scenic resources or degrade the existing visual character of a site, including but not limited to: trees, rock outcroppings, or historic buildings.

Any new development would not be a result of business decisions and not PAR 1110.2. PAR 1110.2 would affect the type of ICE and control systems installed in new developments. However, it is expected that PAR 1110.2 compliant equipment would be similar in aesthetic character to non-compliant PAR 1110.2. Therefore, installation of PAR 1110.2 compliant equipment is not expected to adversely affect aesthetics.

In addition, retrofitted, replaced or new equipment would require new permits or modifications of existing permits. New and modified permit applications require CEQA review in the form of the 400 CEQA form. Even though no aesthetic impacts are expect from PAR 1110.2, the new, retrofit or replacement equipment will be examined for any potential adverse impacts as apart of the normal permitting process.

Additional light or glare would not be created which would adversely affect day or nighttime views in the area since no light generating equipment would be required to comply with proposed rule.

Based upon these considerations, significant adverse aesthetics impacts are not anticipated and will not be further analyzed in the Draft EA. Since no significant aesthetics impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
II. AGRICULTURE RESOURCES. Would the project:			
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland mapping and Monitoring Program of the California Resources Agency, to non- agricultural use?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☑
c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☑

Significance Criteria
Project-related impacts on agricultural resources will be considered significant if any of the following conditions are met:
- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural uses.

Discussion
II.a), b), & c) PAR 1110.2 would reduce NOx, VOCs and CO from gaseous- and liquid-fueled ICE. Compliance includes retrofit or replacement of equipment to achieve BACT emission levels and improving monitoring, recordkeeping and reporting for better compliance.

Existing Facilities
PAR 1110.2 may require replacing or altering existing equipment. Any replacement or retrofit construction would occur at existing commercial or industrial facilities. Therefore, PAR 1110.2 is not expected to convert any classification of farmland to non-agricultural use or conflict with zoning for agricultural use or a Williamson Act contract.

In addition, retrofitted, replaced or new equipment would require new permits or modifications of existing permits. New and modified permit applications require CEQA review in the form of the 400 CEQA form. Even though no agricultural impacts are expect from PAR 1110.2, the new, retrofit or replacement equipment will be examined for any potential adverse impacts as apart of the normal permitting process.

New Development
PAR 1110.2 would not require any new development, but may require minor modifications to buildings or other structures for retrofit or replacement of existing engines; and new, retrofit, or replacement control equipment and monitoring equipment to comply with the proposed rule. New development may be impacted by PAR 1110.2; however, PAR 1110.2 would not be direct or indirect cause of the new development. Similar construction at existing facilities, construction

of ICEs, control technology and monitoring equipment is expected to be pre-manufactured and dropped in place.

Based upon these considerations, significant agricultural resource impacts are not anticipated and will not be further analyzed in the Draft EA. Since no significant agriculture resources impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
III. AIR QUALITY. Would the project:			
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☑	☐
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☑	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☑	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☑	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐
f) Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	☐	☐	☑

III.a) and f) Attainment of the state and federal ambient air quality standards protects sensitive receptors and the public in general from the adverse effects of criteria pollutants which are known to have adverse human health effects. PAR 1110.2 contributes directly to carrying out the goals of the 2007 Draft AQMP by implementing control measure MSC-01 – Facility Modernization. Consistent with control measure MSC-01, PAR 1110.2 is expected to reduce NOx, VOC and CO emissions from all affected source categories, which in turn, will contribute to attaining the state and federal ambient air quality standards. Thus, because PAR 1110.2 implements control measure MSC-01 from the 2007 Draft AQMP, it is not expected to conflict or obstruct implementation of the applicable AQMP.

PAR 1110.2 would make emission limits, monitoring and reporting more stringent. PAR 1110.2 would not diminish the requirements of any other rule or regulation. Therefore, implementing PAR 1110.2 would not diminish an existing air quality rule or future compliance requirement, nor conflict with or obstruct implementation of the applicable air quality plan.

While there are no significance thresholds for greenhouse gases, CO2 emissions from PAR 1110.2 will be reported in the Draft EA for completeness.

III.b) & c)

Air Quality Significance Criteria
To determine whether or not air quality impacts from adopting and implementing the proposed amendments are significant, impacts will be evaluated and compared to the following criteria. The project will be considered to have significant adverse air quality impacts if any one of the thresholds in Table 2-1 are equaled or exceeded.

Construction Air Quality Impacts

Criteria Emissions
Based on a survey of facilities with gaseous- and liquid-fuel engines, SCAQMD staff estimates that 412 engines would require additional source testing g(one additional test every six years) staffing in 2007; 620 engine systems would require minor construction to install infrastructure (sampling ports, platforms, safe access and utilities) and air/fuel ratio controllers by June 2008; 490 engines require installation of CO analyzers and/or NOx-CO CEMS by July 2008; 22 engines would need replacement with electric motors by July 1, 2010; 30 engines would need oxidation catalyst by July 2011; 300 facilities would need modification of three-way catalyst by July 2011; and 78 would need SCR by July 2012. The Landfill Gas to Energy Coalition is concerned that the cost of install in SCR would make flaring an economical alternative to installing SCR. The possibility replacing engines with flares will be examined in the Draft EIR. If it is found that replacing engines with flares is probable, construction emissions from replacement of engines with flares will be analyzed.

Construction or modification of control technologies, engine replacement with electric motor or installation of infrastructure may require cranes, loaders, forklifts, welders and generator sets. Installation of controllers, analyzers, and CEMS systems are likely to require less heavy equipment. All construction would require delivery truck and worker trips. Construction will be evaluated based on the expected number of facilities expected to be affected and the construction schedule. Overlapping construction at the affect facilities may generate significant criteria emissions. Criteria emissions from construction will be analyzed in the Draft EIR.

Toxic Emissions
Diesel exhaust particulate has carcinogenic and chronic non-carcinogenic effects. Diesel exhaust particulate does not have acute health risk values. Carcinogenic health risk is estimated over 70 years for sensitive and residential receptors and 40-years for worker receptors. Construction at any facility is expected to be limited to 32 hours (installation of SCR). Construction for other requirements is expected to last one or two days. Carcinogenic and chronic non-carcinogenic health risks are estimated from annual concentrations. Since the duration of construction for

PAR 1110.2 is much shorter than 70 and 40 years, carcinogenic and chronic non-carcinogenic health risk is expected to be less than significant.

Table 2-1
Air Quality Significance Thresholds

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs) and Odor Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment) Hazard Index ≥ 3.0 (facility-wide)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants [a]		
NO2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)	
PM10 24-hour average annual geometric average annual arithmetic mean	10.4 μg/m^3 (recommended for construction) [b] & 2.5 μg/m^3 (operation) 1.0 μg/m^3 20 μg/m^3	
Sulfate 24-hour average	1 ug/m^3	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)	

[a] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.

[b] Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lbs/day = pounds per day ppm = parts per million ug/m^3 = microgram per cubic meter ≥ greater than or equal to

Operational Air Quality Impacts

PAR 1110.2 would reduce ozone and particulate emissions from gaseous- and liquid-fueled ICEs. PAR 1110.2 would reduce NOx emission by 5,520 pounds per day, VOC emission by 14,762 pounds per day, and CO emissions by 93,256 pounds per day. Table 2-2 presents estimated emission. Table 2-3 presents estimated emission reductions.

Table 2-2
Estimated Emissions

Description	NOx, ton/day	CO, ton/day	VOC, ton/day
Calculated Baseline	2.84	10.35	1.19
Estimated Actual Baseline (Including Excess Emissions)	4.04	50.24	8.2
Estimated Emissions beginning 6/1/2007	3.98	49.95	8.17
Estimated Emissions beginning 7/1/2008	2.77	10.21	1.18
Estimated Emissions beginning 7/1/2010	2.54	8.15	0.95
Estimated Emissions beginning 7/1/2011	2.34	7.26	0.93
Estimated Emissions beginning 7/1/2012	1.28	3.61	0.82

Table 2-3
Estimated Emission Reductions

Description	NOx, ton/day	CO, ton/day	VOC, ton/day
Estimated Emission Reductions beginning 6/1/2007	0.056	0.30	0.027
Estimated Emission Reductions beginning 7/1/2008	1.21	39.74	6.99
Estimated Emission Reductions beginning 7/1/2010	0.23	2.06	0.23
Estimated Emission Reductions beginning 7/1/2011	0.2	0.89	0.02
Estimated Emission Reductions beginning 7/1/2012	1.06	3.65	0.11
Total	**2.76**	**46.64**	**7.38**

The Landfill Gas to Energy Coalition is concerned that the cost of install in SCR would make flaring an economical alternative to installing SCR. The possibility replacing engines with flares will be examined in the Draft EIR. If it is found that replacing engines with flares is probable, operational emissions from replacement of engines with flares will be analyzed.

Summary

The overall objective of the proposed project is to reduce NOx, VOC and CO emissions from gaseous- and liquid-fueled internal combustion engines. PAR 1110.2 would reduce emissions through engine replacement, control equipment, monitoring equipment and recordkeeping.

Health Risk Analysis

PAR 1110.2 would reduce health risk by reducing VOCs from gaseous- and liquid fueled ICE. Diesel exhaust particulate matter is a known carcinogen with chronic non-carcinogenic effects. Gasoline and natural gas exhaust contains benzene, ethylbenzene, toluene, xylenes, PAHs and other toxics. Therefore, by reducing VOCs, PAR 1110.2 indirectly reduces air toxics, which reduces associated health risks.

PAR 1110.2 includes requirements for the installation of SCR systems, which uses ammonia NOx emissions. A typical SCR system design consists of an ammonia storage tank, ammonia vaporization and injection equipment, a booster fan for the flue gas exhaust, an SCR reactor with catalyst, an exhaust stack plus ancillary electronic instrumentation and operations control equipment. The way an SCR system reduces NOx is by a matrix of nozzles injecting a mixture of ammonia and air directly into the flue gas exhaust stream from the combustion equipment. As

this mixture flows into the SCR reactor that is replete with catalyst, the catalyst, ammonia, and oxygen (from the air) in the flue gas exhaust reacts primarily (i.e., selectively) with NO and NO2 to form nitrogen and water in the presence of a catalyst. The amount of ammonia introduced into the SCR system is approximately a one-to-one molar ratio of ammonia to NOx for optimum control efficiency, though the ratio may vary based on equipment-specific NOx reduction requirements. Unreacted ammonia which escapes from the stack is commonly referred to as 'ammonia slip.' Depending on the type of combustion equipment utilizing SCR technology, the typical amount of ammonia slip can vary between five parts per million by volume (ppmv) when the catalyst is fresh and 20 ppmv at the end of the catalyst life, which is generally about five years.

Ammonia is the primary hazardous chemical identified with the proposed project. Ammonia, though not a carcinogen, can have chronic and acute health impacts. Staff estimates approximately 3.64 pounds of ammonia per bhp would be required to reduce NOx. Health risk from ammonia emissions will be evaluated in the Draft EIR.

III.d) Because operational criteria emissions would be reduced, affected facilities are not expected to expose sensitive receptors to substantial operational criteria pollutant concentrations from the implementation of PAR 1110.2. However, because construction criteria pollutant emissions and ammonia emissions during operations may be significant, further evaluation will be presented in the Draft EIR.

III.e) Historically, the SCAQMD has enforced odor nuisance complaints through SCAQMD Rule 402 - Nuisance. Affected facilities are not expected to create objectionable odors affecting a substantial number of people for the following reasons: 1) new installation of compliant ICE systems would be the same as installation of non-compliant ICE systems; and 2) PAR 1110.2 would reduce the emissions and therefore reduce odors; and installation of compliant ICE systems does not require much heavy construction (forklifts and cranes at some facilities), which is often a source of odors from diesel combustion.

Conclusion

Based on the preceding discussion, PAR 1110.2 is expected to reduce NOx, VOC and CO emissions by 5,520, 14,762, and 93,256 pounds per day, respectively, which is an air quality benefit. The proposal has no provision that would cause a violation of any air quality standard or directly contribute to an existing or projected air quality violation. The lower NOx, VOC and CO emissions from gaseous- and liquid ICEs would assist in reducing overall NOx, VOC and CO emissions throughout the district. Thus, PAR 1110.2 is not expected to result in significant criteria pollutant operational adverse air quality impacts.

Construction air quality impacts and ammonia health risk from implementing PAR 1110.2 will be evaluated in the Draft EIR, air quality impacts are not considered to be cumulatively considerable as defined in CEQA Guidelines §15065(c). Therefore, the proposed project is not expected to result in significant averse cumulative impacts for any criteria pollutant.

If construction air quality impacts and ammonia health risk are found to be significant in the Draft EIR, mitigation measures will be identified.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
IV.	**BIOLOGICAL RESOURCES.** Would the project:			
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑
c)	Have a substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☑
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☑
e)	Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☑
f)	Conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☑

Significance Criteria

Impacts on biological resources will be considered significant if any of the following criteria apply:

- The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The project interferes substantially with the movement of any resident or migratory wildlife species.
- The project adversely affects aquatic communities through construction or operation of the project.

Discussion

PAR 1110.2 would reduce NOx, VOCs and CO from gaseous- and liquid-fueled ICE. Compliance includes retrofit or replacement of equipment to achieve BACT emission levels and improving monitoring, recordkeeping and reporting for better compliance.

IV.a), b), c), & d) PA 1110.2 would not require any new development, but may require minor modifications to buildings or other structures for retrofit or replacement of existing engines; and new, retrofit, or replacement control equipment and monitoring equipment to comply with the proposed rule. PAR 1110.2 may require replacing or altering existing equipment. Any new, replacement or retrofit construction would occur at existing commercial or industrial facilities, so new use designations, including biological habitats, are not expected to be altered by the proposed project. Any construction would occur at affected facilities that are already in existence, which means that Greenfield properties have already been disturbed, but not as a result of PAR 1110.5. Any new operations that must comply with PAR 1110.2 are constructed for business reasons other than to comply with PAR 1110.2. Such projects may or may not have adverse impacts on biological resources. However, these projects would be built regardless of whether or not PAR 1110.2 is in effect.

New, retrofit or replacement construction at existing facilities is expected to occur within the boundaries of the existing facilities. The affected sites are expected have been previously disturbed by site preparation, grating, and construction for the existing gaseous- or liquid-fueled ICE systems. Because of combustion hazards associated with the existing ICE and control systems, it is expect that these areas would be void of biological activity for safety and fire prevention reasons. Therefore, any new, retrofit or replacement construction at existing facilities is not expected to occur in areas that would impact biological resources.

In addition, reducing NOx, VOC, and CO emissions from gaseous- and liquid-fueled ICEs would reduce acid deposition and ozone which impact cultural or historic resources downwind. As a result, PR 1110.2 would not directly or indirectly aversely affect riparian habitat, federally protected wetlands, or migratory corridors. For the same reasons PAR 1110.2 is not expected to adversely affect special status plants, animals, or natural communities.

IV.e) & f) PAR 1110.2 would not conflict with local policies or ordinances protecting biological resources nor local, regional, or state conservation plans because it will only affect industrial or commercial ICE operations. Additionally, PAR 1110.2 will not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan for the same reason.

The SCAQMD, as the Lead Agency for the proposed project, has found that, when considering the record as a whole, there is no evidence that the proposed project will have potential for any new adverse effects on wildlife resources or the habitat upon which wildlife depends. Accordingly, based upon the preceding information, the SCAQMD has, on the basis of substantial evidence, rebutted the presumption of adverse effect contained in §753.5 (d), Title 14 of the California Code of Regulations.

Based upon these considerations, significant adverse biological resources impacts are not anticipated and will not be further analyzed in the Draft EA. Since no significant adverse biological resources impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
V.	**CULTURAL RESOURCES.** Would the project:			
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☑	☐
b)	Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☑
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☑
d)	Disturb any human remains, including those interred outside a formal cemeteries?	☐	☐	☑

Significance Criteria

Impacts to cultural resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

PAR 1110.2 would reduce NOx, VOCs and CO from gaseous- and liquid-fueled ICE. Compliance includes retrofit or replacement of equipment to achieve BACT emission levels and improving monitoring, recordkeeping and reporting for better compliance.

V.a) PAR 1110.2 may require replacing or altering existing equipment. Commercial and industrial facilities that operate gaseous- or liquid-fueled ICEs are not expect to be cultural

resources. The affected sites are expected have been previously disturbed by site preparation, grating, and construction for the existing gaseous- or liquid-fueled ICE systems.

Significant adverse impacts to cultural resources that are not listed in historical registries or located in historical preservation overlay zones are not expected for the following reasons. Compliant engines, control technology and monitoring equipment are typically prefabricated and dropped into place at the affected site. Therefore, it is not expected that construction or operation would impact historical or cultural resources surround the affected site. As a result, complying with PR 1110.2 would not require demolition, destruction, relocation or alteration of a resource or its immediate surrounding such that the significance of a cultural resource defined in CEQA Guidelines §15064.5 would be impaired. In addition, reducing NOx, VOC emissions from gaseous- and liquid-fueled ICEs would reduce acid deposition and ozone which impact cultural or historic resources downwind.

V, b), c), & d) PAR 1110.2 would not require any new development, but may require minor modifications to buildings or other structures for retrofit or replacement of existing engines; and new, retrofit, or replacement control equipment and monitoring equipment to comply with the proposed rule. New commercial or industrial development may adversely affect cultural resources. However, any new operations that must comply with PAR 1110.2 are constructed for business reasons other than to comply with PAR 1110.2. These development projects would be built regardless of whether or not PAR 1110.2 is in effect.

PAR 1110.2 is not expected to require physical changes to the environment, which may disturb paleontological or archaeological resources. Furthermore, it is envisioned that the areas where existing ICE systems are used are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed.

Based upon these considerations, significant adverse cultural resources impacts are not expected from the implementing PAR 1110.2 and will not be further assessed in the Draft EA. Since no significant cultural resources impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
VI. ENERGY. Would the project:			
a) Conflict with adopted energy conservation plans?	☑	☐	☑
b) Result in the need for new or substantially altered power or natural gas utility systems?	☑	☐	☐

		Potentially Significant Impact	Less Than Significant Impact	No Impact
c)	Create any significant effects on local or regional energy supplies and on requirements for additional energy?	☑	☐	☐
d)	Create any significant effects on peak and base period demands for electricity and other forms of energy?	☐	☐	☑
e)	Comply with existing energy standards?	☑	☐	☐

Significance Criteria
Impacts to energy and mineral resources will be considered significant if any of the following criteria are met:
- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.
- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

Discussion
PAR 1110.2 would reduce NOx, VOCs and CO from gaseous- and liquid-fueled ICE. Compliance includes retrofit or replacement of equipment to achieve BACT emission levels and improving monitoring, recordkeeping and reporting for better compliance.

PAR 1110.2 would not promote the installation of gaseous- or liquid-fueled engines, but may require the installation or modification of emissions control, sensors, analyzers, CEMS and infrastructure.

VI.a), b), c), d)& e) The Landfill Gas to Energy Coalition is concerned that the cost of the SCR requirement would make flaring gas more economically appealing.

There are several renewable energy goals that have been proposed. The 2002 Renewable Portfolio Standard Program recommended a goal of 20 percent the states electricity mix by 2017. The 2003 Integrated Energy Policy Report recommended achieving 20 percent by 2010. The 2004 Energy Report Update and Energy Action Plan recommended 33 percent by 2020.[12] If landfill gas facility operators would switch from engines to flares because SCR systems would be economically infeasible, then PAR 1110.2 may impact renewable energy plans and existing energy standards..

[12] http://www.energy.ca.gov/renewables/

In addition, if landfill gas facility operators would switch from engines to flares, this may significantly affect power and natural gas utility systems, and local or regional energy supplies at least renewable energy power and natural gas utility systems and supplies.

The Association of California Water Agencies has stated that PAR 1110.2 would severely restrict the ability of water agencies from providing water during power outages. PAR 1110.2 would not affect the water agencies from delivering water during power outages. PAR 1110.2 would not restrict the use of natural gas engines. PAR 1110.2 may require natural gas engines to install new or retrofit monitoring and control equipment, and increase compliance testing on existing engines. The installation of new or retrofit monitoring and control equipment, and increase compliance testing is not expected to impact water supply during power outages. Water districts are expected to provide the appropriate infrastructure to provide water to their customers. Therefore, PAR 1110.2 is not expected to impact water supply during power outages.

As a result, PAR 1110.2 may conflict with energy conservation plans, affect renewable resources result in the need for new or substantially altered power or natural gas systems and supplies. These impact issues will be analyzed in the Draft EA.

VI. The primary effect of implementing PAR 1110.2 is that gaseous- and liquid-fueled ICE would need to be compliant with the proposed rule. Staff estimates that affected commercial and industrial facility operators may require control technology, CO analyzers, AFRC, CEMS or access infrastructure.

Natural Gas Impacts

SCR units would generate a pressure drop though the catalyst and reduce engine efficiency. Non generator engines would require additional natural gas. Based on the pressure drop and reduction of engine efficiency approximately 218 million standard cubic feet (MMscf) of natural gas per year would be required for non generator SCR systems pursuant to PAR 1110.2. Approximately 2.9 MMscf of natural gas would be required for non-generator oxidation catalytic systems. Sixteen two-stroke engines are expected to be replaced with electric motors. Approximately 2,469 MMscf of natural gas per year would be saved by replacing the 22 two-stoke engines with electric motors. Therefore, natural gas usage would be reduced by 2,248 MMscf per year (2,469 – 218 – 2.9 MMscf). Since the total amount of natural gas would be reduced by PAR 1110.2, the proposed project would benefit natural gas reserves in the district. Therefore, PAR 1110.2 is not expected to create any significant effects on local or regional natural gas energy supplies and on requirements for additional energy from natural gas.

Hanover Compressed Natural Gas Company ("Hanover") operates compressed natural gas (CNG) refueling stations for the Los Angeles Metropolitan Transportation Agency (MTA) transit buses. Hanover has stated that the cost impacts from additional monitoring equipment, change of catalyst, compliance and recordkeeping would be cost prohibitive for their engines. If Hanover operators do replace natural gas engines with electric motors, there will be an additional natural gas benefit. Reduction in natural gas from the conversion of natural gas engines to electric motors was not included in the natural gas analysis.

Table 2-4 presents the maximum natural gas usage by 2012, when the SCR unit and two stroke engine requirements are expected to be completed.

Electrical Impacts
CEMS, controllers, oxidation catalyst and SCR units use electricity for ancillary equipment (e.g., fans, motors, etc.). Electric motors are completely operated by electricity for both ancillary equipment (e.g., fans, motors, etc.) and mechanical work.

Table 2-4
Maximum Natural Gas Usage by 2012

Description	Number of Units	Usage, MMcft/day	Usage, MMcft/year
Oxidation Catalyst Requirement	30	0.0004	2.9
SCR Requirement	8	0.03	218
Electric Motor	24	-0.31	-2,469
Total		**-0.28**	**-2,248**

Electricity Usage from Electric Motors
SCAQMD staff estimates that 22 two stroke engines would be replaced with electric motors. The electric motors would require approximately 234,326 MW-hours per year.

Hanover Compressed Natural Gas Company ("Hanover") has stated that the cost impacts from additional monitoring equipment, change of catalyst, compliance and recordkeeping would be cost prohibitive. If Hanover would replace natural gas engines with electric motors an additional 55 MW-hours/year would be required. Therefore, a total of 289,552 MW-hours per year would be needed. Detailed calculations are presented in Appendix B.

Electricity Usage from Control and Monitoring Devices
CEMS, oxidation and SCR catalysts would require additional electricity. By 2012, approximately 5,123 MW per day would be needed. Detailed calculations are presented in Appendix B.

Table 2-5
Maximum Electricity Usage by 2012

Description	Number of Units	Usage, MW/day	Usage, MW/year
Electric Motor	22	29.3	289,552
CEMS Requirement*	320	0.35	2,837
Oxidation Catalyst Requirement	30	0.0018	14
SCR Requirement	78	0.28	2,272
Total		**30**	**294,674**

* 320 engines, 86 CEMS (all engines at each facility share one CEMS)

Electricity Impacts
According to the 2007 Draft AQMP Program EIR, 120,194 gigawatts-hours per year were available in 2002. The 295 gigawatt-hours per year required by PAR 1110.2 would be less than a percent (0.25 percent) of the available 120,194 gigawatt-hours per year. Therefore, the 295

gigawatt-hours per year would be less than significant and not considered to be wasteful use of an energy resource.

Based upon the above considerations, the proposed project is not expected to use energy in a wasteful manner, would not substantially deplete energy resources.

Based upon the preceding analysis, it is not expected that PAR 1110.2 would create any significant effects on peak and base period demands for electricity and other forms of energy since only minor construction activities (installing or replacing appliances, or rendering appliances inoperable) are anticipated as a result of facilities complying PAR 1110.2.

Therefore, PAR 1110.2 is not expected to significantly affect peak and base period demands for electricity and other forms of energy.

Therefore, PAR 1110.2 is may significantly adversely impact energy conservation plans, affect renewable resources result in the need for new or substantially altered power or natural gas systems and supplies and will be discussed in the Draft EA. If significant impacts are found, mitigation measures will also be analyzed in the Draft EA.

		Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
VII.	**GEOLOGY AND SOILS.** Would the project:			
a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☑
	• Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	☑
	• Strong seismic ground shaking?	☐	☐	☑
	• Seismic–related ground failure, including liquefaction?	☐	☐	☑
	• Landslides?	☐	☐	☑
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
c)	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☑
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☑
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☑

Significance Criteria

Impacts on the geological environment will be considered significant if any of the following criteria apply:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, and compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion

PAR 1110.2 would reduce NOx, VOCs and CO from gaseous- and liquid-fueled ICE. Compliance includes retrofit or replacement of equipment to achieve BACT emission levels and improving monitoring, recordkeeping and reporting for better compliance.

VII.a) Southern California is an area of known seismic activity. Structures must be designed to comply with the Uniform Building Code Zone 4 requirements if they are located in a seismically active area. The local city or county is responsible for assuring that a proposed project complies with the Uniform Building Code as part of the issuance of the building permits and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate

earthquakes without structural damage but with some non-structural damage; and (3) resist major earthquakes without collapse but with some structural and non-structural damage.

The Uniform Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The Uniform Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site.

Accordingly, buildings and equipment at existing affected facilities are required to conform to the Uniform Building Code and all other applicable state and local codes in effect at the time they were constructed. PAR 1110.2 would require compliant ICE systems (ICEs, control technology and monitoring equipment). As already noted PAR 1110.2 does not require or promote construction of commercial or industrial land use projects. It is expected that new, retrofitted and replacement ICE systems would be installed according to all applicable state and local codes. As a result, substantial exposure of people or structure to the risk of loss, injury, or death involving seismic-related activities is not anticipated as a result of installing compliant appliances and will not be further analyzed in the Draft EA.

VII.b) PAR 1110.2 would require new, retrofitted and replacement ICE systems. Operators at affected industrial and commercial facilities may retrofit or replace existing ICE systems or add new equipment. It is expected that new, retrofit or replacement equipment are pre-manufactured and dropped in place within existing paved areas at the existing commercial and industrial facilities.

PAR 1110.2 would not require new development. PAR 1110.2 would only affect gaseous- and liquid-fueled ICE systems. There would be no difference in impact to soils from installing a non-compliant versus compliant ICE systems, as new development in the district would continue to be subject to Rule 403-Fugitive Dust. Compliance with Rule 403 would minimize loss of top soil during construction. ICE systems would be built upon concrete foundations which would minimize soil loss.

Installing compliant systems in existing commercial and industrial operation does not require heavy construction that would disturb soil as compliant systems are expected to be pre-manufactured, drop in units. Therefore, no soil disruption from excavation, grading, or filling activities; changes in topography or surface relief features; erosion of beach sand; or changes in existing siltation rates are anticipated from the implementation of PAR 1110.2.

VII.c) & d) Since PAR 1110.2 would primarily affect existing commercial and industrial facilities, it is expected that the soil types present at the affected facilities would not be further susceptible to expansive soils or liquefaction. Furthermore, subsidence is not anticipated to be a problem since no excavation, grading, or filling activities would occur at existing affected facilities because of PAR 1110.2.

PAR 1110.2 would not require or promote new development. At new facilities, the installation of PAR 1110.2 compliant ICE systems would be the similar to installing ICE systems that are compliant with the existing Rule 1110.2. Therefore, installing PAR 1110.2 compliant ICE

systems in at new facilities would not generate any additional impacts. Further, the proposed project does not involve drilling or removal of underground products (e.g., water, crude oil, et cetera) that could produce subsidence effects. Additionally, compliant systems installed in new development have no effect on the potential for landsides, lateral spreading subsidence, etc. The new development, not compliance with PAR 1110.2, would be required to undergo a CEQA analysis, which will evaluate potential geological or soil impacts.

Therefore, PAR 1110.2 would not significantly impact soils.

VII.e) The proposed project does not require or involve the installation of septic tanks or alternative wastewater disposal systems. Therefore, no impacts from failures of septic systems related to soils incapable of supporting such systems are anticipated.

Based on the above discussion, the proposed project is not expected to have an adverse impact on geology or soils. Since no significant adverse impacts are anticipated, this environmental topic will not be further analyzed in the draft EA. No mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
VIII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:			
a)	Create a significant hazard to the public or the environment through the routine transport, use, disposal of hazardous materials?	☐	☑	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☑	☐	☐
c)	Emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☑	☐	☐
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would create a significant hazard to the public or the environment?	☐	☑	☐

		Potentially Significant Impact	Less Than Significant Impact	No Impact
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☑	☐	☐
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☑	☐	☐
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☑	☐
i)	Significantly increased fire hazard in areas with flammable materials?	☐	☐	☑

Significance Criteria

Impacts associated with hazards 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.

PAR 1110.2 would reduce NOx, VOCs and CO from gaseous- and liquid-fueled ICE. Compliance includes retrofit or replacement of equipment to achieve BACT emission levels and improving monitoring, recordkeeping and reporting for better compliance. The primary effects of the proposed amendments with respect to hazards and hazardous materials are the anticipated overall increase in the amount of ammonia injected into SCR units for controlling NOx emissions from gaseous- and liquid-ICE, the increase of ammonia slip emissions, and the increase of spent catalyst.

Ammonia is the primary hazardous chemical identified with the proposed project. Ammonia, though not a carcinogen, can have chronic and acute health impacts. Therefore, an increase in the use of 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 of the facilities that currently use or will begin to use ammonia. Exposure to a toxic gas cloud is the potential hazard associated with this type of control equipment.

To minimize hazards associated with ammonia in control systems, the Executive Officer has prohibited the permitting of control technology using anhydrous ammonia. To further minimize the hazards associated with ammonia used in the SCR process, aqueous ammonia, 19 percent by weight, is typically required as a permit condition associated with the installation of SCR equipment for the following reasons: 1) 19 percent aqueous ammonia does not travel as a dense gas like anhydrous ammonia; and, 2) 19 percent aqueous ammonia is not on any acutely hazardous material lists unlike anhydrous ammonia or aqueous ammonia at higher percentages.

Checklist Response Explanation

8. a), b) and c) The proposed project includes the installation of new SCRs and aqueous ammonia storage tanks. The 2004 Final EA for Regulation XX - RECLAIM evaluated the hazards associated with the use, storage, and transport of aqueous ammonia and concluded that no significant impacts were expected, largely due to the requirement to use 19 percent ammonia (which minimizes the impacts of using higher concentrations of ammonia) (SCAQMD, 2004).

Hazards Due to Transport

The 2004 Final EA for Regulation XX - RECLAIM evaluated specific hazards due to transport of aqueous ammonia to several local refineries. It was determined that in the unlikely event that a tanker truck would rupture and release the entire 7,000 gallon capacity 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 (SCAQMD, 2004).

Based of 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 the hazard analysis in the 2004 Final EA was that potential impacts due to accidental release of aqueous ammonia during transportation are less than significant.

It should be noted that this analysis is based on tanker trucks transporting aqueous ammonia in concentrations less than 19 percent by volume, which is consistent with the RECLAIM program. In the 2004 EA, models using aqueous ammonia concentrations of 29.5 percent by volume showed potentially significant hazard impacts, but since Regulation XX will require concentrations of less than 19 percent by volume, consequences of an accidental release during

transportation would be less than significant. The permit process would require the transport of aqueous ammonia at concentrations less than 19 percent so the transportation hazards are expected to be less than significant.

Hazards Due to Rupture

Emergency Response Planning Guideline (ERPG) 2 (150 ppm) is the lowest ammonia concentration of interest analyzed in the Draft EA. ERPG-2 concentrations are the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their ability to take protective action. The offsite consequence analysis will also provide the distance to the ERPG-3 concentration (750 ppm). ERPG-3 is the maximum concentration below which nearly all individuals could be exposed for one hour without experiencing or developing life threatening health effects. ERPG-3 concentrations are the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects. "Worst-case" atmospheric conditions (e.g., low winds and stable air) will be used to evaluate whether accidental release concentrations exceed the ERPG-2 and ERPG-3 levels.

SCAQMD staff estimates that the largest ammonia tank installed to comply with PAR 1110.2 would be 5,000 gallons. Storage tanks constructed at affected facilities would be surrounded by secondary containment designs (e.g., dykes, berms, etc.). These same containment facilities would be provided at truck loading racks to contain ammonia in the event of a spill during transfer activities.

The worst-case release scenario would be a catastrophic storage tank failure. The rupture of an ammonia storage tank would release the ammonia into the secondary containment area. Ammonia would then vaporize from the liquid pool in the secondary containment area. Adverse impacts from a catastrophic storage tank failure will be analyzed in the Draft EA.

Affected sites located within one-quarter mile of an existing school site will be disclosed in the Draft EA.

8. d) Adverse impacts to affected hazardous materials sites as defined in Government Code §65962.5 will be estimated and evaluated in the Draft EA.

8. e) and f) Adverse impacts from facilities that use SCR and are located within an airport land use plan or within two miles of a public or private use airport will be evaluated in the Draft EA

8. g) The proposed project modifications are located within the existing operating portions of affected facilities. The proposed projects are not expected to alter the routes employees would take to evacuate the site, as the evacuation routes generally direct employees to locations outside of the main operating portions of the facilities. The existing emergency response plan is not expected to require modifications due to the proposed projects. No significant adverse impacts to emergency response or evacuation plans are expected.

8. h) Since existing ICE systems are operating the proposed project would not increase the existing risk of fire hazards in areas with flammable brush, grass, or trees. SCAQMD staff does not expect facilities to alter the type or amount of fuel used when replacing or retrofitting

engines. None of the control technologies or monitoring equipment is expected to use flammable materials. In addition, the proposed projects are located in urbanized, industrial areas and no wildlands are expected to be located in the immediate or surrounding areas. Also, no substantial or native vegetation is expected to exist within the operational portions of any of the affected facilities, since existing ICE systems are operating at these facilities. For these reasons, the proposed projects would not expose people or structures to wildland fires. Therefore, no potential significant adverse impacts resulting from wildland fire hazards are expected from the proposed projects.

8. i) None of the control technologies or monitoring equipment is expected to use flammable materials (aqueous ammonia is not flammable). PAR 1110.2 would not require a change in operation, fuels consumed or stored; therefore, the proposed projects will not increase the potential for fire hazards at the affected facilities.

Conclusion
Ammonia is the only hazardous material associated with PAR 1110.2 that was identified. The effects of an accidental release of ammonia during transported from the proposed projects were not determined to be significant. The effects of an accidental release of ammonia from a catastrophic storage tank failure will be analyzed in the Draft EA. The location of ammonia storage tanks proposed near schools, hazardous material sites, and airport and airstrips will be disclosed in the Draft EA.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
IX.	**HYDROLOGY AND WATER QUALITY.** Would the project:			
a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☑
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or offsite?	☐	☐	☑
d)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☑
e)	Otherwise substantially degrade water quality?	☐	☐	☑
f)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☑
g)	Place within a 100-year flood hazard area structures which would impede or redirect flood flaws?	☐	☐	☑
h)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☑
i)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☑
j)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☑
k)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑
l)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑

m)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☑
n)	Require in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☑

Significance Criteria
Potential impacts on water resources will be considered significant if any of the following criteria apply:

Water Quality:
- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Water Demand:
- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.
- The project increases demand for water by more than five million gallons per day.

Discussion
PAR 1110.2 would reduce NOx, VOCs and CO from gaseous- and liquid-fueled ICE. Compliance includes retrofit or replacement of equipment to achieve BACT emission levels and improving monitoring, recordkeeping and reporting for better compliance.

IX.a), e), f), j), k), & l) PAR 1110.2 would require the replacement or retrofit of ICE systems. PAR 1110.2 has no provision that would require the use of water or the disposal of wastewater, because compliant ICEs do not use water for any reason. Therefore, PAR 1110.2 would not cause the construction of additional water resource facilities, the need for new or expanded water entitlements, or an alteration of drainage patterns. Since it does not require water, the project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

ICE systems do not generate wastewater and, therefore, would not create or contribute to runoff water. ICE systems are housed within structures that would protect them from exposure to and contaminating stormwater. ICE systems that are used outdoors are typically protected from weather, especially rain and would not be expected to contaminate stormwater in any way. Since both compliant and non-compliant ICE systems are typically enclosed systems, ICE systems are not expected to contaminate rainwater. Therefore, PAR 1110.2 would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

In addition, the proposed rule is not expected to require additional wastewater disposal capacity, violate any water quality standard or wastewater discharge requirements, or otherwise substantially degrade water quality.

IX.b), & n) PAR 1110.2 is not expected to substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. PAR 1110.2 would not increase demand for water from existing entitlements and resources, and will not require new or expanded entitlements because compliant devices do not use water for any reason. Therefore, no water demand impacts are expected as the result of implementing the proposed amendments.

IX.c) & d) PAR 1110.2 may include minor construction activities to retrofit or replace ICE systems within new or existing affected facilities, installation of replacement or retrofit equipment is not expected to require earthmoving or excavation so not soil disturbance would occur as a results of implementing PAR 1110.2. As result, no changes to storm water runoff, drainage patterns, groundwater characteristics, or flow are expected. Therefore, potential adverse impacts to drainage patterns, etc., are not expected as a result of implementing PAR 1110.2.

IX.g), h) & i) The project will not require or induce construction of new housing or contribute to the construction of new building structures other than retrofit or replacement of equipment within existing affected facilities. PAR 1110.2 may affect ICE systems at new facilities, but would not require any new facilities. Therefore, PAR 1110.2 is not expected to generate construction of any new structures in 100-year flood areas as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood delineation map. As a result, PAR 1110.2 is not expected to expose people or structures to new significant flooding risks. Modification of existing systems in existing affected facilities would not affect any existing risks from flood, inundation, etc. Consequently, PAR 1110.2 would not affect in any way any potential flood hazards inundation by seiche, tsunami, or mud flow that may already exist relative to existing facilities.

IX.m) PAR 1110.2 will not demand for water supplies, since only minor construction activities (retrofit or replacement of existing equipment) are expected to occur within affected facilities. Similarly, compliant appliances do not use water for any purpose; therefore, no storm water discharge supply facilities or modifications to existing facilities would be required due to the implementation of PAR 1110.2. Accordingly, PAR 1110.2is not expected to generate significant adverse impacts relative to construction of new storm water drainage facilities.

Based upon the above considerations, significant hydrology and water quality impacts are not expected from the implementation of PAR 1110.2 and will not be further analyzed in the Draft EA.

Since no significant hydrology and water quality impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
X.	**LAND USE AND PLANNING.** Would the project:			
a)	Physically divide an established community?	☐	☐	☑
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☑
c)	Conflict with any applicable habitat conservation or natural community conservation plan?	☐	☐	☑

Significance Criteria
Land use and planning impacts will be considered significant if the project conflicts with the land use and zoning designations established by local jurisdictions.

Discussion
X.a) The proposed project would require retrofit or replacement of existing ICE systems and installation of compliant systems at new affected facilities. PAR 1110.2 does not require any new development, but would require installation of compliant systems installed in new development. At existing facilities, PAR 1110.2 would impact the ope1110.2 does not include any components that would require physically dividing an established community.

X.b) & c) There are no provisions in PAR 1110.2 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by regulating NOx, VOC and CO emissions from ICE systems. Therefore, PAR 1110.2 would not affect in any way habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities. Therefore, present or planned land uses in the region will not be significantly adversely affected as a result of the proposed rule

Based upon these considerations, significant land use and planning impacts are not expected from the implementation of PAR 1110.2 and will not be further analyzed in the Draft EA. Since

no significant land use and planning impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES. Would the project:			
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☑
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☑

Significance Criteria

Project-related impacts on mineral resources will be considered significant if any of the following conditions are met:

- The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- The proposed project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Discussion

XI.a) & b) There are no provisions in PAR 1110.2 that would result in the loss of availability of a known mineral resource of value to the region and the residents of the state, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan because compliant appliances typically do not require mineral resources such as sand, gravel, etc..

Based upon the above considerations, significant mineral resources impacts are not expected from the implementation of PAR 1110.2 and will not be further analyzed in the Draft EA. Since no significant mineral resources impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XII.	**NOISE.** Would the project result in:			
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☑
f)	For a project within the vicinity of a private airship, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☑

Significance Criteria

Impacts on noise will be considered significant if:

- Construction noise levels exceed the local noise ordinances or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary. Construction noise levels will be considered significant if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

Discussion

XII.a) PAR 1110.2 would require retrofit and replacement of ICE systems in existing and installation of compliant ICE systems in new affected facilities. Since installation or replacement of ICEs is expected to be comprised of pre-fabricated equipment that would not require much heavy duty construction equipment, noise impacts during replacement would be minimal. Most facilities are not expected to need heavy construction equipment. Large ICE systems may require a crane or lift to install replacement ICE and control equipment or retrofit equipment. However, facilities that use large ICEs, typically have diesel truck, industrial equipment and/or on-site mobile equipment that generate comparable noise. Therefore, the operation of an additional crane or lift is not expected to be significant. The retrofit or replacement systems are not expected to generate more noise than existing systems. New ICE systems at new facilities are not expected to be louder than currently compliant systems that would be required if PAR 1110.2 is not adopted. In addition, building codes typically include set backs for ICE systems from the property line, noise from these systems indoors and outdoors are expected to be limited to acceptable levels by the building permit process. Thus, the proposed project is not expected to expose persons to the generation of excessive noise levels above current facility levels. It is expected that any facility affected by PAR 1110.2 would comply with all existing local noise control laws or ordinances.

In commercial environments Occupational Safety and Health Administration (OSHA) and California-OSHA have established noise standards to protect worker health. It is expected that operators at affected facilities would continue complying with applicable noise standards, which would limit noise impacts to workers, patrons and neighbors.

XII.b) PAR 1110.2 is not anticipated to expose people to or generate excessive groundborne vibration or groundborne noise levels since only minor construction activities are expected to occur at the existing facilities and compliant equipment are not expected to involve, in any way, equipment that generates vibrations over existing equipment.

XII.c) A permanent increase in ambient noise levels at the affected facilities above existing levels as a result of implementing the proposed project is unlikely to occur because for most affected facilities similar equipment would be installed as part of implementing PAR 1110.2. The existing noise levels are unlikely to change and raise ambient noise levels in the vicinities of the existing facilities to above a level of significance, because neither non-compliant nor compliant ICEs are expected to general comparable levels of noise.

XII.d) No increase in periodic or temporary ambient noise levels in the vicinity of affected facilities above levels existing prior to PAR 1110.2 is anticipated because the proposed project would require only minor construction (installation or replacement of ICE systems) activities that would not require heavy equipment besides cranes or lifts. As indicated earlier, operational noise levels are expected to be equivalent to existing noise levels.

XII.e) & f) Implementation of PAR 1110.2 would generally consist of improvements within the existing facilities. Minor construction may be required to install or replace appliances. Even if an affected facility is located near a public/private airport, there are no new noise impacts expected from any of the existing facilities, ether during construction or operation, as a result of complying with the proposed project. Thus, PAR 1110.2 is not expected to expose people residing or working in the vicinities of public airports to excessive noise levels.

Based upon these considerations, significant noise impacts are not expected from the implementation of PAR 1110.2 and are not further evaluated in the Draft EA. Since no significant noise impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING.	Would the project:			
a)	Induce substantial growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☑
b)	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☑
c)	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☑

Significance Criteria

Impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:

- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Discussion

XIII.a) The proposed project is not anticipated to generate any significant effects, either direct or indirect, on the district's population or population distribution as no additional workers are anticipated to be required to comply with the proposed amendments. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing PAR 1110.2. It is expected that any construction activities at affected facilities would use construction workers from the local labor pool in southern California. As such, PAR 1110.2 will not result in changes in population densities or induce significant growth in population.

XIII.b) & c) Because the proposed project affects ICE systems at commercial and industrial facilities, PAR 1110.2 is not expected to result in the creation of any industry that would affect

population growth, directly or indirectly, induce the construction of single- or multiple-family units, or require the displacement of people elsewhere.

Based upon these considerations, significant population and housing impacts are not expected from the implementation of PAR 1110.2 and are not further evaluated in the Draft EA. Since no significant population and housing impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES. Would the proposal result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:			
a) Fire protection?	☐	☑	☐
b) Police protection?	☐	☐	☑
c) Schools?	☐	☐	☑
d) Parks?	☐	☐	☑
e) Other public facilities?	☐	☑	☐

Significance Criteria

Impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion

XIV.a) & b) The replacement or modification of ICE systems is not expected to increase the chances for fires or explosions requiring a response from local fire departments. As shown in the Section VIII - Hazards and Hazardous Material section of the Draft EA, the use of compliant ICE systems is not expected to generate significant explosion or fire hazard impacts.

The Association of California Water Agencies (ACWA) has implied that PAR 1110.2 would require the removal of natural gas engines that would hinder the ability of water agencies to supply water to fight fires. PAR 1110.2 would not require water agencies to remove natural gas engines. PAR 1110.2 may require additional or retrofit monitoring, control equipment, and

recordkeeping. The additional retrofit monitoring, control equipment and recordkeeping is not expected to hinder the delivery of water to fire fighters. Therefore, PAR 1110.2 is not expected to have a significant impact on fire fighters.

In addition, SCAQMD staff has reviewed a list of public water agencies that are members of the ACWA. Some of the largest public water agencies Los Angeles Department of Water and Power (LA DWP), Metropolitan Water District (MWD) of Southern California, MWD of Orange County, and Orange County Water District do not have natural gas engines. There are several public water agencies located in areas susceptible to wildfires that do not have natural gas engines: Elsinore Valley MWD, Idywild Water District (WD), Lake Hemet MWD, etc. Since there are large water districts and water districts in areas susceptible to wildfires that are able to support fire fighters without natural gas engines, it is expected that facilities that have natural gas engines would comply with PAR 1110.2 or develop means used by water districts that do not use natural gas engines to fight wild fires. Therefore, it is not expected that PAR 1110.2 would significantly affect wildfire fighting efforts.

PAR 1110.2 is not expected to have any adverse effects on local police departments for the following reasons. Police would be required to respond to accidental releases of hazardous materials during transport. Since hazards impacts from implementing PAR 1110.2 were concluded to be less than significant, potential impacts to local police departments are also expected to be less than significant.

XIV.c) & d) As indicated in discussion under item XIII. Population and Housing, implementing PAR 1110.2 would not induce population growth or dispersion during either construction or operation. Therefore, with no increase in local population anticipated, additional demand for new or expanded schools or parks is not anticipated. As a result, no significant adverse impacts are expected to local schools or parks.

XIV.e) Besides building permits, there is no other need for government services. The proposal would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. There will be no increase in population and, as a result of implementing; therefore, no need for physically altered government facilities.

Based upon these considerations, significant public services impacts are not expected from the implementation of PAR 1110.2 and are not further evaluated in the Draft EA. Since no significant public services impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XV. RECREATION.			
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☑
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☑

Significance Criteria

Impacts to recreation will be considered significant if:

- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely affects existing recreational opportunities.

Discussion

XV.a) & b) As discussed under "Land Use and Planning" above, there are no provisions in the PAR 1110.2 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the changes proposed in PAR 1110.2. The proposed project would not increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or expansion of existing recreational facilities that might have an adverse physical effect on the environment because it will not directly or indirectly increase or redistribute population.

Based upon these considerations, significant recreation impacts are not expected from the implementation of PAR 1110.2 and are not further evaluated in the Draft EA. Since no significant recreation impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XVI. SOLID/HAZARDOUS WASTE. Would the project:			
a) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☑	☐
b) Comply with federal, state, and local statutes and regulations related to solid and hazardous waste?	☐	☐	☑

Significance Criteria

The proposed project impacts on solid/hazardous waste will be considered significant if the following occurs:

- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.
-

Discussion

XVI.a) PAR 1110.2 would generate both solid and hazardous waste. PAR 1110.2 may necessitate the replacement of two-stroke ICEs with electric motors. Existing ICES are not expected to be classified as hazardous waste. Therefore, the disposal of existing ICEs is expected to be categorized as solid waste.

PAR 1110.2 may require the upgrade of existing catalyst, and installation of new oxidation catalyst systems and SCR systems. Metals used in catalyst are generally recovered because they are made of precious and valuable mettles (e.g., platinum and palladium). Metals can be recovered from approximately 60 percent of the spent catalyst generated from the operation of catalytic oxidizers.[13] None of the SCR catalyst is recycled, because it does not contain precious metals. Catalyst from control technology is classified as hazardous waste. These metals could then be recycled. The remaining material would likely need to be disposed of at a hazardous waste landfill.

Solid Waste

The Final Program Environmental Impact Report for the 2003 AQMP states that the daily landfill capacity for Los Angeles, Orange, Riverside and San Bernardino Counties is 101,344 tons per day (Table 3.5-1, page 3.5-2). In a worst-case scenario, it is estimated that as much as, 151 tons of the material from the replacement of two-stoke engines with electric motors would eventually be sent to landfill by July 1, 2007. Since cities and landfills are required to divert recyclable material to recycling center a large amount of the recyclable from the engines should get recycled. The total waste from PAR 1110.2 would be less than one percent of the total daily

[13] SCAQMD, 2003 Final AQMP Program EIR, 2003.

capacity. Therefore, the increase in solid waste that would be generated from the proposed project is less than significant. Detailed calculations can be found in Appendix B.

Hazardous Waste
Approximately 120 tons of catalyst will be installed pursuant to PAR 1110.2. Catalysts have a lifespan of approximately three years. Assuming that a third of the catalyst is replaced every year approximately 14.6 tons of catalyst will be disposed per year of and 0.7 ton per year will be recycled. Detailed calculations can be found in Appendix B.

Depending on its actual waste designation, spent catalysts would likely be disposed of in a Class II landfill or a Class III landfill that is fitted with liners. According to the Program EIR for the 2003 AQMP (SCAQMD, 2003), total Class III landfill waste disposal capacity in the district is approximately 101,340 tons per day, many of which have liners and can handle Class II and Class III wastes. The initial disposal of two tons of existing catalyst and fifteen tons per year of catalyst is less than one percent of 101,340 tons per day. Therefore disposal of catalyst is not considered significant.

XVI.b) Most cities have solid and hazardous waste disposal requirements. Many cities require that scrap metal be recycled. In addition, because of the value of scrap metal, contractors will recycle scrap metal. Contractors are expected to adherence to the applicable federal, state and local regulatory requirements for the disposal of solid waste.

Based on these considerations, PAR 1110.2 is not expected to significantly increase the volume of solid or hazardous wastes disposed at existing municipal or hazardous waste disposal facilities or require additional waste disposal capacity. Further, implementing PAR 1110.2 is not expected to interfere with any affected facility's ability to comply with applicable local, state, or federal waste disposal regulations. Since no solid/hazardous waste impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
XVII. TRANSPORTATION/TRAFFIC. Would the project:			
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
b)	Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☑
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☑
d)	Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☑
e)	Result in inadequate emergency access or?	☐	☐	☑
f)	Result in inadequate parking capacity?	☐	☐	☑
g)	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☐	☑

Significance Criteria

Impacts on transportation/traffic will be considered significant if any of the following criteria apply:

- Peak period levels on major arterials are disrupted to a point where level of service (LOS) is reduced to D, E or F for more than one month.
- An intersection's volume to capacity ratio increase by 0.02 (two percent) or more when the LOS is already D, E or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.
- The need for more than 350 employees
- An increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day
- Increase customer traffic by more than 700 visits per day.

Discussion

XVII.a) & b) PAR 1110.2 has a variety of requirements that with compliance dates from 2007 to 20012. Most of the construction would occur within the first two years. Based on a survey of

facilities with gaseous- and liquid-fuel engines, SCAQMD staff estimates that 435 engines would require source test in 2007; 528 engine systems would require minor construction to install infrastructure (sampling ports, platforms, safe access and utilities) and air/fuel ratio controllers by June 2008; 742 engines require installation of CO analyzers and/or NOx-CO CEMS by July 2008; 517 engines would need replacement with electric motors by July 1, 2010; 298 engines would need oxidation catalyst or modification of oxidation catalyst by July 2011; and 154 facilities would need oxidation catalyst, modification of oxidation catalyst or SCR. Construction or modification of control technologies, engine replacement with electric motor or installation of infrastructure may require cranes, loaders, forklifts, welders and generator sets. Installation of controllers, analyzers, and CEMS systems are likely to require less heavy equipment. All construction would require delivery truck and worker trips. Based on the above, SCAQMD staff assumes that construction would occur at approximately 15 facilities per day beginning in 2007 through 2008. Between 2009 to 2012, construction would occur at one or two facilities per day. Based on construction at 15 facilities per day, approximately 50 delivery or haul truck trips and 75 worker trips would be required. Since these construction work trips would be spread through the district, these additional construction work trips would not impact transportation or traffic significantly.

During operation, one ammonia delivery per quarter may be required for 76 SCR systems. One trip would be required at each facility every six years for additional source testing. One trip would be required every three years at 11 facilities to replace oxidation catalyst. These additional operational diesel truck trips would not impact transportation or traffic significantly.

XVII.c) PAR 1110.2 would require the replacement or retrofit of existing ICE systems and the installation of compliant ICE systems at new facilities. The stack heights for compliant ICE systems are not expected to be significantly higher than existing systems. Building codes should prevent stacks from adversely affect air traffic patterns. Further, PAR 1110.2 would not affect in any way air traffic in the region because ICE systems or components are not expected to be transported by plane to any appreciable extent.

XVII.d) Since PAR 1110.2 affects ICE systems, no offsite modifications to roadways are anticipated for the proposed project that would result in an additional design hazard or incompatible uses.

XVII.e) Since PAR 1110.2 affects ICE systems, no changes are expected to emergency access at or in the vicinity of the affected facilities. The proposed project is not expected to adversely impact emergency access because it primarily requires replacement of non-compliant appliances with compliant appliances.

XVII.f) Since PAR 1110.2 affects ICE systems, no changes are expected to the parking capacity at or in the vicinity of the affected facilities. PAR 1110.2 is not expected to require additional workers, so additional parking capacity will not be required. Therefore, the project is not expected to adversely impact on- or off-site parking capacity.

XVII.g) Since PAR 1110.2 affects ICE systems, the implementation of PAR 1110.2 would not result in conflicts with alternative transportation, such as bus turnouts, bicycle racks, et cetera.

Based upon these considerations, PAR 1110.2 is not expected to generate significant adverse transportation/traffic impacts and, therefore, this topic will not be considered further. Since no significant transportation/traffic impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XVIII.	**MANDATORY FINDINGS OF SIGNIFICANCE.**			
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☑	☐	☐
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☑
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☑	☐	☐

XVIII.a) As discussed in the "Biological Resources" section, PAR 1110.2 is not expected to significantly adversely affect plant or animal species or the habitat on which they rely because PAR 1110.2 is expected to affect equipment or processes located at existing commercial or industrial facilities, which are typically areas that have already been greatly disturbed and that currently do not support such habitats. Additionally, PAR 1110.2 does not require or induce construction of any new land use projects that could affect biological resources. Construction of new land use projects would be done for reasons unrelated to PAR 1110.2.

XVIII.b) Based on the foregoing analyses, since PAR 1110.2 may generate any project-specific adverse significant environmental impacts for air quality, energy and hazards and hazardous materials. If significant adverse project-specific impacts are generated by PAR 1110.2, the project is expected to be cumulatively significant for those environmental topics. If PAR 1110.2

is not determined to be significant for adverse project-specific impacts, then it is not expected to cause cumulative impacts in conjunction with other projects that may occur concurrently with or subsequent to the proposed project. Related projects to the currently proposed project include existing and proposed rules and regulations, as well as AQMP control measures. The environmental topics checked 'No Impact' (e.g., aesthetics, agriculture resources, biological resources, cultural resources, geology and soils, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, and transportation and traffic) would not be expected to make any contribution to potential cumulative impacts whatsoever. For the environmental topic checked 'Less than Significant Impact' (e.g., solid/hazardous waste), the analysis indicated that project impacts would not exceed any project-specific significance thresholds. This conclusion is based on the fact that the analyses for each of these environmental areas concluded that the incremental effects of the proposed project would be minor and, therefore, not considered to be cumulatively considerable.

XVIII.c) Based on the foregoing analyses, PAR 1110.2 may cause significant adverse effects on human beings. The Draft EA will analyze air quality, energy and hazards and hazardous material impacts expected from the implementation of PAR 1110.2. Based on the preceding analyses, no significant adverse impacts to aesthetics, agriculture resources, biological resources, cultural resources, geology and soils, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, solid/hazardous waste and transportation and traffic are expected as a result of the implementation of PAR 1110.2.

APPENDIX A (OF THE INITIAL STUDY)

PROPOSED RULE 1110.2

In order to save space and avoid repetition, please refer to the latest version of proposed amended Rule 1110.2 located elsewhere in Appendix B of the Draft EA. The April 24 2007 version of the proposed amended rule was circulated with the Notice of Preparation/Initial Study (NOP/IS) that was released on April 26, 2007 for a 30-day public review and comment period ending May 25, 2007.

Hard copies of this NOP/IS, which include the version "PAR 1110.2 (April 24 2007)" of the proposed amended rule, can be obtained through the SCAQMD Public Information Center at the Diamond Bar headquarters or by calling (909) 396-2039

APPENDIX B (OF THE INITIAL STUDY)

ASSUMPTIONS AND CALCULATIONS

Table B-1
PAR 1110.2 Emission Calculations - Summary (tons per day)

	Emissions			Emission Reductions		
Description	**NOx, ton/day**	**CO, ton/day**	**VOC, ton/ year**	**NOx, ton/day**	**CO, ton/day**	**VOC, ton/day**
Calculated Baseline	3.00	10.91	1.25			
Estimated Actual Baseline (Including Excess Emiss.)	4.26	52.98	8.64			
Calculated Emissions beginning 6/1/2007	4.20	52.67	8.62	0.06	0.31	0.03
Calculated Emissions as of 7/1/2008	2.92	10.76	1.24	1.28	41.91	7.37
Calculated Emissions beginning 7/1/2010	2.68	8.60	1.00	0.24	2.17	0.24
Calculated Emissions beginning 7/1/2011	2.46	7.66	0.98	0.21	0.94	0.02
Calculated Emissions beginning 7/1/2012	1.35	3.81	0.86	1.12	3.85	0.12
Totals				2.91	49.17	7.78

Calculated emissions are based on reported fuel use. NOx emissions are based on the NOx limit of each engine or the reported NOx for RECLAIM major sources or if the AER-reported NOx exceeds the calculated NOx based on the NOx limit. CO and VOC emissions are based on the CO and VOC limits for BACT engines. For non-BACT engines, CO and VOC emissions are based on the averaged source test results for the engine or on the average source test results for the category (if there are no source test data for that engine). Emissions are scaled up by a 1/0.696 factor to account for a 69.6% survey response rate.
Excess emissions are based on the results of AQMD unannounced tests, which showed the following results, on average, in terms of the ratio (R) of the measured pollutant concentration to the concentration limit (L):

Rich-burn engines without CEMS:	R-NOx = 2.12 x (45.85 / L-NOx)^0.647
	R-CO = 0.7 x (2000 / L-CO)^0.692
Rich-burn engines with CEMS:	R-NOx = 0.115
	R-CO = 3.65 x (2000 / L-CO)^0.692
Lean-Burn non-biogas BACT engines w/o CEMS:	R-NOx = 1.81
	R-CO = 0.33
In all cases, it is assumed that R-VOC = R-CO	

For the one RECLAIM-major, BACT, rich-burn engine, the excess-emission formula is not applied since the reported NOx emission is close to the BACT NOx limit, suggesting that the engine is not being operated at excessively low NOx as has been observed on average for other rich-burn engines with CEMS.
For RECLAIM-non-major, non-BACT, rich-burn engines, the excess NOx emission formula is not applied if the NOx limit exceeds 100 ppm at 15% O2 since this is considered too far beyond the range of the data upon which the formula is based. In those cases, the excess NOx emission is assumed to be zero.
Emission reductions beginning 6/1/2007 reflect the elimination of elevated emission limits based on efficiency for non-biogas engines and restriction of non-biogas fuel use in biogas engines that are using the elevated emission limits. The biogas/non-biogas portions of these reductions are as follows: NOx- 0.048 /0.024, CO- 0.207/0.160, VOC- 0.019/0.018.
Further reductions beginning 7/1/2008 reflect the effects of increased CEMS monitoring, addition of CEMS CO monitoring, and initiation of inspection and monitoring programs for non-CEMS engines--all of which, combined, are expected to eliminate the excess emissions by 7/1/2008.
Further reductions beginning 7/1/2010 are the result of reducing emission limits on non-biogas engines that are 500 bhp and larger to current non-biogas BACT levels (11 ppm NOx, 70 ppm CO and 30 ppm VOC, all at 15% O2).
Further reductions beginning 7/1/2011 are the result of reducing emission limits on non-biogas engines smaller than 500 bhp to current non-biogas BACT levels.
Further reductions beginning 7/1/2012 are the result of reducing emission limits on biogas engines to current non-biogas
BACT levels.

Table B-2
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
Biogas, BACT, =>1000															
025070	394362	4261	Generator			SCR	0	0	0	0	58.2	58.2	0	0	0
025070	394363	4261	Generator			SCR	0	0	0	0	58.2	58.2	0	0	0
025070	394364	4261	Generator			SCR	0	0	0	0	58.2	58.2	0	0	0
9163	323773	1988	Generator			SCR	0	0	0	0	27.2	27.2	0	0	0
9163	323774	1988	Generator			SCR	0	0	0	0	27.2	27.2	0	0	0
113674	430422	1877	Generator			SCR	0	0	0	0	25.6	25.6	0	0	0
113674	430424	1877	Generator			SCR	0	0	0	0	25.6	25.6	0	0	0
113674	430726	1877	Generator			SCR	0	0	0	0	25.6	25.6	0	0	0
50310	437561	1877	Generator			SCR	0	0	0	0	25.6	25.6	0	0	0
50310	437562	1877	Generator			SCR	0	0	0	0	25.6	25.6	0	0	0
50310	437563	1877	Generator			SCR	0	0	0	0	25.6	25.6	0	0	0
50310	437564	1877	Generator			SCR	0	0	0	0	25.6	25.6	0	0	0
50310	437565	1877	Generator			SCR	0	0	0	0	25.6	25.6	0	0	0
6979	438643	1777	Generator			SCR	0	0	0	0	24.3	24.3	0	0	0
140846	430412	1468	Generator			SCR	0	0	0	0	20.1	20.1	0	0	0
74413	390032	1350	Generator			SCR	0	0	0	0	18.4	18.4	0	0	0
Biogas, BACT, <1000															
013088	414294	400	Compressor			SCR	20	0	0	0	0.0	20.1	0	0	26
Biogas, Non-BACT, =>1000															
104806	323139	4235	Generator			SCR	0	0	0	0	57.9	57.9	0	0	0
104806	323140	4235	Generator			SCR	0	0	0	0	57.9	57.9	0	0	0
29110	414653	4166	Generator			SCR	0	0	0	0	56.9	56.9	0	0	0
29110	414654	4166	Generator			SCR	0	0	0	0	56.9	56.9	0	0	0
29110	414655	4166	Generator			SCR	0	0	0	0	56.9	56.9	0	0	0
29110	414656	4166	Generator			SCR	0	0	0	0	56.9	56.9	0	0	0
29110	414657	4166	Generator			SCR	0	0	0	0	56.9	56.9	0	0	0
17301	414648	3471	Generator			SCR	0	0	0	0	47.4	47.4	0	0	0
17301	414650	3471	Generator			SCR	0	0	0	0	47.4	47.4	0	0	0
17301	414651	3471	Generator			SCR	0	0	0	0	47.4	47.4	0	0	0
113518	414941	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0
113518	414942	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0
113518	414943	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0
142408	437742	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0
142408	437743	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0
142408	437744	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0
142408	437745	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0
142408	437746	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
142417	437754	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0
142417	437755	2650	Generator			SCR	0	0	0	0	36.2	36.2	0	0	0
9961	301547	1599	Generator			SCR	0	0	0	0	21.8	21.8	0	0	0
9961	301548	1599	Generator			SCR	0	0	0	0	21.8	21.8	0	0	0
9961	301549	1599	Generator			SCR	0	0	0	0	21.8	21.8	0	0	0
135216	411148	1408	Generator			SCR	0	0	0	0	19.2	19.2	0	0	0
135216	411147	1158	Generator			SCR	0	0	0	0	15.8	15.8	0	0	0
Biogas, Non-BACT <1000															
9163	433835	920	Generator			SCR	20	0	0	0	12.6	32.7	0	0	0
1179	438072	911	Generator			SCR	0	0	0	0	12.4	12.4	0	0	0
11301	160410	750	Generator			SCR	20	0	0	0	10.2	30.4	0	0	0
11301	160411	750	Generator			SCR	0	0	0	0	10.2	10.2	0	0	0
022674	351750	705	Generator			SCR	0	0	0	0	9.6	9.6	0	0	0
13433	319394	580	Generator			SCR	20	0	0	0	7.9	28.1	0	0	0
13433	319395	580	Generator			SCR	0	0	0	0	7.9	7.9	0	0	0
13433	319396	580	Generator			SCR	0	0	0	0	7.9	7.9	0	0	0
3866	172772	636	Compressor			SCR	0	0	0	0	0	0	0	0	41
001703	373739	530	Compressor			SCR	20	0	0	0	0	20.1	0	0	34
001703	373740	530	Compressor			SCR	0	0	0	0	0	0	0	0	34
019159	416944	260	Compressor			SCR	20	0	0	0	0	20.1	0	0	17
Non-Biogas, RECLAIM, BACT, Rich, Major															
68118	436966	2000	Pump				0	0	0	0	0	0	0	0	0
Non-Biogas, RECLAIM, BACT, Rich, Non-Major															
800128	367656	818	Generator				20	0	0	0	0	20.1	0	0	0
800128	367657	818	Generator				0	0	0	0	0	0	0	0	0
800128	367658	818	Generator				0	0	0	0	0	0	0	0	0
800128	367659	818	Generator				0	0	0	0	0	0	0	0	0
18455	406950	600	Generator				20	0	0	0	0	20.1	0	0	0
18455	406951	564	Generator				0	0	0	0	0	0	0	0	0
18455	406952	564	Generator				0	0	0	0	0	0	0	0	0
141012	432686	790	Compressor				20	0	0	0	0	20.1	0	0	0
141012	432687	790	Compressor				0	0	0	0	0	0	0	0	0
800127	274839	750	Compressor				20	0	0	0	0	20.1	0	0	0
346	335791	545	Compressor				0	0	0	0	0	0	0	0	0
100844	425811	412	Compressor				0	0	0	0	0	0	0	0	0
6714	408065	283	Pump				0	0	0	0	0	0	0	0	0
6714	408067	283	Pump				0	0	0	0	0	0	0	0	0
6714	408064	116	Pump				0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
6714	408068	116	Pump				0	0	0	0	0	0	0	0	0
Non-Biogas, RECLAIM, Non-BACT, Rich, Major															
130211	414383	2068	Generator	Upgrade			0	0	0	0	0	0	0	0	0
Non-Biogas, RECLAIM, Non-BACT, Rich, Non-Major															
98159	332851	870	Generator	Upgrade			0	0	0	0	0	0	0	0	0
5973	362357	818	Generator	Upgrade			20	0	0	0	0	20.1	0	0	0
5973	362358	818	Generator	Upgrade			0	0	0	0	0	0	0	0	0
5973	362359	818	Generator	Upgrade			0	0	0	0	0	0	0	0	0
54547	171158	125	Generator		Upgrade		0	0	0	0	0	0	0	0	0
5973	101703	738	Compressor	Upgrade			0	0	0	0	0	0	0	0	0
5973	101704	738	Compressor	Upgrade			0	0	0	0	0	0	0	0	0
75531	319404	250	Compressor		Upgrade		0	0	0	0	0	0	0	0	0
75531	319405	250	Compressor		Upgrade		0	0	0	0	0	0	0	0	0
11034	190074	132	Compressor		Upgrade		20	0	0	0	0	20.1	0	0	0
11034	190075	132	Compressor		Upgrade		0	0	0	0	0	0	0	0	0
11034	190076	132	Compressor		Upgrade		0	0	0	0	0	0	0	0	0
800189	457331	708	Pump	Upgrade			20	0	0	0	0	20.1	0	0	0
800189	457332	708	Pump	Upgrade			0	0	0	0	0	0	0	0	0
11034	156967	377	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
11034	156968	377	Pump		Upgrade		0	0	0	0	0	0	0	0	0
9053	434478	377	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
9053	434498	377	Pump		Upgrade		0	0	0	0	0	0	0	0	0
9053	434501	377	Pump		Upgrade		0	0	0	0	0	0	0	0	0
11034	156966	287	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
9053	434502	244	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
9053	434503	244	Pump		Upgrade		0	0	0	0	0	0	0	0	0
9053	434504	244	Pump		Upgrade		0	0	0	0	0	0	0	0	0
800189	457324	218	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
800189	457335	218	Pump		Upgrade		0	0	0	0	0	0	0	0	0
11034	190071	193	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
11034	190072	193	Pump		Upgrade		0	0	0	0	0	0	0	0	0
11034	190073	193	Pump		Upgrade		0	0	0	0	0	0	0	0	0
800189	457334	151	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
800189	457325	102	Pump		Upgrade		0	0	0	0	0	0	0	0	0
800189	457326	102	Pump		Upgrade		0	0	0	0	0	0	0	0	0
8582	198426	97	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
8582	198427	97	Pump		Upgrade		0	0	0	0	0	0	0	0	0
8582	198428	97	Pump		Upgrade		0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
9217	196405	86	Pump		Upgrade		0	0	0	0	0	0	0	0	0
9217	196409	86	Pump		Upgrade		0	0	0	0	0	0	0	0	0
Non-Biogas, RECLAIM, Non-BACT, Lean, Major, 4-Stroke															
5973	147546	5500	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
5973	156060	5500	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
5973	156061	5500	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
5973	156062	5500	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
5973	156063	5500	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
800128	153507	2000	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
800128	159101	2000	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
800128	159102	2000	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
800128	159103	2000	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
800128	159104	2000	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
9053	434505	1650	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
9053	434506	1650	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
9053	434507	1650	Compressor	Ox Cat			0	0	0	0	0	0	0	0	0
Non-Biogas, RECLAIM, Non-BACT, Lean, Major, 2-Stroke															
4242	170675	3000	Generator	Electric			0	17,367	0	0	0	17,367	-193	0	0
8582	368116	2000	Compressor	Electric			0	12,305	0	0	0	12,305	-129	0	0
8582	368117	2000	Compressor	Electric			0	12,305	0	0	0	12,305	-129	0	0
8582	368118	2000	Compressor	Electric			0	12,305	0	0	0	12,305	-129	0	0
4242	169829	3200	Compressor	Electric			0	19,688	0	0	0	19,688	-206	0	0
4242	172126	3000	Compressor	Electric			0	18,458	0	0	0	18,458	-193	0	0
800127	327697	1800	Compressor	Electric			0	11,075	0	0	0	11,075	-116	0	0
800127	327699	1800	Compressor	Electric			0	11,075	0	0	0	11,075	-116	0	0
8582	311760	1350	Compressor	Electric			0	8,306	0	0	0	8,306	-87	0	0
8582	311761	1350	Compressor	Electric			0	8,306	0	0	0	8,306	-87	0	0
8582	311755	1100	Compressor	Electric			0	6,768	0	0	0	6,768	-71	0	0
8582	311756	1100	Compressor	Electric			0	6,768	0	0	0	6,768	-71	0	0
4242	364371	995	Compressor	Electric			20	6,122	0	0	0	6,142	-64	0	0
4242	364373	995	Compressor	Electric			0	6,122	0	0	0	6,122	-64	0	0
4242	364374	995	Compressor	Electric			0	6,122	0	0	0	6,122	-64	0	0
Non-Biogas, RECLAIM, Non-BACT, Lean, Non-Major															
17953	384810	810	Generator	Ox Cat			0	0	3.47	0	0	3.5	0	0	0
800127	169969	328	Generator		Ox Cat		20	0	0	1.41	0	21.6	0	0	0
800127	169970	328	Generator		Ox Cat		0	0	0	1.41	0	1.4	0	0	0
800127	169971	328	Generator		Ox Cat		0	0	0	1.41	0	1.4	0	0	0
800127	169972	328	Generator		Ox Cat		0	0	0	1.41	0	1.4	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
101369	292228	88	Generator		Ox Cat		0	0	0	0.38	0	0.4	0	0	0
800363	347919	300	Compressor		Ox Cat		0	0	0	0	0	0	0	0	0
800189	457333	218	Pump		Ox Cat		20	0	0	0	0	20.1	0	0	0
Non-Biogas, Non-RECLAIM, BACT, Rich, =>1000															
007417	409351	2200	Generator				0	0	0	0	0	0	0	0	0
11245	406575	2080	Generator				0	0	0	0	0	0	0	0	0
11245	406576	2080	Generator				0	0	0	0	0	0	0	0	0
11245	406577	2080	Generator				0	0	0	0	0	0	0	0	0
132687	401752	1898	Generator				0	0	0	0	0	0	0	0	0
132687	401753	1898	Generator				0	0	0	0	0	0	0	0	0
129033	388869	1695	Generator				0	0	0	0	0	0	0	0	0
129033	388870	1695	Generator				0	0	0	0	0	0	0	0	0
129033	388871	1695	Generator				0	0	0	0	0	0	0	0	0
129033	388873	1695	Generator				0	0	0	0	0	0	0	0	0
129033	388875	1695	Generator				0	0	0	0	0	0	0	0	0
129033	388876	1695	Generator				0	0	0	0	0	0	0	0	0
129033	388877	1695	Generator				0	0	0	0	0	0	0	0	0
3513	399704	1692	Generator				0	0	0	0	0	0	0	0	0
3513	399705	1692	Generator				0	0	0	0	0	0	0	0	0
6324	416768	1478	Generator				0	0	0	0	0	0	0	0	0
6324	416769	1478	Generator				0	0	0	0	0	0	0	0	0
67399	401572	1470	Generator				0	0	0	0	0	0	0	0	0
43880	434981	1050	Compressor				0	0	0	0	0	0	0	0	0
43880	434982	1050	Compressor				0	0	0	0	0	0	0	0	0
43880	434983	1050	Compressor				0	0	0	0	0	0	0	0	0
136965	416861	2000	Pump				0	0	0	0	0	0	0	0	0
68112	423950	2000	Pump				0	0	0	0	0	0	0	0	0
800236	377389	1564	Pump				0	0	0	0	0	0	0	0	0
800236	377395	1564	Pump				0	0	0	0	0	0	0	0	0
800236	377397	1564	Pump				0	0	0	0	0	0	0	0	0
800236	377399	1564	Pump				0	0	0	0	0	0	0	0	0
800236	377400	1564	Pump				0	0	0	0	0	0	0	0	0
Non-Biogas, Non-RECLAIM, BACT, Rich, <1000															
96326	434798	999	Generator				20	0	0	0	0	20.1	0	0	0
96326	434799	999	Generator				0	0	0	0	0	0	0	0	0
1912	408888	998	Generator				20	0	0	0	0	20.1	0	0	0
1912	408889	998	Generator				0	0	0	0	0	0	0	0	0
001703	299074	930	Generator				20	0	0	0	0	20.1	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
001703	331502	930	Generator				0	0	0	0	0	0	0	0	0
120088	387989	930	Generator				20	0	0	0	0	20.1	0	0	0
120088	387990	930	Generator				0	0	0	0	0	0	0	0	0
121454	387995	930	Generator				20	0	0	0	0	20.1	0	0	0
121454	387996	930	Generator				0	0	0	0	0	0	0	0	0
131709	398473	930	Generator				0	0	0	0	0	0	0	0	0
45063	396528	840	Generator				0	0	0	0	0	0	0	0	0
19185	428146	800	Generator				20	0	0	0	0	20.1	0	0	0
138723	422556	792	Generator				20	0	0	0	0	20.1	0	0	0
138723	422557	792	Generator				0	0	0	0	0	0	0	0	0
58639	390872	791	Generator				20	0	0	0	0	20.1	0	0	0
79174	385862	738	Generator				0	0	0	0	0	0	0	0	0
131258	420975	643	Generator				0	0	0	0	0	0	0	0	0
99201	421763	585	Generator				20	0	0	0	0	20.1	0	0	0
139280	424326	585	Generator				0	0	0	0	0	0	0	0	0
99201	421980	584	Generator				20	0	0	0	0	20.1	0	0	0
19185	428143	543	Generator				20	0	0	0	0	20.1	0	0	0
89159	422466	531	Generator				0	0	0	0	0	0	0	0	0
133176	403608	530	Generator				20	0	0	0	0	20.1	0	0	0
133176	403610	530	Generator				0	0	0	0	0	0	0	0	0
133176	403611	530	Generator				0	0	0	0	0	0	0	0	0
132251	409035	530	Generator				20	0	0	0	0	20.1	0	0	0
132251	409036	530	Generator				0	0	0	0	0	0	0	0	0
138293	421366	530	Generator				20	0	0	0	0	20.1	0	0	0
138293	421367	530	Generator				0	0	0	0	0	0	0	0	0
138293	421368	530	Generator				0	0	0	0	0	0	0	0	0
138851	422959	530	Generator				20	0	0	0	0	20.1	0	0	0
138851	422960	530	Generator				0	0	0	0	0	0	0	0	0
141084	431261	530	Generator				20	0	0	0	0	20	0	0	0
141084	431262	530	Generator				0	0	0	0	0	0	0	0	0
70769	408911	495	Generator				0	0	0	0	0	0	0	0	0
140945	430753	380	Generator				0	0	0	0	0	0	0	0	0
65819	389615	366	Generator				0	0	0	0	0	0	0	0	0
137369	418087	350	Generator				0	0	0	0	0	0	0	0	0
118124	417507	336	Generator				0	0	0	0	0	0	0	0	0
118124	417508	336	Generator				0	0	0	0	0	0	0	0	0
131157	391590	310	Generator				20	0	0	0	0	20.1	0	0	0
131157	391591	310	Generator				0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
131157	391592	310	Generator				0	0	0	0	0	0	0	0	0
131157	391593	310	Generator				0	0	0	0	0	0	0	0	0
131157	391594	310	Generator				0	0	0	0	0	0	0	0	0
131157	391596	310	Generator				0	0	0	0	0	0	0	0	0
131157	391597	310	Generator				0	0	0	0	0	0	0	0	0
131157	391598	310	Generator				0	0	0	0	0	0	0	0	0
131157	391599	310	Generator				0	0	0	0	0	0	0	0	0
123684	395143	310	Generator				0	0	0	0	0	0	0	0	0
131156	396199	310	Generator				0	0	0	0	0	0	0	0	0
131155	396200	310	Generator				0	0	0	0	0	0	0	0	0
138279	421318	310	Generator				0	0	0	0	0	0	0	0	0
141363	432379	310	Generator				0	0	0	0	0	0	0	0	0
143086	438530	310	Generator				20	0	0	0	0	20.1	0	0	0
143086	438531	310	Generator				0	0	0	0	0	0	0	0	0
143086	438533	310	Generator				0	0	0	0	0	0	0	0	0
143086	438534	310	Generator				0	0	0	0	0	0	0	0	0
133802	405959	282	Generator				20	0	0	0	0	20.1	0	0	0
133802	405960	282	Generator				0	0	0	0	0	0	0	0	0
133802	405961	282	Generator				0	0	0	0	0	0	0	0	0
133802	405962	282	Generator				0	0	0	0	0	0	0	0	0
141084	431264	282	Generator				20	0	0	0	0	20.1	0	0	0
129336	389961	275	Generator				0	0	0	0	0	0	0	0	0
140947	430760	270	Generator				0	0	0	0	0	0	0	0	0
140947	430762	270	Generator				0	0	0	0	0	0	0	0	0
140947	430764	270	Generator				0	0	0	0	0	0	0	0	0
141199	435531	270	Generator				0	0	0	0	0	0	0	0	0
141199	435532	270	Generator				0	0	0	0	0	0	0	0	0
141199	435533	270	Generator				0	0	0	0	0	0	0	0	0
135490	412041	268	Generator				0	0	0	0	0	0	0	0	0
135490	412042	268	Generator				0	0	0	0	0	0	0	0	0
135490	412043	268	Generator				0	0	0	0	0	0	0	0	0
45938	417562	240	Generator				0	0	0	0	0	0	0	0	0
2638	320968	225	Generator				0	0	0	0	0	0	0	0	0
2638	320969	225	Generator				0	0	0	0	0	0	0	0	0
131426	431200	220	Generator				0	0	0	0	0	0	0	0	0
131426	431201	220	Generator				0	0	0	0	0	0	0	0	0
130085	392437	210	Generator				0	0	0	0	0	0	0	0	0
134448	408357	210	Generator				0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
134449	408359	210	Generator				0	0	0	0	0	0	0	0	0
138055	420563	210	Generator				0	0	0	0	0	0	0	0	0
138056	420564	210	Generator				0	0	0	0	0	0	0	0	0
140466	428824	210	Generator				0	0	0	0	0	0	0	0	0
82513	433441	202	Generator				20	0	0	0	0	20.1	0	0	0
82513	433442	202	Generator				0	0	0	0	0	0	0	0	0
82513	433443	202	Generator				0	0	0	0	0	0	0	0	0
82513	433444	202	Generator				0	0	0	0	0	0	0	0	0
82513	433445	202	Generator				0	0	0	0	0	0	0	0	0
82513	433446	202	Generator				0	0	0	0	0	0	0	0	0
132653	435512	195	Generator				0	0	0	0	0	0	0	0	0
137976	435522	195	Generator				0	0	0	0	0	0	0	0	0
137976	435523	195	Generator				0	0	0	0	0	0	0	0	0
138791	422748	173	Generator				0	0	0	0	0	0	0	0	0
132182	400404	162	Generator				0	0	0	0	0	0	0	0	0
129434	390240	157	Generator				0	0	0	0	0	0	0	0	0
5023	387253	149	Generator				0	0	0	0	0	0	0	0	0
5023	387254	149	Generator				0	0	0	0	0	0	0	0	0
45882	387483	135	Generator				0	0	0	0	0	0	0	0	0
83509	416748	135	Generator				0	0	0	0	0	0	0	0	0
83509	416749	135	Generator				0	0	0	0	0	0	0	0	0
133802	405963	110	Generator				20	0	0	0	0	20.1	0	0	0
70989	281036	101	Generator				0	0	0	0	0	0	0	0	0
34961	321188	94	Generator				0	0	0	0	0	0	0	0	0
34961	321189	94	Generator				0	0	0	0	0	0	0	0	0
120956	361525	93.8	Generator				0	0	0	0	0	0	0	0	0
116813	372297	86	Generator				0	0	0	0	0	0	0	0	0
116813	372298	86	Generator				0	0	0	0	0	0	0	0	0
116813	372299	86	Generator				0	0	0	0	0	0	0	0	0
16211	403396	86	Generator				0	0	0	0	0	0	0	0	0
16211	403879	86	Generator				0	0	0	0	0	0	0	0	0
16211	403881	86	Generator				0	0	0	0	0	0	0	0	0
16211	403882	86	Generator				0	0	0	0	0	0	0	0	0
16211	403884	86	Generator				0	0	0	0	0	0	0	0	0
16211	403886	86	Generator				0	0	0	0	0	0	0	0	0
129025	388842	80	Generator				0	0	0	0	0	0	0	0	0
129664	391023	80	Generator				0	0	0	0	0	0	0	0	0
115471	409783	74	Generator				0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
115471	409784	74	Generator				0	0	0	0	0	0	0	0	0
115471	409785	74	Generator				0	0	0	0	0	0	0	0	0
43759	434971	800	Compressor				20	0	0	0	0	20.1	0	0	0
43759	434972	800	Compressor				0	0	0	0	0	0	0	0	0
43759	434973	800	Compressor				0	0	0	0	0	0	0	0	0
22265	434975	800	Compressor				20	0	0	0	0	20.1	0	0	0
22265	434976	800	Compressor				0	0	0	0	0	0	0	0	0
22265	434977	800	Compressor				0	0	0	0	0	0	0	0	0
013088	342013	700	Compressor				20	0	0	0	0	20.1	0	0	0
013088	416840	700	Compressor				0	0	0	0	0	0	0	0	0
134325	407959	607	Compressor				20	0	0	0	0	20.1	0	0	0
134325	407960	607	Compressor				0	0	0	0	0	0	0	0	0
134325	407961	607	Compressor				0	0	0	0	0	0	0	0	0
134326	407963	607	Compressor				0	0	0	0	0	0	0	0	0
134326	407964	607	Compressor				0	0	0	0	0	0	0	0	0
134326	407965	607	Compressor				0	0	0	0	0	0	0	0	0
134329	407967	607	Compressor				20	0	0	0	0	20.1	0	0	0
134329	407968	607	Compressor				0	0	0	0	0	0	0	0	0
134329	407969	607	Compressor				0	0	0	0	0	0	0	0	0
83111	385480	585	Compressor				0	0	0	0	0	0	0	0	0
18517	434978	530	Compressor				20	0	0	0	0	20.1	0	0	0
18517	434979	530	Compressor				0	0	0	0	0	0	0	0	0
18517	434980	530	Compressor				0	0	0	0	0	0	0	0	0
001703	331499	465	Compressor				20	0	0	0	0	20.1	0	0	0
8309	342750	450	Compressor				0	0	0	0	0	0	0	0	0
53745	350036	415	Compressor				0	0	0	0	0	0	0	0	0
50645	350037	415	Compressor				0	0	0	0	0	0	0	0	0
111116	388705	405	Compressor				0	0	0	0	0	0	0	0	0
140028	429785	400	Compressor				0	0	0	0	0	0	0	0	0
66086	419537	365	Compressor				0	0	0	0	0	0	0	0	0
66086	419538	365	Compressor				0	0	0	0	0	0	0	0	0
019159	331495	330	Compressor				20	0	0	0	0	20.1	0	0	0
22092	367195	292	Compressor				0	0	0	0	0	0	0	0	0
800041	326508	220	Compressor				0	0	0	0	0	0	0	0	0
123664	370691	203	Compressor				0	0	0	0	0	0	0	0	0
94117	347693	200	Compressor				0	0	0	0	0	0	0	0	0
134328	407966	195	Compressor				0	0	0	0	0	0	0	0	0
134330	407970	195	Compressor				0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
89852	401453	194	Compressor				0	0	0	0	0	0	0	0	0
64375	386532	158	Compressor				0	0	0	0	0	0	0	0	0
139380	424742	158	Compressor				0	0	0	0	0	0	0	0	0
139380	424743	158	Compressor				0	0	0	0	0	0	0	0	0
139380	424744	158	Compressor				0	0	0	0	0	0	0	0	0
49572	434072	153	Compressor				0	0	0	0	0	0	0	0	0
49572	434472	153	Compressor				0	0	0	0	0	0	0	0	0
49572	434473	153	Compressor				0	0	0	0	0	0	0	0	0
49572	434474	153	Compressor				0	0	0	0	0	0	0	0	0
109393	317735	149	Compressor				0	0	0	0	0	0	0	0	0
109393	317738	149	Compressor				0	0	0	0	0	0	0	0	0
109393	317742	149	Compressor				0	0	0	0	0	0	0	0	0
111345	324916	145	Compressor				0	0	0	0	0	0	0	0	0
18650	328168	145	Compressor				0	0	0	0	0	0	0	0	0
16211	403397	119	Compressor				0	0	0	0	0	0	0	0	0
123664	406670	539	Other				0	0	0	0	0	0	0	0	0
001703	426335	815	Pump				20	0	0	0	0	20.1	0	0	0
001703	373968	814	Pump				0	0	0	0	0	0	0	0	0
96562	353382	750	Pump				20	0	0	0	0	20.1	0	0	0
001703	356818	700	Pump				20	0	0	0	0	20.1	0	0	0
133829	406061	526	Pump				0	0	0	0	0	0	0	0	0
139509	425325	524	Pump				20	0	0	0	0	20.1	0	0	0
139509	425326	524	Pump				0	0	0	0	0	0	0	0	0
139509	425327	524	Pump				0	0	0	0	0	0	0	0	0
111406	416671	512	Pump				0	0	0	0	0	0	0	0	0
54773	415033	473	Pump				20	0	0	0	0	20.1	0	0	0
54773	415034	473	Pump				0	0	0	0	0	0	0	0	0
125016	374784	429	Pump				0	0	0	0	0	0	0	0	0
16239	420868	405	Pump				20	0	0	0	0	20.1	0	0	0
96562	364871	395	Pump				20	0	0	0	0	20.1	0	0	0
96562	364887	395	Pump				0	0	0	0	0	0	0	0	0
98380	292781	369	Pump				20	0	0	0	0	20.1	0	0	0
98380	292782	369	Pump				0	0	0	0	0	0	0	0	0
98380	292784	369	Pump				0	0	0	0	0	0	0	0	0
98380	292785	369	Pump				0	0	0	0	0	0	0	0	0
57555	420687	369	Pump				0	0	0	0	0	0	0	0	0
108286	313977	365	Pump				0	0	0	0	0	0	0	0	0
108293	336542	365	Pump				0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
108288	339584	365	Pump				0	0	0	0	0	0	0	0	0
070303	405402	365	Pump				0	0	0	0	0	0	0	0	0
54771	415036	350	Pump				0	0	0	0	0	0	0	0	0
16239	321174	329	Pump				20	0	0	0	0	20.1	0	0	0
16239	321175	329	Pump				0	0	0	0	0	0	0	0	0
16239	321176	329	Pump				0	0	0	0	0	0	0	0	0
16239	321177	329	Pump				0	0	0	0	0	0	0	0	0
52718	342367	321	Pump				0	0	0	0	0	0	0	0	0
52718	342369	321	Pump				0	0	0	0	0	0	0	0	0
87640	342373	321	Pump				0	0	0	0	0	0	0	0	0
94996	359880	310	Pump				0	0	0	0	0	0	0	0	0
94998	407123	310	Pump				0	0	0	0	0	0	0	0	0
95000	439777	310	Pump				0	0	0	0	0	0	0	0	0
94677	428124	305	Pump				0	0	0	0	0	0	0	0	0
5322	422131	289	Pump				0	0	0	0	0	0	0	0	0
52886	388444	246	Pump				0	0	0	0	0	0	0	0	0
52886	388445	246	Pump				0	0	0	0	0	0	0	0	0
52886	388447	246	Pump				0	0	0	0	0	0	0	0	0
52886	388449	246	Pump				0	0	0	0	0	0	0	0	0
52883	388459	246	Pump				0	0	0	0	0	0	0	0	0
52883	388462	246	Pump				0	0	0	0	0	0	0	0	0
070309	333800	225	Pump				0	0	0	0	0	0	0	0	0
070292	334717	225	Pump				20	0	0	0	0	20.1	0	0	0
68181	363123	225	Pump				0	0	0	0	0	0	0	0	0
070290	363870	225	Pump				0	0	0	0	0	0	0	0	0
119118	352647	220	Pump				0	0	0	0	0	0	0	0	0
119118	352648	220	Pump				0	0	0	0	0	0	0	0	0
119118	352649	220	Pump				0	0	0	0	0	0	0	0	0
113029	329845	211	Pump				0	0	0	0	0	0	0	0	0
070280	327127	200	Pump				0	0	0	0	0	0	0	0	0
94678	413795	200	Pump				0	0	0	0	0	0	0	0	0
95000	286934	180	Pump				0	0	0	0	0	0	0	0	0
93720	420807	160	Pump				0	0	0	0	0	0	0	0	0
54773	415030	158	Pump				20	0	0	0	0	20.1	0	0	0
54773	415031	158	Pump				0	0	0	0	0	0	0	0	0
54773	415032	158	Pump				0	0	0	0	0	0	0	0	0
66411	279623	157	Pump				0	0	0	0	0	0	0	0	0
2868	279621	145	Pump				0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
120455	359159	145	Pump				0	0	0	0	0	0	0	0	0
120455	359167	145	Pump				0	0	0	0	0	0	0	0	0
070289	390099	145	Pump				0	0	0	0	0	0	0	0	0
94676	413796	145	Pump				0	0	0	0	0	0	0	0	0
94676	413797	145	Pump				0	0	0	0	0	0	0	0	0
94999	286933	137	Pump				0	0	0	0	0	0	0	0	0
132772	401914	125	Pump				0	0	0	0	0	0	0	0	0
136018	413764	95	Pump				0	0	0	0	0	0	0	0	0
125300	375524	80	Pump				0	0	0	0	0	0	0	0	0
125300	375526	80	Pump				0	0	0	0	0	0	0	0	0
125300	375527	80	Pump				0	0	0	0	0	0	0	0	0
125300	375529	80	Pump				0	0	0	0	0	0	0	0	0
14898	389366	75	Pump				0	0	0	0	0	0	0	0	0
14898	389368	75	Pump				0	0	0	0	0	0	0	0	0
136021	413763	74	Pump				0	0	0	0	0	0	0	0	0
Non-Biogas, Non-RECLAIM, BACT, Lean, =>1000															
3671	408492	3352	Generator				0	0	0	0	0	0	0	0	0
3671	408493	3352	Generator				0	0	0	0	0	0	0	0	0
4773	386614	2682	Generator				0	0	0	0	0	0	0	0	0
4773	386615	2682	Generator				0	0	0	0	0	0	0	0	0
21123	405486	2494	Generator				0	0	0	0	0	0	0	0	0
45973	423225	2307	Generator				0	0	0	0	0	0	0	0	0
102153	403632	2095	Generator				0	0	0	0	0	0	0	0	0
102153	403633	2095	Generator				0	0	0	0	0	0	0	0	0
138267	421271	2083	Generator				0	0	0	0	0	0	0	0	0
138267	438902	2083	Generator				0	0	0	0	0	0	0	0	0
65818	422450	1737	Generator				0	0	0	0	0	0	0	0	0
7796	391786	1468	Generator				0	0	0	0	0	0	0	0	0
77033	400718	1468	Generator				0	0	0	0	0	0	0	0	0
109524	413078	1468	Generator				0	0	0	0	0	0	0	0	0
62589	415988	1468	Generator				0	0	0	0	0	0	0	0	0
129827	426299	1468	Generator				0	0	0	0	0	0	0	0	0
Non-Biogas, Non-RECLAIM, BACT, Lean, <1000															
7814	412278	898	Generator				0	0	0	0	0	0	0	0	0
132087	399874	880	Other				20	0	0	0	0	20.1	0	0	0
132087	399876	880	Other				0	0	0	0	0	0	0	0	0
Non-Biogas, Non-RECLAIM, Non-BACT, Rich, =>1000															
14437	288133	1200	Generator	Upgrade			0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
14437	288134	1200	Generator	Upgrade			0	0	0	0	0	0	0	0	0
14437	341089	1200	Generator	Upgrade			0	0	0	0	0	0	0	0	0
118684	350357	1131	Generator	Upgrade			0	0	0	0	0	0	0	0	0
118684	350358	1131	Generator	Upgrade			0	0	0	0	0	0	0	0	0
Non-Biogas, Non-RECLAIM, Non-BACT, Rich, <1000															
42218	117607	930	Generator	Upgrade			20	0	0	0	0	20.1	0	0	0
42218	117608	930	Generator	Upgrade			0	0	0	0	0	0	0	0	0
42217	117609	930	Generator	Upgrade			0	0	0	0	0	0	0	0	0
013088	414452	930	Generator	Upgrade			20	0	0	0	0	20.1	0	0	0
142517	438239	713	Generator	Upgrade			0	0	0	0	0	0	0	0	0
85339	274452	315	Generator		Upgrade		0	0	0	0	0	0	0	0	0
86055	279345	294	Generator		Upgrade		0	0	0	0	0	0	0	0	0
20231	281005	150	Generator		Upgrade		20	0	0	0	0	20.1	0	0	0
20231	281006	150	Generator		Upgrade		0	0	0	0	0	0	0	0	0
10636	316911	148	Generator		Upgrade		0	0	0	0	0	0	0	0	0
6728	316912	148	Generator		Upgrade		0	0	0	0	0	0	0	0	0
18435	316913	148	Generator		Upgrade		0	0	0	0	0	0	0	0	0
2638	172356	145	Generator		Upgrade		0	0	0	0	0	0	0	0	0
79856	328255	145	Generator		Upgrade		0	0	0	0	0	0	0	0	0
140598	429420	135	Generator		Upgrade		0	0	0	0	0	0	0	0	0
82303	329294	94	Generator		Upgrade		0	0	0	0	0	0	0	0	0
33465	313771	86	Generator		Upgrade		0	0	0	0	0	0	0	0	0
660	442592	600	Compressor	Upgrade			20	0	0	0	0	20.1	0	0	0
660	442593	600	Compressor	Upgrade			0	0	0	0	0	0	0	0	0
660	442594	600	Compressor	Upgrade			0	0	0	0	0	0	0	0	0
019159	416831	330	Compressor		Upgrade		20	0	0	0	0	20.1	0	0	0
113251	410103	250	Compressor		Upgrade		0	0	0	0	0	0	0	0	0
007417	411022	225	Compressor		Upgrade		20	0	0	0	0	20.1	0	0	0
007417	411023	225	Compressor		Upgrade		0	0	0	0	0	0	0	0	0
007417	411024	225	Compressor		Upgrade		0	0	0	0	0	0	0	0	0
10827	280612	145	Compressor		Upgrade		0	0	0	0	0	0	0	0	0
78802	280570	400	Other		Upgrade		0	0	0	0	0	0	0	0	0
62851	322538	94	Other		Upgrade		0	0	0	0	0	0	0	0	0
65818	311320	810	Pump	Upgrade			20	0	0	0	0	20.1	0	0	0
076581	220569	660	Pump	Upgrade			20	0	0	0	0	20.1	0	0	0
95318	281245	634	Pump	Upgrade			20	0	0	0	0	20.1	0	0	0
95318	281247	634	Pump	Upgrade			0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
95318	281251	634	Pump	Upgrade			0	0	0	0	0	0	0	0	0
95318	281254	634	Pump	Upgrade			0	0	0	0	0	0	0	0	0
95318	281257	634	Pump	Upgrade			0	0	0	0	0	0	0	0	0
95318	281260	634	Pump	Upgrade			0	0	0	0	0	0	0	0	0
95066	280183	594	Pump	Upgrade			0	0	0	0	0	0	0	0	0
94967	280194	594	Pump	Upgrade			0	0	0	0	0	0	0	0	0
48820	159531	581	Pump	Upgrade			0	0	0	0	0	0	0	0	0
77388	426136	525	Pump	Upgrade			20	0	0	0	0	20.1	0	0	0
77388	426144	525	Pump	Upgrade			0	0	0	0	0	0	0	0	0
77388	426145	525	Pump	Upgrade			0	0	0	0	0	0	0	0	0
103070	312478	512	Pump	Upgrade			0	0	0	0	0	0	0	0	0
68143	187169	500	Pump	Upgrade			0	0	0	0	0	0	0	0	0
103052	390939	500	Pump	Upgrade			0	0	0	0	0	0	0	0	0
070296	411474	500	Pump	Upgrade			20	0	0	0	0	20.1	0	0	0
076581	220570	450	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
95977	281266	427	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070282	375501	425	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070286	410481	425	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070292	425052	425	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
15748	280342	417	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
15748	280344	417	Pump		Upgrade		0	0	0	0	0	0	0	0	0
20231	435450	409	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
20231	435451	409	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94950	280975	400	Pump		Upgrade		0	0	0	0	0	0	0	0	0
53733	280999	395	Pump		Upgrade		0	0	0	0	0	0	0	0	0
24427	281000	395	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95535	281109	395	Pump		Upgrade		0	0	0	0	0	0	0	0	0
21104	407532	395	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
65818	311322	370	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
58639	435736	370	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
74396	280341	369	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070292	214307	330	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
070292	214308	330	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070282	256758	330	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070311	267082	330	Pump		Upgrade		0	0	0	0	0	0	0	0	0
019159	367167	330	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
019159	367168	330	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070290	367776	330	Pump		Upgrade		0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
070296	390974	330	Pump		Upgrade		20	0	0	0	0	20	0	0	0
21104	414791	330	Pump		Upgrade		20	0	0	0	0	20	0	0	0
21104	436827	330	Pump		Upgrade		0	0	0	0	0	0	0	0	0
21104	436828	330	Pump		Upgrade		0	0	0	0	0	0	0	0	0
21104	436829	330	Pump		Upgrade		0	0	0	0	0	0	0	0	0
21104	436830	330	Pump		Upgrade		0	0	0	0	0	0	0	0	0
52348	276622	318	Pump		Upgrade		0	0	0	0	0	0	0	0	0
52348	276625	318	Pump		Upgrade		0	0	0	0	0	0	0	0	0
52348	276627	318	Pump		Upgrade		0	0	0	0	0	0	0	0	0
103052	170492	300	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070305	267083	300	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94940	280974	283	Pump		Upgrade		0	0	0	0	0	0	0	0	0
83315	280968	280	Pump		Upgrade		0	0	0	0	0	0	0	0	0
83315	280969	280	Pump		Upgrade		0	0	0	0	0	0	0	0	0
83315	280970	280	Pump		Upgrade		0	0	0	0	0	0	0	0	0
132190	264164	275	Pump		Upgrade		0	0	0	0	0	0	0	0	0
83313	280967	270	Pump		Upgrade		0	0	0	0	0	0	0	0	0
18239	328539	265	Pump		Upgrade		0	0	0	0	0	0	0	0	0
18239	328540	265	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94998	280360	250	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94999	280365	250	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95000	280369	250	Pump		Upgrade		0	0	0	0	0	0	0	0	0
83312	280965	250	Pump		Upgrade		0	0	0	0	0	0	0	0	0
83312	280966	250	Pump		Upgrade		0	0	0	0	0	0	0	0	0
83318	280971	250	Pump		Upgrade		0	0	0	0	0	0	0	0	0
84162	306922	238	Pump		Upgrade		0	0	0	0	0	0	0	0	0
84162	245380	230	Pump		Upgrade		0	0	0	0	0	0	0	0	0
52885	245384	230	Pump		Upgrade		0	0	0	0	0	0	0	0	0
52885	245385	230	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94442	274654	230	Pump		Upgrade		0	0	0	0	0	0	0	0	0
11301	215041	225	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
11301	215043	225	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070295	267086	225	Pump		Upgrade		0	0	0	0	0	0	0	0	0
11301	311565	225	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
11301	311566	225	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070300	335327	225	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070292	368326	225	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
070304	388598	225	Pump		Upgrade		0	0	0	0	0	0.00	0	0	0
070290	390942	225	Pump		Upgrade		0	0	0	0	0	0.00	0	0	0
070296	390946	225	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
15748	280343	220	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
070298	267085	200	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070280	267096	200	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070295	375503	200	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070302	402959	200	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070300	433992	200	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070300	433993	200	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070300	433994	200	Pump		Upgrade		0	0	0	0	0	0	0	0	0
2924	264159	190	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94938	280976	186	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94937	280978	186	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94937	280980	186	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94937	280981	186	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94995	280355	180	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94998	280359	180	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94997	280362	180	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94999	280364	180	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95979	281236	180	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
95979	281237	180	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95979	281240	180	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95979	281241	180	Pump		Upgrade		0	0	0	0	0	0	0	0	0
132189	264161	175	Pump		Upgrade		0	0	0	0	0	0	0	0	0
72489	288630	172	Pump		Upgrade		0	0	0	0	0	0	0	0	0
72489	288631	172	Pump		Upgrade		0	0	0	0	0	0	0	0	0
72489	288632	172	Pump		Upgrade		0	0	0	0	0	0	0	0	0
81001	246340	170	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070284	267090	165	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070284	267091	165	Pump		Upgrade		0	0	0	0	0	0	0	0	0
2868	274540	157	Pump		Upgrade		0	0	0	0	0	0	0	0	0
2868	279544	157	Pump		Upgrade		0	0	0	0	0	0	0	0	0
66403	279545	157	Pump		Upgrade		0	0	0	0	0	0	0	0	0
66403	279546	157	Pump		Upgrade		0	0	0	0	0	0	0	0	0
66413	279547	157	Pump		Upgrade		0	0	0	0	0	0	0	0	0
94928	280632	150	Pump		Upgrade		0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
94928	280633	150	Pump		Upgrade		0	0	0	0	0	0	0	0	0
20231	281023	150	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
20231	281024	150	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070317	267076	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070299	267084	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070283	267094	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
66413	279624	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
66413	311099	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
66413	311100	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070313	328532	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070281	393971	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
136235	414451	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070293	436931	145	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95979	281242	144	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
95979	281243	144	Pump		Upgrade		0	0	0	0	0	0	0	0	0
52883	245374	143	Pump		Upgrade		0	0	0	0	0	0	0	0	0
52883	245375	143	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070307	267080	140	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95000	280367	140	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95067	280185	137	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95067	280190	137	Pump		Upgrade		0	0	0	0	0	0	0	0	0
95067	280191	137	Pump		Upgrade		0	0	0	0	0	0	0	0	0
52884	245388	121	Pump		Upgrade		0	0	0	0	0	0	0	0	0
96374	280786	116	Pump		Upgrade		0	0	0	0	0	0	0	0	0
96374	280788	116	Pump		Upgrade		0	0	0	0	0	0	0	0	0
96374	280790	116	Pump		Upgrade		0	0	0	0	0	0	0	0	0
3513	399707	109	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
3513	399708	109	Pump		Upgrade		0	0	0	0	0	0	0	0	0
3513	399709	109	Pump		Upgrade		0	0	0	0	0	0	0	0	0
71685	280685	100	Pump		Upgrade		0	0	0	0	0	0	0	0	0
65819	311321	99	Pump		Upgrade		0	0	0	0	0	0	0	0	0
070295	241359	95	Pump		Upgrade		0	0	0	0	0	0	0	0	0
20231	281016	75	Pump		Upgrade		20	0	0	0	0	20.1	0	0	0
20231	281021	75	Pump		Upgrade		0	0	0	0	0	0	0	0	0
48523	288615	61	Pump		Upgrade		0	0	0	0	0	0	0	0	0
48523	288616	61	Pump		Upgrade		0	0	0	0	0	0	0	0	0

Table B-2 (Continued)
PAR1110.2 - Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Use CEMS, MW-hr/yr	Electric Use Engine, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use Cat Ox, MW-hr/yr	Electric Use SCR, MW-hr/yr	Electric Total, MW-hr/yr	Natural Gas Electric, MMscf/yr	Natural Gas Cat Ox, MMscf/yr	Natural Gas SCR, MMscf/yr
48523	288617	61	Pump		Upgrade		0	0	0	0	0	0	0	0	0
Survey Total							1,975	163,091	3	6	1,581	166,656	-1,718	2.0	152
District Total							2,837	234,326	5	9	2,272	239,448	-2,469	2.9	218

Control Measure

Install NOx-CO CEMS (CEMS) (costs are for one CEMS serving one or more engines)--Life=20 yrs

Power use by sample pump, refrigeration condenser and climate control (2,300 W x 8,760 op hr/yr), 2,300 W from Power Systems estimate provided to Dr. Howard Lange, April 12, 2007..

Upgrade Three-Way Catalyst (Upgrade)--NAIC=421730, Life=3 yrs

For estimate: 1-in. H2O pressure drop, if generator, electrical production decrease, kWh/yr = 0.00074 parasitic factor*bhp*8,000 op hr/yr*0.746 kW/bhp*0.97 motor efficiency OR if work engine, increased natural gas use by plant, scf/yr = (0.00074 parasitic factor*bhp*8, 000 op hr/yr*2545 Btu/bhp)/0.31 motor efficiency/1,020 Btu/scf.

Remove Engine and Replace with Electric Motor (generator engines not replaced) (Electric)--, Life=30 yrs (motor)

Reduced natural gas use, SCF/yr = (bhp*8, 000 op hr/yr *2,545 Btu/bhp) /0.31 motor efficiency/1,020 Btu/scf but corresponding increase in grid power production if this engine drives a generator kWh/yr = (bhp*8, 000 op-hr/yr *0.97 motor efficiency *0.746 kW/bhp

Increased power use (if non-generator), kWh/yr= (bph*8, 000 op hr/yr)/0.97 motor efficiency *0.746 kW/bhp

Install fuel gas cleanup system and SCR (SCR)--Life=30 yrs, Mntnc=replace sorbent monthly and catalysts (2) every 3 yrs

(Catalyst volume & weight.--1 CF per MMBtu/hr [includes ox cat], 1.2 specific gravity. Total cat volume, weight per HP = 14.2 cubic in, 0.615 lb)

For est. pressure drops of 3-in. H2O in cleanup system and 3-in. H2O in SCR+catox system, if generator, electrical production decrease, kWh/yr = 0.00236 parasitic factor * bhp*8, 000 op hr/yr *0.97 motor efficiency *0.746 kW/bhp OR if work engine, increase natural gas use by plant, scf/yr = (0.00236 parasitic factor*bhp*8, 000 op hr/yr *2,545 Btu/bhp)/0.31 motor efficiency/1,020 Btu/scf.

Table B-3
Hanover Engine Energy Analysis

Facility ID No.	Appl. No.	Engine HP	Engine Use	Primary Fuel	Natural Gas Usage, MMcft/yr	Natural Gas Energy, MMBtu/yr	Electric Energy, MW-hr/yr
43880	434981	1,050	Compressor	Natural Gas	15.91	16,233	6,078
43880	434982	1,050	Compressor	Natural Gas	13.84	14,121	6,078
43880	434983	1,050	Compressor	Natural Gas	13.84	14,121	6,078
43759	434971	800	Compressor	Natural Gas	12.16	12,407	4,631
43759	434972	800	Compressor	Natural Gas	12.16	12,407	4,631
43759	434973	800	Compressor	Natural Gas	12.16	12,407	4,631
22265	434975	800	Compressor	Natural Gas	10.64	10,857	4,631
22265	434976	800	Compressor	Natural Gas	10.64	10,857	4,631
22265	434977	800	Compressor	Natural Gas	10.64	10,857	4,631
18517	434978	530	Compressor	Natural Gas	8.98	9,157	3,068
18517	434979	530	Compressor	Natural Gas	8.98	9,157	3,068
18517	434980	530	Compressor	Natural Gas	8.98	9,157	3,068
					139	141,739	55,227

Remove Engine and Replace with Electric Motor (generator engines not replaced) (Electric)-- (motor), Life=30 yrs (motor)

Reduced natural gas use, SCF/yr = (bhp*8, 000 op hr/yr *2,545 Btu/bhp) /0.31 motor efficiency/1,020 Btu/scf but corresponding increase in grid power production if this engine drives a generator kWh/yr = (bhp*8, 000 op-hr/yr *0.97 motor efficiency *0.746 kW/bhp

Table B-4
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
Biogas, BACT, =>1000										
025070	394362	4261	Generator			SCR	0	0	0	2,131
025070	394363	4261	Generator			SCR	0	0	0	2,131
025070	394364	4261	Generator			SCR	0	0	0	2,131
9163	323773	1988	Generator			SCR	0	0	0	994
9163	323774	1988	Generator			SCR	0	0	0	994
113674	430422	1877	Generator			SCR	0	0	0	939
113674	430424	1877	Generator			SCR	0	0	0	939
113674	430726	1877	Generator			SCR	0	0	0	939
50310	437561	1877	Generator			SCR	0	0	0	939
50310	437562	1877	Generator			SCR	0	0	0	939
50310	437563	1877	Generator			SCR	0	0	0	939
50310	437564	1877	Generator			SCR	0	0	0	939
50310	437565	1877	Generator			SCR	0	0	0	939
6979	438643	1777	Generator			SCR	0	0	0	889
140846	430412	1468	Generator			SCR	0	0	0	734
74413	390032	1350	Generator			SCR	0	0	0	675
Biogas, BACT, <1000										
013088	414294	400	Compressor			SCR	0	0	0	200
Biogas, Non-BACT, =>10000										
104806	323139	4235	Generator			SCR	0	0	0	2,118
104806	323140	4235	Generator			SCR	0	0	0	2,118
29110	414653	4166	Generator			SCR	0	0	0	2,083
29110	414654	4166	Generator			SCR	0	0	0	2,083
29110	414655	4166	Generator			SCR	0	0	0	2,083
29110	414656	4166	Generator			SCR	0	0	0	2,083
29110	414657	4166	Generator			SCR	0	0	0	2,083
17301	414648	3471	Generator			SCR	0	0	0	1,736
17301	414650	3471	Generator			SCR	0	0	0	1,736
17301	414651	3471	Generator			SCR	0	0	0	1,736
113518	414941	2650	Generator			SCR	0	0	0	1,325
113518	414942	2650	Generator			SCR	0	0	0	1,325
113518	414943	2650	Generator			SCR	0	0	0	1,325

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
142408	437742	2650	Generator			SCR	0	0	0	1,325
142408	437743	2650	Generator			SCR	0	0	0	1,325
142408	437744	2650	Generator			SCR	0	0	0	1,325
142408	437745	2650	Generator			SCR	0	0	0	1,325
142408	437746	2650	Generator			SCR	0	0	0	1,325
142417	437754	2650	Generator			SCR	0	0	0	1,325
142417	437755	2650	Generator			SCR	0	0	0	1,325
9961	301547	1599	Generator			SCR	0	0	0	800
9961	301548	1599	Generator			SCR	0	0	0	800
9961	301549	1599	Generator			SCR	0	0	0	800
135216	411148	1408	Generator			SCR	0	0	0	704
135216	411147	1158	Generator			SCR	0	0	0	579
Biogas, Non-BACT <1000										
9163	433835	920	Generator			SCR	0	0	0	460
1179	438072	911	Generator			SCR	0	0	0	456
11301	160410	750	Generator			SCR	0	0	0	375
11301	160411	750	Generator			SCR	0	0	0	375
022674	351750	705	Generator			SCR	0	0	0	353
13433	319394	580	Generator			SCR	0	0	0	290
13433	319395	580	Generator			SCR	0	0	0	290
13433	319396	580	Generator			SCR	0	0	0	290
3866	172772	636	Compressor			SCR	0	0	0	318
001703	373739	530	Compressor			SCR	0	0	0	265
001703	373740	530	Compressor			SCR	0	0	0	265
019159	416944	260	Compressor			SCR	0	0	0	130
Non-Biogas, RECLAIM, BACT, Rich, Major										
68118	436966	2000	Pump				0	0	0	0
Non-Biogas, RECLAIM, BACT, Rich, Non-Major										
800128	367656	818	Generator				0	0	0	0
800128	367657	818	Generator				0	0	0	0
800128	367658	818	Generator				0	0	0	0
800128	367659	818	Generator				0	0	0	0
18455	406950	600	Generator				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
18455	406951	564	Generator				0	0	0	0
18455	406952	564	Generator				0	0	0	0
141012	432686	790	Compressor				0	0	0	0
141012	432687	790	Compressor				0	0	0	0
800127	274839	750	Compressor				0	0	0	0
346	335791	545	Compressor				0	0	0	0
100844	425811	412	Compressor				0	0	0	0
6714	408065	283	Pump				0	0	0	0
6714	408067	283	Pump				0	0	0	0
6714	408064	116	Pump				0	0	0	0
6714	408068	116	Pump				0	0	0	0
Non-Biogas, RECLAIM, Non-BACT, Rich, Major										
130211	414383	2068	Generator	Upgrade			0	0	83	0
Non-Biogas, RECLAIM, Non-BACT, Rich, Non-Major										
98159	332851	870	Generator	Upgrade			0	0	35	0
5973	362357	818	Generator	Upgrade			0	0	33	0
5973	362358	818	Generator	Upgrade			0	0	33	0
5973	362359	818	Generator	Upgrade			0	0	33	0
54547	171158	125	Generator		Upgrade		0	0	5.0	0
5973	101703	738	Compressor	Upgrade			0	0	30	0
5973	101704	738	Compressor	Upgrade			0	0	30	0
75531	319404	250	Compressor		Upgrade		0	0	10	0
75531	319405	250	Compressor		Upgrade		0	0	10	0
11034	190074	132	Compressor		Upgrade		0	0	5.3	0
11034	190075	132	Compressor		Upgrade		0	0	5.3	0
11034	190076	132	Compressor		Upgrade		0	0	5.3	0
800189	457331	708	Pump	Upgrade			0	0	28	0
800189	457332	708	Pump	Upgrade			0	0	28	0
11034	156967	377	Pump		Upgrade		0	0	15	0
11034	156968	377	Pump		Upgrade		0	0	15	0
9053	434478	377	Pump		Upgrade		0	0	15	0
9053	434498	377	Pump		Upgrade		0	0	15	0
9053	434501	377	Pump		Upgrade		0	0	15	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
11034	156966	287	Pump		Upgrade		0	0	11	0
9053	434502	244	Pump		Upgrade		0	0	10	0
9053	434503	244	Pump		Upgrade		0	0	10	0
9053	434504	244	Pump		Upgrade		0	0	10	0
800189	457324	218	Pump		Upgrade		0	0	8.7	0
800189	457335	218	Pump		Upgrade		0	0	8.7	0
11034	190071	193	Pump		Upgrade		0	0	7.7	0
11034	190072	193	Pump		Upgrade		0	0	7.7	0
11034	190073	193	Pump		Upgrade		0	0	7.7	0
800189	457334	151	Pump		Upgrade		0	0	6.0	0
800189	457325	102	Pump		Upgrade		0	0	4.1	0
800189	457326	102	Pump		Upgrade		0	0	4.1	0
8582	198426	97	Pump		Upgrade		0	0	3.9	0
8582	198427	97	Pump		Upgrade		0	0	3.9	0
8582	198428	97	Pump		Upgrade		0	0	3.9	0
9217	196405	86	Pump		Upgrade		0	0	3.4	0
9217	196409	86	Pump		Upgrade		0	0	3.4	0
Non-Biogas, RECLAIM, Non-BACT, Lean, Major, 4-Stroke										
5973	147546	5500	Compressor	Ox Cat			0	220	0	0
5973	156060	5500	Compressor	Ox Cat			0	220	0	0
5973	156061	5500	Compressor	Ox Cat			0	220	0	0
5973	156062	5500	Compressor	Ox Cat			0	220	0	0
5973	156063	5500	Compressor	Ox Cat			0	220	0	0
800128	153507	2000	Compressor	Ox Cat			0	80	0	0
800128	159101	2000	Compressor	Ox Cat			0	80	0	0
800128	159102	2000	Compressor	Ox Cat			0	80	0	0
800128	159103	2000	Compressor	Ox Cat			0	80	0	0
800128	159104	2000	Compressor	Ox Cat			0	80	0	0
9053	434505	1650	Compressor	Ox Cat			0	66	0	0
9053	434506	1650	Compressor	Ox Cat			0	66	0	0
9053	434507	1650	Compressor	Ox Cat			0	66	0	0
Non-Biogas, RECLAIM, Non-BACT, Lean, Major, 2-Stroke										
4242	170675	3000	Generator	Electric			14,000	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
8582	368116	2000	Compressor	Electric			14,000	0	0	0
8582	368117	2000	Compressor	Electric			14,000	0	0	0
8582	368118	2000	Compressor	Electric			14,000	0	0	0
4242	169829	3200	Compressor	Electric			14,000	0	0	0
4242	172126	3000	Compressor	Electric			14,000	0	0	0
800127	327697	1800	Compressor	Electric			14,000	0	0	0
800127	327699	1800	Compressor	Electric			14,000	0	0	0
8582	311760	1350	Compressor	Electric			14,000	0	0	0
8582	311761	1350	Compressor	Electric			14,000	0	0	0
8582	311755	1100	Compressor	Electric			14,000	0	0	0
8582	311756	1100	Compressor	Electric			14,000	0	0	0
4242	364371	995	Compressor	Electric			14,000	0	0	0
4242	364373	995	Compressor	Electric			14,000	0	0	0
4242	364374	995	Compressor	Electric			14,000	0	0	0
Non-Biogas, RECLAIM, Non-BACT, Lean, Non-Major										
17953	384810	810	Generator	Ox Cat			0	32	0	0
800127	169969	328	Generator		Ox Cat		0	0	0	0
800127	169970	328	Generator		Ox Cat		0	0	0	0
800127	169971	328	Generator		Ox Cat		0	0	0	0
800127	169972	328	Generator		Ox Cat		0	0	0	0
101369	292228	88	Generator		Ox Cat		0	0	0	0
800363	347919	300	Compressor		Ox Cat		0	0	0	0
800189	457333	218	Pump		Ox Cat		0	0	0	0
Non-Biogas, Non-RECLAIM, BACT, Rich, =>1000										
007417	409351	2200	Generator				0	0	0	0
11245	406575	2080	Generator				0	0	0	0
11245	406576	2080	Generator				0	0	0	0
11245	406577	2080	Generator				0	0	0	0
132687	401752	1898	Generator				0	0	0	0
132687	401753	1898	Generator				0	0	0	0
129033	388869	1695	Generator				0	0	0	0
129033	388870	1695	Generator				0	0	0	0
129033	388871	1695	Generator				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
129033	388873	1695	Generator				0	0	0	0
129033	388875	1695	Generator				0	0	0	0
129033	388876	1695	Generator				0	0	0	0
129033	388877	1695	Generator				0	0	0	0
3513	399704	1692	Generator				0	0	0	0
3513	399705	1692	Generator				0	0	0	0
6324	416768	1478	Generator				0	0	0	0
6324	416769	1478	Generator				0	0	0	0
67399	401572	1470	Generator				0	0	0	0
43880	434981	1050	Compressor				0	0	0	0
43880	434982	1050	Compressor				0	0	0	0
43880	434983	1050	Compressor				0	0	0	0
136965	416861	2000	Pump				0	0	0	0
68112	423950	2000	Pump				0	0	0	0
800236	377389	1564	Pump				0	0	0	0
800236	377395	1564	Pump				0	0	0	0
800236	377397	1564	Pump				0	0	0	0
800236	377399	1564	Pump				0	0	0	0
800236	377400	1564	Pump				0	0	0	0
Non-Biogas, Non-RECLAIM, BACT, Rich, <1000										
96326	434798	999	Generator				0	0	0	0
96326	434799	999	Generator				0	0	0	0
1912	408888	998	Generator				0	0	0	0
1912	408889	998	Generator				0	0	0	0
001703	299074	930	Generator				0	0	0	0
001703	331502	930	Generator				0	0	0	0
120088	387989	930	Generator				0	0	0	0
120088	387990	930	Generator				0	0	0	0
121454	387995	930	Generator				0	0	0	0
121454	387996	930	Generator				0	0	0	0
131709	398473	930	Generator				0	0	0	0
45063	396528	840	Generator				0	0	0	0
19185	428146	800	Generator				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
138723	422556	792	Generator				0	0	0	0
138723	422557	792	Generator				0	0	0	0
58639	390872	791	Generator				0	0	0	0
79174	385862	738	Generator				0	0	0	0
131258	420975	643	Generator				0	0	0	0
99201	421763	585	Generator				0	0	0	0
139280	424326	585	Generator				0	0	0	0
99201	421980	584	Generator				0	0	0	0
19185	428143	543	Generator				0	0	0	0
89159	422466	531	Generator				0	0	0	0
133176	403608	530	Generator				0	0	0	0
133176	403610	530	Generator				0	0	0	0
133176	403611	530	Generator				0	0	0	0
132251	409035	530	Generator				0	0	0	0
132251	409036	530	Generator				0	0	0	0
138293	421366	530	Generator				0	0	0	0
138293	421367	530	Generator				0	0	0	0
138293	421368	530	Generator				0	0	0	0
138851	422959	530	Generator				0	0	0	0
138851	422960	530	Generator				0	0	0	0
141084	431261	530	Generator				0	0	0	0
141084	431262	530	Generator				0	0	0	0
70769	408911	495	Generator				0	0	0	0
140945	430753	380	Generator				0	0	0	0
65819	389615	366	Generator				0	0	0	0
137369	418087	350	Generator				0	0	0	0
118124	417507	336	Generator				0	0	0	0
118124	417508	336	Generator				0	0	0	0
131157	391590	310	Generator				0	0	0	0
131157	391591	310	Generator				0	0	0	0
131157	391592	310	Generator				0	0	0	0
131157	391593	310	Generator				0	0	0	0
131157	391594	310	Generator				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
131157	391596	310	Generator				0	0	0	0
131157	391597	310	Generator				0	0	0	0
131157	391598	310	Generator				0	0	0	0
131157	391599	310	Generator				0	0	0	0
123684	395143	310	Generator				0	0	0	0
131156	396199	310	Generator				0	0	0	0
131155	396200	310	Generator				0	0	0	0
138279	421318	310	Generator				0	0	0	0
141363	432379	310	Generator				0	0	0	0
143086	438530	310	Generator				0	0	0	0
143086	438531	310	Generator				0	0	0	0
143086	438533	310	Generator				0	0	0	0
143086	438534	310	Generator				0	0	0	0
133802	405959	282	Generator				0	0	0	0
133802	405960	282	Generator				0	0	0	0
133802	405961	282	Generator				0	0	0	0
133802	405962	282	Generator				0	0	0	0
141084	431264	282	Generator				0	0	0	0
129336	389961	275	Generator				0	0	0	0
140947	430760	270	Generator				0	0	0	0
140947	430762	270	Generator				0	0	0	0
140947	430764	270	Generator				0	0	0	0
141199	435531	270	Generator				0	0	0	0
141199	435532	270	Generator				0	0	0	0
141199	435533	270	Generator				0	0	0	0
135490	412041	268	Generator				0	0	0	0
135490	412042	268	Generator				0	0	0	0
135490	412043	268	Generator				0	0	0	0
45938	417562	240	Generator				0	0	0	0
2638	320968	225	Generator				0	0	0	0
2638	320969	225	Generator				0	0	0	0
131426	431200	220	Generator				0	0	0	0
131426	431201	220	Generator				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
130085	392437	210	Generator				0	0	0	0
134448	408357	210	Generator				0	0	0	0
134449	408359	210	Generator				0	0	0	0
138055	420563	210	Generator				0	0	0	0
138056	420564	210	Generator				0	0	0	0
140466	428824	210	Generator				0	0	0	0
82513	433441	202	Generator				0	0	0	0
82513	433442	202	Generator				0	0	0	0
82513	433443	202	Generator				0	0	0	0
82513	433444	202	Generator				0	0	0	0
82513	433445	202	Generator				0	0	0	0
82513	433446	202	Generator				0	0	0	0
132653	435512	195	Generator				0	0	0	0
137976	435522	195	Generator				0	0	0	0
137976	435523	195	Generator				0	0	0	0
138791	422748	173	Generator				0	0	0	0
132182	400404	162	Generator				0	0	0	0
129434	390240	157	Generator				0	0	0	0
5023	387253	149	Generator				0	0	0	0
5023	387254	149	Generator				0	0	0	0
45882	387483	135	Generator				0	0	0	0
83509	416748	135	Generator				0	0	0	0
83509	416749	135	Generator				0	0	0	0
133802	405963	110	Generator				0	0	0	0
70989	281036	101	Generator				0	0	0	0
34961	321188	94	Generator				0	0	0	0
34961	321189	94	Generator				0	0	0	0
120956	361525	93.8	Generator				0	0	0	0
116813	372297	86	Generator				0	0	0	0
116813	372298	86	Generator				0	0	0	0
116813	372299	86	Generator				0	0	0	0
16211	403396	86	Generator				0	0	0	0
16211	403879	86	Generator				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
16211	403881	86	Generator				0	0	0	0
16211	403882	86	Generator				0	0	0	0
16211	403884	86	Generator				0	0	0	0
16211	403886	86	Generator				0	0	0	0
129025	388842	80	Generator				0	0	0	0
129664	391023	80	Generator				0	0	0	0
115471	409783	74	Generator				0	0	0	0
115471	409784	74	Generator				0	0	0	0
115471	409785	74	Generator				0	0	0	0
43759	434971	800	Compressor				0	0	0	0
43759	434972	800	Compressor				0	0	0	0
43759	434973	800	Compressor				0	0	0	0
22265	434975	800	Compressor				0	0	0	0
22265	434976	800	Compressor				0	0	0	0
22265	434977	800	Compressor				0	0	0	0
013088	342013	700	Compressor				0	0	0	0
013088	416840	700	Compressor				0	0	0	0
134325	407959	607	Compressor				0	0	0	0
134325	407960	607	Compressor				0	0	0	0
134325	407961	607	Compressor				0	0	0	0
134326	407963	607	Compressor				0	0	0	0
134326	407964	607	Compressor				0	0	0	0
134326	407965	607	Compressor				0	0	0	0
134329	407967	607	Compressor				0	0	0	0
134329	407968	607	Compressor				0	0	0	0
134329	407969	607	Compressor				0	0	0	0
83111	385480	585	Compressor				0	0	0	0
18517	434978	530	Compressor				0	0	0	0
18517	434979	530	Compressor				0	0	0	0
18517	434980	530	Compressor				0	0	0	0
001703	331499	465	Compressor				0	0	0	0
8309	342750	450	Compressor				0	0	0	0
53745	350036	415	Compressor				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
50645	350037	415	Compressor				0	0	0	0
111116	388705	405	Compressor				0	0	0	0
140028	429785	400	Compressor				0	0	0	0
66086	419537	365	Compressor				0	0	0	0
66086	419538	365	Compressor				0	0	0	0
019159	331495	330	Compressor				0	0	0	0
22092	367195	292	Compressor				0	0	0	0
800041	326508	220	Compressor				0	0	0	0
123664	370691	203	Compressor				0	0	0	0
94117	347693	200	Compressor				0	0	0	0
134328	407966	195	Compressor				0	0	0	0
134330	407970	195	Compressor				0	0	0	0
89852	401453	194	Compressor				0	0	0	0
64375	386532	158	Compressor				0	0	0	0
139380	424742	158	Compressor				0	0	0	0
139380	424743	158	Compressor				0	0	0	0
139380	424744	158	Compressor				0	0	0	0
49572	434072	153	Compressor				0	0	0	0
49572	434472	153	Compressor				0	0	0	0
49572	434473	153	Compressor				0	0	0	0
49572	434474	153	Compressor				0	0	0	0
109393	317735	149	Compressor				0	0	0	0
109393	317738	149	Compressor				0	0	0	0
109393	317742	149	Compressor				0	0	0	0
111345	324916	145	Compressor				0	0	0	0
18650	328168	145	Compressor				0	0	0	0
16211	403397	119	Compressor				0	0	0	0
123664	406670	539	Other				0	0	0	0
001703	426335	815	Pump				0	0	0	0
001703	373968	814	Pump				0	0	0	0
96562	353382	750	Pump				0	0	0	0
001703	356818	700	Pump				0	0	0	0
133829	406061	526	Pump				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
139509	425325	524	Pump				0	0	0	0
139509	425326	524	Pump				0	0	0	0
139509	425327	524	Pump				0	0	0	0
111406	416671	512	Pump				0	0	0	0
54773	415033	473	Pump				0	0	0	0
54773	415034	473	Pump				0	0	0	0
125016	374784	429	Pump				0	0	0	0
16239	420868	405	Pump				0	0	0	0
96562	364871	395	Pump				0	0	0	0
96562	364887	395	Pump				0	0	0	0
98380	292781	369	Pump				0	0	0	0
98380	292782	369	Pump				0	0	0	0
98380	292784	369	Pump				0	0	0	0
98380	292785	369	Pump				0	0	0	0
57555	420687	369	Pump				0	0	0	0
108286	313977	365	Pump				0	0	0	0
108293	336542	365	Pump				0	0	0	0
108288	339584	365	Pump				0	0	0	0
070303	405402	365	Pump				0	0	0	0
54771	415036	350	Pump				0	0	0	0
16239	321174	329	Pump				0	0	0	0
16239	321175	329	Pump				0	0	0	0
16239	321176	329	Pump				0	0	0	0
16239	321177	329	Pump				0	0	0	0
52718	342367	321	Pump				0	0	0	0
52718	342369	321	Pump				0	0	0	0
87640	342373	321	Pump				0	0	0	0
94996	359880	310	Pump				0	0	0	0
94998	407123	310	Pump				0	0	0	0
95000	439777	310	Pump				0	0	0	0
94677	428124	305	Pump				0	0	0	0
5322	422131	289	Pump				0	0	0	0
52886	388444	246	Pump				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
52886	388445	246	Pump				0	0	0	0
52886	388447	246	Pump				0	0	0	0
52886	388449	246	Pump				0	0	0	0
52883	388459	246	Pump				0	0	0	0
52883	388462	246	Pump				0	0	0	0
070309	333800	225	Pump				0	0	0	0
070292	334717	225	Pump				0	0	0	0
68181	363123	225	Pump				0	0	0	0
070290	363870	225	Pump				0	0	0	0
119118	352647	220	Pump				0	0	0	0
119118	352648	220	Pump				0	0	0	0
119118	352649	220	Pump				0	0	0	0
113029	329845	211	Pump				0	0	0	0
070280	327127	200	Pump				0	0	0	0
94678	413795	200	Pump				0	0	0	0
95000	286934	180	Pump				0	0	0	0
93720	420807	160	Pump				0	0	0	0
54773	415030	158	Pump				0	0	0	0
54773	415031	158	Pump				0	0	0	0
54773	415032	158	Pump				0	0	0	0
66411	279623	157	Pump				0	0	0	0
2868	279621	145	Pump				0	0	0	0
120455	359159	145	Pump				0	0	0	0
120455	359167	145	Pump				0	0	0	0
070289	390099	145	Pump				0	0	0	0
94676	413796	145	Pump				0	0	0	0
94676	413797	145	Pump				0	0	0	0
94999	286933	137	Pump				0	0	0	0
132772	401914	125	Pump				0	0	0	0
136018	413764	95	Pump				0	0	0	0
125300	375524	80	Pump				0	0	0	0
125300	375526	80	Pump				0	0	0	0
125300	375527	80	Pump				0	0	0	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
125300	375529	80	Pump				0	0	0	0
14898	389366	75	Pump				0	0	0	0
14898	389368	75	Pump				0	0	0	0
136021	413763	74	Pump				0	0	0	0
Non-Biogas, Non-RECLAIM, BACT, Lean, =>1000										
3671	408492	3352	Generator				0	0	0	0
3671	408493	3352	Generator				0	0	0	0
4773	386614	2682	Generator				0	0	0	0
4773	386615	2682	Generator				0	0	0	0
21123	405486	2494	Generator				0	0	0	0
45973	423225	2307	Generator				0	0	0	0
102153	403632	2095	Generator				0	0	0	0
102153	403633	2095	Generator				0	0	0	0
138267	421271	2083	Generator				0	0	0	0
138267	438902	2083	Generator				0	0	0	0
65818	422450	1737	Generator				0	0	0	0
7796	391786	1468	Generator				0	0	0	0
77033	400718	1468	Generator				0	0	0	0
109524	413078	1468	Generator				0	0	0	0
62589	415988	1468	Generator				0	0	0	0
129827	426299	1468	Generator				0	0	0	0
Non-Biogas, Non-RECLAIM, BACT, Lean, <1000										
7814	412278	898	Generator				0	0	0	0
132087	399874	880	Other				0	0	0	0
132087	399876	880	Other				0	0	0	0
Non-Biogas, Non-RECLAIM, Non-BACT, Rich, =>1000										
14437	288133	1200	Generator	Upgrade			0	0	48	0
14437	288134	1200	Generator	Upgrade			0	0	48	0
14437	341089	1200	Generator	Upgrade			0	0	48	0
118684	350357	1131	Generator	Upgrade			0	0	45	0
118684	350358	1131	Generator	Upgrade			0	0	45	0
Non-Biogas, Non-RECLAIM, Non-BACT, Rich, <1000										
42218	117607	930	Generator	Upgrade			0	0	37	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
42218	117608	930	Generator	Upgrade			0	0	37	0
42217	117609	930	Generator	Upgrade			0	0	37	0
013088	414452	930	Generator	Upgrade			0	0	37	0
142517	438239	713	Generator	Upgrade			0	0	29	0
85339	274452	315	Generator		Upgrade		0	0	13	0
86055	279345	294	Generator		Upgrade		0	0	12	0
20231	281005	150	Generator		Upgrade		0	0	6.0	0
20231	281006	150	Generator		Upgrade		0	0	6.0	0
10636	316911	148	Generator		Upgrade		0	0	5.9	0
6728	316912	148	Generator		Upgrade		0	0	5.9	0
18435	316913	148	Generator		Upgrade		0	0	5.9	0
2638	172356	145	Generator		Upgrade		0	0	5.8	0
79856	328255	145	Generator		Upgrade		0	0	5.8	0
140598	429420	135	Generator		Upgrade		0	0	5.4	0
82303	329294	94	Generator		Upgrade		0	0	3.8	0
33465	313771	86	Generator		Upgrade		0	0	3.4	0
660	442592	600	Compressor	Upgrade			0	0	24	0
660	442593	600	Compressor	Upgrade			0	0	24	0
660	442594	600	Compressor	Upgrade			0	0	24	0
019159	416831	330	Compressor		Upgrade		0	0	13	0
113251	410103	250	Compressor		Upgrade		0	0	10	0
007417	411022	225	Compressor		Upgrade		0	0	9.0	0
007417	411023	225	Compressor		Upgrade		0	0	9.0	0
007417	411024	225	Compressor		Upgrade		0	0	9.0	0
10827	280612	145	Compressor		Upgrade		0	0	5.8	0
78802	280570	400	Other		Upgrade		0	0	16	0
62851	322538	94	Other		Upgrade		0	0	3.8	0
65818	311320	810	Pump	Upgrade			0	0	32	0
076581	220569	660	Pump	Upgrade			0	0	26	0
95318	281245	634	Pump	Upgrade			0	0	25	0
95318	281247	634	Pump	Upgrade			0	0	25	0
95318	281251	634	Pump	Upgrade			0	0	25	0
95318	281254	634	Pump	Upgrade			0	0	25	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
95318	281257	634	Pump	Upgrade			0	0	25	0
95318	281260	634	Pump	Upgrade			0	0	25	0
95066	280183	594	Pump	Upgrade			0	0	24	0
94967	280194	594	Pump	Upgrade			0	0	24	0
48820	159531	581	Pump	Upgrade			0	0	23	0
77388	426136	525	Pump	Upgrade			0	0	21	0
77388	426144	525	Pump	Upgrade			0	0	21	0
77388	426145	525	Pump	Upgrade			0	0	21	0
103070	312478	512	Pump	Upgrade			0	0	20	0
68143	187169	500	Pump	Upgrade			0	0	20	0
103052	390939	500	Pump	Upgrade			0	0	20	0
070296	411474	500	Pump	Upgrade			0	0	20	0
076581	220570	450	Pump		Upgrade		0	0	18	0
95977	281266	427	Pump		Upgrade		0	0	17	0
070282	375501	425	Pump		Upgrade		0	0	17	0
070286	410481	425	Pump		Upgrade		0	0	17	0
070292	425052	425	Pump		Upgrade		0	0	17	0
15748	280342	417	Pump		Upgrade		0	0	17	0
15748	280344	417	Pump		Upgrade		0	0	17	0
20231	435450	409	Pump		Upgrade		0	0	16	0
20231	435451	409	Pump		Upgrade		0	0	16	0
94950	280975	400	Pump		Upgrade		0	0	16	0
53733	280999	395	Pump		Upgrade		0	0	16	0
24427	281000	395	Pump		Upgrade		0	0	16	0
95535	281109	395	Pump		Upgrade		0	0	16	0
21104	407532	395	Pump		Upgrade		0	0	16	0
65818	311322	370	Pump		Upgrade		0	0	15	0
58639	435736	370	Pump		Upgrade		0	0	15	0
74396	280341	369	Pump		Upgrade		0	0	15	0
070292	214307	330	Pump		Upgrade		0	0	13	0
070292	214308	330	Pump		Upgrade		0	0	13	0
070282	256758	330	Pump		Upgrade		0	0	13	0
070311	267082	330	Pump		Upgrade		0	0	13	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
019159	367167	330	Pump		Upgrade		0	0	13	0
019159	367168	330	Pump		Upgrade		0	0	13	0
070290	367776	330	Pump		Upgrade		0	0	13	0
070296	390974	330	Pump		Upgrade		0	0	13	0
21104	414791	330	Pump		Upgrade		0	0	13	0
21104	436827	330	Pump		Upgrade		0	0	13	0
21104	436828	330	Pump		Upgrade		0	0	13	0
21104	436829	330	Pump		Upgrade		0	0	13	0
21104	436830	330	Pump		Upgrade		0	0	13	0
52348	276622	318	Pump		Upgrade		0	0	13	0
52348	276625	318	Pump		Upgrade		0	0	13	0
52348	276627	318	Pump		Upgrade		0	0	13	0
103052	170492	300	Pump		Upgrade		0	0	12	0
070305	267083	300	Pump		Upgrade		0	0	12	0
94940	280974	283	Pump		Upgrade		0	0	11	0
83315	280968	280	Pump		Upgrade		0	0	11	0
83315	280969	280	Pump		Upgrade		0	0	11	0
83315	280970	280	Pump		Upgrade		0	0	11	0
132190	264164	275	Pump		Upgrade		0	0	11	0
83313	280967	270	Pump		Upgrade		0	0	11	0
18239	328539	265	Pump		Upgrade		0	0	11	0
18239	328540	265	Pump		Upgrade		0	0	11	0
94998	280360	250	Pump		Upgrade		0	0	10	0
94999	280365	250	Pump		Upgrade		0	0	10	0
95000	280369	250	Pump		Upgrade		0	0	10	0
83312	280965	250	Pump		Upgrade		0	0	10	0
83312	280966	250	Pump		Upgrade		0	0	10	0
83318	280971	250	Pump		Upgrade		0	0	10	0
84162	306922	238	Pump		Upgrade		0	0	9.5	0
84162	245380	230	Pump		Upgrade		0	0	9.2	0
52885	245384	230	Pump		Upgrade		0	0	9.2	0
52885	245385	230	Pump		Upgrade		0	0	9.2	0
94442	274654	230	Pump		Upgrade		0	0	9.2	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
11301	215041	225	Pump		Upgrade		0	0	9.0	0
11301	215043	225	Pump		Upgrade		0	0	9.0	0
070295	267086	225	Pump		Upgrade		0	0	9.0	0
11301	311565	225	Pump		Upgrade		0	0	9.0	0
11301	311566	225	Pump		Upgrade		0	0	9.0	0
070300	335327	225	Pump		Upgrade		0	0	9.0	0
070292	368326	225	Pump		Upgrade		0	0	9.0	0
070304	388598	225	Pump		Upgrade		0	0	9.0	0
070290	390942	225	Pump		Upgrade		0	0	9.0	0
070296	390946	225	Pump		Upgrade		0	0	9.0	0
15748	280343	220	Pump		Upgrade		0	0	8.8	0
070298	267085	200	Pump		Upgrade		0	0	8.0	0
070280	267096	200	Pump		Upgrade		0	0	8.0	0
070295	375503	200	Pump		Upgrade		0	0	8.0	0
070302	402959	200	Pump		Upgrade		0	0	8.0	0
070300	433992	200	Pump		Upgrade		0	0	8.0	0
070300	433993	200	Pump		Upgrade		0	0	8.0	0
070300	433994	200	Pump		Upgrade		0	0	8.0	0
2924	264159	190	Pump		Upgrade		0	0	7.6	0
94938	280976	186	Pump		Upgrade		0	0	7.4	0
94937	280978	186	Pump		Upgrade		0	0	7.4	0
94937	280980	186	Pump		Upgrade		0	0	7.4	0
94937	280981	186	Pump		Upgrade		0	0	7.4	0
94995	280355	180	Pump		Upgrade		0	0	7.2	0
94998	280359	180	Pump		Upgrade		0	0	7.2	0
94997	280362	180	Pump		Upgrade		0	0	7.2	0
94999	280364	180	Pump		Upgrade		0	0	7.2	0
95979	281236	180	Pump		Upgrade		0	0	7.2	0
95979	281237	180	Pump		Upgrade		0	0	7.2	0
95979	281240	180	Pump		Upgrade		0	0	7.2	0
95979	281241	180	Pump		Upgrade		0	0	7.2	0
132189	264161	175	Pump		Upgrade		0	0	7.0	0
72489	288630	172	Pump		Upgrade		0	0	6.9	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
72489	288631	172	Pump		Upgrade		0	0	6.9	0
72489	288632	172	Pump		Upgrade		0	0	6.9	0
81001	246340	170	Pump		Upgrade		0	0	6.8	0
070284	267090	165	Pump		Upgrade		0	0	6.6	0
070284	267091	165	Pump		Upgrade		0	0	6.6	0
2868	274540	157	Pump		Upgrade		0	0	6.3	0
2868	279544	157	Pump		Upgrade		0	0	6.3	0
66403	279545	157	Pump		Upgrade		0	0	6.3	0
66403	279546	157	Pump		Upgrade		0	0	6.3	0
66413	279547	157	Pump		Upgrade		0	0	6.3	0
94928	280632	150	Pump		Upgrade		0	0	6.0	0
94928	280633	150	Pump		Upgrade		0	0	6.0	0
20231	281023	150	Pump		Upgrade		0	0	6.0	0
20231	281024	150	Pump		Upgrade		0	0	6.0	0
070317	267076	145	Pump		Upgrade		0	0	5.8	0
070299	267084	145	Pump		Upgrade		0	0	5.8	0
070283	267094	145	Pump		Upgrade		0	0	5.8	0
66413	279624	145	Pump		Upgrade		0	0	5.8	0
66413	311099	145	Pump		Upgrade		0	0	5.8	0
66413	311100	145	Pump		Upgrade		0	0	5.8	0
070313	328532	145	Pump		Upgrade		0	0	5.8	0
070281	393971	145	Pump		Upgrade		0	0	5.8	0
136235	414451	145	Pump		Upgrade		0	0	5.8	0
070293	436931	145	Pump		Upgrade		0	0	5.8	0
95979	281242	144	Pump		Upgrade		0	0	5.8	0
95979	281243	144	Pump		Upgrade		0	0	5.8	0
52883	245374	143	Pump		Upgrade		0	0	5.7	0
52883	245375	143	Pump		Upgrade		0	0	5.7	0
070307	267080	140	Pump		Upgrade		0	0	5.6	0
95000	280367	140	Pump		Upgrade		0	0	5.6	0
95067	280185	137	Pump		Upgrade		0	0	5.5	0
95067	280190	137	Pump		Upgrade		0	0	5.5	0
95067	280191	137	Pump		Upgrade		0	0	5.5	0

Table B-4 (Continued)
PAR1110.2 - Solid and Hazardous Waste Estimates

Facility ID No.	Appl. No.	Engine HP	Engine Use	(d)(1)(B) Reduced Limits, 500+ HP 7/1/10	(d)(1)(B) Reduced Limits <500 HP 7/1/11	(d)(1)(C) Reduced Limits Biogas 7/1/12	Electric Engine, lb	New Cat Ox, lb	Upgrade Cat Ox, lb	SCR Cat, lb
52884	245388	121	Pump		Upgrade		0	0	4.8	0
96374	280786	116	Pump		Upgrade		0	0	4.6	0
96374	280788	116	Pump		Upgrade		0	0	4.6	0
96374	280790	116	Pump		Upgrade		0	0	4.6	0
3513	399707	109	Pump		Upgrade		0	0	4.4	0
3513	399708	109	Pump		Upgrade		0	0	4.4	0
3513	399709	109	Pump		Upgrade		0	0	4.4	0
71685	280685	100	Pump		Upgrade		0	0	4.0	0
65819	311321	99	Pump		Upgrade		0	0	4.0	0
070295	241359	95	Pump		Upgrade		0	0	3.8	0
20231	281016	75	Pump		Upgrade		0	0	3.0	0
20231	281021	75	Pump		Upgrade		0	0	3.0	0
48523	288615	61	Pump		Upgrade		0	0	2.4	0
48523	288616	61	Pump		Upgrade		0	0	2.4	0
48523	288617	61	Pump		Upgrade		0	0	2.4	0
Survey Total							210,000	1,730	2,847	59,039
District Total							301,724	2,486	4,090	84,826

Description	**Total**	**Upgrade**	**Three Year**	**Annual**
Solid Waste	301,724			
Hazardous Waste Recycled		2,454	3,946	1,315
Hazardous Waste Disposed		1,636	87,457	29,152

Notes
Data from SCAQMD Staff Survey of ICE engines, 2005. Based on known engines the survey data is representative of 69.6 percent of the ICE engines in the district.
Total district estimated by scaling the survey data by 1.437 (1/0.696)
Oxidation catalyst weight per horsepower = 0.4 pound
SCR catalyst weight per horsepower = 0.5 pound
Average engine weight 14,000 pounds
Assumed all catalyst is hazardous waste
Assumed 60 percent of oxidation catalyst is recycled based on SCAQMD, 2003 Final AQMP Program EIR, 2003. SCR catalyst is not recycled.
Upgrade, Hazardous Waste Recycled = 0.6 x District total upgraded catalyst.
Upgrade, Hazardous Waste Disposed = 0.6 x District total upgraded catalyst.
Three year, Hazardous Waste Recycled = 0.6 x (District total new cat ox + District total upgrade cat ox)

Three year, Hazardous Waste Disposed = 0.4 x (District total new cat ox + District total upgrade cat ox) + District total SCR cat
Annual, Hazardous Waste Recycled = Three year, Hazardous Waste Recycled/3 years
Annual, Hazardous Waste Disposed = Three year, Hazardous Waste Disposed/3 years