ENVIRONMENTAL ASSESSMENT

AIR QUALITY

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SUMMARY OF CONCLUSIONS

Staff cannot conclude that PG&E's proposed Humboldt Bay Repowering Project (HBRP) would be likely to conform with applicable federal, state and North Coast Unified Air Quality Management District (NCUAQMD) air quality laws, ordinances, regulations and standards (LORS), which precludes staff from making a determination as to whether HBRP would result in significant air quality-related impacts.

Staff has identified proposed conditions of certification, but many issues remain either unresolved or lack complete analysis. Staff finds the following:

- PG&E has not proposed any annual limit on the number of hours of operation in diesel mode, except for 50 hours/year/engine for maintenance and testing, because PG&E states that a natural gas supply curtailment is an "emergency." However, Energy Commission staff and the NCUAQMD both seek to limit the hours of operation in diesel mode because the potential emissions of the project need to be clearly defined. The NCUAQMD has determined that the project should be limited to 1,000 engine-hours per year in the diesel mode.
- PG&E seeks the flexibility to operate the HBRP during natural gas curtailments, which are determined by gas supply constraints while the transmission grid operators may dictate when the plant must operate. However, HBRP would need to remain within fuel use and emission limits established by NCUAQMD. There is a potential for the power plant to violate NCUAQMD limits if actual fuel use or emissions occur at or near the maximum anticipated levels or if HBRP is forced by grid operators to be online during lengthy or severe natural gas curtailments.
- If the project is allowed to fire diesel fuel beyond 50 hours per engine per year, and the natural gas curtailment is not considered an emergency under the definition in Title 17 Code of California Regulations (CCR) 93115.4(a)(30) by the regulatory agencies, then the project would be in violation of diesel particulate matter limit standards of Title 17 CCR 93115.6 (a)(3)(A)2.
- The NCUAQMD's Preliminary Determination of Compliance (PDOC) included a review of emission control technologies that does not include an analysis of the cost-effectiveness of various control technologies, namely diesel particulate filters or alternative fuels.
- The applicant's offset package for the HBRP is based on actual emission reductions including historic emissions from the Humboldt Bay Power Plant (HBPP) that may have occurred during emergency use of the HBPP. If natural gas curtailment is defined as emergency use for this project (for both the HBPP and the HBRP), then the applicant's approach overestimates the emission reductions and underestimates the offset requirements.
- The PDOC included ambient air quality impacts caused by the project, but the visibility analysis and analysis of whether particulate matter emissions would comply with federal increment consumption requirements was not available at the time of the NCUAQMD review. For the visibility analysis, the agencies responsible for

determining compliance (the U.S. Forest Service and the National Park Service) analyzed only the 50 hours/engine annual usage, not the up to 100 hours/engine annual usage. Thus those agencies will need to re-address the issue of compliance with federal visibility requirements.

To address issues related to conforming with LORS, staff has provided a PDOC public comment letter and recommendations that the NCUAQMD can take as part of its ongoing review of the project. Additionally, Energy Commission staff has advised the NCUAQMD that air quality impacts could be reduced with the use of a backup fuel other than diesel or use of an add-on control device to reduce diesel particulate matter.

INTRODUCTION

This analysis evaluates the expected air quality impacts from the emissions of criteria air pollutants from both the construction and operation of HBRP. Criteria air pollutants are defined as air contaminants for which the state and/or federal government has established an ambient air quality standard to protect public health. Exposure to the criteria pollutants, especially diesel particulate matter (DPM), a toxic air contaminant, can exacerbate public health impacts that are also described in the **Public Health** section of the PSA.

The criteria pollutants analyzed are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), and particulate matter (PM). Two subsets of particulate matter are inhalable particulate matter less than 10 microns in diameter (PM10) and fine particulate matter less than 2.5 microns in diameter) (PM2.5). Nitrogen oxides (NOx, consisting primarily of nitric oxide (NO) and NO_2 and reactive organic compounds (ROC) emissions readily react in the atmosphere as precursors to ozone and, to a lesser extent, particulate matter. Sulfur oxides (SOx) readily react in the atmosphere to form particulate matter and are major contributors to acid rain. Greenhouse gas (GHG) emissions are not criteria pollutant and are discussed later.

In carrying out this analysis, the California Energy Commission (Energy Commission) staff evaluated the following three major points:

- whether the HBRP is likely to conform with applicable federal, state, and NCUAQMD air quality laws, ordinances, regulations and standards (Title 20, California Code of Regulations, section 1744 (b));
- whether the HBRP is likely to cause new violations of ambient air quality standards or contribute substantially to existing violations of those standards (Title 20, California Code of Regulations, section 1743); and
- whether mitigation measures proposed for the project are adequate to lessen potential impacts to a level of insignificance (Title 20, California Code of Regulations, section 1742 (b)).

LAWS, ORDINANCES, REGULATION, AND STANDARDS

The following federal, state, and local laws and policies pertain to the control of criteria pollutant emissions and the mitigation of air quality impacts. Staff's analysis examines the project's compliance with these requirements, shown in **Air Quality Table 1**.

AIR QUALITY Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	**U.S. Environmental Protection Agency (U.S. EPA)**
CAAA of 1990, 40 CFR 50	National Ambient Air Quality Standards (NAAQS).
CAA Sec. 171-193, 42 USC 7501	New Source Review (NSR) requires permits for new stationary sources (see NCUAQMD Rule 110).
40 CFR 52.21	Prevention of Significant Deterioration (PSD) requires major sources to obtain permits for emissions of attainment pollutants. PSD review requires the new or modified source to achieve the Best Available Control Technology (BACT) and to demonstrate that significant deterioration of ambient air quality would not occur. NCUAQMD implements the PSD program with U.S. EPA oversight (also NCUAQMD Rule 110). The existing HBPP is a major source and PSD review applies to the HBRP, which would be a major modification of the source.
40 CFR 60, Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (also NCUAQMD Rule 104.11). Requires reduction compression ignition engine emissions to less than 1.2 grams of NOx per brake-horsepower-hour (g/bhp-hr) and 0.11 g/bhp-hr of diesel PM (DPM, according to U.S. EPA Method 5). Requires the emergency standby generator engine and fire water pump engine to meet U.S. EPA Tier 3 requirements.
40 CFR 70, CAA Sec 401, 42 USC 7651	Title V Operating Permit program requires filing of an application within one year after start of operation of modified or new sources (also NCUAQMD Regulation V).
40 CFR 72, CAA Sec 401 42 USC 7651	Title IV Acid Rain program requires federal Title IV permit and compliance with acid rain provisions. Applicable only to electrical generating units greater than 25 MW; not applicable to individual generating units at HBRP.

State	California Air Resources Board and Energy Commission
Health and Safety Code (HSC) Section 40910-40930	Permitting of source needs to be consistent with approved Clean Air Plan. The 1984 NCUAQMD New Source Review program of Rule 1-200(c) and 1-220 is consistent with the applicable air quality management plan, the State Implementation Plan (SIP).
California Health & Safety Code Section 41700	Public Nuisance Provisions – outlaws discharge of air contaminants causing nuisance, injury, detriment or annoyance

Title 17 CCR 93115	Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition (CI) Engines. Establishes operating requirements and emission standards for emergency standby diesel-fueled CI engines [17 CCR 93115.6] and emission standards for stationary prime diesel-fueled CI engines [17 CCR 93115.7]. The standards are 0.15 g/bhp-hr DPM for emergency engines used fewer than 50 hours per year or 0.01 g/bhp-hr DPM for prime engines. All compression ignition engines proposed for HBRP are subject to the ATCM.

Local	**North Coast Unified Air Quality Management District**
NCUAQMD Rule 102	Required Permits. Requires an Authority to Construction (ATC) and Permit to Operate (PTO) be issued by the Air Pollution Control Officer (APCO).
NCUAQMD Rule 104	Prohibitions. Prohibits excessive visible emissions (Rule 104.2), particulate matter from combustion (Rule 104.3.4.1), and sulfur dioxide emissions (Rule 104.5).
NCUAQMD Rule 110	NSR and PSD. Requires implementation of BACT that is technologically feasible and determined by the Air Pollution Control Officer to be cost-effective (Rule 110.5.1). Requires offsets be provided so new or modified sources cause no net increase (Rule 110.1.2). Requires air quality impact analysis that demonstrates that new or modified sources do not cause or worsen the violation of an ambient air quality standard (Rule 110.5.5 and 110.7). Requires power plants be subject to Preliminary and Final Determination of Compliance (PDOC and FDOC, respectively) by the NCUAQMD Air Pollution Control Officer with public notice and public comment. The NCUAQMD issued a PDOC on October 24, 2007 (NCUAQMD 2007). If the NCUAQMD issues an FDOC, it would serve as an ATC only after the Energy Commission certifies HBRP (Rule 110.9).
NCUAQMD Rule 1-200(c) and 1-220	1984 NSR requirements (approved as part of SIP), consistent with federal PSD review and current Rule 110.

SETTING

CLIMATE AND METEOROLOGY

The climate of the greater Humboldt Bay region, including Eureka and the immediate coastal strip where the project site is located, is characterized as Mediterranean. Summers with little or no rainfall and low overcast and fog are frequently observed. Winters are wet, with frequent passage of Pacific storms, and temperatures are mild. The overall climate at the project site is dominated by the semi-permanent eastern Pacific high pressure system centered off the coast of California. In the summer, the

high pressure system results in strong northwesterly flows and negligible precipitation. In the winter, storms originating in the Gulf of Alaska reach northern California, bringing wind and rain. As winter storms move in, the prefrontal winds are generally from the southeast to southwest. Over the Humboldt Bay area, the hills generally deflect these winds south to southeast. After frontal passage, the winds are generally from the north to northwest (PG&E 2006a).

Ambient temperatures in the project area are moderated because of its proximity to Humboldt Bay. During the summer months, average maximum temperatures are under 65˚F. Average maximum winter temperatures are about 55˚F. Average minimum temperatures are between 40 and 45˚F in winter. During the rainy season, generally November through March, Eureka receives 75% of its average rainfall, with most of the rain falling during December and January. The average annual rainfall is 39 inches (WRCC 2007).

The terrain in the vicinity of the Humboldt Bay Power Plant rises rapidly from the bay on the north side to an elevation of less than 100 feet at Buhne Point peninsula. Terrain to the north and east of the site is generally flat. To the south and east, the terrain rises rapidly, forming Humboldt Hill, which reaches an elevation of over 500 feet within 2 miles of the project and is the site of several small neighborhoods. Humboldt County is mostly mountainous except for the level plain that surrounds Humboldt Bay (PG&E 2006a).

The climate affects the pollution potential of the area, especially during the late fall and winter, when particulate matter levels are highest. Colder, more stagnant conditions during this time of the year are conducive to the buildup of PM, including the formation of secondary ammonium nitrate. In addition, increased emissions from residential fireplaces and wood stoves during this time of year contribute to increased direct particulate emissions (PG&E 2006a).

AMBIENT AIR QUALITY STANDARDS

The United States Environmental Protection Agency (U.S. EPA) and the California Air Resource Board (ARB) have both established allowable maximum ambient concentrations of criteria air pollutants, based upon public health impacts called ambient air quality standards. The California Ambient Air Quality Standards (CAAQS), established by ARB, are typically lower (more stringent) than the federally established National Ambient Air Quality Standards (NAAQS). The federal Clean Air Act requires the periodic review of the science upon which the standards are based and the standards themselves.

Ambient air quality standards are designed to protect people who are most susceptible to respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. The ambient standards are also set to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

Current state and federal air quality standards are listed in **Air Quality Table 2**. The averaging times for the various air quality standards (the duration over which all measurements taken are averaged) range from one hour to one year. The standards

are read as a concentration, in parts per million (ppm), or as a weighted mass of material per unit volume of air, in milligrams (mg or 10^{-3} g) or micrograms (µg or 10^{-6} g) of pollutant in a cubic meter (m^3) of ambient air, drawn over the applicable averaging period.

AIR QUALITY Table 2
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Standard
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	None
	8 Hour	0.070 ppm (137 µg/m^3)	0.08 ppm (157 µg/m^3)
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	150 µg/m^3
	Annual	20 µg/m^3	None
Fine Particulate Matter (PM2.5)	24 Hour	None	35 µg/m^3
	Annual	12 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	0.25 ppm (470 µg/m^3)	None
	Annual	None	0.053 ppm (100 µg/m^3)
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 µg/m^3)	None
	3 Hour	None	0.5 ppm (1300 µg/m^3)
	24 Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)
	Annual	None	0.03 ppm (80 µg/m^3)

Source: ARB, February 2007 (Note: New 1-hour NO_2 CAAQS of 0.18 ppm [338 µg/m^3] and annual NO_2 CAAQS of 0.030 ppm [56 µg/m^3] are expected to be approved by the Office of Administrative Law in late 2007.)

The California Air Resources Board and the U.S. EPA designate regions where ambient air quality standards are not met as “nonattainment areas.” Where a pollutant exceeds standards, the federal and state Clean Air Acts both require air quality management plans that demonstrate how the standards will be achieved. These laws also provide the basis for implementing agencies to develop mobile and stationary source performance standards.

EXISTING AMBIENT AIR QUALITY

Air Quality Table 3 summarizes the attainment status of the air quality in the NCUAQMD. Violations of federal and state ambient air quality standards generally do not occur, except for particulate matter, which violates the state standards in almost every part of California.

AIR QUALITY Table 3
Attainment Status of North Coast Unified Air Quality Management District

Pollutants	Federal Classification	State Classification
Ozone	Attainment/Unclassified	Attainment
PM10	Attainment	**Nonattainment**
PM2.5	Attainment	Attainment/Unclassified
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment

Source: ARB 2007 (http://www.arb.ca.gov/desig/desig.htm).

Nonattainment Pollutants

The criteria pollutant of primary concern in the NCUAQMD is particulate matter, which occurs at levels above the state PM10 standard. **Air Quality Table 4** summarizes the existing ambient monitoring data for particulate matter (PM10 and PM2.5) collected by ARB and NCUAQMD from monitoring stations closest to the project site. Data marked in **bold** indicates that the most-stringent current standard was exceeded. Note that an exceedance is not necessarily a violation of the standard, and that only persistent exceedances lead to designation of an area as nonattainment.

AIR QUALITY Table 4
Eureka, Highest Existing Ambient Concentrations ($\mu g/m^3$)

Pollutant, Location	Averaging Time	2002	2003	2004	2005	2006
PM10, Eureka (I Street)	24 hour	38.0	**71.1**	**63.9**	**71.0**	**72.2**
PM10, Eureka (I Street)	Annual	22	21	**20.7**	13.6	**21.1**
PM2.5, Eureka (I Street)	24 hour	23.7	**36.1**	25.6	31.8	35.0
PM2.5, Eureka (I Street)	Annual	7.9	---	8.2	---	---

Source: ARB, Air Quality Data Statistics; (http://www.arb.ca.gov/adam/welcome.html). Accessed Nov 12, 2007.
Note: PM10 based on California monitoring methods.

Respirable Particulate Matter (PM10)

PM10 is a mixture of particles and droplets that vary in size and chemical composition, depending upon the origin of the pollution. An extremely wide range of sources, including natural causes, most mobile sources, and many stationary sources, causes emissions that directly and indirectly lead to increased ambient particulate matter. This makes it an extremely difficult pollutant to manage. Particulate matter caused by any combustion process can be generated directly by burning the fuel, but it can also be formed downwind when various precursor pollutants chemically interact in the atmosphere to form solid precipitates. These solids are called secondary particulate matter since the contaminants are not directly emitted, but are rather indirectly formed as a result of precursor emissions.

Gaseous contaminants such as NOx, SO_2, organic compounds, and ammonia (NH_3) from natural or man-made sources can form secondary particulate nitrates, sulfates, and organic solids. Secondary particulate matter is mostly finer PM10, whereas particles from dust sources tend to be the coarser fraction of PM10.

Pollutants that Attain the Ambient Air Quality Standards

Fine Particulate Matter (PM2.5)

Particles and droplets with an aerodynamic diameter less than or equal to 2.5 microns (PM2.5) penetrate more deeply into the lungs than PM10, so can therefore be much more damaging to public health than larger particles.

PM2.5 is mainly a product of combustion and includes nitrates, sulfates, organic carbon (ultra-fine dust), and elemental carbon (ultra-fine soot). Almost all combustion-related particles, including those from wood smoke and cooking, are smaller than 2.5 microns. Nitrate and sulfate particles are formed through complex chemical reactions in the atmosphere. Particulate nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the winter make up a large portion of the total PM2.5. Ammonium sulfate is also a concern because of the ready availability of ammonia in the atmosphere. The ambient PM2.5 data collected at Eureka (**Air Quality Table 4**) indicates that existing conditions occasionally approach the new 35 $\mu g/m^3$ daily NAAQS and exceeded it in 2003.

Ozone

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between precursor air pollutants. The primary ozone precursors are NOx and ROC, which interact in the presence of sunlight and warm air temperatures to form ozone. Locations in coastal Humboldt County do not provide the sunlight and warm temperatures to cause abundant ozone concentrations. Humboldt County generally shows higher ozone concentrations in the winter months, rather than the summer months. Because the higher ozone concentrations occur in the absence of conditions that would cause the formation of photochemical ozone, this indicates that the ozone in the Eureka area is not primarily photochemical but is mostly natural background or, under certain conditions, is related to stratospheric ozone intrusion (PG&E 2006a).

Carbon Monoxide

Carbon monoxide (CO) is a by-product of incomplete combustion common to any fuel-burning source. Ambient concentrations of CO vary substantially depending upon the proximity of the source since the pollutant disperses quickly and oxidizes in the air. Mobile sources are the principal sources of CO emissions, and they have historically been the focus of regional and statewide strategies to attain and maintain CO ambient air quality standards. Ambient CO concentrations attain the standards due to two state-wide programs for all mobile sources: the 1992 wintertime oxygenated gasoline program, and Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also helped reduce CO emissions. Because ARB has not conducted CO monitoring in Humboldt County since 1991 (ARB 2006a), the nearest local data comes from Mendocino County (Willits and Ukiah).

Nitrogen Dioxide

Approximately 90% of the NOx emitted from combustion sources is in the form of nitric oxide, while the balance is NO_2. Nitric oxide (NO) is oxidized in the presence of ozone

to form NO_2, but some level of photochemical activity is needed for this conversion. High concentrations of NO_2 tend to occur during the fall (not in the winter) when atmospheric conditions tend to trap ground-level releases but lack significant photochemical activity (less sunlight). In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) tend to engage the NO in reactions with ROC to create ozone and also disperse the NO_2. The formation of NO_2 in the summer, with the help of the ozone, is according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

Urban areas typically have high daytime ozone concentrations that drop substantially at night as the above reaction takes place when ozone scavenges the available NO. If ozone is unavailable to oxidize the NO, less NO_2 will form because the reaction is "ozone-limited." This reaction explains why, in urban areas, ground-level ozone concentrations drop at night, while aloft and in downwind rural areas (without sources of fresh NO emissions), ozone concentrations can remain relatively high.

New state one hour and annual average ambient air quality standards for NO_2 may become law in late 2007. Although the attainment designations have not yet been established for the new, more stringent standards, in 2006 the entire state attained the NO_2 standards. Background airborne conditions of NO_2 in the project area (Willits and Ukiah) have been approximately 0.009 ppm annually, or 17 $\mu g/m^3$ over the past three years. As such, NCUAQMD appears likely to attain the proposed standards because the highest hourly background NO_2 concentrations of 0.05 ppm are less than one-third of the new standards (ARB 2007).

Sulfur Dioxide

Sulfur dioxide is typically emitted as a result of the combustion of fuels containing sulfur. When high levels are present in ambient air, SO_2 leads to sulfite particulate formation and acid rain. Natural gas and California diesel fuel contain very little sulfur and so therefore result in very little SO_2 emissions when burned. By contrast, high sulfur fuels like coal emit large amounts of SO_2 when burned. Sources of SO_2 emissions come from every economic sector and include a wide variety of gaseous, liquid, and solid fuels. The entire state is designated attainment for all SO_2 ambient air quality standards. The nearest recent monitoring station for SO_2 is in the San Francisco Bay Area air basin.

Summary of Existing Ambient Air Quality

The local and recent ambient air quality data show existing violations of ambient air quality standards for PM10 in the baseline conditions. Staff uses the highest local background ambient air concentrations over the past three years as the baseline for staff's analysis of potential ambient air quality impacts for the proposed HBRP. The highest concentrations are shown in **Air Quality Table 5**.

AIR QUALITY Table 5
Highest Local Background Concentrations (μg/m^3)

Pollutant	Location	Averaging Time	Background	Limiting Standard	Percent of Standard
PM10	Eureka	24 hour	**72.2**	50	**144**
		Annual	**21.1**	20	**106**
PM2.5	Eureka	24 hour	35.0	35	100
		Annual	8.2	12	68
CO	Ukiah	1 hour	3,250	23,000	14
		8 hour	1,978	10,000	20
NO_2	Ukiah	1 hour	75.2	470	16
		Annual	17.0	100	17
SO_2	San Francisco	1 hour	114.4	655	17
		24 hour	21.0	105	20
		Annual	5.8	80	7

Source: AFC Table 8.1-25 (PG&E, September 2007), updated with ARB 2007.

REGIONAL SETTING

The existing Humboldt Bay Power Plant consists of two electric utility steam boilers (Units 1 and 2, 105 MW combined) and two peaking combustion turbines (Mobile Emergency Power Plants (MEPPs 2 and 3), 30 MW combined). The existing steam boilers operate on either natural gas or #6 fuel oil while the MEPPs operate only on distillate fuel. Annual generation at the existing HBPP historically has not exceeded 700,000 megawatt-hours (MWh), which represents an annual average capacity factor of less than 60% for the 135 MW existing HBPP (Response to DR8).

The boilers at HBPP are dual-fuel fired to use liquid fuel at times of natural gas curtailments. The liquid fuel supply is brought to the region via barge or tanker truck from refiners in the San Francisco Bay Area and stored onsite. During storms, tanker trucks are normally the only way of delivery.

Natural gas supply curtailments, rare in most parts of California, occur commonly in the Humboldt area during cold weather conditions, characterized by average daily temperatures of less than 50°F (AFC Section 6.1). The HBPP is a “noncore” customer of natural gas, which means that the natural gas supply to the existing HBPP and the proposed HBRP is “interruptible.” PG&E’s gas operations that are governed by and approved by the California Public Utilities Commission (CPUC) dictate that the natural gas supply to “noncore” customers be curtailed when natural gas is needed by “core” (i.e., residential) customers. The determination as to whether gas supplies need to be curtailed (and whether gas supplies to HBRP would need to be curtailed in the future) on any single day depends on the forecast for electrical demand and dispatch issued by the California Independent System Operator (CAISO) and a forecast for natural gas consumption by other noncore and core customers prepared by PG&E’s gas operations. These forecasts are made daily, and are dependent on weather conditions as well as other factors (Responses to DR 4 and 5, Jan 12, 2007).

Natural gas and oil fuel switching historically has occurred at HBPP due to economic reasons and to manage the inventory of oil stored onsite (Response to WSQ-4, Feb 13,

2007). PG&E examined the effects of historic natural gas supply interruptions in the region, testing, and maintenance and found that over the past 13 years, oil had been burned in the boilers and MEPPs to generate about 7,500 MWh per year (or 46 full-load hours per year of the proposed HBRP as in Table WSQ4-2, Feb 13, 2007). **Air Quality Table 6** shows the rate of distillate fuel and fuel oil consumption for the existing HBPP.

AIR QUALITY Table 6
Existing Liquid Fuel Consumption at HBPP (MMBtu/year)

Year	HBPP Boilers	HBPP MEPPs	Total
2005	0	175,583	175,583
2004	0	192,472	192,472
2003	5,496	230,932	236,428
2002	4,475	117,539	122,014
2001	2,665,729	281,249	2,946,978
2000	147,495	489,771	637,267
1999	0	134,482	134,482
1998	8,297	73,479	81,777
1997	0	16,306	16,306
1996	130,325	53,665	183,990
1995	398,104	27,944	426,048
1994	11,225	24,978	36,203
1993	137,725	9,694	147,419

Source: Response to Data Request 7, Table DR7-1, liquid fuel consumption for all reasons including natural gas curtailments, emergencies, maintenance, and economic fuel switching.

The historic actual emissions from HBPP from September 2004 through September 2006 are documented by PG&E (AFC Table 8.1A-1) and summarized in **Air Quality Table 7**.

AIR QUALITY Table 7
Existing HBPP Annual Average Emissions (tons per year)

Emission Source	NOx	ROC	PM10	PM2.5	CO	SOx
HBPP Unit 1 (HB 1)	464.2	11.6	10.1	10.1	53.4	0.8
HBPP Unit 2 (HB 2) *	432.8	11.9	12.3	12.3	55.0	28.0
HBPP Turbine 2 (MEPP 2)	19.3	0.5	2.5	2.5	2.0	0.6
HBPP Turbine 3 (MEPP 3)	20.4	0.5	2.4	2.4	1.9	0.6
Grand Total for HBPP	**936.8**	**24.5**	**27.4**	**27.4**	**112.3**	**30.0**

Source: AFC Table 8.1-9 and Table 8.1A-1, average tons per year from September 29, 2004 to September 28, 2006, includes natural gas curtailments for all units and emergency use of HBPP Unit 2 on fuel oil in August and September 2006.
Note: * Includes emissions from emergency operations, which may not qualify for use as an offset in New Source Review, per NCUAQMD Rule 110, Section 6.2.2. Subject to downward revision in Final Staff Assessment.
Ambient Air Quality Effects of Existing HBPP

PG&E examined the ambient air quality effects of existing HBPP operations using a dispersion modeling analysis. The analysis was conducted using a methodology similar to the applicant's methodology for determining HBRP impacts (see **Modeling Methodology for HBRP**). The maximum modeled concentrations due to HBPP operations are not additive to the background concentrations because the background concentrations include HBPP along with the effects of all other existing sources, and the concentration data are taken from different times.

Air Quality Table 8 shows the effects of existing HBPP operations in comparison with the standards and relevant background conditions. The existing HBPP does not cause any localized violations of ambient air quality standards, but according to modeling results, high levels of NO_2 may be caused by the existing power plant.

AIR QUALITY Table 8
Existing HBPP Ambient Air Quality Effects (μg/m^3)

Pollutant	Averaging Time	Maximum Modeled Concentration	Limiting Standard	Background
PM10	24 hour	7.8	50	**72.2**
	Annual	0.3	20	**21.1**
PM2.5	24 hour	7.8	35	35.0
	Annual	0.3	12	8.2
CO	1 hour	110	23,000	3,250
	8 hour	55	10,000	1,978
NO_2	1 hour	267.3	470	75.2
	Annual	9.1	100	17.0
SO_2	1 hour	10	655	114.4
	24 hour	2.6	105	21.0
	Annual	0.04	80	5.8

Source: Response to Data Request 12, Table DR12-1, (PG&E Jan 12, 2007).

PROJECT DESCRIPTION AND PROPOSED EMISSIONS

The HBRP would include the following new stationary sources of emissions:

- Ten dual fuel-fired reciprocating internal combustion engine-generator sets, each 16.3 MW (gross), 22,931 bhp, Wärtsilä model 18V50DF, with each engine abated by a selective catalytic reduction (SCR) system and an oxidation catalyst. Natural gas use would be limited to an equivalent of no more than 6,445 operating hours per year, and operation in diesel mode would be limited to no more than 1,000 engine-hours per year (NCUAQMD 2007);
- one nominal 350 kilowatt (kW) Caterpillar model DM8149, diesel fuel-fired emergency engine-generator set (i.e., “black start” engine), 469 bhp; and
- one diesel fuel-fired emergency engine to power a fire water pump nominally rated at 210 bhp.

Under normal operations, each of the ten Wärtsilä engines would fire natural gas with a diesel fuel pilot. The maximum heat input for each Wärtsilä engine would be 143.6 million British thermal units (Btu) per hour (MMBtu/hr) of natural gas at the higher heating value (HHV) with a 0.8 MMBtu/hr diesel fuel pilot.

As described in the AFC (Section 2.7.3), there are circumstances when the project would be subject to natural gas curtailment as required by PG&E’s California Public Utility Commission Gas Tariff Rule 14. During cold winter circumstances, the priority for natural gas consumption would be residential customers in the Humboldt County region. The requirements of Rule 14 (C)(1)(b) outlines the steps PG&E would take due to local constraints such as in the Humboldt County area that affect Noncore End-Use

Customers. Staff understands that the existing HBPP and the proposed HBRP are Noncore End-Use Customers, and thus their natural gas supply could be constrained. Staff sees that this natural gas supply constraint is a foreseeable circumstance, is specified in the "contract" between PG&E and the CPUC, and thus is not an emergency situation.

During natural gas curtailments and emergencies, any number of the Wärtsilä engines could be fired exclusively on diesel fuel. All engines would use ARB ultra-low-sulfur (0.0015% or 15 ppm sulfur by weight) diesel fuel. The emergency generator and fire pump engines would be U.S. EPA Tier 3 certified.

The HBRP would also require shutdown of the existing HBPP Units 1 and 2 and MEPPs, following commissioning of the new HBRP. Demolition of HBPP and other activities on the site related to decommissioning Unit 3 are not part of the HBRP (see **Project Description**). Emissions caused during the construction phase for HBRP, initial commissioning, and operation are described here.

Proposed Construction Emissions

Construction of HBRP is expected to take about 18 months preceded by one additional month of road construction and two months of site clearing (AFC Appendix 8.1D). During the construction period, air emissions would be generated from the exhaust of heavy equipment and fugitive dust from removing existing structures on the site and from activity on unpaved surfaces. Site development would require minimal grading or earthmoving activities because both the site and the temporary construction parking areas along King Salmon Avenue are essentially flat. Construction activities would occur in the following main phases:

- Road construction (the new access road and potable water pipeline along the east side of the Intake Canal);
- Site preparation (demolition of the painting and sandblasting building, storage building and diesel tank basin from the HBRP project site; installation of drainage systems, underground utilities, and conduits; grading and backfilling; and installation of pilings);
- Foundation work;
- Installation of major mechanical and electrical equipment; and
- Construction/installation of major structures.

The types of activities that cause construction emissions would include heavy equipment use and fugitive dust activities, along with ocean freighter and heavy haul tractor transport of the engines and generators (AFC Appendix 8.1D).

Fugitive dust emissions from the construction of the project will result from:

- Dust created during site preparation and grading/excavation at the construction site;
- Dust created during onsite travel on paved and unpaved surfaces;
- Dust created during aggregate and soil loading and unloading operations; and
- Wind erosion of areas disturbed during construction activities.

Combustion emissions during construction will result from:

- Exhaust from the diesel construction equipment used for site preparation, grading, excavation, trenching, and construction of onsite structures;
- Exhaust from water trucks used to control construction dust emissions;
- Exhaust from portable welding machines;
- Exhaust from pickup trucks and diesel trucks used to transport workers and materials around the construction site;
- Exhaust from diesel trucks used to deliver concrete, fuel, and construction supplies to the construction site;
- Exhaust from automobiles used by workers to commute to the construction site; and
- Exhaust from portable generators and light carts.

Estimates of the highest daily emissions and total annual emissions for the entire construction period are shown in **Air Quality Table 9** and **Table 10**, respectively.

AIR QUALITY Table 9
HBRP, Estimated Maximum Daily Construction Emissions (lb/day)

Activity	NOx	ROC	PM10	PM2.5	CO	SOx
On-site Fugitive Dust	---	---	12.5	1.6	---	---
On-site Equipment Exhaust	111.9	27.5	3.4	3.4	321.4	0.2
Off-site Truck and Worker Travel	240.6	47.0	5.5	5.5	411.4	0.4
Off-site Barge Transport	253.9	312.8	14.7	14.7	0.2	36.8
Off-site Heavy Haul Tractor	12.6	0.4	0.4	0.4	4.6	<0.1
Total On-site Daily Emissions	**111.9**	**27.5**	**15.9**	**6.0**	**321.4**	**0.2**

Source: AFC Appendix 8.1D, Tables 8.1D-3 and 8.1D-4.

AIR QUALITY Table 10
HBRP, Estimated Annual Construction Emissions (tons/year, tpy)

Activity	NOx	ROC	PM10	PM2.5	CO	SOx
On-site Fugitive Dust	---	---	1.1	0.1	---	---
On-site Equipment Exhaust	10.9	2.3	0.3	0.3	26.9	<0.1
Off-site Truck and Worker Travel	13.5	3.6	0.3	0.3	31.7	<0.1
Off-site Barge Transport	2.5	0.4	0.2	0.2	3.1	<0.1
Off-site Heavy Haul Tractor	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Annual Emissions	**27.0**	**6.3**	**1.9**	**0.9**	**61.7**	**<0.1**

Source: AFC Appendix 8.1D, Table 8.1D-4, with total 20 one-day round-trips for barge and heavy haul tractor transport.

Proposed Initial Commissioning Emissions

New power generation facilities must go through initial firing and commissioning phases before becoming commercially available to generate electricity. During this period, emissions exceed those that occur during normal operations because of numerous start-ups and shutdowns, periods of low load operation, and other testing that is required before emission control systems are fine-tuned for optimum performance.

The NCUAQMD allows up to 100 hours of operation per engine without full emissions controls, limited to discrete commissioning activities that can only be properly executed without full operation of the SCR or oxidation catalyst systems (NCUAQMD 2007).

Air Quality Table 11 presents the maximum allowed short-term emissions of NOx, CO, and ROC. PM10, PM2.5, and SO_2 emissions are not included here since they are proportional to fuel use, and fuel use during commissioning is equal to that during full load operations.

AIR QUALITY Table 11
HBRP, Maximum Initial Commissioning Emissions

Source	NOx	ROC	CO
Ten Internal Combustion Engines (lb/hr)	323.3	86.6	197.2
Ten Internal Combustion Engines (lb/day)	4,365	1,559	2,662

Source: PDOC Condition 75, Table 5.6, NCUAQMD 2007.

Operation Emission Controls

NOx Controls

Exhaust from each of the primary engines will be treated by an SCR system before being released into the atmosphere. SCR refers to a process that chemically reduces NOx to elemental nitrogen and water vapor by injecting ammonia (NH_3) into the flue gas stream in the presence of a catalyst and excess oxygen. The process is termed selective because the ammonia preferentially reacts with NOx rather than oxygen. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or noble metals are also used. Regardless of the type of catalyst used, efficient conversion of NOx to nitrogen and water vapor requires the uniform mixing of ammonia into the exhaust gas stream and a catalyst surface large enough to ensure sufficient time for the reaction to take place.

ROC and CO Controls

Engine emissions of CO and unburned hydrocarbons, including ROC, would be controlled with an oxidation catalyst installed in conjunction with the SCR catalyst. An oxidation catalyst system chemically reacts with organic compounds and CO with excess oxygen to form carbon dioxide (CO_2) and water. Unlike the SCR system for reducing NOx, an oxidation catalyst does not require any additional chemicals.

PM10/PM2.5 and SOx Controls

Use of pipeline-quality natural gas, a clean-burning fuel that contains very little sulfur or noncombustible solid residue, and ARB ultra-low sulfur diesel fuel will limit the formation of SOx and particulate matter. Natural gas does contain small amounts of a sulfur-based scenting compound known as mercaptan, which results in some SOx emissions when burned. The applicant and the NCUAQMD both expect the annual average natural gas sulfur content to be less than 0.33 grains per 100 cubic feet at standard temperature and pressure (0.33 gr/100 scf). SOx emissions would be very low using these fuels.

Use of diesel fuel for pilot ignition and during natural gas curtailments causes relatively high levels of particulate matter when compared to exclusive use of natural gas.[1] PG&E expects to achieve a certain amount (a reduction of 30%) of particulate matter control with the oxidation catalysts when the engines are fired in diesel mode (Response to Data Request 94, October 2007). This control effectiveness is made implicit by PG&E by proposing to achieve emissions below the manufacturer's guarantee. Under PG&E's proposal, the reductions expected with the oxidation catalyst would not be specifically verified by testing or monitoring.

Proposed Operation Emissions

Criteria pollutant emissions from each of the ten 22,931 bhp Wärtsilä 18V50DF reciprocating internal combustion engines are based upon the applicant's proposal of:

- dual-fuel firing capability in two modes: "natural gas mode" with a small amount of diesel as a pilot injection fuel; and "diesel mode" firing exclusively liquid fuel;
- NOx emissions in natural gas mode controlled to 6 parts per million by volume, dry basis (ppmvd) corrected to 15% oxygen, averaged over any 3-hour period and 35 ppmvd in diesel mode;
- PM10 emissions of 3.6 lb/hr per engine in natural gas mode (equivalent to 0.072 grams per horsepower-hour) up to 10.8 lb/hr per engine (0.214 g/bhp-hr) in diesel mode;
- sulfur emissions limited by the average natural gas sulfur content of less than 0.33 grains per 100 cubic feet at standard temperature and pressure (0.33 gr/100 scf) and use of ARB ultra-low-sulfur (0.0015% or 15 ppm sulfur by weight) diesel fuel;
- ammonia slip (NH_3) controlled to 10 ppmvd at 15% O_2 for any 3-hour period;
- operations limited by fuel and emissions limits equivalent to 6,497 full-load hours annually for each engine, limited by the NCUAQMD PDOC to 1,000 engine-hours annually in diesel mode, which provides an annual capacity factor of approximately 70% (NCUAQMD 2007); and
- startups and shutdowns limited to no more than 365 hours in startup (0.5 hr per event) or shutdown (8.5 minutes per event) for each engine per year.

The ability of the proposed internal combustion engines to start quickly and reach operating capacity within 30 minutes minimizes the variability of emissions that can typically occur when operating in a peaking mode. The ability to incrementally dispatch each of the ten engines also minimizes the emissions that would occur during partial load operation.

Air Quality Table 12 summarizes basic fuel specifications and exhaust concentrations based on the maximum (worst-case) estimated emissions during operation, and **Air Quality Tables 13** through **15** summarize the maximum (worst-case) estimated emissions during operation.

[1] Exclusive firing of natural gas in internal combustion engines causes roughly 0.02 grams-per-brake horsepower-hour (g/bhp-hr) of PM10/PM2.5, which would be about one-tenth of what is emitted during diesel firing. The factor of 0.02 g/bhp-hr is from Table I-2 of the California Air Resources Board's (CARB) "*Guidance for the Permitting of Electrical Generation Technologies*" dated July 2002.

AIR QUALITY Table 12
HBRP, Wärtsilä Fuel Specifications and Maximum Exhaust Concentrations

Parameter	Natural Gas Mode With Diesel Pilot	Diesel Mode
Fuel Higher Heating Value (HHV)	1,021 Btu/scf	136,903 Btu/gal
Nominal Heat Input Rate per Wärtsilä Engine	143.9 MMBtu/hr gas (plus 0.8 MMBtu/hr diesel pilot)	148.9 MMBtu/hr
Annual Heat Input Rate (Ten Wärtsilä Engines)	9,400,000 MMBtu/yr	148,900 MMBtu/yr *
NOx	6.0 ppmvd	35.0 ppmvd
ROC	28.0 ppmvd	40.0 ppmvd
PM10	3.6 lb/hr-engine (0.07 g/bhp-hr)	10.8 lb/hr-engine (0.21 g/bhp-hr)
CO	13.0 ppmvd	20.0 ppmvd
Sulfur Content	1 gr/100 scf (max) 0.33 gr/100 scf (avg)	15 ppmw
Ammonia Slip (NH_3)	10 ppmvd	10 ppmvd

Source: AFC Tables 8.1-10 and Tables 8.1-11A and B, Table 8.1-14. Exhaust gas concentrations based on 15% O_2.
Note: * Based on 1,000 engine-hours per year in diesel mode (NCUAQMD 2007).

Emissions from the 469 bhp emergency standby generator engine are based upon:

- NOx emissions limited to 3.47 g/bhp-hr;
- PM10 emissions limited to 0.05 g/bhp-hr;
- exclusive use of ARB ultra-low-sulfur diesel fuel (15 ppmw);
- operation for maintenance and testing not permitted during times of Wärtsilä engine operation in diesel mode (PDOC Condition 101); and
- operation for maintenance and testing permitted up to 45 minutes per day and not more than 50 hours per year (PDOC Condition 102).

Emissions from the 210 bhp emergency fire water pump engine are based upon:

- NOx emissions limited to 4.9 g/bhp-hr;
- PM10 emissions limited to 0.06 g/bhp-hr;
- exclusive use of ARB ultra-low-sulfur diesel fuel (15 ppmw);
- operation for maintenance and testing not permitted during times of Wärtsilä engine operation in diesel mode (PDOC Condition 101) or during same 24-hour period as testing of emergency standby generator (PDOC Condition 100); and
- operation permitted up to one hour per day and not more than 50 hours per year for maintenance and testing purposes.

Air Quality Table 13 lists the maximum 1-hour emissions from each piece of proposed equipment from manufacturer estimates (AFC Table 8.1-15 and 8.1-16, September 2007).

AIR QUALITY Table 13
HBRP, Maximum Short-Term Emissions Rates (pounds per hour [lb/hr])

Source	NOx	ROC	PM10/ PM2.5	CO	SO_2
Natural Gas Mode, Each Wärtsilä Engine (lb per 30-minute startup event)	22	15.4	---	22	---
Natural Gas Mode, Each Wärtsilä Engine (maximum lb per normal hour)	3.1	5.1	3.6	4.1	0.4
Diesel Mode, Each Wärtsilä Engine (lb per 30-minute startup event)	154	13.2	---	22	---
Diesel Mode, Each Wärtsilä Engine (maximum lb per normal hour)	19.6	7.9	10.8	6.9	0.2
Ten Wärtsilä Engines (maximum lb/hr) *	484.8	179.0	108.0	241.0	4.0
Emergency Fire Pump Engine (lb/hr)	2.27	0.23	0.06	0.30	<0.01
Emergency Standby Generator (lb/hr)	3.59	0.41	0.05	0.65	<0.01
Maximum Hourly Limit in PDOC (Applicable to Ten Wärtsilä Engines)	**392**	**---**	**---**	**---**	**---**

Source: AFC Table 8.1-15 and 8.1-16, PDOC Condition 48 (NCUAQMD 2007).
Note: * Basis of maximum lb/hr is worst of either 10 engines in natural gas startup mode or eight engines in diesel mode with simultaneous startup of two engines in diesel mode (AFC p.8.1-29).

Air Quality Table 14 lists the maximum emissions during any given day of operation from the proposed equipment. These emissions are based upon three startups of each Wärtsilä engine, with the remainder of the day in full load operation. The emergency standby generator would only be tested for 45 minutes per day (AFC Table 8.1-17), and the fire pump engine would not operate on any day when the power plant is in diesel mode.

AIR QUALITY Table 14
HBRP, Maximum Daily Emissions (lb/day)

Source	NOx	ROC	PM10/ PM2.5	CO	SO_2
Natural Gas Mode, Ten Wärtsilä Engines (maximum lb per day) *	1,359	1,608	864	1,584	96.0
Diesel Mode, Ten Wärtsilä Engines (maximum lb per day) *	9,036	2,175	2,592	2,211	52.8
Emergency Standby Generator (lb/day @ 45 min per day for testing)	2.69	0.31	0.04	0.49	0.01
Maximum Daily Limit in PDOC (Applicable to Ten Wärtsilä Engines)	**---**	**---**	**1,542**	**---**	**---**

Source: AFC Table 8.1-17, with limit in PDOC Condition 60 (NCUAQMD 2007).
Note: * Basis of maximum lb/day is 24 hours of full load with three startups per day per engine (PDOC Condition 90).

Air Quality Table 15 lists maximum annual emissions from each source with the federally enforceable total annual emission limits established by the NCUAQMD for the proposed project (PDOC Condition 61, NCUAQMD 2007). The permit conditions make the limit on total annual emissions consistent with 6,497 hours of operation and 365 startups and shutdowns annually for each engine.

AIR QUALITY Table 15
HBRP, Maximum Annual Emissions (tons per year)

Source	NOx	ROC	PM10/ PM2.5	CO	SO_2
Ten Wärtsilä Engines (tpy limit in PDOC)	174.2	188.9	118.7	171.0	4.4
Emergency Fire Pump Engine (tpy)	0.057	0.006	0.002	0.008	<0.01
Emergency Standby Generator (tpy)	0.090	0.010	0.001	0.016	<0.01
Total Maximum Annual Emissions	**174.3**	**188.9**	**118.7**	**171.0**	**4.4**

Source: PDOC Condition 61 (NCUAQMD 2007).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff characterizes air quality impacts as follows: All project emissions of any nonattainment criteria pollutants (PM10) and precursors (PM2.5, NOx, ROC, SOx, and NH_3) are considered significant and must be mitigated. For short-term construction activities that essentially cease before operation of the power plant, our assessment is qualitative and mitigation consists of controlling construction equipment tailpipe emissions and fugitive dust emissions to the maximum extent feasible. For operating emissions, mitigation includes both the Best Available Control Technology (BACT) and emission reduction credits (ERC) or other valid emission reductions to offset emissions of both nonattainment criteria pollutants and their precursors.

The ambient air quality standards used by staff as the basis for characterizing project impacts are health-based standards established by the ARB and U.S. EPA. They are set at levels that contain a margin of safety to adequately protect the health of all people, including those most sensitive to adverse air quality impacts such as the elderly, persons with existing illnesses, children, and infants.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Ambient air quality impacts occur when a project increases the concentration of a pollutant. Project-related emissions are the actual mass of emitted pollutants, which are diluted in the atmosphere before reaching the ground. Analysis of the impacts begins with quantifying the emissions, then using an atmospheric dispersion model to determine the probable change in ground-level concentrations.

Dispersion models complete complex, repeated calculations that consider emissions in the context of various ambient meteorological conditions, local terrain, and the built environment. For HBRP, the meteorological data used as an input to the dispersion model includes five years (2001-2005) of hourly wind speeds and directions measured at the Woodley Island meteorological station, combined with upper-air meteorological data for coastal northern California from Oakland.

The project-related modeled concentrations are then added to background concentrations to arrive at the total impact of the project. The total impact is then compared with the ambient air quality standards for each pollutant to determine whether

the project's emissions would either cause a new violation of the ambient air quality standards or contribute to an existing violation.

Modeling Methodology for HBRP

The dispersion modeling protocol developed by the applicant for HBRP involves three major U.S. EPA models used together (AFC Attachment 8.1B-1, September 2007). The applicant used the U.S. EPA's Industrial Source Complex Short Term Model (ISCST3, version 02035) as both a screening and refined model to estimate the direct impacts of NOx, PM10, CO, and SOx emissions during HBRP construction. Staff accepts the ISCST3 model based on its reliability in predicting impacts, although since 2005, the U.S. EPA has not maintained ISCST3 as a "preferred" model (U.S. EPA 2005).

The applicant uses the American Meteorological Society/Environmental Protection Agency Regulatory Model known as AERMOD (version 06341) for a partial analysis of the operating-phase emissions. AERMOD is a "preferred" model, and the applicant uses it as a screening tool and as a foundation for all refined modeling. The applicant additionally uses a separate "complex terrain" model instead of AERMOD for all terrain above the 100-foot stack top.

The U.S. EPA Guideline on Air Quality Models (40 CFR 51, Appendix W) defines AERMOD as the recommended model for refined analysis of stationary sources in all terrain. In promulgating the 2005 Guideline (70 FR 68220, November 9, 2005), the U.S. EPA establishes the scientific merits and adequacy of AERMOD:

> ". . . the adequacy of AERMOD's complex terrain approach for regulatory applications is seen most directly in its performance. AERMOD's complex terrain component has been evaluated extensively by comparing model-estimated regulatory design values and concentration frequency distributions with observations. These comparisons have demonstrated AERMOD's superiority to ISC3ST[sic] and CTDMPLUS (Complex Terrain Dispersion Model PLUS unstable algorithms) in estimating those flat and complex terrain impacts of greatest regulatory importance. For incidental and unique situations involving a well-defined hill or ridge and where a detailed dispersion analysis of the spatial pattern of plume impacts is of interest, CTDMPLUS in the Guideline's appendix A remains available." (U.S. EPA 2005)

This indicates that although AERMOD alone provides a refined model suitable for complex terrain, the U.S. EPA also allows CTDMPLUS for cases involving a well defined hill or ridge and where a detailed dispersion analysis of the spatial pattern of plume impacts is of interest. The applicant believes that Humboldt Hill and the terrain to the south of HBRP presents a unique situation suitable for analysis with CTDMPLUS.

The Guideline poses a vexing issue for regulators and the regulated community because the U.S. EPA essentially recommends two different models for the purpose of refined analysis of complex terrain, meaning that modelers may be tempted to select one model over another to arrive at results that suit the modelers' needs. Staff is concerned that using different models for the same purpose may lead to "cherry-picking" results.

Staff avoids this concern by implementing AERMOD alone. Staff believes that AERMOD alone provides a suitable analysis of HBRP impacts in all terrain. AERMOD is a newer model than CTDMPLUS that is simpler to execute because it does not involve labor intensive, case-specific, interpretation of data on terrain elevations, meteorological data, or model output results. AERMOD, or its predecessor (ISCST3), has been normally used over the past dozen years or more by power plant developers and Energy Commission staff. As such, staff selects AERMOD without using CTDMPLUS to create an assessment of impacts that is easily repeatable, transparent, and comparable to assessments of other power plant projects conducted by staff.

Construction Impacts and Mitigation

This section discusses the project's short-term direct construction ambient air quality impacts assessed by the applicant and independently reviewed by Energy Commission staff. The applicant estimated the emissions of the main site construction activities and modeled the impacts using the ISCST3 model for all pollutants except NO_2, which was modeled with the Ozone Limited Method (ISC3-OLM) and the Ambient Ratio Method (ARM).[2]

Air Quality Table 16 summarizes the results of the modeling analysis for construction activities. The total impact is the sum of the existing background condition plus the maximum impact predicted by the modeling analysis for project activity. The values in **bold** in the Impact and Background columns represent the values that either equal or exceed the relevant ambient air quality standard.

[2] The OLM is a screening technique that predicts NO_2 formation from NOx emissions depending on whether sufficient ambient ozone is present. NO_2 formation is directly proportional to, but can also be limited by, ozone concentrations. Higher ambient ozone concentrations enables more conversion of NOx to NO_2. The NO_2 modeling conducted by the HBRP applicant used maximum annual ozone concentrations from Ukiah, a location expected to have higher peak ozone concentrations than the project site. While Energy Commission staff does not endorse using such geographically disparate data, this approach should not under-estimate overall NO_2 impacts.

AIR QUALITY Table 16
HBRP, Construction-Phase Maximum Impacts (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	27	**72.2**	**99.2**	50	**198**
	Annual	3	**21.1**	**24.1**	20	**121**
PM2.5	24 hour	8	35.0	**43.0**	35	**123**
	Annual	1	8.2	9.2	12	77
CO	1 hour	5,231	3,250	8,481	23,000	37
	8 hour	1,138	1,978	3,116	10,000	31
NO_2	1 hour	227	75.2	302.2	470	64
	Annual	20	17.0	37	100	37
SO_2	1 hour	3	114.4	117.4	655	18
	24 hour	0.3	21.0	21.3	105	20
	Annual	0.04	5.8	5.84	80	7

Source: AFC Table 8.1D-7, Sept 07.

The maximum modeled construction-phase impacts are predicted to occur at the eastern fence line between the project site and Highway 101. The concentrations decrease rapidly with distance, typically reduced by half before reaching the highway. At the South Bay Union School, the maximum daily PM10 impacts would be less than one-fifth of the maximum (or less than 5 μg/m^3).

Staff believes that particulate matter emissions from construction would cause a significant impact that warrants additional mitigation because they will contribute to existing violations of PM10 ambient air quality standards and potentially cause new violations of the PM2.5 standards. Significant secondary impacts would also occur for PM10 and PM2.5 because construction-phase emissions of particulate matter precursors (including SOx, NOx, and ROC) would also contribute to violations of these standards.

The direct construction-phase impacts of NO_2, in conjunction with worst-case background conditions, would not cause new violations of the 1-hour or annual NO_2 ambient air quality standard.

The direct construction-phase impacts of CO and SO_2 would not be significant because construction of the project would neither cause nor contribute to a violation of these standards. Mitigation for construction emissions of PM10, PM2.5, SOx, NOx, and ROC would be appropriate for reducing construction-phase impacts to PM10 and PM2.5.

Construction Mitigation

The applicant proposes implementation of a number of control measures to reduce emissions of particulate matter, particulate matter precursors, and ozone precursors in a manner consistent with local air district recommendations, soil erosion control requirements, and nuisance prohibitions (AFC Section 8.1.2.4, PG&E, September 2007). Staff agrees that the applicant's proposed mitigation measures would be effective. The proposed measures for reducing exhaust emissions from heavy equipment include:

- limiting time spent with the engine idling by shutting down equipment when not in use;
- regular preventive maintenance to prevent emission increases due to engine problems;
- use of low sulfur and low aromatic fuel meeting California standards for motor vehicle diesel fuel; and
- use of low-emitting gas and diesel engines meeting state and federal emissions standards for construction equipment, including but not limited to catalytic converter systems and particulate filter systems.

The following mitigation measures are proposed to control fugitive dust emissions:

- use either water application or chemical dust suppressant application to control dust emissions from onsite unpaved road travel and unpaved parking areas;
- use vacuum sweeping and/or water flushing of paved road surface to remove buildup of loose material to control dust emissions from travel on the paved access road (including adjacent public streets impacted by construction activities) and paved parking areas;
- cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard;
- limit traffic speeds on all unpaved site areas to 15 mph;
- install sandbags or other erosion control measures to prevent silt runoff to roadways;
- replant vegetation in disturbed areas as quickly as possible;
- use wheel washers or wash off tires of all trucks exiting construction site; and
- mitigate fugitive dust emissions from wind erosion of areas disturbed from construction activities (including storage piles) by application of either water or chemical dust suppressant.

Because of the predicted significant particulate matter impacts, staff recommends additional construction mitigation measures to reduce construction-phase impacts to a less than significant level. Staff believes that the short-term and variable nature of construction activities warrants a qualitative approach to mitigation. Construction emissions and the effectiveness of mitigation varies widely depending on variable levels of activity, the specific work taking place, the specific equipment, soil conditions, weather conditions, and other factors, making precise quantification difficult. Despite this variability, there are a number of feasible control measures that can be implemented to significantly reduce construction emissions. Staff has determined that the use of oxidizing soot filters is a viable emissions control technology for all heavy diesel-powered construction equipment that does not use an ARB-certified low emission diesel engine. In addition, staff proposes that, prior to beginning construction, the applicant should provide an Air Quality Construction Mitigation Plan (AQCMP) that specifically identifies mitigation measures to be employed by the applicant to limit air quality impacts during construction. Staff includes proposed staff Conditions of Certification **AQ-SC1** through **AQ-SC5** to implement these requirements. These conditions are consistent with both the applicant's proposed mitigation and the

conditions of certification adopted in similar prior licensing cases. Compliance with these conditions would substantially eliminate the potential for significant construction-phase air quality impacts.

Operation Impacts and Mitigation

The following section discusses ambient air quality impacts that were estimated by Energy Commission staff and the results of screening modeling conducted by the applicant using AERMOD. The applicant also performed a number of direct impact modeling analyses, including both fumigation modeling and modeling for impacts during commissioning that are reviewed here.

Routine Operation Impacts

A refined dispersion modeling analysis was performed to identify off-site criteria pollutant impacts that would occur from routine operational emissions throughout the life of the project. This impact analysis includes both maximum operating and start-up/shutdown scenarios to determine worst-case air quality impacts on both a short-term and an annual basis. The predicted maximum concentrations and impacts during natural gas mode and diesel mode operating profiles are shown separately in **Air Quality Tables 17** and **18**, respectively.

AIR QUALITY Table 17
HBRP, Routine Operation Maximum Impacts in Natural Gas Mode (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	36.0	**72.2**	**108.2**	50	**216**
	Annual	2.2	**21.1**	**23.3**	20	**117**
PM2.5	24 hour	18.2	35.0	**53.2**	35	**152**
	Annual	2.2	8.2	10.4	12	87
CO	1 hour	1,517.8	3,250	4,767.8	23,000	21
	8 hour	646.4	1,978	2,624.4	10,000	26
NO_2	1 hour *	229.7	75.2	304.9	470	65
	Annual	3.4	17.0	20.4	100	20
SO_2	1 hour	25.2	114.4	139.6	655	21
	24 hour	4.0	21.0	25.0	105	24
	Annual	0.1	5.8	5.9	80	7

Source: Staff independent analysis using AERMOD, full-receptor grid, and AFC Table 8.1B-4, Sep 2007, except NO2.
Note: * NO_2 basis is NOx emission limit of 392 lb/hr for ten engines (as shown in **Air Quality Table 13**) and OLM modeling results as per AFC Table 8.1-17 and 8.1-22.

AIR QUALITY Table 18
HBRP, Routine Operation Maximum Impacts in Diesel Mode (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	65.2	**72.2**	**137.4**	50	**275**
PM2.5	24 hour	32.6	35.0	**67.6**	35	**193**
CO	1 hour	658.2	3,250	3,908.2	23,000	17
	8 hour	277.5	1,978	2,255.5	10,000	23
NO_2	1 hour	338.0	75.2	413.2	470	88
SO_2	1 hour	13.7	114.4	128.1	655	20
	24 hour	2.2	21.0	23.2	105	22

Source: Staff independent analysis, using AERMOD, full-receptor grid, and AFC Table 8.1B-4, Sep 2007, except NO2.
Note: * NO_2 basis is NOx emission rate of 676 lb/hr for ten engines (exceeding limits of **Air Quality Table 13**) and OLM modeling results as per AFC Table 8.1-17 and 8.1-22.

Maximum modeled impacts are predicted to occur in the elevated terrain approximately two kilometers directly south of the site. The highest PM10 impacts experienced at the South Bay Elementary School would be less than one-tenth of the overall maximum modeled impact (less than 3.6 µg/m^3 daily average in natural gas mode and less than 6.5 µg/m^3 in diesel mode). Residential receptors are located near the point of the maximum modeled PM10 and PM2.5 concentrations on Humboldt Hill and would experience impacts similar to those shown in **Air Quality Tables 17** and **18**.

Staff believes that particulate matter emissions during natural gas mode and diesel mode operation would cause a significant impact that warrants additional mitigation because they will contribute to existing violations of PM10 ambient air quality standards and potentially cause new violations of the PM2.5 standards. Significant secondary impacts would also occur for PM10 and PM2.5 because emissions of particulate matter precursors (including SOx, NOx, and ROC) would also contribute to violations of these standards.

The direct impacts of NO_2, in conjunction with worst-case background conditions, would not cause new violations of the 1-hour or annual NO_2 ambient air quality standard provided that PG&E can comply with the 392 lb/hr NOx emission limit in **Air Quality Table 13** (PDOC Condition 48) in natural gas mode and a 676 lb/hr NOx limit in diesel mode (PDOC Condition 49).

The direct impacts of CO and SO_2 would not be significant because operation of the project would neither cause nor contribute to a violation of these standards. Mitigation for emissions of PM10, PM2.5, SOx, NOx, and ROC during routine operation would be appropriate for reducing impacts to the PM10 and PM2.5 standards.

Mitigation for Routine Operation

Mitigation for PM10/PM2.5

HBRP is required by NCUAQMD rules to offset NOx, ROC, and PM10 emission increases. The applicant proposes to use the actual emission reductions that would occur with shutdown of the existing HBPP and one certificate of Emission Reduction Credits (ERC) to offset project emissions of PM10/PM2.5. Staff and the District

considers SOx to be a PM10/PM2.5 precursor and also recommends offsetting SOx emission increases with emission reductions. **Air Quality Table 19** summarizes the reductions that would occur with the applicant's proposed mitigation strategy.

AIR QUALITY Table 19
Summary of Mitigation for HBRP Annual Emissions (tpy)

Emission Reductions	NOx	ROC	PM10/ PM2.5	SOx
Reductions from HBPP Shutdown *	936.8	24.5	27.4	30.0
Offsets Provided by HBPP Shutdown	149.2	23.4	24.9	---
Surplus Provided by HBPP Shutdown *	787.6	1.1	2.5	30.0
Offsets Provided by ERC #07-098-12	---	1.6	6.4	---

Emission Mitigation Balance	NOx	ROC	PM10/ PM2.5	SOx
Proposed HBRP Emission Increases	174.2	188.9	118.7	4.4
Balance (Increases Minus Offsets)	25.0	163.9	87.4	4.4
Balance of NOx	25.0	---	---	---
Balance of ROC in NOx-Equivalent (1:1)	163.9	---	---	---
Balance of PM10 in NOx-Equivalent (3.58:1)	312.9	---	---	---
Total Balance	501.8	---	---	4.4
Do Surplus Reductions Mitigate Increases?	Yes	Yes	Yes	Yes

Source: Air Quality Table 15 and PDOC Table 16 of Engineering Evaluation (NCUAQMD 2007).
Emission Reduction Credits (#07-098-12) from Eel River Sawmills, Redcrest, CA.
NOx-Equivalent: Interpollutant trading ratios: 3.58-to-1.0 for NOx-to-PM10/PM2.5; and 1-to-1 for NOx-to-ROC (NCUAQMD 2007).
Note: * Includes emissions from emergency operations, which may not qualify for use as an offset in New Source Review, per NCUAQMD Rule 110, Section 6.2.2. Subject to revision in Final Staff Assessment.

The amount of offsets that should be credited from the shutdown of the HBPP is largely centered on the requirements of PG&E's CPUC Gas Tariff Rule 14. If one could presume that the requirements under Rule 14 are normal operation, then the firing of liquid fuels during natural gas curtailments in the HBPP are included as normal operation. The definition of Historic Actual Emissions, per NCUAQMD Rule 110, Section 6.2.2 excludes emissions that are unrepresentative of normal operations. Thus the NCUAQMD must decide whether the firing of liquid fuels is a normal operation of the HBPP or an emergency circumstance. If it is an emergency circumstance, then the emissions generated during the firing of liquid fuels should be deleted from the offset calculations. Staff is of the belief that because of the contractual commitment in Gas Tariff Rule 14, the operation of HBPP with liquid fuels does constitute normal operation, and thus all the emission offsets shown above in Table 19 should be credited. However, this determination of what constitutes "normal" operation and what constitutes "emergency" operation has serious ramifications to how the proposed HBRP should operate under diesel fuel mode, which will be discussed later in this analysis.

Staff believes that the amount of emission reductions should not include historic emissions from emergency circumstances experienced by the existing sources, such as fuel-oil firing in Humboldt Bay Power Plant Unit 2 (HB2). During August and September 2006 the supply of natural gas was not available due to a rupture in the natural gas pipeline. If NCUAQMD agrees and a smaller level of emission reductions from the

HBPP shutdown is ultimately quantified by the NCUAQMD, then **Air Quality Table 19** will need to be revised and additional mitigation may be necessary.

The actual emission reductions of NOx achieved with shutdown of the existing HBPP would fully offset project NOx emissions (see **Air Quality Table 7**), with surplus NOx reductions (i.e., more reductions than increases) after considering the NOx emission increases caused by HBRP. Similarly, the reductions of SOx would exceed the proposed increases. The applicant proposes to use an "interpollutant trade" to exchange surplus NOx reductions for project-related increases of PM10/PM2.5 and ROC. Based on local meteorology, emission sources, and ambient air quality, the NCUAQMD and ARB developed an interpollutant trading ratio that allows exchange of 3.58 tons of NOx reductions for each ton of proposed PM10/PM2.5 increases (NCUAQMD 2007). Reductions of NOx may also be exchanged for proposed ROC increases at a one-to-one ratio. If the emission offsets are ultimately determined to be calculated correctly, that is that all operations of the HBPP from October 2004 through September 2006 are deemed normal, then the emission reductions shown in **Air Quality Table 19** and required by proposed Condition of Certification **AQ-SC7**, proposed PM10/PM2.5 emissions would be fully offset and project-related impacts to PM10/PM2.5 would be mitigated to a less than significant level.

Secondary Pollutant Impacts

The project's gaseous emissions of NOx, SO_2, ROC, and ammonia (NH_3) are precursor pollutants that can contribute to the formation of secondary pollutants, ozone, PM10, and PM2.5. The process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there are no agency-recommended models or procedures for estimating ozone or particulate nitrate or sulfate formation from a single project. However, because of the known relationships of NOx and ROC to ozone and of NOx, SO_2, and NH_3 emissions to secondary PM10 and PM2.5 formation, it can be said that unmitigated emissions of these pollutants would contribute to higher ozone and PM10/PM2.5 levels in the region. Impacts of NOx and ROC to ozone concentrations would not be significant because the region does not experience existing violations of the ozone ambient standards, and the project is not likely to cause a new violation of ozone standards. Fully offsetting SOx as a precursor to PM10/PM2.5 as described above would similarly reduce the contribution of SOx to secondary impacts to a less than significant level.

Ammonia is a particulate precursor but not a criteria pollutant. Reactive with sulfur and nitrogen compounds, ammonia is common in the atmosphere primarily from natural sources or as a byproduct of tailpipe controls on motor vehicles. Ammonia particulate forms more readily with sulfates than with nitrates. Fully offsetting NOx and SOx limits the formation of particulate nitrates and sulfates, and the secondary pollutant impacts would be reduced to a less than significant level because compliance with a 10 ppmvd ammonia slip limit would control NH_3 emissions to the extent feasible.

Fumigation Impacts

There is the potential that higher short-term concentrations of pollutants may occur during fumigation conditions. Fumigation conditions are generally short-term in nature and only compared to standards shorter than 24 hours. The applicant analyzed the air

quality impacts of HBRP under shoreline fumigation conditions and thermal inversion breakup conditions.

Shoreline fumigation occurs when dense, cool air over water moves onshore and falls, displacing warmer, lighter air over land. The surface and the air over land both tend to heat and cool more rapidly than over water. During an inland sea breeze, the unstable air over land gradually increases in depth with inland distance. The boundary between the stable air over the water and the unstable air over the land and the wind speed determine if a plume is likely to cross from the stable cooler air and cause elevated ground-level concentrations on the land. Shoreline fumigation was assumed to persist for up to three hours (PG&E CD-ROM, Sep 2007).

Thermal inversion breakup fumigation occurs when a stable layer of air lies a short distance above the release point of a plume and unstable air lies below. Under these conditions, an exhaust plume may be drawn to the ground, causing high ground-level pollutant concentrations. Inversion breakup fumigation was assumed to persist 90 minutes (PG&E CD-ROM, Sep 2007).

The analysis of fumigation impacts considers routine emissions of ten engines simultaneously under any mode of operation (except startups) using the SCREEN3 Model (version 96043) (AFC Table 8.1B-6 and Table 8.1B-7). The maximum impacts under shoreline fumigation conditions would occur approximately 0.5 km from the HBRP stacks, and the maximum impacts under inversion breakup fumigation conditions would occur approximately 7 to 9 km from the HBRP stacks. Although the location of maximum impact would change, the short-term project impacts would not exceed the impacts for routine operation shown in **Air Quality Tables 17** and **18**, above. Therefore, no additional mitigation is required for fumigation impacts.

Commissioning-Phase Impacts

The applicant expects initial commissioning to involve no more than five of the dual-fuel engines simultaneously at any one time, for between 30 and 60 days. Performance and emission testing would follow, requiring an additional 45 to 90 days (AFC Section 8.1.2.7.6). Short-term averaging periods are evaluated here because emissions would be limited by conducting most commissioning activities over the span of an 18-hour day with no other operations the remainder of the day (AFC Table 8.1B-10).

Up to 100 hours per engine of operation without full emission controls could occur during commissioning. Impacts due to maximum hourly emission rates of PM10, PM2.5, and SO_2 would occur under similar exhaust conditions as start-up modes, but PM10/PM2.5 impacts would be limited by the periods of non-operation that occur during the days of commissioning. The commissioning-phase impacts of CO and NO_2 would also be similar to those during routine operations. The impacts during commissioning of HBRP are provided in **Air Quality Table 20**.

AIR QUALITY Table 20
HBRP, Commissioning-Phase Maximum Impacts (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	14.0	**72.2**	**86.2**	50	**172**
PM2.5	24 hour	7.0	35.0	**42.0**	35	**120**
CO	1 hour	1,242	3,250	4,492	23,000	20
	8 hour	529	1,978	2,507	10,000	25
NO_2	1 hour	233.3	75.2	308.5	470	66

Source: AFC Table 8.1-23, with independent staff assessment.

Commissioning activities at HBRP should not result in any significant operational or emission changes at the existing Humboldt Bay Power Plant, except for possible reduced output of HBPP and reduced emissions. For any power that is delivered to the grid by the HBRP units during commissioning, less power generation would be required from the existing plant with a corresponding decrease in emissions (Response to Data Request 13, Jan 12, 2007). **Air Quality Table 8** shows the existing effects of HBPP operations that would be somewhat offset during commissioning of HBRP.

Visibility Impacts

A visibility analysis of the project's gaseous emissions is required for federal PSD review. The Class I areas near HBRP are managed by either the U.S. Forest Service (USFS) or the National Park Service (NPS). The nearest Class I areas and the associated Federal Land Managers (FLM) and distances, are as follows:

- Redwood National Park, NPS, 26 miles (42 km)
- Marble Mountain Wilderness Area, USFS, 62 miles (100 km)
- Yolla Bolly Wilderness Area, USFS, 71 miles (114 km)

The applicant prepared a Class I Impacts Analysis that included a visibility analysis for the nearest Class I areas. The visibility analysis includes two components: (1) a regional haze analysis to determine the change in light extinction in the Class I areas, and (2) a coherent visible plume impact analysis. The USFS provided comments on the analysis (October 17, 2007) that are attached with the NCUAQMD PDOC (NCUAQMD 2007), and the USFS indicated that its conclusions were based on limiting HBRP to no more than 50 hours per engine per year in diesel mode. The PDOC however would allow more frequent operation of HBRP in diesel mode than was contemplated by the FLMs. Without an updated opinion from the FLMs, Energy Commission staff does not have sufficient information to conclude whether HBRP would cause significant visibility impacts.

CUMULATIVE IMPACTS AND MITIGATION

“Cumulative impacts” are defined as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (CEQA Guidelines, §15355). Such impacts can be relatively minor and incremental yet still be significant because of the existing environmental background, particularly when considering other closely related past, present, and reasonably foreseeable future projects.

Criteria pollutants have impacts that are usually (though not always) cumulative by their nature. Rarely will a project itself cause a violation of a federal or state criteria pollutant standard. However, many new sources contribute to violations of criteria pollutant standards because of elevated background conditions. Air districts attempt to reduce background criteria pollutant levels by adopting attainment plans, which are multi-faceted programmatic approaches to attainment. Attainment plans typically include new source review requirements that provide offsets and use Best Available Control Technology, combined with more stringent emissions controls on existing sources.

The discussion of cumulative air quality impacts includes the following three analyses:

- a summary of projections for criteria pollutants by the air district and the air district's programmatic efforts to abate such pollution;
- an analysis of the project's "localized cumulative impacts" when combined with other reasonably foreseeable local sources; and
- a discussion of greenhouse gas impacts.

Summary of Projections

The federal and California Clean Air Acts direct local air quality management agencies, in this case, ARB and NCUAQMD, to implement plans and programs that lead to attainment and maintenance of the ambient air quality standards. The NCUAQMD New Source Review program for permitting new and modified stationary sources, and other programs for reducing emissions from mobile sources or area-wide sources, are part of state-wide air quality management plans that apply to sources in the NCUAQMD (including the State Implementation Plan or SIP). Region-wide emission forecasts are routinely compiled by ARB, and they show that the trend of emission increases from electric utilities in Humboldt County should remain stable without substantially increasing from the current conditions to 2020 (ARB 2007).

The NCUAQMD adopted a PM10 Attainment Plan on May 11, 1995 that identified a need for substantial reductions in Eureka-area PM10 emissions from 1991 levels in order to eventually achieve attainment of the 50 $\mu g/m^3$ California ambient air quality standard. The plan identified control strategies for the sources that could be reduced most cost effectively, and they included reducing vehicle miles traveled with transportation and traffic control and reducing residential wood burning (NCUAQMD 1995). Although vehicle miles traveled have been generally increasing, total PM10 emissions in Humboldt County have remained stable since 1995. None of the control strategies in the PM10 Attainment Plan would apply to the proposed HBRP. Compliance of the HBRP with the NCUAQMD New Source Review rule would ensure that no net emission increase occurs after considering interpollutant trades, which would ensure that the project would be consistent with the air quality management plans.

Localized Cumulative Impacts

The combined air quality impacts of the proposed project and other reasonably foreseeable local projects are presented here. The analysis for localized cumulative impacts depends upon identifying which present and future projects are not included in the "background" conditions.

Reasonably foreseeable future projects in the area are those that are either currently under construction or in the process of being approved by a local air district or municipality. Projects that have not yet entered the approval process do not qualify as "foreseeable" because they lack the detailed information needed to conduct this analysis. Sources that are presently operational are included in the background concentrations. No foreseeable future projects that would emit more than 10 pounds per day within six miles of HBRP were identified by NCUAQMD when this information was requested (AFC Appendix 8.1F).

Greenhouse Gas Emissions

In addition to the criteria air pollutants, the generation of electricity can produce air emissions known as greenhouse gases (GHG). Greenhouse gases contribute to the warming of the earth's atmosphere. They include primarily carbon dioxide, nitrous oxide (N_2O), and methane (CH_4, unburned natural gas). Also included are sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs) from transformers and chillers.

Climate change from rising temperatures represents a risk to California's economy, public health, and environment (CEC 2003). In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including the need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p.5). In 2003, the Energy Commission recommended that the state require reporting of greenhouse gas emissions as a condition of the state licensing of new electric generating facilities (CEC 2003, p. 42). This reporting would be in accordance with reporting protocols currently in place or that will be adopted with the implementation of new laws.

The Intergovernmental Panel on Climate Change (IPCC), an international scientific body, has developed standard reporting protocols and methodologies for governments and agencies when calculating GHG inventories. The IPCC-approved methodology for calculating the greenhouse gas emissions in an inventory is specific to the type of fossil fuel burned. In its revised *1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual,* the IPCC established the factors for oxidation, fuel-based emissions, and global warming potential.

The California Global Warming Solutions Act of 2006 (AB32) requires ARB to adopt a statewide greenhouse gas emissions limit equivalent to the statewide GHG emissions levels in 1990, to be achieved by 2020. To achieve this, ARB has a mandate to adopt rules and regulations that will achieve maximum technologically feasible and cost-effective GHG emission reductions.

The ARB adopted three early-action GHG reduction measures in June 2007 and is expected to establish a statewide emissions cap by January 2008. By January 1, 2008, ARB is scheduled to adopt regulations requiring mandatory GHG emissions reporting, and to define the statewide GHG emissions cap for 2020. The ARB would then adopt a plan by January 1, 2009, that would indicate how GHG emission reductions would be achieved through regulations, market mechanisms, and other actions. Then, during 2009, ARB staff would draft language to implement its plan and hold public workshops on each of its measures, including market mechanisms (ARB 2006b). Strategies that the state might pursue to manage GHG emissions in California are identified in the

California Climate Action Team's report to the Governor (CalEPA 2006). Some strategies focus on reducing consumption of petroleum across all areas of the California economy. Improvements in transportation energy efficiency (fuel economy), land use planning, and alternatives to petroleum-based fuels are also expected to provide substantial reductions by 2020 (CalEPA, 2006).

SB1368[3] was also enacted in 2006, prohibiting utilities from entering into long-term investments with power plants exceeding the GHG Environmental Performance Standard established by the CPUC and Energy Commission. At its January 25, 2007 meeting, the California Public Utilities Commission (CPUC) adopted an Emissions Performance Standard for the state's Investor Owned Utilities of 1,100 pounds (or 0.5 metric tons) CO_2 per megawatt-hour (MWh) of electricity produced. The Emissions Performance Standard applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or longer, including contracts with power plants located outside of California.[4] A similar performance standard for Publicly Owned Utilities was adopted by the Energy Commission in August 2007.[5] The proposed HBRP would be a base load generation facility because it is designed and intended to provide electricity at an annual capacity factor of more than 60%. In natural gas mode, HBRP would emit approximately 1,040 pounds of CO_2 per MWh, but in diesel mode HBRP would emit about 1,470 pounds of CO_2 per MWh, which would be over the Emissions Performance Standard.[6] Over an annual average, HBRP would be expected to achieve less than 1,100 pounds of CO_2 per MWh because the time in diesel mode would be limited (see **Project Description and Proposed Emissions**).

Staff recommends Condition of Certification **AQ-SC8**, which requires the project owner to report quantities of relevant emitted greenhouse gases from the HBRP power plant. Staff believes that **AQ-SC8**, along with reporting GHG emissions, will make the project consistent with the regulations and policies described above. The greenhouse gas emissions to be reported in Condition of Certification **AQ-SC8** are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, and HFC and PFC emissions that are directly associated with the production and transmission of electricity. When the requirements of AB32 are implemented, the project would be subject to the new regulations, and the project owner may be forced to implement GHG control measures.

COMPLIANCE WITH LORS

FEDERAL

40 CFR Part 52.21, PSD Increment. PG&E provided an analysis of PSD Class I and Class II increment consumption for the HBRP on November 2, 2007 after the PDOC was issued. The NCUAQMD should review the analysis and determine in consultation with U.S. EPA whether any significant increment consumption would occur.

[3] Public Utilities Code § 8340 et seq.

[4] See Rule at http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm

[5] See CEC Docket # 06-OIR-1, http://www.energy.ca.gov/ghgstandards/documents.

[6] CO_2 per MWh = [(148.9 MMBtu/hr)*(44 lb C/MMBtu)] * (44 lb CO_2)/(12 lb C) per 16.3 MW.

40 CFR Part 52.21, Class I Impact Analysis. The U.S. Forest Service (USFS) reviewed a Class I impact analysis prepared by the applicant and issued an opinion in a letter dated October 16, 2007, attached with the PDOC (NCUAQMD 2007). The USFS analysis of visibility impacts due to HBRP was based upon the dual-fuel engines operating in diesel mode for up to 50 hours per engine per year. Because the PDOC would allow up to 1,000 engine-hours per year in diesel mode, the original visibility analysis based on 50 hours per engine per year is now invalid. Before staff can conclude whether HBRP is likely to comply with this aspect of PSD review, the NCUAQMD should reopen consultation with the USFS and NPS, and the NCUAQMD should secure an opinion on whether any significant Class I impacts would occur.

40 CFR Part 60, Subpart IIII. Compliance with the New Source Performance Standard (NSPS) Subpart IIII threshold of 0.11 g/bhp-hr for diesel particulate matter must be demonstrated by using U.S. EPA Method 5 for testing, which obtains the filterable subset of PM10. The PDOC however would allow "Diesel Particulate Matter" emissions of up to 0.15 g/bhp-hr. Before staff can conclude whether HBRP is likely to comply with the NSPS, this limit should be revised by NCUAQMD to 0.11 g/bhp-hr to match the limit in NSPS Subpart IIII.

STATE

Title 17 CCR 93115, Airborne Toxic Control Measure (ATCM). There are a number of provisions of Title 17 CCR 93115 that apply to the HBRP as it pertains to the exclusive firing of diesel fuel. First, the definition of what constitutes "Emergency Use" under Section 93115.4 (ATCM for Stationary CI Engines – Definitions) must be determined. Section 93115.4 (30) defines ""Emergency Use" means providing electrical power or mechanical work during any of the following events and subject to the following conditions:

(A) the failure or loss of all or part of normal electrical power service or normal natural gas supply to the facility:

1. which is caused by any reason other than the enforcement of a contractual obligation the owner or operator has with a third party or any other party; and

2. which is demonstrated by the owner or operator to the district APCO's satisfaction to have been beyond the reasonable control of the owner or operator."

Based on staff's discussion on Gas Tariff Rule 14 (p. 4.1-13) and the applicant's treatment of natural gas curtailments as part of the normal baseline for the emission offsets (p. 4.1-26), staff believes that because PG&E is subject to a contractual obligation with the CPUC (subsection (A)1) when a curtailment occurs, the firing of diesel fuel in the HBRP does not constitute an "Emergency Use" as defined in subsection 93115.4(30).

With that being the case, then what are the requirements for firing diesel fuel in a non-emergency (that is a natural gas curtailment) in the ATCM? The requirements of subsection 93115.6, the ATCM for Stationary CI Engines – Emergency Standby Diesel-Fueled CI Engine (>50 bhp) Operating Requirements and Emission Standards, are the pertinent requirements. Subsection (a)(3)(A) states, "Diesel PM Standard and Hours of Operating Requirements.

1. General Requirements: New stationary emergency standby diesel-fueled engines (>50 bhp) shall:
   a. emit diesel PM at a rate less than or equal to 0.15 g/bhp-hr; and …..
   b. not operate more than 50 hours per year for maintenance and testing purposed, except as provided in 93115.6(a)(3)(A)2."

Section (A)2 has a Table 1 with a summary of the emission standards and operating requirements during non-emergency use. Staff believes that when HBRP operates under natural gas curtailment, the project is limited to a diesel PM standard of ≤0.15 g/bhp-hr and that this limit applies up to only 50 hours/year for maintenance and testing. If PG&E wanted to operate beyond 50 hours/year for each engine for maintenance and testing, then under the non-emergency requirement of Table 1, the diesel PM standard would be ≤0.01 g/bhp-hr. It is unlikely that the Wärtsilä 18V50DF engine can meet this limit without some form of post-combustion controls when firing 100% diesel fuel. It may be possible to meet this limit if diesel particulate filters are installed. Further analysis of a DPF installation would have to be performed to determine this technology's feasibility on this particular model engine. If there is a true "emergency" such as a physical cut-off of the natural gas supply by a natural event such as a landslide, then the ATCM of ≤0.01 g/bhp-hr would not apply.

Since the applicant wants to operate the project in diesel mode beyond 50 hours/engine/year for circumstances that include maintenance and testing as well as normal, non-emergency operation triggered by curtailments, and the PDOC issued by the NCUAQMD would allow each engine to operate up to an average of 100 hours/engine/year, it appears that the project would be in violation of Title 17 CCR 93115.6. There are two ways that staff believes that this issue can be resolved.

The first is that the HBRP must be limited for diesel firing to no greater than 50 hours/engine/year for maintenance and testing AND normal, non-emergency operation. Alternatively, diesel particulate matter must be controlled or another fuel other than diesel fuel that can meet the ATCM of ≤0.01 g/bhp-hr would have to be used during the natural gas curtailment (normal, non-emergency) operation of the project.

LOCAL

The Preliminary Determination of Compliance (NCUAQMD 2007) summarizes how the proposed HBRP would comply with NCUAQMD requirements. Staff believes that the PDOC and supporting Engineering Evaluation lack a complete analysis and that additional detail and revisions to the PDOC are needed before staff could conclude whether HBRP is likely to comply with NCUAQMD requirements. What follows is a summary of the major issues that need to be resolved with either a revised PDOC or the Final Determination of Compliance.

Staff's complete recommendations for revising the PDOC and its conditions are shown in a public comment letter dated November 21, 2007 from the Energy Commission Environmental Protection Office Manager to the NCUAQMD Air Pollution Control Officer (APCO). A copy of the letter that has been filed with the NCUAQMD is included in **Air Quality Appendix 1**.

NCUAQMD, PDOC Fuel Use and Emission Limits. The HBRP may have difficulty demonstrating compliance with limits in the PDOC on diesel mode operation or limits on emissions of hourly NOx or daily PM10. The impacts identified in this staff assessment are based on the following:

- NOx emissions during natural gas mode not exceeding 392 lb/hr for the ten dual-fuel engines (PDOC Condition 48) or 676 lb/hr at any time (PDOC Condition 49).
- PM10/PM2.5 emissions not exceeding 1,542 lb/day for the ten dual-fuel engines at any time (PDOC Condition 60).
- Diesel fuel firing limitation for any purpose, including natural gas curtailments, of 1,088,362 gallons per year, which is equivalent to 149,000 MMBtu/yr (PDOC Condition 54).
- Diesel mode operation limited to no more than 1,000 engine-hr per year for any purpose, including natural gas curtailments (PDOC Condition 90).

These limits do not allow a full level of operational flexibility. Natural gas curtailments are dictated by the CPUC, and "local capacity" or "must-run" requirements from CAISO to meet electrical demands in the region could force HBRP to operate at times of natural gas curtailments. If lengthy or severe curtailments occur, emissions could exceed the NOx and PM10/PM2.5 limits identified above or diesel fuel use limits also identified above. Although the HBRP would provide improved efficiency compared to the existing HBPP, the existing power plant normally historically required more than 149,000 MMBtu/yr of liquid fuel (see **Air Quality Table 6**), which would not be allowed under the current PDOC. Similarly, the applicant has no way of controlling whether natural gas curtailments dictate more than 1,000 engine-hours per year in diesel mode or the number of multiple simultaneous startups that may be needed in diesel mode. Operation for more than one day in full capacity in diesel mode may also be foreseeable. Because the NOx and PM10/PM2.5 emission limits are substantially lower than the emission rates guaranteed by the engine manufacturer, natural gas curtailments and "must-run" requirements could force HBRP to violate the air permit conditions.

Staff explored options for reducing NOx and PM10/PM2.5 emissions and reducing the need for diesel mode operation with numerous Data Requests to the applicant, status report letters, and workshops in early 2007. Staff encouraged PG&E to examine basic alternatives to the project design, including:

- establishing a more reliable natural gas supply by reinforcing the natural gas supply pipeline, using local gas fields for storage of natural gas, or providing on-site storage of natural gas using either compressed natural gas (CNG) or liquid states for its storage; and
- evaluating propane as an alternative to the proposed diesel backup fuel.

PG&E rejected these and other design options as infeasible or not cost-effective, but these options could be explored in more depth. At this time, staff has no recommendation for resolving the issues posed by the operational limits because allowing more diesel mode operation or higher levels of NOx or PM10/PM2.5 emissions during natural gas curtailments would result in additional environmental impacts requiring further analysis.

NCUAQMD Rule 110, New Source Review. The PDOC includes definitions of "Natural Gas Curtailment" and "Diesel Particulate Matter ATCM Emergency Use" that are unnecessary. Energy Commission staff views curtailments as part of normal, foreseeable operations, which are distinctly not emergencies. In order for potential facility emissions to be known, fuel use and emission limitations should be applicable to all HBRP operations including those during natural gas curtailments. The PDOC allows an excursion of emission limits during curtailments (PDOC Condition 59), which makes it difficult to determine the true potential emissions of the HBRP. Staff recommends removing the terms "Natural Gas Curtailments" and "Diesel Particulate Matter ATCM Emergency Use" from the PDOC and permit conditions because defining a curtailment is truly the responsibility of the CPUC in Gas Tariff Rule 14, not the NCUAQMD, and the California Code of Regulations (17 CCR 93115.4) presently includes a definition of "Emergency Use" for the ATCM. The NCUAQMD should remove the excursions allowed by the PDOC and determine the potential emissions from HBRP during all operations including natural gas curtailments.

NCUAQMD Rule 110, BACT. The PDOC includes a BACT determination that is based on an assertion from PG&E that Diesel Particulate Filters would not be cost effective, but this determination should be based on an independent engineering evaluation of cost effectiveness by the NCUAQMD. The NCUAQMD should illustrate how the cost-effectiveness analysis conforms with the definitions in NCUAQMD Rule 110, Section 4.5.2 and Section 4.8 and federal guidelines for sources subject to PSD review.

NCUAQMD Rule 110, Offsets. Offset requirements are defined in the PDOC on the basis that certain quantities of emissions reductions would occur with the shutdown of the existing HBPP, but these quantities appear to include emissions that occurred during "emergency use" of fuel-oil firing in Humboldt Bay Power Plant Unit 2 (HB2). The definition of Historic Actual Emissions, per NCUAQMD Rule 110, Section 6.2.2 excludes emissions that are unrepresentative of normal operations. A reasonable interpretation of "emergency use" would be that emissions generated during emergencies are not representative of normal operations. Staff believes that because of the contractual agreement between the CPUC and PG&E articulated in Gas Tariff Rule 14, the firing of liquid fuels in the HBPP is a normal and foreseeable event. However, if it is ultimately determined that natural gas curtailment is "an emergency" in the context of defining the HBRP, then those similar operations for the existing HBPP must be defined as an emergency also. Thus the emission reductions available to the HBRP would have to be adjusted downward. The NCUAQMD may have to recalculate the baseline emissions from the existing Humboldt Bay Power Plant and exclude any emissions that occurred due to an "emergency" condition. Staff recommends Condition of Certification **AQ-SC7** to ensure that offsets are fully provided.

NOTEWORTHY PUBLIC BENEFITS

The two existing electric utility steam generating units (105 MW) and the two peaking combustion turbines (30 MW) at Humboldt Bay Power Plant will be shut down following commissioning of the new units. All four units will need to be shut down once the new engines are operational in order for the new emissions of HBRP to be allowed by the NCUAQMD.

The proposed project would improve the overall thermal efficiency of the power plant from about 12,000 to 22,000 Btu/kWh for the steam boilers (Response to Data Request 5, Jan 12, 2007) to approximately 9,600 Btu/kWh for the ten new engines. This improvement leads to a reduction in emissions of most pollutants, including greenhouse gases, when compared to existing conditions. It also leads to a reduction in the need to fire liquid fuel at the facility because less natural gas fuel would be used to generate the same amount of power.

CONCLUSIONS

A major issue for this project is whether a natural gas curtailment under the requirements of PG&E's California Public Utilities Commission (CPUC) Gas Tariff Rule 14 constitutes an emergency through the enforcement of this obligation that PG&E has with the CPUC. This curtailment has two significant implications on the project: the amount of offsets available from the existing HBPP to the HBRP; and whether the HBRP can operate in a 100% diesel mode beyond 50 hours/engine/year for maintenance, testing, and normal operation.

The applicant contends that the amount of offsets available from the HBPP to the HBRP includes emissions that occurred during the firing of fuel oil and diesel in HBPP. Thus, based on the interpretation of District Rule 110 (Offsets), those emissions are from normal operation (and not from an emergency). But for the HBRP, the very same circumstances that result in "normal operation" for the purposes of offset calculations, are considered emergency from a standpoint of compliance with the state Airborne Toxic Control Measures. Staff believes that gas curtailments need to be treated consistently across the entire spectrum of the analysis. If the natural gas curtailment under Gas Tariff Rule 14 is not considered an emergency (as staff believes), but is normal operation, then the offset calculations as provided in this analysis are likely to conform with the District Rule 110 requirements and the diesel fuel firing in the HBRP would need to be limited to no greater than 50 hours per engine per year to conform with Title 17 CCR Section 93115.6. If, however, a natural gas curtailment under Gas Tariff Rule 14 is considered an emergency, then the offset calculations need to be re-calculated to reflect this "non-normal" operation, and thus more offsets may be necessary. While defining a natural gas curtailment as an emergency would allow for greater than 50 hours per engine per year in diesel mode and compliance with Title 17 CCR Section 93115.6, staff does not agree with such an interpretation.

This issue of how to define natural gas curtailment under the Gas Tariff 14 requirements results in the following conclusions:

- PG&E has not proposed any annual limit on the number of hours of operation in diesel mode, except for maintenance and testing, because PG&E states that a natural gas supply curtailment is an "emergency." However, Energy Commission staff and the NCUAQMD both seek to limit the hours of operation in diesel mode because the potential emissions of the project need to be clearly defined. The NCUAQMD has determined that the project should be limited to 1,000 engine-hours per year in the diesel mode.
- PG&E seeks the flexibility to operate the HBRP during natural gas curtailments, which are determined by gas supply constraints and the transmission grid operators (the CAISO) that dictate when the plant must operate. However, HBRP would need

to remain within fuel use and emission limits established by NCUAQMD. There is a potential for the power plant to violate NCUAQMD limits if actual fuel use or emissions occur at or near the maximum anticipated levels or if HBRP is forced by grid operators to be online during lengthy or severe natural gas curtailments.

- If the project is allowed to fire diesel fuel beyond 50 hours per engine per year, and the natural gas curtailment is not considered an emergency under the definition in Title 17 Code of California Regulations (CCR) 93115.4(a)(30) by the regulatory agencies, then the project would be in violation of diesel particulate matter limit standards of Title 17 CCR 93115.6 (a)(3)(A)2.
- If however, the natural gas curtailment is considered "an emergency", then the applicant's offset package for the HBRP is incorrectly based on emission reductions including historic emissions from the Humboldt Bay Power Plant that may have occurred during emergency use of the HBPP. This was the applicant's approach, and it overestimates the emission reductions and underestimates the offset requirements.

In addition, the following issues also need to be resolved:

- The PDOC includes a review of BACT without an analysis of the cost-effectiveness of various control technologies, which is required by NCUAQMD Rule 110, Section 4.5.2 and Section 4.8.
- As discussed in the Compliance with LORS (Federal) section, the visibility analysis (Class I Impact Analysis) and analysis of whether particulate matter emissions would comply with federal increment consumption (PSD Increment) requirements were not available at the time of the NCUAQMD issuance of the PDOC, therefore compliance with those requirements has not been determined.

Additionally, staff identifies a number of significant air quality impacts that may occur with the project as currently defined. Changes to the offset calculations, if they are required for compliance with NCUAQMD Rule 110, Section 6.2.2 would trigger a need for additional offsets to fully mitigate the project's potential impacts. The HBRP may have difficulty demonstrating compliance with limits in the PDOC on diesel mode operation or limits on emissions of hourly NOx or daily PM10. The limits do not allow a full level of operational flexibility, and natural gas curtailments or CAISO electrical demands could force HBRP to operate in a manner that would exceed these limits. For example, HBRP may be forced by natural gas curtailments to operate more than 1,000 engine-hours per year. Similarly, operating scenarios of multiple simultaneous startups in diesel mode, or operation for more than one day in full-capacity diesel mode, may be foreseeable. Because the NOx and PM10 emission limits are substantially lower than the emission rates guaranteed by the engine manufacturer for these scenarios, HBRP could be forced to violate the air permit conditions.

Staff has no recommendation for resolving the issue of operational limits at this time because allowing more diesel mode operation or higher levels of NOx or PM10 emissions would result in additional environmental impacts which have not yet been analyzed. However, the use of a backup fuel other than diesel or use of an add-on control device for particulate matter would likely address these issues. Several alternative fuels and alternative mitigations are briefly discussed in the **Public Health**

section of this PSA and would be equally applicable to reducing air quality impacts associated with diesel fuel.

PROPOSED CONDITIONS OF CERTIFICATION

STAFF-RECOMMENDED CONDITIONS OF CERTIFICATION

If the issues identified above can be satisfactorily resolved, then staff proposes the following Conditions of Certification (identified as the **AQ-SCx** series of conditions) to provide mitigation during the construction phase of the project and to report greenhouse gas (GHG) emissions.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with conditions **AQ-SC3, AQ-SC4** and **AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM delegates. The AQCMM and AQCMM delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the construction project manager (CPM).

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM delegates. The AQCMM and all delegates must be approved by the CPM before the start of ground disturbance.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide, for approval, an AQCMP that details the steps to be taken and the reporting requirements necessary to ensure compliance with conditions of certification **AQ-SC3, AQ-SC4** and **AQ-SC5**.

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt. The AQCMP must be approved by the CPM before the start of ground disturbance.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each monthly compliance report (MCR) that demonstrates compliance with the following mitigation measures for purposes of preventing all fugitive dust plumes from leaving the project site and linear facility routes. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a. All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply

with the dust mitigation objectives of **AQ-SC4**. The frequency of watering may be either reduced or eliminated during periods of precipitation.

b. No vehicle shall exceed 15 miles per hour within the construction site.

c. The construction site entrances shall be posted with visible speed limit signs.

d. All construction equipment vehicle tires shall be inspected and washed as necessary to be free of dirt prior to entering paved roadways.

e. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

f. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

g. All construction vehicles shall enter the construction site through the treated entrance roadways unless an alternative route has been submitted to and approved by the CPM.

h. Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.

i. All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

j. At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or run-off from the construction site is visible on the public roadways.

k. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered or treated with appropriate dust suppressant compounds.

l. All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks to provide at least two feet of freeboard.

m. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The project owner shall include in the MCR: (1) a summary of all actions taken to maintain compliance with this condition; (2) copies of any complaints

filed with the air district in relation to project construction; and (3) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes with the potential to be transported off the project site, 200 feet beyond the centerline of the construction of linear facilities, or within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not providing effective mitigation. The AQCMM or delegate shall then implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed.

Step 1: The AQCMM or delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or delegate shall direct implementation of additional methods of dust suppression if Step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2 specified above fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMP shall include a section detailing how additional mitigation measures will be accomplished within specified time limits.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the MCR, a construction mitigation report that demonstrates compliance with the following mitigation measures for purposes of controlling diesel construction-related emissions. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

b. All construction diesel engines with a rating of 100 hp or higher shall meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless certified by the on-site AQCMM that such engine is not available for a particular item of

equipment. In the event that a Tier 2 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a Tier 1 engine. In the event a Tier 1 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a catalyzed diesel particulate filter (soot filter) unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is "not practical" for the following, as well as other, reasons.

1. There is no available soot filter that has been certified by either the California Air Resources Board or U.S. Environmental Protection Agency for the engine in question; or

2. The construction equipment is intended to be on site for 10 days or less.

3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not possible.

c. The use of a soot filter may be terminated immediately if one of the following conditions exists, provided that the CPM is informed within 10 working days of the termination:

1. The use of the soot filter is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.

2. The soot filter is causing or is reasonably expected to cause significant engine damage.

3. The soot filter is causing or is reasonably expected to cause a significant risk to workers or the public.

4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

d. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (b) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

e. All diesel heavy construction equipment shall not idle for more than five minutes, to the extent practical.

Verification: The project owner shall include in the MCR: (1) a summary of all actions taken to maintain compliance with this condition; (2) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that the equipment has been properly maintained; and (3) any other documentation deemed necessary by the CPM and AQCMM to verify compliance

with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. EPA, and any revised permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any proposed air permit modification to the CPM within five working days of its submittal either by: 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC7 The project owner shall provide emission reductions in the form of "actual emission reductions" (calculated per NCUAQMD Rule 110) or emission reduction credits (ERCs) to offset NOx, ROC, PM10, and SOx emissions. The project owner shall demonstrate that the reductions are provided in the form and amount required by the District.

The project owner shall surrender the ERCs from among those that are listed in the table below or a modified list, as allowed by this condition. If additional ERCs are submitted, the project owner shall submit an updated table including the additional ERCs to the CPM. The project owner shall request CPM approval for any substitutions, modifications, or additions to the listed credits.

The CPM, in consultation with the District, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards, and that the requested change(s) will not cause the project to result in a significant environmental impact. The District must also confirm that each requested change is consistent with applicable federal and state laws and regulations.

Emission Reduction Certificate Number, Location	**NOx (tpy)**	**ROC (tpy)**	**PM10 (tpy)**	**SOx (tpy)**
ERC #07-098-12 Eel River Sawmills, Redcrest, CA	0	1.6	6.4	0
Proposed Offsets Provided by HBPP Shutdown	149.2	23.4	24.9	0
Surplus Reductions from HBPP Needed to Mitigate HBRP	501.8	0	0	4.4

Verification: The project owner shall submit to the CPM records showing that the project's offset requirements have been met prior to initiating construction. If the CPM approves a substitution or modification to the list of ERCs, the CPM shall file a statement of the approval with the project owner and Commission docket. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC8 Until the California Global Warming Solutions Act of 2006 (AB32) is implemented, the project owner shall either participate in a greenhouse gas

(GHG) registry approved by the CPM, or report on a annual basis to the CPM the quantity of greenhouse gases emitted as a direct result of facility electricity production.

The project owner shall maintain a record of fuels types and carbon content used on-site for the purpose of power production. These fuels shall include but are not limited to each fuel type burned: (1) all fuel burned in internal combustion engines; (2) fuel used in fuel gas heaters and emergency equipment; and (3) all fuels used in any capacity for the purpose of facility startup, shutdown, operation, or emission controls.

The project owner may perform annual source tests of CO_2 and CH_4 emissions from the exhaust stacks while firing the facility's primary fuel, using the following test methods or other test methods as approved by the CPM. The project owner shall produce fuel-based emission factors in units of lbs CO_2 equivalent per mmBtu of fuel burned from the annual source tests. If a secondary fuel is approved for the facility, the project owner may also perform these source tests while firing the secondary fuel.

Pollutant	Test Method
CO_2	EPA Method 3A
CH_4	EPA Method 18 (POC measured as CH_4)

As an alternative to performing annual source tests, the project owner may use the Intergovernmental Panel on Climate Change (IPCC) Methodologies for Estimating Greenhouse Gas Emissions (MEGGE). If MEGGE is chosen, the project owner shall calculate the CO_2, CH_4 and N_2O emissions using the appropriate fuel-based carbon content coefficient (for CO_2) and the appropriate fuel-based emission factors (for CH_4 and N_2O).

The project owner shall convert the N_2O and CH_4 emissions into CO_2 equivalent emissions using the current IPCC Global Warming Potentials (GWP). The project owner shall maintain a record of all SF_6 that is used for replenishing on-site transformers. At the end of each reporting period, the project owner shall total the mass of SF_6 used and convert that to a CO_2 equivalent emission using the IPCC GWP for SF_6. The project owner shall maintain a record of all PFCs and HFCs used for replenishing on-site refrigeration and chillers directly related to electricity production. At the end of each reporting period, the project owner shall total the mass of PFCs and HFCs used and convert that mass to a CO_2 equivalent emission using the IPCC GWP.

On an annual basis, the project owner shall report the CO_2 and CO_2 equivalent emissions from the described emissions of CO_2, N_2O, CH_4, SF_6, PFCs, and HFCs.

Verification: The project annual greenhouse gas emissions shall be reported, as a CO_2 equivalent, by the project owner to a climate action registry approved by the CPM, or to the CPM as part of the fourth quarterly operation report (**AQ-SC9**) or the annual air

quality report, until such time that GHG reporting requirements are adopted and in force for the project as part of the California Global Warming Solutions Act of 2006.

AQ-SC9 The project owner shall submit to the CPM quarterly operation reports following the end of each calendar quarter that include operational and emissions information as necessary to demonstrate compliance with the conditions of certification. The quarterly operation report shall specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit quarterly operation reports to the CPM and APCO no later than 30 days following the end of each calendar quarter. The report for the fourth quarter can be an annual compliance summary for the preceding year. This information shall be maintained on site for a minimum of five years and shall be provided to the CPM and District personnel upon request.

DISTRICT-RECOMMENDED CONDITIONS OF CERTIFICATION

As discussed in the analysis (see **Local LORS**), staff has a number of issues related to the conditions recommended by NCUAQMD in the Preliminary Determination of Compliance. Staff has prepared a comment letter that addresses a number of concerns with the conditions that we are including as **Air Quality Appendix 1** of this analysis. Unless and until these concerns are satisfactorily addressed, staff would not support the District-Recommended Conditions of Certification. However, the conditions are shown here in their present form for informational purposes.

I. GENERAL CONDITIONS

AQ-1 This Permit is issued pursuant to California Health and Safety Code Section 42301.1.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-2 The NCUAQMD Rules and Regulations may be superseded or revised by the NCUAQMD Board with notice as required by state law. It is Permittee's responsibility to stay current with Rules and Regulations governing its business. The Permittee is therefore expected to comply with all new Rules and Regulations.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-3 The "Right of Entry", as delineated in California Health and Safety Code Section 41510 of Division 26, shall apply at all times. Failure to do so may be grounds for permit suspension or revocation.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-4 This Permit does not convey any property rights of any sort, or any exclusive privilege.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-5 Any violation of any condition of this Permit is a violation of NCUAQMD Rules and Regulations, and California State Law.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-6 Permit requirements apply to the facility owner and/or operator(s) and any contractor(s) or subcontractor(s) performing any activity authorized under this Permit. Any person(s) including contractor(s), subcontractor(s), not in compliance with the applicable permit requirements are in violation of State and Local laws and subject to appropriate civil and criminal penalties. The facility owner and/operator, and all contractor(s) or subcontractor(s) are strictly liable for the actions and violations of their employee(s). A violation committed by a contractor(s) or subcontractor(s) shall be considered a violation by the facility owner(s) and/or operator(s), and is also a violation by the contractor(s) and/or any subcontractor(s).

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-7 This Permit shall be posted in a conspicuous location at the site and shall be made available to NCUAQMD representatives upon request.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-8 Changes in plans, specifications, and other representations proposed in the application documents shall not be made if they will increase the discharge of emissions or cause a change in the method of control of emissions or in the character of emissions. Any proposed changes, regardless of emissions consequence, shall be submitted as a modification to this Permit. No modification shall be made prior to issuance of a permit revision for such modification.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-9 Knowing and willful misrepresentation of a material fact in the application for the Permit, or failure to comply with any condition of the Permit or of the NCUAQMD Rules and Regulations, or any state or federal law, shall be grounds for revocation of this Permit.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-10 Permittee shall not construct, erect, modify, operate, or use any equipment which conceals the emission of an air contaminant, which would otherwise constitute a violation of the limitations of this Permit.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-11 Commencement of any act or operation authorized by this Permit shall be conclusively deemed to be acceptance of all terms and conditions of this Permit.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-12 The APCO reserves the right to amend this Permit in order to ensure compliance with all applicable Federal, State and Local laws, Rules and Regulations or to mitigate or abate any public nuisance. Such amendments may include requirements for additional operating conditions, testing, data collection, reporting and other conditions deemed necessary by the APCO.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-13 In the event that two or more conditions may apply, and such conditions both cannot apply without conflict, the condition(s) most protective of the environment and the public health and safety shall prevail. In the event that a condition(s) of the Permit and a requirement of a Federal, State or Local law, rule or regulation may also apply, and both cannot apply without conflict, the requirements most protective of the environment and the public health and safety shall prevail.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-14 If any provision or condition of this Permit is found invalid by a court of competent jurisdiction, such finding shall not affect the validity or enforcement of the remaining provisions.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-15 This Permit is effective only upon payment of fees in accordance with NCUAQMD Rules and Regulations. In the event of facility closure or change of ownership or responsibility, the new owner or operator shall be assessed and shall pay any unpaid fees

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-16 This Permit is not transferable from either one location to another, from one piece of equipment to another, or from one person to another, except as provided herein. In the event of any change in control or ownership of the subject facility, the Permittee shall notify the succeeding owner of this Permit and its conditions; and shall notify the NCUAQMD of the change in control or ownership within fifteen (15) days of that change.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-17 A request for Transfer of Ownership of this Permit shall be submitted to the APCO prior to commencing any operation of the subject equipment and/or

operations by any owner(s) and/or operator(s) not otherwise identified in this Permit. Failure to file the Transfer of Ownership constitutes a separate and independent violation, and is cause for voiding this Permit. The burden of applying for a Transfer of Ownership is on the new owner(s) and/or operator(s). Any Permit transfer authorized pursuant to a transfer of ownership request shall contain the same conditions as this Permit.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-18 This Permit is issued pursuant to NCUAQMD Rule 110 §9 and shall only become effective after a Final Determination of Compliance has been issued by the APCO pursuant to NCUAQMD Rule 110 §9.6.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-19 The authorization for equipment installation and construction activities identified in this Permit shall expire no more than 545 days from date of issue. Should the need arise, the Permit may be extended by the NCUAQMD APCO for up to an additional twelve (12) months for good cause shown. The burden of proof lies with the Permittee to demonstrate good cause for such action.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-20 Once the subject equipment has been constructed in compliance with the conditions of this permit, this Authority to Construct Permit shall serve as a Temporary Permit to Operate for a period not to exceed one hundred and eighty (180) days of operation. Should the need arise, the Temporary Permit to Operate may be extended by the APCO for up to an additional ninety (90) days for good cause shown. The burden of proof lies with the Permittee to demonstrate good cause for such action.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-21 This Permit does not authorize the emission of air contaminants in excess of those allowed by the federal Clean Air Act, California Health and Safety Code or the Rules and Regulations of the NCUAQMD. This Permit shall not be considered as permission to violate existing laws, ordinances, regulation or statutes of other governmental agencies. The violation of any of these terms and conditions shall be grounds for revocation of this Permit, and shall be a violation of NCUAQMD Rules and Regulations.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-22 Permittee shall not discharge such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which

cause or have a natural tendency to cause injury or damage to business or property.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-23 Permittee shall not discharge into the atmosphere from any source whatsoever any air contaminant for a period or periods aggregating more than three (3) minutes in any one hour which is as dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines; or of such opacity as to obscure an observer's view to a degree equal to or greater than Ringelmann 1 or twenty (20) percent opacity.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-24 The handling, transporting, or open storage of material in such a manner which allows unnecessary amounts of particulate matter to become airborne shall not be permitted. Reasonable precautions shall be taken to prevent particulate matter from becoming airborne.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-25 All equipment regulated by this Permit shall at all times be maintained in good working order and shall be operated as efficiently as possible so as to ensure compliance with all applicable emission limits. For purposes of compliance with this requirement, good working order, efficient operation, and proper maintenance shall mean the implementation of all protocols, procedures, and activities recommended by the device manufacturer or those required by this Permit.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-26 The Permittee shall provide training and instruction to all contractor(s), subcontractor(s), and employee(s). Training shall include the identification of all the requirements contained within this Permit, and the appropriate method to be used to comply with the permit conditions. Training shall occur prior to any of the contractor(s), subcontractor(s), or employee(s) constructing or operating equipment authorized by this permit. Records documenting the persons receiving instruction and the instruction materials shall be made available to the APCO upon request.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-27 Permittee shall furnish to the APCO, within a reasonable time, any information that the NCUAQMD may request to determine compliance with this Permit or whether cause exists for modifying, revoking and reissuing, or terminating this Permit. Upon request, Permittee shall also furnish to the NCUAQMD copies of records required to be kept by this Permit.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-28 As used in this Permit, the following terms shall have the meaning set out herein:

II. Terms & Definitions

a. **Acfm**: actual cubic feet per minute

b. **Alternative Liquid Fuel**: An alternative diesel fuel or CARB Diesel Fuel with fuel additives that meets the requirements of the California Air Resources Board Verification Procedure, as codified in title 13, CCR, sections 2700-2710

c. **APCO:** the NCUAQMD Air Pollution Control Officer

d. **Calendar Day**: Any continuous 24-hour period beginning at 12:00 AM or 0000 hours

e. **California Air Resources Board (CARB) Diesel Fuel**: Any diesel fuel that is commonly or commercially known, sold, or represented by the supplier as diesel fuel No. 1-D or No. 2-D, pursuant to the specifications in ASTM D975-81, "Standard Specification for Diesel Fuel Oils," as modified in May 1982, which is incorporated herein by reference, and that meets the specifications defined in Title 13 CCR, sections 2281, 2282 and 2284

f. **CAM Plan**: Compliance Assurance Monitoring Plan, as defined in 40 CFR 64

g. **CARB**: the California Air Resources Board

h. **CEC CPM**: California Energy Commission Compliance Program Manager

i. **CEMS**: Continuous Emissions Monitoring System

j. **CFR**: the Code of Federal Regulations

k. **Commencement of Onsite Construction**: the commencement of a program of significant and continuous construction at the Facility or modification of the emissions unit(s) subject to this Permit

l. **Commissioning Activities**: All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the owner's engineer to ensure safe and reliable steady state operation of the reciprocating engines and associated electrical delivery systems

m. **Commissioning Period**: For each reciprocating engine considered separately, the time period that commences when a Reciprocating Engine is first fired. The period shall terminate when each individual

reciprocating engine has successfully completed both performance and compliance testing. The commissioning period shall not exceed 180 days under any circumstances.

n. **COMS**: Continuous Opacity Monitor

o. **Corrected Concentration**: The concentration of any pollutant (generally NO_x, CO, ROG, or NH_3) corrected to a standard stack gas oxygen concentration. For emission points S-1 through S-12, the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis

p. **Diesel Mode:** the firing of reciprocating engines S-1 through S-10 on 100% CARB diesel or alternative liquid fuel

q. **Diesel Particulate Matter (DPM):** filterable particulate matter (PM) measured using EPA method 5

r. **Diesel Particulate Matter ATCM Emergency Use**: shall only pertain to engines S-11 and S-12 and shall mean providing electrical power or mechanical work during any of the following events and subject to the following conditions:

   i. The failure of loss of all or part of normal electrical power service or normal gas supply to the facility which is demonstrated by the Permittee to the NCUAQMD APCO's satisfaction to have been beyond the reasonable control of the Permittee.

   ii. The failure of the facility's internal power distribution system which is demonstrated by the owner or operator to the NCUAQMD APCO's satisfaction to have been beyond the reasonable control of the Permittee.

   iii. The pumping of water for fire suppression or protection.

s. **District**: North Coast Unified Air Quality Management District

t. **Dscfm**: dry standard cubic feet per minute

u. **Emergency:** operation arising from a sudden and reasonably unforeseeable event beyond the control of the permittee (e.g., an act of God) which causes the excess of a limitation under this permit and requires immediate and corrective action. An "emergency" does not include noncompliance as a result of improperly designed or installed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

v. **EPA**: the United States Environmental Protection Agency

w. **Facility:** the site of the Humboldt Bay Repowering Project at HBPP

x. **Firing Hours:** Period of time during which fuel is flowing to a unit, measured in minutes divided by 60

y. **HBRP**: Humboldt Bay Repowering Project

z. **HBPP**: Existing Humboldt Bay Power Plant and applicable NCUAQMD permits.

aa. **Heat Input**: the energy (heat) input of the fuel combusted at the higher heating value (HHV) of the fuel

bb. **HHV**: Higher Heating Value

cc. **Hr**: one hour – a standard measurement of time

dd. **H_2S**: Hydrogen Sulfide

ee. **Lb**: pound – an English unit of measurement of weight and mass being equivalent to 7000 grains, 16 ounces, and 0.453 kilograms

ff. **Maintenance and Testing:** Operation of the reciprocating engines to (a) evaluate the ability of an engine or its supported equipment to perform during an emergency; or (b) facilitate the training of personnel on emergency activities; or (c) perform emissions testing, maintenance and operational testing, or safety-related testing as required by any government agency or by the manufacturer as a requirement of any law, regulation, rule, ordinance, standard, or contract

gg. **MMBtu**: million British thermal units

hh. **Natural Gas**: any mixture of gaseous hydrocarbons containing at least 80% methane by volume as determined by Standard Method ASTM D1945-64

ii. **Natural Gas Curtailment:** A reduction in the natural gas supply available to the Facility as specified below.

   i. Curtailment directed by a regulatory agency, or automatically implemented by PG&E in accordance with procedures approved by a regulatory agency; and

   ii. Curtailment cannot be related to fuel pricing (i.e., units will not be switched to Diesel fuel operation simply because gas prices are higher than Diesel prices).

jj. **Natural Gas Mode:** the firing of natural gas and CARB diesel or alternative liquid fuel in the engines where the diesel fuel or alternative liquid fuel is used solely for pilot injection and does not exceed 0.8 MMBtu total heat input per hour

kk. **NCUAQMD**: North Coast Unified Air Quality Management District

ll. **NFPA**: National Fire Protection Association

mm. **Normal Operations:** the operation of the Wärtsilä reciprocating engines identified in this permit, when firing in natural gas mode with diesel pilot injection, when not in startup, shutdown or malfunction mode

nn. **Notice**: unless otherwise stated, shall be in writing, sent postage prepaid, to the APCO and include all information required. Notice shall be sent to the APCO at the following address: 2300 Myrtle Ave., Eureka, CA 95501

oo. **O_2**: Oxygen

pp. **Permittee:** the owner or operator identified on the Permit title page (PG&E)

qq. **PM**: Particulate Matter

rr. **Ppmvd:** parts per million, volumetric dry

ss. **Responsible Official:** person(s) who have direct supervisorial authority or control to affect operations of the equipment authorized pursuant to this Permit, and who have the ability to certify that a source complies with all applicable federal requirements and federally enforceable permit conditions as generally defined in NCUAQMD Rule 101 §1.245

tt. **Rolling 3-hour Period:** Any consecutive three-hour period, not including start-up or shut-down periods

uu. **ROC:** reactive organic carbon consistent with NCUAQMD Rule 101 §1.294 and HSC

vv. **Quarter:** calendar quarter, consisting of the following Q1 - January through March; Q2 - April through June; Q3 - July through September; Q4 - October through December

ww. **Shutdown Period:** The 30 minute period immediately prior to the termination of fuel flow to the reciprocating engine.

xx. **SO_2**: Sulfur Dioxide

yy. **Startup Period:** The lesser of the first 60 minutes of continuous fuel flow to the reciprocating engine after fuel flow is initiated or the period of time from reciprocating engine fuel flow initiation until the reciprocating engine achieves two consecutive valid 15-minute average CEM data points in compliance with the emission concentration limits of conditions 55 and 57.

zz. **VEE**: Visible Emissions Evaluation

aaa. **Year**: Any consecutive twelve-month period of time

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

III. Authorized Equipment

AQ-29 The Permittee shall install and construct the project as described in Authority To Construct application October 20th 2006 and its series of amendments ending with the most recent submittal of September 30th 2007. Should discrepancies or contradictions exist between the application and this Permit, the provisions of this Permit shall prevail. The specific components authorized are listed in Table 1.0 and Table 2.0 below.

Table 1.0 Authorized Emission Devices

Unit No.	Equipment	Nominal Size
S-1	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #1**, equipped with lean burn technology, abated by A-1 SCR and B-1oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-2	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #2**, equipped with lean burn technology, abated by A-2 SCR and B-2 oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-3	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #3**, equipped with lean burn technology, abated by A-3 SCR and B-3 oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-4	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #4**, equipped with lean burn technology, abated by A-4 SCR and B-4 oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-5	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #5**, equipped with lean burn technology, abated by A-5 SCR and B-5 oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-6	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #6**, equipped with lean burn technology, abated by A-6 SCR and B-6 oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-7	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #7**, equipped with lean burn technology, abated by A-7 SCR and B-7 oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-8	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #8**, equipped with lean burn technology, abated by A-8 SCR and B-8 oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-9	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #9**, equipped with lean burn technology, abated by A-9 SCR and B-9 oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-10	**Wärtsilä 18V50DF Dual Fuel Reciprocating Engine #10**, equipped with lean burn technology, abated by A-10 SCR and B-10 oxidation catalyst	148.9 MMBtu/hr 16.3 MW 22,931 BHp
S-11	**Caterpillar DM8149 (or equivalent) Diesel-fired Emergency IC Engine** powering a 350kW electrical generator	469 HP
S-12	**Clarke/John Deere JU6H-UF50 (or equivalent) Diesel-fired Emergency IC Engine** powering a fire water pump	210 HP

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-30 The Permittee shall not modify the equipment subject to this permit in such a manner so as to exceed the Heat Input Capacities, or deviate from the

nominal full-load design specifications so as to alter the dispersion modeling results, as identified in Table 1.1, Table 1.2, or Table 1.3.

Table 1.1 S-1 Through S-10 Engine Specifications

Primary Fuel	Natural Gas
Backup Fuel	CARB Diesel
Design Ambient Temperature	67.5 ˚F
Nominal Heat Input Rate (HHV)	143.9 MMBtu/hr natural gas plus 0.79 MMBtu pilot fuel (natural gas mode) – OR – 148.9 MMBtu/hr CARB Diesel Fuel (diesel mode)
Nominal Exhaust Temperature	728˚F
Exhaust Flow Rate	121,500 acfm
Exhaust Release Height	100 Feet
Exhaust O2 Concentration, dry volume	11.6%
Exhaust CO2 Concentration, dry volume	5.3%
Emission Controls	Lean Burn Technology and SCR; Oxidation Catalyst
SIC	4911
SCC	20100202 natural gas mode; 20100301 diesel mode

Table 1.2 S-11 Engine Specifications

Primary Fuel	CARB Diesel
Nominal Heat Input Rate (HHV)	4.0 MMBtu/hr
Heat Input, gal/hr	29.1
SIC	4911
SCC	20100301

Table 1.3 S-12 Engine Specifications

Primary Fuel	CARB Diesel
Nominal Heat Input Rate (HHV)	1.68 MMBtu/hr
Heat Input, gal/hr	12.3
SIC	4911
SCC	20201607

The Permittee shall only fire reciprocating engines S-1 through S-10 with fuel which meets or exceeds the fuel specifications identified in Table 1.4.

Table 1.4 Fuel Specifications for S-1 through S-10

Fuel Type	Property	Value
Natural Gas	Sulfur Content	< 1 gr / 100scf per test; annual average <0.33gr/100scf
CARB Diesel	Sulfur Content	< 15 ppm

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-31 Reciprocating engines S-1 through S-10 shall be equipped with a monitoring system capable of measuring and recording hours of operation (in tenths of an hour) and fuel consumption (in tenths of a gallon) while operating in natural gas mode and diesel mode. The measuring devices shall be accurate to plus or minus 1% at full scale, and at least once every twelve months or at more frequent intervals if necessary to ensure compliance with the 1% accuracy requirement.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-32 The exhaust stacks shall not be fitted with rain caps or any other similar device which would impede vertical exhaust flow.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-33 The Permittee shall install and maintain a non-resettable hour meter with a minimum display capability of 9,999 hours upon the Emergency IC Diesel Generators S-11 and S-12. [Section 93115, Title 17, California Code of Regulations, Air Toxic Control Measure (ATCM) for Stationary Compression Ignition (CI) engines]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-34 The Emergency IC Diesel Generators S-11 and S-12 shall use one of the following fuels:

a. CARB Diesel Fuel, or

b. An alternative diesel fuel that meets the requirements of the Verification Procedure (as codified in CCR Title 13 Sections 2700-2710), or

c. CARB Diesel Fuel used with fuel additives that meets the requirements of the Verification Procedure (as codified in CCR Title 13 Sections 2700-2710), or

d. Any combination of a) through d) above.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-35 The reciprocating engines S-11 and S-12 shall be certified to meet the EPA Tier 3 emission levels. [40 CFR 60 Subpart IIII]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-36 The Permittee shall obtain APCO approval for the use of any equivalent engine for S-11 or S-12 not specifically approved by this Authority to

Construct. Approval of an equivalent engine shall be made only after the APCO's determination that the submitted design and performance data for the proposed IC engine is equivalent to the approved engine.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-37 The Permittee's request for approval of an equivalent engine shall include the following information: engine manufacturer and model number, horsepower (hp) rating, exhaust stack information, and manufacturer's guaranteed emission concentrations.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-38 The Permittee's request for approval of an equivalent engine shall be submitted to the District at least 90 days prior to the planned installation date. The Permittee shall also notify the District at least 30 days prior to the actual installation of the District approved equivalent engine. [District Rule 103 §6.0]

Table 2.0 Authorized Control Devices

Control Equipment	Mfgr	Model	Type	Specifications
Oxidation Catalyst	TBD	TBD	TBD	TBD (min 70% reduction CO)
Selective Catalytic Reduction System	TBD	TBD	TBD	TBD

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-39 The Permittee shall install a gas temperature monitor at the selective catalytic reduction inlet and at the face of the oxidation catalyst. [40 CFR 63 Subpart ZZZZ; BACT]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-40 Ammonia injection grids shall be equipped with operational ammonia flow meters and injection pressure indicators. The flow meters shall be accurate to plus or minus 1% at full scale and shall be calibrated at least once every twelve months or at more frequent intervals if necessary to ensure compliance with the 1% requirement.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-41 The Permittee shall install points of access to the Emission Devices, Control Devices, and Continuous Emission Monitoring Devices such that source testing in accordance with the appropriate reference test methods can be performed. All points of access shall conform to the latest Cal-OSHA safety standards. For purposes of compliance with this part, appropriate test methods shall mean the test methods identified in the Testing and Compliance Monitoring Conditions section of this Permit; and the collection of

gas samples with a portable NOx, CO, and O2 analyzer. Sample collection ports shall be located in accordance with 40 CFR Part 60 Appendix A, and with the CARB document entitled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-42 Each reciprocating engine shall be equipped with a continuous emission monitor (CEM) for NOx, CO, and CO2. Continuous emissions monitor(s) shall meet the requirements of 40 CFR part 60, Appendices B and F, and District-approved protocol during normal operations. The monitors shall be designed and operated so as to be capable of monitoring emissions during normal operating conditions and during Startup and Shutdowns Periods.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-43 The Permittee shall demonstrate compliance with the ammonia slip limit by using the following calculation procedure: The ammonia emission concentration shall be verified by the continuous recording of the ratio of the ammonia injection rate to the NOx inlet rate into the SCR control system (molar ratio). The maximum allowable NH3:NOx molar ratio shall be determined during any required source test, and shall not be exceeded until reestablished through another valid source test. Alternatively, the Permittee may be required to install, operate and maintain a continuous in-stack emissions monitor for emissions of ammonia. The Permittee shall obtain APCO approval for the installation and use the ammonia CEMs equipment at least 60 days prior to the planned installation date. [District Rule 103 §6.0]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-44 Prior to commencement of construction, in accordance with Rule 106 §6.6, the Permittee shall provide to the NCUAQMD APCO documentation of transfer of ownership of Emission Reduction Credits sufficient to offset the emissions identified in Table 3. Prior to commencement of the Commissioning Period, the Permittee shall surrender to the NCUAQMD sufficient emission credits to offset the increases listed in Table 3.0 below. NOx credits provided to offset PM10 increases shall be at an inter-pollutant ratio of 3.58:1 after the appropriate distance ratio is applied. [District Rule 110] [40 CFR 51, Appendix S]

Table 3.0 HBRP Required Offsets By Quarter

Pollutant	Pollutant Quantities in Tons			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
NOx	1.40	1.34	1.35	1.33
PM_{10}	2.45	2.35	2.37	2.34
ROC	0.62	0.59	0.59	0.59

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

IV. Emission Limiting Conditions

AQ-45 The Permittee shall not discharge particulate matter into the atmosphere from any combustion source in excess of 0.20 grains per cubic foot of dry gas calculated to 12% CO2 at standard conditions. [NCUAQMD Rule 104 §3.1]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-46 The Permittee shall not discharge sulfur dioxide into the atmosphere in excess of 1000 ppmv or 40 tons per year from each of the Emergency IC Diesel Generators S-11 and S-12.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-47 Visible emissions from reciprocating engines S-1 through S-12 shall not exhibit opacity of 20% or greater, except for up to three minutes in any hour.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-48 During periods of normal plant operations when any combination of reciprocating engines S-1 through S-10 are in a Startup Period, the discharge of NOx from the combination of all engines, shall not exceed 392 lbs per hour.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-49 During periods of Natural Gas Curtailment when any combination of reciprocating engines S-1 through S-10 are in a Startup Period, the discharge of NOx from the combination of all engines shall not exceed 676 lbs per hour.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-50 The Permittee shall not discharge diesel particulate matter from reciprocating engines S-1 through S-10 while operating in Diesel Mode such that emissions of Diesel Particulate Matter exceed 0.15 g/bhp-hr.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

V. Heat Input & Fuel Limitations

Engines S-1 Through S-10

AQ-51 The Permittee shall not operate reciprocating internal combustion engines S-1 through S-10 in such a manner so as to exceed the heat input capacities listed in Table 4.0 on a per engine basis.

Table 4.0 Heat Input Limitations Per Engine

Each Unit[1]	Heat Input, MMBtu (HHV)		
	Hourly 3 hr rolling average	Daily 24 hour rolling average	Annual 365 day rolling average
Natural Gas[2]	143.9	3,454	927,450
Diesel Pilot	0.8	19	5,100
Diesel Mode	148.9	3574	14,890[3]

Notes:

1) Each unit can only run in either Natural Gas or Diesel Mode, not both simultaneously.
2) Heat Input in Natural Gas Mode is the sum of natural gas and diesel pilot also.
3) This limit applies to operation for maintenance and testing, and during periods of Natural Gas Curtailments as defined in this permit. The limit shall not apply to fuel consumed during the Commissioning Period.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-52 The Permittee shall not operate reciprocating internal combustion engines S-1 through S-10 in such a manner so as to exceed the heat input capacities listed in Table 4.1 below calculated as a sum of all 10 engines.

Table 4.1 Heat Input Limitations S-1 Through S-10 Engines Combined

Sum of All 10 Units	Heat Input, MMBtu (HHV)		
	Hourly	Daily	Annual
Natural Gas[1]	1,439	34,536	9,274,500
Diesel Pilot	7.9	190	51,000
Diesel Mode	1,489	35,736	140,890[2]

Notes:

1) Total Heat Input in Natural Gas Mode is the sum of natural gas and diesel pilot.
2) This limit applies to operation for maintenance and testing, and during periods of Natural Gas Curtailments as defined in this permit. The limit shall not apply to fuel consumed during the Commissioning Period.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-53 The Permittee shall not exceed the diesel fuel firing limits listed in Table 4.2 below while operating reciprocating engines S-1 through S-10 in Natural Gas Mode.

Table 4.2 Diesel Fuel Firing Limitations (Pilot)

Engines S-1 Through S-10	Gallons of Diesel Fuel		
	Hourly 3 hr rolling average	Daily 24 hour rolling average	Annual 365 day rolling average
All Combined	58	1,402	376,734

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-54 The Permittee shall not exceed the diesel fuel firing limits listed in Table 4.3 below while operating reciprocating engines S-1 through S-10 in Diesel Mode.

Table 4.3 Diesel Fuel Firing Limitations

Engines S-1 Through S-10	Gallons of Diesel Fuel		
	Hourly 3 hr rolling average	Daily 24 hour rolling average	Annual 365 day rolling average
Per Engine	1,088	26,106	-
All Combined	10,876	261,061	1,088,362

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

VI. Pollutant Limitations

S-1 - S-10 Natural Gas Mode

AQ-55 The Permittee shall not operate reciprocating engines S-1 through S-10, such that they individually discharge pollutants exceeding the limits identified in Table 5.0 below based upon a three (3) hour rolling average. The limits shall not apply during Startup or Shutdown Periods.

Table 5.0 Natural Gas Mode Emission Limits Reciprocating Engines S-1 through S-10

Pollutant	Emission Rate		
	Ppmvd @ 15% O_2	Lb/hr	Lb/MMBtu
CO	13	4.1	0.029
NH_3	10	1.9	0.013
NOx	6.0	3.1	0.022
PM_{10}	-	3.6	-
ROC	28	5.1	0.035
SOx	-	0.40	0.0028

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-56 The combined discharge of pollutants, from the reciprocating engines S-1 through S-10 shall not exceed the limits listed in Table 5.1 below during any Calendar Day in which none of the engines are operated in Diesel Mode for any period of time. For purposes of compliance with this condition, the

emissions from Startup and Shutdown Periods shall be included in the daily calculation of emissions.

Table 5.1 S-1 Through S-10 Combined Natural Gas Mode Limit

Pollutant	Emission Rate Lb/Day
CO	**1,589**
NH_3	**456**
NOx	**1,365**
PM_{10}	**864**
ROC	**1,608**
SOx	**97**

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

S-1 - S-10 Diesel Mode

AQ-57 The Permittee shall not discharge pollutants into the atmosphere from the reciprocating engines S-1 through S-10 while in Diesel Mode, based upon a three (3) hour rolling average, in excess of the emission limits identified in Table 5.2 below. The limits shall not apply during Startup or Shutdown Periods.

Table 5.2 Diesel Mode Emission Limits for Reciprocating Engines S-1 through S-10

Pollutant	Emission Rate		
	ppmvd @ 15% O_2	Lb/hr	Lb/MMBtu
CO	20.0	6.9	0.047
NH_3	10	2.1	0.014
NOx	35.0	19.6	0.134
PM_{10}	-	10.8	0.14
ROC	40.0	7.9	0.053
SOx	0.40	0.22	0.0016

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-58 While operating in reciprocating engines S-1 through S-10 during an event consistent with the definition of Diesel Particulate Matter ATCM Emergency Use, the Permittee shall not operate the reciprocating engines S-1 through S-10 such that Diesel Particulate Matter is emitted exceeds 0.15 g/bhp-hr.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-59 The discharge of Diesel Particulate Matter into the atmosphere from the reciprocating engines S-1 through S-10 while in Diesel Mode shall not exceed the emission limits identified in Table 5.3 below. The limits shall not apply during Startup or Shutdown Periods and shall exclude emissions during the Commissioning Period and during periods of Natural Gas Curtailment as defined in this permit.

Table 5.3 Diesel Particulate Matter Limitations

Engines S-1 Through S-10	Diesel Particulate Matter (pounds)		
	Hourly 3 hr rolling average	Daily 24 hour rolling average	Annual 365 day rolling average
Per Engine	5.56	133.4	-
All Combined	55.6	1,334	5,560

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-60 The combined discharge of pollutants from the reciprocating engines S-1 through S-10 during any Calendar Day shall not exceed the limits listed in Table 5.4 below during any Calendar Day in which one or more of the engines are operated in diesel mode for any period of time. For purposes of compliance with this condition, the emissions from Startup and Shutdown Periods shall be included in the daily calculation of emissions.

Table 5.4 S-1 Through S-10 Combined Diesel Mode Limit

Pollutant	Emission Rate Lb/Day
CO	**2,219**
NH_3	**507**
NOx	**9,101**
PM_{10}	**1,542**
ROC	**2,183**
SOx	**96**

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-61 The combined discharge of pollutants from the reciprocating engines S-1 through S-10 during any calendar year shall not exceed the limits listed in Table 5.5 below.

Table 5.5 S-1 Through S-10 Combined Annual Emission Limits

Pollutant	Emission Rate Tons/Yr
CO	**171.0**
NOx	**174.2**
PM_{10}	**118.7**
ROC	**188.9**
SOx	**4.4**

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

Engines S-11 and S-12

AQ-62 The Permittee shall not operate reciprocating engines S-11 and S-12 such that pollutant discharge into the atmosphere exceeds the quantities in Table 5.6 below.

Table 5.6 Reciprocating Engines S-11 and S-12 Emission Limits

Unit	Pollutant	g/Hp – hr	lb/hr
S-11 Emergency Generator	CO	0.63	0.65
	DPM	0.05	0.05
	NOx	3.47	3.59
	ROC (non-methane HC)	0.4	0.41
	SOx	-	.0061
S-12 Fire Pump	CO	0.59	.27
	DPM	0.14	0.06
	NOx	4.9	2.27
	ROC (non-methane HC)	0.5	0.23
	SOx	-	0.0026

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-63 The combined discharge of pollutants from the reciprocating engines S-11 through S-12 during any calendar year shall not exceed the limits listed in Table 5.7 below.

Table 5.7 S-11 and S-12 Combined Annual Emission Limits

Pollutant	Emission Rate Lbs/Yr
CO	**46**
NOx	**293**
DPM	**5.5**
ROC	**32**
SOx	**0.4**

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

VII. Startup Commissioning & Simultaneous Operation

AQ-64 This Permit supplements existing NCUAQMD Permit Numbers for the HBPP of NS-020 (Boiler #1), NS-21 (Boiler #2) and NS-057 (Turbines) until such time as the sources are decommissioned.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-65 The Permittee shall notify the District of the anticipated date of initial startup of the reciprocating engines S-1 through S-10 not more than 60 days, or less than 30 days prior to initial startup. The Permittee shall notify the APCO of the actual startup of reciprocating engines S-1 through S-10 not more than 15 days after actual initial startup.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-66 The existing generating units at Humboldt Bay Power Plant shall be shut down as soon as possible following the commercial operation of all of the reciprocating engines S-1 through S-10. The existing generating units at Humboldt Bay Power Plant (NCUAQMD Permit Numbers NS-020, NS-21 and NS-057) and the new HBRP reciprocating engines S-1 through S-10 shall not be in simultaneous operation for more than 180 calendar days, including the Commissioning Period, unless such operation is required by the California Independent System Operator. [District Rule 110]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-67 Selective catalytic reduction (SCR) systems and oxidation catalysts shall serve each reciprocating engine except as provided for in Condition #71. Permittee shall submit SCR and oxidation catalyst design details to the District at least 90 days prior to scheduled delivery of these systems to the site. [District Rule 110]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-68 Permittee shall submit continuous emission monitor design, installation, and operational details to the District within 120 days following commencement of construction. [District Rule 110]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-69 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the reciprocating engines shall be tuned to minimize emissions.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-70 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Selective Catalytic Reduction (SCR) system and the oxidation catalyst shall be installed, adjusted, and operated to minimize emissions from each reciprocating engine.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-71 The continuous monitors specified in Permit Conditions 32, 34, 40, and 41 shall be installed, calibrated, and operational prior to the first firing of reciprocating engines S-1 through S-10. After first firing, the detection range of the CEMS shall be adjusted as necessary to accurately measure the resulting range of NOx and CO emission concentrations.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-72 The Permittee shall record and monitor the parameters identified in Table 7.0 of this Permit at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation). The Permittee shall use APCO approved methods to calculate heat input rates, oxides of nitrogen mass emission rates (reported as nitrogen dioxide), carbon monoxide mass emission rates, and NOx and CO emission concentrations, summarized for each hour and each day.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-73 The total number of firing hours of each reciprocating engine S-1 through S-10 without abatement of emissions by the SCR system and the oxidation catalyst shall not exceed 100 hours for each engine during the Commissioning Period. Such operation of each reciprocating engine without abatement shall be limited to discrete Commissioning Activities that can only be properly executed without the SCR system and the oxidation catalyst in place. Upon completion of these activities for each engine, the Permittee shall provide written notice to the District and the unused balance of the allowable firing hours without abatement for that engine shall expire.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-74 When one or more reciprocating engines S-1 through S-10 are undergoing Commissioning Activities without an SCR system and oxidation catalyst installed, the Permittee shall not:

a. Fire more than five uncontrolled reciprocating engines simultaneously.

b. Operate the uncontrolled engines such that their combined hours of operation exceed 90 engine-hours during any Calendar Day.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-75 During the Commissioning Period while the engines are being operated without an SCR system and oxidation catalyst, the Permittee shall not operate reciprocating engines S-1 through S-10, such that the combined emissions exceed any of the limits in Table 5.6 below:

Table 5.6 S-1 through S-10 Combined Commissioning Emission Limits

Pollutant	Lbs/hr	Lbs/day
CO	197.2	2,662
NOx	323.3	4,365
PM_{10}	54	1,296
ROC (Methane)	86.6	1,559
SOx (SO_2)	2.0	48.4

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-76 During the Commissioning Period, after steady-state operation of the SCR system and the oxidation catalyst has been achieved, the NOx and CO emissions from each reciprocating engine shall thereafter comply with the limits specified in Permit Conditions 54, 55, 56, 57, and 58.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-77 Firing hours on 100% CARB Diesel Fuel or Alternative Liquid Fuel during the Commissioning Period shall not be considered Maintenance and Testing for purposes of compliance with the annual operating hour limitations specified in the Operational Conditions section of this Permit.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-78 The total mass emissions of NOx, CO, VOC, PM10, and SOx that are emitted from the reciprocating engines during the Commissioning Period shall accrue towards the emission limits specified in Condition 59.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-79 The Permittee shall submit a plan to the District at least four weeks prior to the first operation of the first of reciprocating engines S-1 through S-10, describing the procedures to be followed during the Commissioning Period. The plan shall include a description of each Commissioning Activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the reciprocating engines, the installation and operation of the SCR systems and the oxidation catalysts, the installation, calibration, and testing of the NOx and CO continuous emissions monitors, and any activities requiring the firing of each unit without abatement by an SCR system or oxidation catalyst.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-80 Not later than 90 days prior to first operation, the Permittee shall prepare and submit to the District for approval a plan for complying with the requirements

of 40 CFR 63 Subpart ZZZZ. This compliance plan shall provide for an initial performance test on each engine to demonstrate that each oxidation catalyst is achieving a minimum 70% reduction in CO. Oxidation catalyst pressure drop and inlet temperature shall be measured during the initial performance test.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-81 Not later than 90 days prior to first operation, the Permittee shall prepare and submit to the District for approval a plan for complying with the requirements of 40 CFR 60 Subpart IIII. This compliance plan shall provide for an initial performance test on each reciprocating engine to demonstrate compliance with the NOx and PM limitations of 40 CFR §60.4204(c)(1) and (c)(2) and shall establish operating parameters to be monitored continuously to ensure that each reciprocating engine continues to meet the applicable emission standards.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

IX. Operational Conditions

AQ-82 In the event of an excess emission incident, regardless of the cause, the Permittee shall immediately take corrective action to minimize the release of excess emissions. Notice shall be provided to the District as indicated in the Reporting and Recordkeeping Section of this Permit. For purposes of compliance with this condition, excess emissions shall mean discharge of pollutants in quantities which exceed those authorized by Federal, State, NCUAQMD Rules, and this Permit.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-83 All equipment listed in Table 1.0 Authorized Emission Devices and 2.0 Authorized Control Devices shall be operated and maintained by the Permittee in accordance with manufacturer's specifications for optimum performance; and in a manner so as to minimize emissions of air contaminants into the atmosphere.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-84 The Permittee shall implement and maintain a written Startup, Shutdown, and Malfunction Plan as described in as described in 40 CFR 63.6(e) (3) which contains specific procedures for maintaining the reciprocating engines S-1 through S-12, their associated control devices, their associated CEMS, sensors, measuring devices, and their associated exhaust gas duct work, during periods of startup, shutdown, and malfunction. The Plan shall also include a specific program of corrective actions to be implemented in the event of a malfunction in either the process or control systems. Modifications to the Plan are subject to APCO approval and the Permittee shall not operate the reciprocating engines S-1 through S-12 and their associated control

devices unless a District approved Startup, Shutdown, and Malfunction Plan is in effect. The Plan shall be submitted to the District less than thirty (30) calendar days prior to the Commissioning Period for any of reciprocating engines S-1 through S-10.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-85 The Permittee shall develop, implement and maintain a written Device Operational Plan that contains specific procedures for operating the reciprocating engines S-1 through S-12, their associated control devices, their associated CEMS, sensors, measuring devices, and their associated exhaust gas duct work under the varying load conditions which may occur during normal modes of operation. The Plan shall also include specific protocols to be followed when transitioning between modes of operation. This plan shall be consistent with the requirements of this Permit, and all local, state and federal laws, rules, and regulations. The plan shall include, but not be limited to, daily system integrity inspections and the recording of operational parameters. The Plan shall be submitted to the District not more than sixty (60) calendar days following expiration of the Commissioning Period for any of reciprocating engines S-1 through S-10. The Plan is subject to APCO approval. The Permittee shall not operate the reciprocating engines S-1 through S-12 and their associated control devices, after the expiration of the Commissioning Period for any of the reciprocating engines plus 60 days, unless a District approved Device Operational Plan is in effect.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-86 The Permittee shall develop, implement and maintain a written Device Maintenance & Replacement Plan that contains specific procedures for equipment maintenance and identifies replacement intervals for components of the reciprocating engines S-1 through S-12, their associated control devices, their associated CEMS, sensors, measuring devices, and their associated exhaust gas duct work. The Plan shall be submitted to the District not more than sixty (60) calendar days following expiration of the Commissioning Period for any of reciprocating engines S-1 through S-10. The Plan is subject to APCO approval. The Permittee shall not operate the reciprocating engines S-1 through S-12 and their associated control devices, after the expiration of the Commissioning Period for any of the reciprocating engines plus 60 days, unless a District approved Device Maintenance & Replacement Plan is in effect.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-87 The Permittee shall only operate the Reciprocating engines S-1 through S-10 in Natural Gas Mode except during the Commissioning Period, during Maintenance and Testing, and during Natural Gas Curtailments as set forth in this permit.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-88 The Permittee shall not operate reciprocating engines S-1 through S-10 such that Startup Periods exceed 60 minutes in length.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-89 The Permittee shall not operate reciprocating engines S-1 through S-10 such that Shutdown Periods exceed 30 minutes in length.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-90 The Permittee shall not operate the reciprocating engines S-1 through S-10 such that the combined hours of operation during Startup and Shutdown Periods exceeds 30 engine-hours per day.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-91 The Permittee shall not operate the reciprocating engines S-1 through S-10 such that the combined hours of operation during Startup and Shutdown Periods exceeds 3,650 engine-hours per calendar year.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-92 The Permittee shall not operate any of the reciprocating engines S-1 through S-10 below 50% load except during Startup and Shutdown Periods.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-93 The Permittee shall not operate the reciprocating engines S-1 through S-10 for more than 80 engine-hours per Calendar Day at loads less than 12.0 MW.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-94 While operating the reciprocating engines S-1 through S-10 in Diesel Mode, the Permittee shall fire the engines:

a. Only with CARB Diesel as specified in Table 1.4 Fuel Specifications for S-1 through S-10;

b. For no more than 50 hours per year for each engine for Maintenance and Testing. [CCR Title 17, §93115], and

c. Such that the combined engine operating hours does not exceed 1000.0 engine hours per year on a 365 day rolling average basis.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-95 For each Oxidation Catalyst installed, during the performance testing required pursuant to the Testing and Monitoring section of this Permit, the Permittee shall determine the pressure drop across each catalyst. The Permittee shall operate the reciprocating engines S-1 through S-10 such that the pressure drop across the catalyst does not exceed the following acceptable range for any period of time: The acceptable pressure range is two inches of water column (plus or minus 10%) deviation from the pressure drop established during performance testing.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-96 The Permittee shall not operate reciprocating engines S-1 through S-10 if the inlet temperature of the oxidation catalyst is outside of the acceptable operating range for any period of time. The acceptable operating range of the oxidation catalyst is greater than or equal to 450 ˚F and less than or equal to 1350 ˚F. Each reciprocating engine is paired with a single oxidation catalyst unit. For purposes of compliance with this condition, each engine and catalyst pair is evaluated separately. This Condition does not apply during Startup or Shutdown Periods or during malfunctions. [40 CFR 63 Subpart ZZZZ]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-97 The Permittee shall not operate reciprocating engines S-1 through S-10 unless the CO emissions from the units are abated by the oxidation catalyst at a rate greater than or equal to 70%, calculated on a 3 hour rolling average. This Condition does not apply during Startup or Shutdown Periods or during malfunctions. [40 CFR 63 Subpart ZZZZ]

Engines S-11 and S-12

AQ-98 The Emergency IC Diesel Generators S-11 and S-12 are authorized the following maximum allowable annual hours of operation governed by the Stationary Diesel Engine ATCM as listed in Table 6.0 below:

Table 6.0 Hours of Operation for Emergency IC Diesel Generators S-11 & S-12

Emergency Use	Non-Emergency Use	
	Emission Testing to show compliance	Maintenance & Testing
Not Limited by the ATCM	Not Limited by the ATCM	50 hours/year

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-99 The Permittee shall not operate the reciprocating engines S-11 and S-12, for the purpose of maintenance and testing, in excess of the hours limits listed in Table 6.1 below:

Table 6.1 S-11 and S-12 Hourly Operating Limits

Device	Daily	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
S-11	1	12	12	13	13
S-12	1	12	12	13	13

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-100 The Permittee shall not operate the reciprocating engines S-11 and S-12, for the purpose of maintenance and testing, within the same 24 hour period.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-101 The Permittee shall not operate the reciprocating engines S-11 and S-12, for the purpose of maintenance and testing, when any of the reciprocating engines S-1 through S-10 are operating in diesel mode.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-102 The Permittee shall not operate reciprocating engine S-11, for the purpose of maintenance and testing, for more than 45 minutes in any 60 minute period.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

VIII. Reporting & Recordkeeping Conditions

AQ-103 The Permittee shall report all occurrences of breakdowns of the equipment listed in Table 1.0 Authorized Emission Devices or Table 2.0 Authorized Control Devices which result in the release of emissions in excess of the limits identified in this Permit. Said report shall be submitted to the District in accordance with the timing requirements of NCUAQMD Rule 105 §5.0.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-104 The Permittee shall maintain a Breakdown log that describes the breakdown or malfunction, includes the date and time of the malfunction, the cause of the malfunction, corrective actions taken to minimize emissions and the date and time when the malfunction was corrected.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-105 The Permittee shall immediately record the following information when an event occurs where emissions from the equipment listed in Table 1.0 Authorized Emission Devices are in excess of any limits incorporated within this permit:

a. Date and time of the excess emission event

b. Duration of the excess emission event

c. Description of the condition or circumstance causing or contributing to the excess emission event

d. Emission unit of control device or monitor affected

e. Estimation of the quantity and type of pollutants released

f. Description of corrective action taken

g. Actions taken to prevent reoccurrence of excess emission event.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-106 The Permittee shall provide to the District, a completed "Compliance Certification" form signed by the Facility's Responsible Official which certifies the compliance status of the facility twice per calendar year. The compliance certification form must be submitted to the NCUAQMD according to the following schedule: The semiannual certification (covering quarters 1 and 2) must be submitted prior to July 31st of the reporting year; and the annual certification (covering quarters 1, 2, 3, and 4) prior to January 31st of the following calendar year. The content of the Certification shall include copies of the "" records designated in Table 7.0 to be kept "Annually".

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-107 The Permittee shall maintain monthly log of usage for the Emergency IC Diesel Generators S-11 and S-12 in accordance with applicable Reporting Requirements for Emergency Standby Engines, Item (e)(4)(I) of Section 93115, Title 17, California Code of Regulations, Air Toxic Control Measure (ATCM) for Stationary Compression Ignition (CI) engines. The monthly log of usage shall list and document the nature of use for each of the following by recording the hour meter readings for each operational event:

a. Emergency use hours of operation;

b. Maintenance and testing hours of operation (e.g., load testing, weekly testing, rolling blackout, general power outage, etc

c. Hours of operation for emission testing to show compliance with §(e)(2)(A)3 and (e)(2)(B)3 of the ATCM;

d. Hours of operation to comply with requirements of NFPA 25;

e. Hours of operation for all other uses other than those specified in§(e)(2)(A)3 and (e)(2)(B)3 of the ATCM;

f. Fuel used through the retention of fuel purchase records that account for all fuel used in the engine and all fuel purchased for use in the engine,

and, at a minimum, contain the following information for each individual fuel purchase transaction:

i. Identification of the fuel purchased as either CARB Diesel, or an alternative diesel fuel that meets the requirements of the Verification Procedure;

ii. Sulfur content of the fuel;

iii. Amount of fuel purchased;

iv. Date when the fuel was purchased;

v. Signature of owner or operator or representative of owner or operator who received the fuel; and

vi. Signature of fuel provider indicating fuel was delivered.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-108 The Permittee shall continuously maintain onsite for the most recent five year period and shall be made available to the NCUAQMD APCO upon request, the records as listed in Table 7.0 below.

Table 7.0 Required Records for Engines S-1 through S-10

Frequency	Information to be Recorded
Upon Occurrence	A. Records of maintenance conducted on engines (40 CFR 60 Subpart IIII) B. Time, duration, and fuel firing mode for each engine startup C. Time, duration, and fuel firing mode for each engine shutdown D. Time, duration and reason for each period of operation in Diesel Mode E. For each bulk delivery of diesel fuel received, certification from the supplier that the diesel fuel meets or exceeds CARB Diesel specifications F. For each bulk delivery of diesel fuel received, the higher heating value (HHV) of the fuel
At least one electronic reading every 15 minutes	A. NOx (ppmvd @15% O_2) B. CO (ppmvd @15% O_2) C. O_2 (%) D. Exhaust gas temperature as SCR inlet (˚F) E. Exhaust gas temperature at OC inlet (˚F) F. Engine load (%)
Hourly	A. NOx (ppmvd @15% O_2) and lb/hr, on a rolling 3 hour average B. CO (ppmvd @15% O_2) and lb/hr, on a rolling 3 hour average C. ROC (ppmvd @15% O_2) and lb/hr, on a rolling 3 hour average D. NH3 (ppmvd @15% O_2) and lb/hr, on a rolling 3 hour average E. SOx (ppmvd @15% O_2) and lb/hr, on a rolling 3 hour average F. Natural gas fuel consumption (MMBtu HHV, 3-hr rolling average)

Frequency	Information to be Recorded
	G. Diesel pilot fuel consumption (MMBtu HHV, 3-hr rolling average) H. Diesel fuel consumption during Diesel Mode (MMBtu HHV, 3-hr rolling average) I. Volumetric proportion of natural gas to diesel pilot injection when operating in Natural Gas Mode
Daily	A. NOx (lbs/day) B. CO (lbs/day) C. ROC (lbs/day) D. SOx (lbs/day) E. PM (lbs/day) F. Diesel Particulate Matter (lbs/day) G. Natural gas fuel consumption (MMBtu HHV) H. Diesel pilot fuel consumption (MMBtu HHV) I. Diesel fuel consumption during Diesel Mode (MMBtu HHV) J. Engine load (% load on a 24 hour average) K. Hours of operation L. Quantity of fuel combusted (therms, gallons)
Monthly	A. Sulfur content of natural gas (gr/100scf, monthly fuel testing) B. Natural gas sulfur content (gr/100scf, 12 month rolling average)
Quarterly	A. NOx (tons) B. CO (tons) C. SOx (tons) D. ROC(tons) E. PM (tons) F. Diesel Particulate Matter (tons) G. Natural gas fuel consumption (MMBtu HHV) H. Diesel pilot fuel consumption (MMBtu HHV) I. Diesel fuel consumption during Diesel Mode (MMBtu HHV) J. Sulfur content of natural gas (gr/100scf, 12 month rolling average) K. Hours of operation L. Quantity of fuel combusted (therms, gallons)
Annually	A. NOx (tons) B. CO (tons) C. SOx (tons) D. ROC(tons) E. PM (tons) F. Diesel Particulate Matter (tons)

Frequency	Information to be Recorded
	G. Natural gas fuel consumption (MMBtu HHV) H. Diesel pilot fuel consumption (MMBtu HHV) I. Diesel fuel consumption during Diesel Mode (MMBtu HHV) J. Sulfur content of natural gas (gr/100scf, annual average) K. Hours of operation L. Quantity of fuel combusted (therms, gallons)

AQ-109 For each Quarter, the Permittee shall submit a written report to the APCO detailing the following items for the operation of the CEMS. The report shall conform to the requirements of District Rules and Regulations Appendix B, Section 2.2, and shall be submitted within 30 days of the end of the quarter.

a. Time intervals,

b. Date and magnitude of excess emissions,

c. Nature and cause of excess (if known),

d. Corrective actions taken and preventive measures adopted;

e. Averaging period used for data reporting shall correspond to the averaging period for each respective emission standard;

f. Applicable time and date of each period during which the CEM was inoperative (except for zero and span checks) and the nature of system repairs and adjustments; and

g. A negative declaration when no excess emissions occurred.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-110 The Permittee shall provide notification and record keeping as required pursuant to 40 CFR, Part 60, Subpart A, 60.7.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-111 The Permittee shall annually prepare and submit a comprehensive facility wide emission inventory report for all criteria pollutants and toxic air contaminants emitted from the facility. The inventory and report shall be prepared in accordance with the most recent version of the CAPCOA / CARB reference document Emission Inventory Criteria Guidelines. The inventory report shall be submitted to the NCUAQMD APCO no later than January 31st of the following calendar year. The inventory report is subject to NCUAQMD APCO approval.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-112 No later than 14 months after the Commissioning Period for reciprocating engines S-1 through S-10 has concluded, the Permittee shall submit to the NCUAQMD APCO a revised health risk assessment. The health risk assessment shall be prepared pursuant to an NCUAQMD APCO approved protocol based upon CARB and California Office of Health and Hazard Assessment guidance documents.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-113 The Permittee shall submit the health risk assessment protocol to the NCUAQMD APCO for review no later than 9 months after the Commissioning Period for the reciprocating engines S-1 through S-10 has concluded.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-114 Not later than 24 hours after determining that diesel mode operation is to occur as a result of an expected Natural Gas Curtailment, the permittee shall notify the APCO by telephone, email, electronic page, or facsimile. The notification shall include, but not be limited to, the following:

a. The anticipated start time and duration of operation in diesel mode under the Natural Gas Curtailment; and

b. The anticipated quantity of Diesel fuel expected to be burned under the Natural Gas Curtailment.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-115 Not later than 24 hours following the end of a period of any diesel mode operation, the permittee shall notify the APCO by email or facsimile of the following:

a. The actual start time and end time of the period of diesel mode operation;

b. The identification of the Reciprocating engines that were operated and the average load at which each reciprocating engine was operated on Diesel fuel during the diesel mode operating period; and

c. The actual quantity of Diesel fuel consumed during the diesel mode operation.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

IX. Testing & Compliance Monitoring Conditions

AQ-116 The Permittee shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-117 The Permittee shall monitor and record exhaust gas temperature at selective catalytic reduction inlet and at the face of the oxidation catalyst. [40 CFR 63 Subpart ZZZZ]

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-118 Not less than thirty days prior to the date of any source test required by this Permit, the Permittee shall provide the NCUAQMD APCO with written notice of the planned date of the test and a copy of the source test protocol.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-119 Source test results shall be summarized in a written report and submitted to the NCUAQMD APCO directly from the independent source testing firm on the same day, the same time, and in the same manner as submitted to Permittee. Source Test results shall be submitted to the NCUAQMD APCO no later than 60 days after the testing is completed.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-120 The Permittee shall demonstrate compliance with all the emission limits identified in this Permit during the Commissioning Period of each of the reciprocating engines S-1 through S-10 using the following methods. Testing shall be conducted both while the engines are operated in Natural Gas Mode and while operated in Diesel Mode. All compliance tests shall be conducted at 50%, 75%, and 95% or greater of the operating capacity of each reciprocating engine. Alternative test methods may be approved by the APCO.

a. Particulate Matter – CARB Method 5 (front and back half) or EPA Methods 201a and 202

b. Diesel Particulate Matter – CARB Method 5 (front half)

c. Visible Emissions

   i. Permittee shall perform a “Visible Emission Evaluation” (VEE) concurrent with particulate matter testing. A CARB certified contractor shall perform such an evaluation.

d. Ammonia – Bay Area Air Quality Management District Method ST-1B

e. Reactive Organic Gases – CARB Method 100

f. Nitrogen Oxides – CARB Method 100

g. Carbon Monoxide – CARB Method 100

h. Oxygen – CARB Method 100

   i. Oxygen shall be measured at the inlet and outlet of the oxidation catalyst

   ii. Oxygen measurements shall be made at the same time as the CO measurements

   iii. Pressure drop measurements across the catalyst shall be made at the same time as the CO measurements

i. Natural Gas Fuel Sulfur Content – ASTM D3246

j. Liquid Fuel Sulfur Content – ASTM D5453-93

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-121 The Permittee shall demonstrate compliance with all the emission limits identified in this Permit for the reciprocating engines S-1 through S-10 once per calendar year unless indicated below, using the following methods. Except as provided in Condition 123, testing shall be conducted while the engines are operated in Natural Gas Mode. All compliance tests shall be conducted at an operating capacity of 50%, 75%, or 95% or greater during the testing of each reciprocating engine. Alternative test methods may be approved by the APCO.

a. Particulate Matter – CARB Method 5 (front and back half) or EPA Methods 201a and 202

b. Diesel Particulate Matter – CARB Method 5 (front half)

c. Visible Emissions - Permittee shall perform a “Visible Emission Evaluation” (VEE) concurrent with particulate matter testing. A CARB certified contractor shall perform such an evaluation.

d. Ammonia – Bay Area Air Quality Management District Method ST-1B

e. Reactive Organic Gases – CARB Method 100

f. Nitrogen Oxides – CARB Method 100

g. Carbon Monoxide – CARB Method 100

h. Oxygen – CARB Method 100

   i. Oxygen shall be measured at the inlet and outlet of the oxidation catalyst

   ii. Oxygen measurements shall be made at the same time as the CO measurements

   iii. Pressure drop measurements across the catalyst shall be made at the same time as the CO measurements

i. Natural Gas Fuel Sulfur Content – ASTM D3246

j. Liquid Fuel Sulfur Content – ASTM D5453-93

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-122 The engines shall be tested on a rotating basis with all of the engines to be tested in natural gas mode each year and all engines tested at the three different load values at least once every three years. Each engine shall be tested, at the following loads (50%, 75%, >95%) or under conditions determined by the APCO to most challenge the emission control equipment. The APCO may waive some or all of the testing requirements if the results of previous compliance tests have demonstrated compliance with permitted emission limits by a sufficient margin.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-123 Permittee shall demonstrate compliance with permitted emission limits for Engines S-1 through S-10 while operating in Diesel Mode once every three years or following each 200 hours of operation of an individual engine in Diesel mode whichever is sooner. Compliance shall be demonstrated as indicated below using the following methods. All compliance tests shall be conducted while an engine is operated in Diesel mode at 50%, 75% or 95% or greater operating capacity of each engine; or under conditions determined by the APCO to most challenge the emission control equipment. Alternative test methods may be approved by the APCO:

a. Particulate Matter - CARB Method 5 (front and back half), or EPA Methods 201a and 202.

b. Diesel Particulate Matter – CARB Method 5 (front half only)

c. Visible Emissions - U.S. EPA Method 9

d. Ammonia – Bay Area Air Quality Management District Method ST-1B

e. Reactive Organic Gases – ARB Method 100

f. Nitrogen Oxides -- ARB Method 100

g. Carbon Monoxide – ARB Method 100

   i. CO shall be measured at the inlet and outlet of the oxidation catalyst.

h. Oxygen – ARB Method 100

   i. Oxygen shall be measured at the inlet and outlet of the oxidation catalyst.

   ii. Oxygen measurements shall be made at the same time as the CO measurements.

i. Liquid Fuel Sulfur Content – ASTM D5453-93

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-124 The engines shall be tested at various loads (50%, 75%, >95%) on a rotating basis, with one-third of the engines to be tested in diesel mode in each year tested at each of the three loads. The APCO may waive some or all of the testing requirements if the results of previous compliance tests have demonstrated compliance with permitted emission limits by a sufficient margin.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-125 The Permittee shall demonstrate compliance with the hourly, daily, and annual ROC emission limits through the use of valid CO CEM data and the ROC/CO relationship determined by annual CO and ROC source tests; and APCO approved emission factors and methodology.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-126 The Permittee shall demonstrate compliance with the hourly, daily, and annual SOx emission limits through the use of valid fuel use records, natural gas sulfur content, diesel fuel sulfur content, mass balance calculations; and APCO approved emission factors and methodology. The natural gas sulfur content shall be determined on a monthly basis using ASTM D3246.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-127 The Permittee shall demonstrate compliance with the hourly, daily, and annual PM emission limits and the diesel particulate matter emission limits through the use of valid fuel use records, source tests, and APCO approved emission factors and methodology.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-128 Relative accuracy test audits (RATAs) shall be performed on each CEMS at least once every twelve months, in accordance with the requirements of 40 CFR 60, Appendix B. Calibration Gas Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The District shall be notified at least 30 days in advance of the scheduled date of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District within 60 days after the testing was performed.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-129 No later than 180 days after construction of the equipment authorized pursuant to this permit begins, and concurrent with the commencement of operation, the Permittee shall provide full funding for the purchase and installation of a new PM10/PM2.5 monitoring station to be installed at a location approved by the APCO. The funding shall include all costs associated with the purchase, installation, operation and maintenance (including personnel costs) of the monitoring station for an initial period of not less than five (5) years. PG&E shall reimburse the District for costs incurred within 30 days of receiving an invoice from the District. At the conclusion of that period, the APCO may extend the operation of the site if deemed in the best interest of the District, and PG&E will continue to fund all costs associated with its continued operation. The District shall be responsible for the procurement, operation and maintenance of the site, and District staff will be responsible for collecting, securing, and quality assuring all data.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

AQ-130 No later than 180 days after construction of the equipment authorized pursuant to this permit begins, and concurrent with the commencement of operation, the Permittee shall provide full funding for the purchase and installation of a new meteorological monitoring station to be installed at a location approved by the APCO. The funding shall include all costs associated with the purchase, installation, operation and maintenance (including personnel costs) of the meteorological monitoring station for an initial period of not less than five (5) years. PG&E shall reimburse the District for costs incurred within 30 days of receiving an invoice from the District. At the conclusion of that period, the APCO may extend the operation of the site if deemed in the best interest of the District, and PG&E will continue to fund all costs associated with its continued operation. The District shall be responsible for the procurement, operation and maintenance of the site, and District staff will be responsible for collecting, securing, and quality assuring all data. The data collected at the station shall meet the requirements of EPA-454/R-99-005 “Meteorological Monitoring Guidance for Regulatory Modeling Applications” February 2000.

Verification: The project owner shall submit to the CPM the quarterly operation reports (**AQ-SC9**).

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AIR QUALITY APPENDIX 1

COPY OF ENERGY COMMISSION STAFF COMMENTS ON PDOC

Attached is a copy of the staff comments filed with the NCUAQMD.

November 21, 2007

Mr. Richard L. Martin, Jr.
Air Pollution Control Officer
North Coast Unified Air Quality Management District
2300 Myrtle Avenue
Eureka, CA 95501

Dear Mr. Martin:

HUMBOLDT BAY REPOWERING PROJECT (06-AFC-7)
PRELIMINARY DETERMINATION OF COMPLIANCE, PERMIT NO. 440-1

Energy Commission staff appreciates the opportunity to provide written public comments on the Preliminary Determination of Compliance (PDOC) issued by the District on October 24, 2007 for the Humboldt Bay Repowering Project (HBRP) proposed by Pacific Gas and Electric Company (PG&E). We look forward to continuing to work closely with the North Coast Unified Air Quality Management District (District) on the HBRP.

In reviewing the PDOC and the accompanying Engineering Evaluation (EE), we have a concern that there is insufficient data to support some of the conclusions in the document. As a consequence, at this time we cannot determine whether the HBRP will comply with applicable laws, ordinances, regulations, and standards. One issue in particular, the firing of the diesel fuel, requires additional analysis to determine the potential for significant impacts to the air quality and public health. After the District has had an opportunity to review our comments, we suggest meeting with you at your convenience, to discuss relevant issues and to answer any questions.

General Comments

Definition of Natural Gas Curtailment. Section III of the PDOC includes a definition of "Natural Gas Curtailment" that staff believes is ambiguous. We believe that establishing such a definition is unnecessary, especially since curtailments may be confused with emergencies. Staff views curtailments as part of normal, foreseeable operations, which are distinct from emergencies. Staff recommends removing the term from the PDOC and permit conditions. This should be possible with a comprehensive limitation of operation in diesel mode (for example, by prohibiting fuel switching for economic reasons in Condition 87 and Condition 94).

If the term "Natural Gas Curtailment" is not removed, the District's EE should address the following questions: What regulatory agencies would specify a curtailment? The agency(s) should be specifically identified. Also, what "procedures approved by a regulatory agency" would be used to trigger a Natural Gas Curtailment? Specific agencies and circumstances that would trigger diesel operation under this definition would need to be identified in the definition. This is important because it would more clearly define to all parties the circumstances and the specific regulatory steps and

responsibilities that would be implemented under the definition of "natural gas curtailment."

Definition of Emergency Use. The definition of "Diesel Particulate Matter ATCM Emergency Use" (PDOC Section III) appears to conflict with the definition of Emergency Use in the Airborne Toxic Control Measure for Stationary Compression Ignition Engines [Section 93115.4(a)(30), title 17, California Code of Regulations (CCR)]. In addition, when conducting a health risk assessment, the use of diesel fuel during curtailments cannot be considered an "emergency" and therefore must be included in the health risk assessment as per Cal-EPA guidelines (Office of Environmental Health Hazard Assessment: *Air Toxics Hot Spots Program Risk Assessment Guidelines,* August 2003, page 1-2).

The District definition excludes the dual-fuel engines (S-1 to S-10) which are stationary compression ignition engines subject to the Airborne Toxic Control Measure (ATCM), at least in diesel mode, as noted in the California Air Resources Board (ARB) letter in the attachments to the EE (EE p. 45). Additionally, because HBRP is subject to natural gas curtailment by PG&E's California Public Utilities Commission (CPUC) Gas Tariff Rule 14 (AFC Section 2.7.3), the normal natural gas supply to the proposed dual-fuel engines can be curtailed through the enforcement of this obligation that PG&E has with the CPUC. Partial or total loss of the natural gas supply due to third-party agreements does not qualify as an event for "emergency use" under the definition in the CCR. Because the CCR already provides a definition for "Emergency Use" that applies to all stationary compression ignition engines at the facility, the District should not establish its own definition which could be interpreted contrary to the CCR. Staff recommends removing the term "Diesel Particulate Matter ATCM Emergency Use" from the PDOC and permit conditions.

If a definition of "Diesel Particulate Matter ATCM Emergency Use" is retained by the District, it should apply to all compression ignition engines, including S-1 through S-10, and it should be made consistent with the definition of "Emergency Use" in the current CCR.

Best Available Control Technology. The BACT determination is based on an assertion from PG&E that Diesel Particulate Filters would not be cost effective (EE p.39), but this determination should be based on an independent engineering evaluation of cost effectiveness by the District. The Engineering Evaluation should illustrate how the cost-effectiveness analysis conforms with the definitions in Rule 110, Section 4.5.2 and Section 4.8 and federal guidelines for sources subject to Prevention of Significant Deterioration (PSD) review.

ATCM Applicability. The District states that "according to the applicant" the dual-fuel Wärtsilä engines are exempt from the ATCM during natural gas mode (EE p.45), and that the ATCM applies to the Wärtsilä engines only during diesel mode operation. The District should ensure that the final determination is either made by the District independently or by the ARB.

The dual-fuel engines in the PDOC (S-1 to S-10) are stationary compression ignition engines that appear to be subject to the ATCM, at least in diesel mode, as noted in the ARB letter attached to the PDOC. In its letter, ARB did not clarify whether diesel mode

operation would be subject to the ATCM for emergency engines (17 CCR 93115.6) or the ATCM for prime diesel-fueled engines (17 CCR 93115.7). Energy Commission staff does not view a natural gas curtailment as an opportunity for "emergency use," but if the dual-fuel engines in diesel mode are treated as "emergency standby" engines, then standards in Section 93115.6(a)(3) would be triggered. The emission standard for an emergency standby engine that is allowed to operate up to 100 hours per year for maintenance and testing is 0.01 g/bhp-hr diesel particulate matter (DPM). The PDOC (Conditions 51 and 52) would allow each of the ten proposed dual-fuel engines to operate in diesel mode for an average of 100 hours/year for maintenance and testing (and curtailments), but the PDOC would also allow an emission rate of 0.15 g/bhp-hr DPM, which exceeds the standard in the ATCM Section 93115.6(a)(3)(A)(2). The 0.01 g/bhp-hr DPM standard for prime diesel-fueled engines in ATCM Section 93115.7(a)(1) would also be exceeded.

Offset Requirements.

The discussion in the EE (p.23 to 24) lacks sufficient detail to determine the level of onsite reductions due to the Humboldt Bay Power Plant (HBPP) shutdown. The District should provide an assessment of the "actual emissions" (defined in Rule 110, Section 4.2) from the HBPP as a first step in determining the quantity of offsets. It is not clear from the Engineering Evaluation whether any of the reductions would meet the eligibility standards for banking (in District Rule 106). At a minimum, the enforceable reductions requested by the applicant should be tabulated. For example, the Engineering Evaluation does not show any reductions of sulfur oxides (SOx) even though they are required for offsetting SOx are a precursor to PM10. The purpose of the small table (ERCs tons/yr) on p.24 of the EE should be disclosed. The applicability of and whether the PDOC demonstrates compliance with the public notification requirements for emission reduction credits (District Rule 106, Section 14.6) should also be described.

Offset requirements are defined in the PDOC (EE p.23) on the basis that certain quantities of emissions reductions would occur with the shutdown of the existing HBPP. These quantities should not include emissions that occurred during an "emergency." The definition of Historic Actual Emissions, per Rule 110, Section 6.2.2 excludes emissions that are unrepresentative of normal operations. A reasonable interpretation of "emergency use" would be that emissions generated during emergencies are not representative of normal operations. In evaluating the emission offset calculations, it appears that some of the baseline emissions from the existing Humboldt Bay Power Plant occurred while that facility was operating in an "emergency" condition. We recommend that the District follow one clear definition of "emergency" and then analyze the appropriate quantity of emission reductions consistent with Section 6.2.2. Staff believes the District should re-evaluate whether credits should be included in the offset calculations for the following:

- The circumstance when the Humboldt Bay Power Plant Unit 2 (HB2) fired fuel oil between the months of August 1 to September 28, 2006 (shown on AFC Table 8.1A-9).
- The situations where the Mobile Emergency Power Plant Units 2 and 3 (MEPP2 and MEPP3) operated for virtually every month over the two year period of October 2004 through September 2006 (shown on AFC Table 8.1A-9). Were these operations

considered “normal” or do they constitute an “emergency,” and what were those circumstances of operation?

New Source Performance Standards (NSPS). Compliance with the NSPS 40 CFR Part 60 Subpart IIII threshold of 0.15 g/KW-hr (or 0.11 g/bhp-hr) for particulate matter (EE p.44) should be demonstrated by using U.S. EPA Method 5 for testing. Using the District definition of "Diesel Particulate Matter" from the PDOC, the engines should not be allowed to emit more than 0.11 g/bhp-hr Diesel Particulate Matter. The limit of 0.15 g/bhp-hr shown in Condition 50 should be revised to 0.11 g/bhp-hr for the engines to comply with NSPS Subpart IIII. The limit specified in Condition 58 should also be revised to 0.11 g/bhp-hr.

Ambient Air Quality Impacts. The District’s ambient air quality impacts analysis appears to be based on outdated dispersion modeling. The District (EE p.18) says that the applicant did not model particulate matter less than 2.5 microns (PM2.5) separately from particulate matter less than 10 microns (PM10). This does not recognize that a separate PM2.5 analysis was provided by PG&E in AFC Section 8.1.2.8.3, September 2007. The issue regarding terrain between the stack base and stack top (EE p.40) was resolved with modeling conducted in early 2007. It is also not clear from the analysis whether the District accurately portrayed the potential PM10/PM2.5 impacts based upon the potential for the engines to operate at 1,000 engine-hours per year in diesel mode (as allowed by Condition 94). PG&E did not provide the Energy Commission with an analysis of impacts at 100 hours/year/engine in diesel mode in its September 2007 filing, which was based on 50 hours/year/engine with stack heights of 100 feet. If the District is citing an analysis that considers 1,000 engine-hours per year with a stack height of 100 feet from PG&E, rather than conducting its own analysis, then PG&E’s analysis should be cited. Similarly, the District appears to analyze only 50 hour/year/engine in diesel mode (EE Table 16, p.41), which would not capture the full impacts allowed by Condition 94.

PG&E’s analysis of PSD Class I and Class II increment consumption for the HBRP in its current configuration was dated November 2, 2007. It is unclear how the District was able to determine compliance with the PSD increments requirements (EE p.42) if PG&E did not provide an analysis until after the PDOC was issued. If the District is citing an analysis from PG&E, rather than conducting its own, then that analysis should be cited.

Health Risk Assessment. The Engineering Evaluation (p. 22) indicates that a health risk assessment has been performed, but there is no evidence of it or its conclusions in the analysis.

National Park Service and Department of Agriculture (Forest Service) Visibility Analysis. As part of the District’s PSD analysis, the National Park Service and the Department of Agriculture Forest Service were asked by the District to evaluate the visibility impacts of the project on nearby Class I areas such as the Redwood National Park, and the Marble and Yolla Bolly Wilderness Areas. In a letter dated August 29, 2007 from the National Park Service and included in the PDOC, the Park Service states, “Because the North Coast Unified Air Quality Management District will limit oil firing to only 50 hours per year, we do not request that Sierra Research conduct a VISCREEN analysis for emissions from oil firing. “ Similarly, in a letter dated October 16, 2007 from the Forest Service and included in the PDOC, the Forest Service also

understands that the project would be limited to 50 hours of diesel and therefore the Forest Service would not require additional visibility modeling. However, the PDOC allows for up to 1,000 engine-hours per year. Since the Park Service and the Forest Service were unaware of this project change, these agencies should be informed of such a change, and given the opportunity to re-evaluate whether additional visibility analysis should be performed.

Comments on Specific PDOC Conditions

Condition 30 – This condition requires that the equipment shall not be modified "so as to alter the dispersion modeling results." In order to be clear regarding what modeling results are being referred to, the condition should reference in the Engineering Evaluation the specific modeling results that are of concern. If changes were necessary to the heat input capacities or changes to the full-load design specifications that "alter the dispersion modeling results," it is not clear how the applicant would demonstrate compliance with the condition. Would the applicant need to provide a revised modeling analysis? If so, the condition should include a provision to provide that analysis. However, a permit condition that actually references modeling results is unconventional.

Table 2.0 Authorized Control Devices – This table is not referenced by any previous or subsequent permit conditions. Condition 103 only refers to this table many pages later. This table has no requirements for the Authorized Control Devices other than these devices are "to be determined" (TBD). Since it is not clear when the specifications for this equipment will be determined, the purpose of this table is also unclear. As it is, it does not seem to provide any enforceable purpose.

Condition 44 – This condition requires that off-site emission reduction credits (ERCs) be surrendered prior to construction. However, the vast majority of the "offsets" are from the shutdown of the HBPP. There is no condition that requires the permanent shutdown and the surrender of the Permits to Operate of the HBPP. This requirement should be included in this set of permit conditions. (See comment for Condition 64).

Condition 44 - Table 3.0 should be revised to reflect the offsets required (including the HBPP) based on reductions of Historic Actual Emissions consistent with District Rule 110, Section 6.2.2.

Consistent with many other power plant conditions in the state concerning the surrender of ERCs, the specific ERC certificate numbers should be included in the condition and Engineering Evaluation. If the applicant needs to change the ERC package, it would be a relatively straightforward process of informing the District of the change in the ERC package.

Condition 46 – This limits sulfur dioxide (SO_2) from each back-up engine (S-11 and S-12) to 1,000 parts per million (ppm) or 40 tons per year. This condition appears to enforce the sulfur oxide emissions limit of District Rule 104, Subsection 5. That reference should be included in the permit condition as is done in the previous Condition 45.

Condition 48 – This condition limits the natural gas start-up hourly NOx emissions to 392 lb/hour for all 10 engines. However, the hourly startup NOx emissions are shown

as 830 lb/hour in Table 4 of the Engineering Evaluation. The vendor guarantee of 22 lb/hour/engine was also presented as the maximum NOx startup emissions. Three different hourly startup figures are thus potentially presented, 220, 392 and 830 lb/hour for all 10 engines. The figures used in the permit condition should be supported in the Engineering Evaluation, and there should be an analysis of why the 392 lb/hour limit was chosen.

Condition 49 – This condition seeks to limit the diesel mode start-up hourly NOx emissions to 676 lb/hour for all 10 engines. However, the hourly startup NOx emissions are shown as 830 lb/hour in Table 4 of the Engineering Evaluation. The vendor guarantee of 154 lb/hr/engine was also presented in Table 4 as the maximum NOx startup emissions per engine in diesel mode. Three different hourly startup figures are thus potentially presented, 676, 830 and potentially 1540 (154 lb x 10 engines) lb/hour for all 10 engines. The figures used in the permit condition should be supported in the Engineering Evaluation, and there should be an analysis of why the 676 lb/hr figure was chosen. The District should consider eliminating this condition because comments provided by PG&E to the Energy Commission on October 31, 2007 in response to Data Request 92 imply that with consideration of background NO2, operating at 676 lb/hr could cause a violation of the new 1-hour California Ambient Air Quality Standard for NO_2.

There does not appear to be any permit conditions for limiting CO emissions during startup for firing either natural gas or diesel. We would recommend that CO limits (derived from Table 4 of the Engineering Evaluation) be added for startup.

There does not appear to be any conditions limiting startups to a maximum of 5 engines per 60 minute period, as recommended on p.17 of the Engineering Evaluation.

Condition 50 - Compliance with the NSPS 40 CFR Part 60 Subpart IIII threshold of 0.15 g/KW-hr (or 0.11 g/bhp-hr) for particulate matter on p. 44 of the Engineering Evaluation must be demonstrated by using U.S. EPA Method 5 for testing. Using the District definition of "Diesel Particulate Matter" from the PDOC, the engines should not be permitted to emit more than 0.11 g/bhp-hr DPM. The limit of 0.15 g/bhp-hr shown in Condition 50 should be revised to 0.11 g/bhp-hr for the engines to comply with NSPS Subpart IIII. This comment also applies to Condition 58.

Conditions 51 and 52 – These conditions limit the fuel heat input. The Engineering Evaluation should provide the calculations to substantiate these figures. Condition 51 should clarify whether the annual diesel mode limit in Table 4.0 applies to each engine, because elsewhere the conditions would allow the flexibility for one engine to operate for more than 100 hours annually in diesel mode as long as all ten engines remain within the 1,000 engine-hours per year allowed by Condition 94.

Condition 54 – This condition limits the amount of diesel fuel gallons that can be burned. The annual figure (1,088,362 gal/yr) is twice the figure presented in Table 2 (544,181 gal/yr) of the Engineering Evaluation. The fuel use figure in Condition 54 would be equivalent to 149,000 MMBtu/yr when converted to a heat input basis. This exceeds the heat input limit for diesel mode (140,890 MMBtu/year) in Condition 52. Condition 52 and Condition 54 should be revised to show one consistent heat input and fuel use limitation.

Condition 55 – This condition would limit NOx emissions on a three-hour rolling basis, but revising this to a 1-hour limit should be considered because compliance with the one-hour NO_2 ambient air quality standard depends on minimizing hourly NOx emissions.

Condition 56 – None of the daily emission limits of Table 5.1 match the Daily Emission Rates of Table 5 in the Engineering Evaluation. Table 5 (EE p. 10) does not provide a daily summary of natural gas mode emissions, the most likely emissions event that will occur with this project. Table 5 of the Engineering Evaluation should be revised to reflect this fact, and to thus provide the basis for the emission limits presented in Table 5.1 of Condition 56.

Condition 58 – This condition refers to operating engines S-1 through S-10 during an event consistent with the definition of "Diesel Particulate Matter ATCM Emergency Use." However, as defined by the District (PDOC p.10) the "Diesel Particulate Matter ATCM Emergency Use" term would apply only to engines S-11 and S-12. The emission limits of the ATCM should apply to engines S-1 through S-10, at all times or at least in diesel mode (as implied on EE p. 45), depending on final interpretation by ARB. Additionally, the emission rate proposed by the applicant is not clearly reported by the District because the Engineering Evaluation (p.8) shows a rate of 0.15 g/bhp-hr while p. 12 shows 0.11 g/bhp-hr. Condition 58 should be revised to show that the applicable limit applies to S-1 through S-10 when they operate in diesel mode, regardless of the event that triggers diesel mode.

Condition 59 - This condition limits Diesel Particulate Matter while in diesel mode. However, there is the caveat in the condition that states that these limits would not apply during Natural Gas Curtailment. Since diesel fuel will have to be fired if the project operates during a curtailment, the Diesel Particulate Matter limit must apply, regardless of the event that triggers diesel mode. The reference to excluding Natural Gas Curtailment should be removed.

Is it unclear why startup and shutdown periods would be excluded from these hourly, daily, and annual limits. Since that Diesel Particulate Matter (DPM) emissions are a function of the amount of fuel burned, it does not appear to be appropriate to exclude periods of startup and shutdown in these limits. In addition, PM will be monitored by source test emission factors and fuel flow, thus determining compliance with the limits excluding startups would entail specifically finding those times where startups and shutdowns occur and removing that fuel flow data. Staff believes that this additional compliance complexity is not necessary or appropriate.

Condition 60 – Some of the daily emission limits presented in Table 5.4 of this condition are not consistent with the daily emission figures presented in Table 5 of the Engineering Evaluation. Specifically, the ammonia (NH_3) limit in Table 5.4 is 507 lb vs. 443 lb in Table 5 (EE p.10). Also, the PM10 emission limit in Table 5.4 is 1,542 lb vs. 2,592 lb in Table 5. If the lower PM10 figure is chosen, technical justification should be provided since it appears not to reflect the maximum potential hourly (10.8 lb/hr) emission rate presented in Table 4 of the Engineering Evaluation.

Condition 61 – This condition provides the annual emission limits. However, Table 9 of the Engineering Evaluation summarized the annual emissions from the 10 engines, and none of the figures in Condition 61 agree with the figures in Table 9 (EE p.17). Table 9 also references that "applicant proposes 830 lb/hr NOx limit for all Wärtsilä engines combined, regardless of fuel type." However, as pointed out earlier in comments to Conditions 48 and 49, the startup limit is currently proposed at 676 lb/hr, and a limit of 392 lb/hr seems to be necessary. If the emissions summary in Table 9 of the Engineering Evaluation shows the maximum emissions, but lower or higher emission limits are needed, the Engineering Evaluation should provide explanations of why the conditions must have lower or higher limits. If a justifiable NOx emission startup limit can be arrived at, the figures in Table 9 and in Table 5.5 of Condition 61 would need to be adjusted.

Condition 61 – Table 5.5 allows 174.2 tons per year of NOx from sources S-1 through S-10, but Table 16 of the Engineering Evaluation (p. 23 of EE) would only provide offsets for about 150 tons per year. Sufficient offsets must be provided by the project and in Condition 44 (Table 3.0) to fully offset the annual NOx emissions.

Condition 63 – There are emission differences (CO and NOx) for the annual limits presented in Table 5.7 vs. the emission figures of the Engineering Evaluation Table 9.

Condition 64 – As stated in comments concerning the offset calculations (Condition 44), staff believes that a condition should be added that all permits to operate the existing HBPP should be surrendered, once the engines S-1 through 10 complete their commissioning phase. The term "until such time as the sources are decommissioned" is vague and should be deleted. Since the "offsets" provided by shutdown of the HBPP enable the new emissions from the HBRP, it is necessary that permit conditions clearly require surrendering the Permits to Operate for HBPP. See comments to Condition 66.

Condition 66 – The term "as soon as possible following commercial operation" is used in this condition. As discussed above concerning Condition 64, we believe the language must provide a specific time limitation. We suggest: "The existing generating units at the Humboldt Bay Power Plant, permit units NS-020 (Boiler #1), NS-21 (Boiler #2) and NS-57 (Turbines), shall be shutdown and their Permits to Operate (PTOs) surrendered once engines S-1 through S-10 have successfully completed their Commissioning Phase as defined elsewhere in this permit."

The term "unless such operation is required by the California Independent System Operator" (for continued operation of HBPP) must be deleted if, as proposed, the existing HBPP is to be shutdown to provide offsets for the new HBRP.

Condition 69 – The term "At the earliest feasible opportunity" is not an enforceable time limit. Staff recommends that equipment tuning be tied to the Commissioning Plan submitted for approval in Condition 79. We suggest: "In accordance with the District approved Commissioning Plan required under Condition 79, the reciprocating engines shall be tuned to minimize emissions in the time frame specified in the approved Commissioning Plan."

Condition 70 - The term "At the earliest feasible opportunity" is not an enforceable time limit. Staff recommends that installation, adjustment, and initial operations of the SCR

and oxidation catalyst be tied to the Commissioning Plan submitted for approval in Condition 79. We suggest: "In accordance with the NCUAQMD approved Commissioning Plan required under Condition 79, the Selective Catalytic Reduction (SCR) system and the oxidation catalyst shall be installed, adjusted, and operated to minimize emissions from each reciprocating engine in the time frame specified in the approved Commissioning Plan."

Condition 71 – The reference to continuous monitors specified in Conditions 32, 34, 40, and 41 appear to be in error, as these conditions do not mention continuous monitors. This condition seems to refer to Conditions 31, 33, 39, and 42 instead.

Condition 73 – There is a limit in this condition that during Commissioning, each engine would operate no more than 100 hours without the SCR and oxidation catalyst installed. The Engineering Evaluation should discuss how this figure was derived.

Condition 74 – There is a limit in this condition that during Commissioning, no more than five uncontrolled engines would be operated simultaneously and that their combined daily operation would not exceed 90 engine-hours. The Engineering Evaluation should discuss how these figures were derived, and the potential impacts on the ambient air quality standards (specifically NO_2 and CO) that these operational scenarios would cause.

Condition 75 – This condition limits the hourly and daily emission levels during Commissioning. Staff did not find any information in the Engineering Evaluation that supports how the limits for CO, NOx, PM10, ROC (Methane) and SOx (SO_2) were derived.

Staff recommends that the District include a separate heading discussion in the Engineering Evaluation on the Commissioning phase of the project that addresses the issues raised on Conditions 73 through 75.

Condition 76 – This condition limits the NOx and CO emissions during the Commissioning Period after the SCR and oxidation catalyst are in operation. The reference to Condition 58 should be deleted as this condition limits particulate emissions. Staff also suggests adding Condition 60 to the referred conditions as this condition does have daily NOx and CO limits.

Condition 77 – It is unclear whether there is an hourly restriction for testing diesel during Commissioning. It could be inferred that the hourly limits in Conditions 73 and 74 limit combined the hours of diesel mode and natural gas mode, but those conditions are unclear on this point. Conditions 73 and 74 should either state that the limits include both modes, or Condition 77 should specify a limit on the number of hours in diesel mode during Commissioning.

Condition 78 – This condition refers to limits in Condition 59, but the correct reference is probably another condition (possibly Condition 61).

Condition 84 – This condition requires that a very detailed Startup, Shutdown, and Malfunction Plan be submitted to the District less than 30 days prior to the

Commissioning Period. We believe that to adequately review and approve this plan, that the plan should be submitted *not later* than 30 days prior to Commissioning.

Condition 87 – The term Natural Gas Curtailments should be removed and replaced with a prohibition on fuel switching to diesel mode for economic reasons.

Condition 93 – The Engineering Evaluation should identify how the figures of 80 engine-hours per Calendar Day and loads less than 12 MW were derived.

Condition 97 – It is not specified how the requirement for an oxidation catalyst abatement efficiency of 70% will be demonstrated.

Condition 103 – This condition references a Table 2.0 Authorized Control Devices. However, this table has no requirements for the Authorized Control Devices other than that these devices are "to be determined" (TBD). See earlier comment on page 5 about Table 2.0.

Condition 123 – This condition requires that once every three years or following each 200 hours of operation of each engine in diesel mode, that the unit would be completely source tested using diesel fuel. We suggest that this condition include language to clarify that the number of hours needed for this testing would need to comply with the limitation on Maintenance and Testing in Condition 94(b).

We appreciate the District working with Energy Commission staff on this Application for Certification. If you have any questions regarding our comments, please contact Keith Golden at (916) 653-1643. We look forward to discussing our comments with you.

Sincerely,

/s/

PAUL RICHINS
Environmental Protection Office Manager

cc: Docket (06-AFC-7)
Proof of Service List
California Air Resources Board
US Environmental Protection Agency, Region IX
United States Department of the Interior, National Park Service
United States Department of Agriculture, Forest Service, Pacific Southwest Region