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5.1 Air Quality

5.1.1 Introduction

This section presents the methodology and results of an analysis performed to assess potential impacts of airborne emissions from the construction and operation of the Pecho Energy Storage Center (PESC or Pecho) and the Project's compliance with applicable air quality requirements. The report was prepared using guidance from the California Environmental Quality Act (CEQA) Air Quality Handbook (San Luis Obispo County April 2012).

Section 5.1.1 presents the introduction, applicant information, and the basic SLOCAPCD rules applicable to PESC. Section 5.1.2 presents data on the emissions of criteria and air toxic pollutants from the PESC. Section 5.1.3 presents the Pecho project description, both current and proposed. Section 5.1.4 presents emissions evaluation data. Section 5.1.5 discusses the best available control technology (BACT) evaluations for PESC. Section 5.1.6 presents the air quality impact analysis for PESC. Section 5.1.7 discusses the meteorological data selection process required to analyze the impacts of the PESC. Section 5.1.8 presents applicable laws, ordinances, regulations, and standards (LORS). Section 5.1.8.1 presents specific LORS, Section 5.1.8.3 presents agency contacts, and Section 5.1.8.4 presents permit requirements and schedules. Section 5.1.9 contains references cited or consulted in preparing this section. Appendices 5.1A to 5.1G contain the emissions calculations, air quality impact analysis for construction and operation phases, regional emissions inventory data, and the mitigation strategy support data.

The PESC will be a 400-megawatt (MW) (net) advanced compressed air energy storage (A-CAES) process that includes above-ground electric air compression and power generation equipment, an underground air storage cavern, heat exchangers, and two diesel fuel-fired internal combustion engines driving emergency generators each with a capacity of up to 5 MW. A detailed description of the PESC is presented in Section 2, Project Description.

Air will be the dominant pathway for public exposure to chemical substances released by PESC. Emissions to the air will consist primarily of combustion by-products produced by internal combustion engines driving emergency generators. Potential health risks from combustion emissions will occur primarily from inhalation.

During construction, regulated air emissions will be emitted to the atmosphere due to combustion of fuel in reciprocating internal combustion engines (off-road and mobile sources), traffic on unpaved roads, bulldozing, wind erosion, grading, and material movement.

During normal operation, the PESC will not routinely operate combustion units or emit regulated pollutants to the atmosphere. Regulated emission of air pollutants will only occur from the stationary internal combustion engines for maintenance and readiness testing or in the emergency event of a fire or power outage. Only one engine is required to support critical loads; the second engine is redundant and only one engine is assumed to operate at any given time.

5.1.2 Regulatory Items Affecting New Source Review

Regulated air emissions from Pecho operations will not exceed federal major source thresholds under nonattainment New Source Review (NSR) or Prevention of Significant Deterioration (PSD) and, therefore, federal NSR will not apply to this project. Because nonattainment NSR does not apply, emission offsets are not required.

The Pecho project site is in a geographic area that is in attainment or unclassified for all regulated National Ambient Air Quality Standards. The area is also in attainment or unclassified for all California Ambient Air Quality Standards except for PM10, for which the entire County of San Luis Obispo is considered nonattainment.

The PESC will include two reciprocating internal combustion engines that will vent regulated pollutants to the atmosphere and must obtain an authority to construct and operate. The following steps summarize the air permitting process:

- Pecho LD Energy Storage, LLC will prepare and submit an authority to construct and permit to operate application using approved SLOCAPCD forms including the “Authority to Construct/Permit Application” form, “Contacts” from and “Internal Combustion Engine Process” form. Emission calculations will be provided with the application.
- SLOCAPCD will issue an authority to construct which also includes temporary authorization to operate for 90 days.
- The authorized emission units can be constructed and commissioned.
- Pecho will notify SLOCAPCD after the units have been commissioned and are ready to inspect.
- The SLOCAPCD will schedule an inspection and subsequently issue a permit to operate allowing commercial operation of the authorized emission units.

To date, the applicant has yet to obtain the air construction or operating permits described above. It is anticipated that the process to obtain the air permits will begin approximately 1 year before the desired construction date and after the final generator selection has occurred.

The proposed emission units will likely use catalytic oxidation and/or selective catalytic reduction to meet Tier 4 standards. These control technologies are an integral part of the engine and cannot be bypassed by the operator and so they are considered integral to the emission unit and are therefore not considered to be add-on pollution control equipment.

The direct construction and operation emissions impacts associated with the Project are analyzed according to SLOCAPCD and California Energy Commission (CEC) modeling requirements. An air quality analysis was conducted to demonstrate that impacts from nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM)10, and PM2.5 will comply with the California and National Ambient Air Quality Standards (CAAQS/NAAQS) for the applicable averaging periods. Impacts from nearby sources are not anticipated to be significant but will be assessed for criteria pollutants under separate cover if requested by SLOCAPCD or the CEC. The need for a cumulative source analysis will be assessed after the CEC data adequacy review. A search of the California Air Resource Board (CARB) Pollution Mapping Tool shows that the closest tracked source is California Polytechnic State University located approximately 8.5 miles to the southeast of the PESC; this is outside of the CEC’s suggested radius of 6 miles to consider nearby sources, therefore, no cumulative air quality modeling protocol is provided in this study.

Worst-case annual emissions for operation are summarized in Table 5.1-1.

Table 5.1-1: Facility PTE Summary and Major Source/Attainment Status for Operation of Two Diesel Generators

Pollutant	Pecho PTE (tpy)	Federal Attainment	State Attainment	Federal NA NSR Major Source Threshold (tpy)	Federal PSD Major Source Threshold (tpy)
NOx	1.65	Y	Y	N/A	250
CO	8.58	Y	Y	N/A	250
VOC	1.89	N/A	N/A	N/A	250
SO_2	0.02	Y	Y	N/A	250
PM10	0.07	Y	N	N/A	250
PM2.5	0.07	Y	Y	N/A	250
GHG (CO_2e)	1,554.18	N/A	N/A	N/A	75,000
Ozone	N/A	Y	Y	N/A	N/A

Note: Greenhouse Gas (GHG) can only be a major source under PSD if another regulated pollutant is major for PSD.

tpy = tons per year; APCD = air pollution control department; N/A = not applicable; NSR = new source review; SD = prevention of significant deterioration; NOx = nitrogen oxides; CO = carbon monoxide; VOC = volatile organic compounds; SO_2 = sulfur dioxide; PM10 = particulate matter less than 10 microns; PM2.5 = particulate matter less than 2.5 microns; GHG (CO_2e) = greenhouse gas.

Source: Attainment Status (San Luis Obispo County Attainment Status, January 29, 2019)

5.1.3 Project Description

The following sections describe the project.

5.1.3.1 Pecho Site Location

The PESC will be located in San Luis Obispo County within the San Luis Obispo County Air Pollution Control District (SLOCAPCD). The Pecho site is located just off California State Highway 1 near the intersection of San Luisito Creek Road to the east of Morro Bay, California.

Figure 5.1-1 shows the Pecho site and immediate vicinity.

LEGEND

- PREFERRED ROUTE
- ALTERNATE 1
- ALTERNATE 2
- ROADS
- COASTAL CREEKS
- PECHO SITE
- MORRO BAY CITY

1:26,500

3,000 0 3,000 Feet

REFERENCE

COORDINATE SYSTEM: NAD 1983 STATEPLANE CALIFORNIA V FIPS 0405 FEET

CLIENT
HYDROSTOR, INC.

PROJECT
PECHO ENERGY STORAGE CENTER (PESCO)

TITLE
LOCATION OF PECHO SITE

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-07
PREPARED	MR
DESIGN	XX
REVIEW	DS
APPROVED	XX

PROJECT No.	CONTROL	Rev.	FIGURE
21465954	---	---	**5.1-1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

Path: G:\GIS\Sites\MorroBay_Rosmond\Maps\AirQuality\Pecho\Figure 5.1-1 Location of Pecho Site.mxd

5.1.3.2 Project Equipment Specifications

PESC will consist of the following major equipment and operation:

- Two diesel-fired internal combustion engines driving generators for emergency use (only one engine will operate at a given time). The final capacity is not known but will be no more than 5 MW. We have assumed a 5 MW unit for this analysis.

All power generated from the Pecho A-CAES will be delivered to a Pacific Gas and Electric Company substation except for power generated by the emergency generators.

Equipment specifications are summarized in Table 5.1-2.

Table 5.1-2: Equipment Specifications

Parameter	Two identical Emergency Diesel Generators
Manufacturer	Caterpillar
Model	Standby DM5417-06
Engine Power	5,580 bkW
Fuel	Ultra-low sulfur diesel
Maximum Fuel Consumption	197.3 g/bkw-hr
Annual Limits	200 hours per year
Exhaust flow, acfm	42,896.7
Exhaust temperature, Fahrenheit (°F)	718.5

bkW = brake kilowatt; G/bkw-hr= grams per brake kilowatt-hour; acfm = actual cubic feet per minute; °F= Fahrenheit
Source: Caterpillar Technical Specifications (CAT 2012)

During the operational phase, the diesel generators will supply emergency power for critical loads in the event of a power loss. These generators are the only stationary sources that will combust fossil fuel and are anticipated to operate for up to 50 hours (each) per year for testing and maintenance but will be limited to 200 hours per year each in an air permit. SLOCAPCD will likely require permitted operation for maintenance and readiness testing to be limited to less than 50 hours (each) per year depending on the risk prioritization score. This analysis includes emissions from the operation of the two emergency diesel generators. Table 5.1-3 provides the location and source characteristics for each generator stack. Figure 5.1-2 shows the site property boundary and location of the two emission sources.

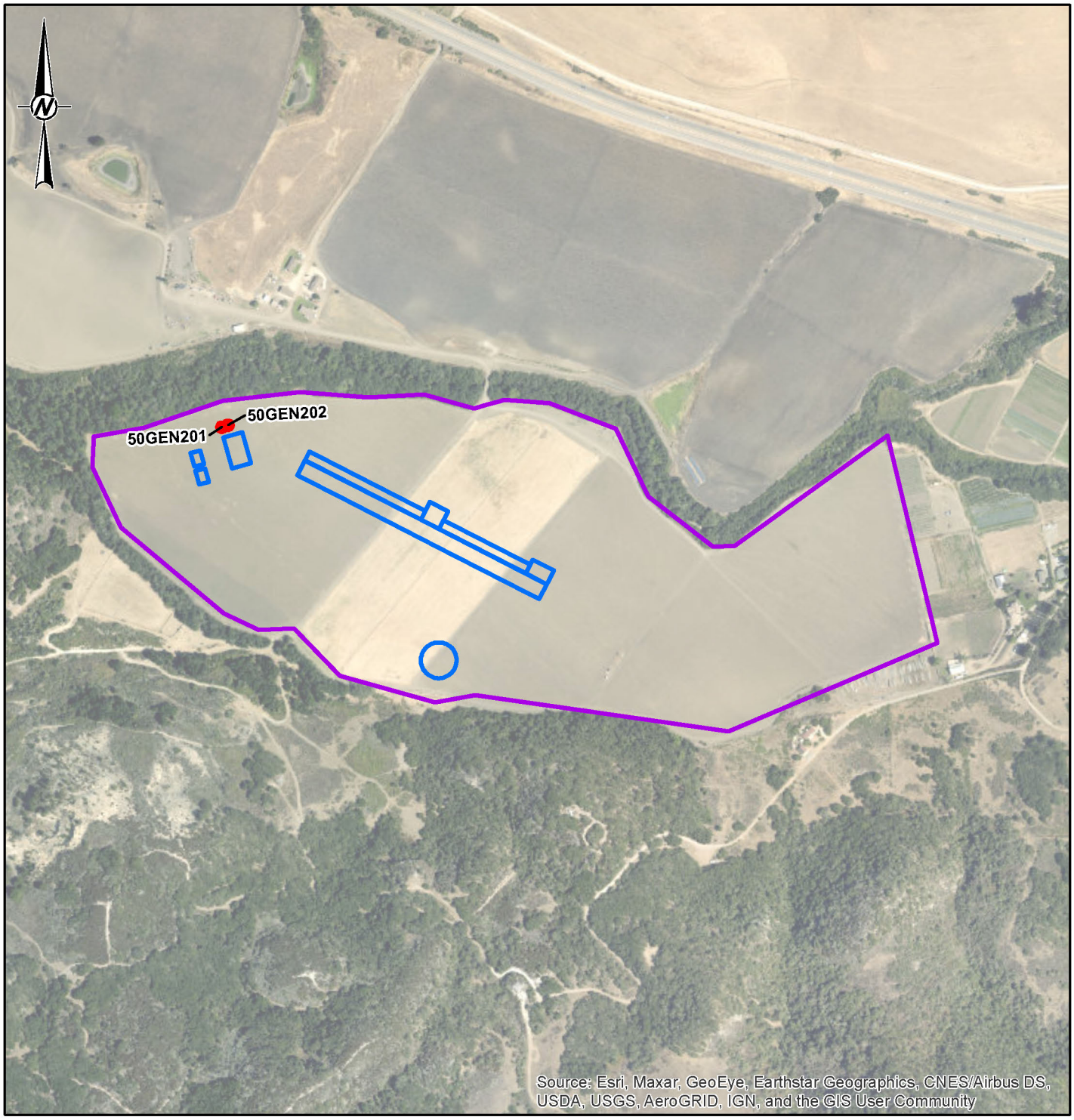
Table 5.1-3: Emission Unit Specifications

Source ID	Description	UTM Easting Coordinate (m)	UTM Northing Coordinate (m)	Stack Height from grade (ft)	Stack Inside Diameter (ft)	Stack Elevation (m)	Exhaust Gas Temperature (°F)	Exhaust Gas Flowrate (actual cfm)	Exhaust Velocity (m/s)
50GEN201	Emergency Diesel Generator	699,643.6	3,914,548.5	13.0	1.5	799.6	718.5	42,896.7	123.3
50GEN202	Emergency Diesel Generator	699,652.2	3,914,550.9	13.0	1.5	799.5	718.5	42,896.7	123.3

Source: TWD (August 2021), and Caterpillar Technical Specifications (CAT 2012).

Coordinate datum = UTM Zone 10, NAD83 North.

m = meters, f = feet, °F = Fahrenheit, cfm = cubic feet meters, m/s = meters per second



LEGEND

- POINT SOURCE
- STRUCTURE
  ONLY STRUCTURES THAT CAN INFLUENCE AIR DISPERSION FROM POINT SOURCES WERE INCLUDED IN THE MODEL
- PECHO SITE - PROPERTY BOUNDARY

0 500 1,000
Feet

CLIENT
HYDROSTOR INC.

REFERENCE(S)
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

PROJECT
PECHO ENERGY STORAGE CENTER

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	10/11/2021
DESIGNED	MR
PREPARED	MR
REVIEWED	MS
APPROVED	DS

TITLE
LOCATION OF GEM EMISSION SOURCES DURING OPERATION PHASE

PROJECT NO.	CONTROL	REV.	FIGURE
21465954	–	–	**5.1-2**

5.1.3.2.1 Fuels

Fuel use at the PESC will be limited to ultra-low sulfur diesel fuel. For this application, diesel fuel is assumed to have a heating value of 137,000 (British Thermal Units per gallon (Btu/gallon) as referenced in the calculations. (Appendix 5.1A and 5.1B)

5.1.4 Emissions Evaluation

5.1.4.1 Facility Emissions and Permit Limitations

The approximate 80-acre proposed Pecho site is currently used for farming and there are no existing air pollution sources. Figure 5.1-1 shows the Pecho site and immediate vicinity.

5.1.4.2 Facility Emissions

Operation of the PESC will not result in stationary source emissions greater than 250 tpy for any criteria pollutants, as such, the PESC will be considered a minor NSR source for NOx, CO, VOC, and PM10/PM2.5 under federal regulations. The PESC will not trigger requirements of the Federal PSD program since the emissions of one or more criteria pollutants will not exceed the 250 tpy major source applicability thresholds. Criteria pollutant emissions from the emission units are presented in the following sections, while emissions of hazardous air pollutants are presented in Section 5.9, Public Health. Detailed calculations for criteria air pollutant emission calculations are provided in Appendix 5.1A.

Hourly, daily, and annual emissions for criteria pollutants are based upon the highest emissions for each pollutant considering that the emission units are classified as emergency use and are limited to 200 hours per year of operation.

5.1.4.3 Normal Operations

Operation of the emergency engines at PESC will result in emissions to the atmosphere of both criteria and toxic air pollutants. Criteria pollutant emissions include NOx, CO, VOCs, SOx, PM10, PM2.5, and CO_2e. Air toxic pollutants will consist of a combination of hazardous air pollutants and other compounds which are commonly generated from the combustion of fuel. Table 5.1-4 lists the pollutants that may potentially be emitted from PESC. Other than the operation of the generators for testing and maintenance, there are no additional significant sources of air emissions from the maintenance of the PESC. Commissioning of emergency generators is not anticipated to take a significant amount of time and will result in emissions that are characteristically similar to normal operation; no air emission testing is anticipated for commissioning.

SLOCAPCD's CEQA Air Quality Handbook was reviewed for assessing and mitigating operational impacts. Operational significance criteria are identified as follows:

a) Consistency with the most recent Clean Air Plan for San Luis Obispo County.

b) Consistency with a plan for the reduction of greenhouse gas emissions that has been adopted by the jurisdiction in which the project is located and that, at a minimum, complies with State CEQA Guidelines Section 15183.5.

c) Comparison of predicted ambient criteria pollutant concentrations resulting from the project to state and federal health standards, when applicable.

d) Comparison of calculated project emissions to SLO County APCD emission thresholds; and,

e) The evaluation of special conditions which apply to certain projects.

Construction of the PESC would be consistent with the Clean Air Plan because facilities of this nature are necessary to store and therefore, further develop renewable energy projects. Land use will be consistent with the intended use before construction. GHG emissions from PESC are insignificant and the primary purpose of the process likely indirectly has a net GHG benefit by storing energy and releasing it on demand. The air modeling analysis and health risk assessment documents compliance with federal and state ambient air quality standards and health risk benchmarks.

Significance levels for project-level operations are stated in Table 5.1-4.

Table 5.1-4: Thresholds of Significance for Operational Emission Impacts

Pollutant	Daily Threshold	Annual Threshold
NOx + ROG	25 lb	25 tons
DPM	1.25 lb	N/A
Fugitive PM10	25 lb	25 tons
CO	550 lb	N/A
GHG	10,000 metric tons per year	

Table 5.1-6 shows operational emissions for one of two identical generators. Based on these emissions, the daily threshold for NOx + ROG will be exceeded but not the annual threshold. On-site mitigation includes the installation of engines that meet BACT. Based on the emergency nature of the emissions, it is not anticipated that additional off-site mitigation will be necessary. DPM emissions will exceed the daily threshold during prolonged operation in an emergency but not during routine testing. The PESC is not located within 1000 feet of a sensitive receptor. BACT will be implemented and best management practices such as testing the engine during daytime hours can be enforced through the air permit. An HRA has been conducted on the DPM emissions and the risk was found to be negligible. Fugitive PM10 is not anticipated to be significant and is not quantified. All roadways will be paved. Minimal amounts of employee traffic are anticipated. No routine haul truck traffic is anticipated. Carbon monoxide emissions could exceed the daily significance threshold during prolonged operation in an emergency but not during routine testing. Dispersion modeling shows that ambient air concentrations due to CO emissions are not significant. Potential emissions are significantly less than the threshold for GHG. Even after amortizing direct construction GHG emissions into operation, the threshold is not anticipated to be exceeded.

Some projects require special conditions to be addressed. Health risks due to emissions from the operation of PESC were considered and found to be insignificant. The operations will not require a vehicle fleet, therefore special conditions related to fleet vehicles are not applicable. Naturally occurring asbestos (if present) will be considered and either an exemption request will be completed or an asbestos health and safety program and asbestos dust mitigation plan (if applicable will be assembled). No unpaved roads are anticipated for operation.

Table 5.1-5: Chemical Substances Potentially Emitted to the Air from the PESC

Criteria Pollutants	Greenhouse Gasses	Other Compounds	
Particulate Matter (PM)	Carbon Dioxide (CO_2)	Acenaphthene Acenaphthylene Acetaldehyde Acrolein Anthracene Benzo(a)anthracene Benzene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,l)perylene Benzo(k)fluoranthene Chrysene	Dibenz(a,h)anthracene Fluoranthene Fluorene Formaldehyde Indeno(1,2,3-cd)pyrene Naphthalene Phenanthrene Propylene Pyrene Toluene Xylene
PM less than 10 microns (PM10)	Methane (CH_4)		
PM less than 2.5 microns (PM2.5)	Nitrous Oxide (N_2O)		
Carbon Monoxide (CO)			
Nitrogen Oxides (NOx)			
Volatile Organic Compounds (VOC)			

PM = particulate matter; CO_2 = Carbon Dioxide; CH_4 = Methane; PM10/PM 2.5 = particulate matter less than 10 or less than 2.5 microns; N_2O = Nitrous Oxide; CO = carbon monoxide; NOx = Nitrogen Oxides

Source: Section 5.1, Air Quality, Appendix 5.1A, and 5.1B, and Section 5.9, Public Health, Appendix 5.9C.

5.1.4.4 Criteria Pollutant Emissions

Table 5.1-6 presents a summary of the maximum short-term and annual criteria pollutant emissions for the worst-case operational scenario. Detailed calculations for criteria air pollutant emission calculations for operation are provided in Appendix 5.1A.

Table 5.1-6: Facility Maximum Emission Rate and PTE Summary for Operation of One Generator

Pollutant	Maximum Emission Rate (lb/hr)	Potential to Emit (tpy)
NOx	8.25	0.825
CO	42.892	4.289
VOC	9.472	0.947
SO_2	0.091	0.009
PM10	0.330	0.033
PM2.5	0.330	0.033
GHG (CO2e)	7,770.88	777.09

Note(s): Emissions represent one generator, both generators are identical. Only one generator will operate at a time, but both generators are assumed to operate 200 hours per year.

lb/hr = pound per hour; tpy = tons per year; NOx = nitrogen oxides; CO = carbon monoxide; VOC = volatile organic compounds; SO_2 = sulfur dioxide; PM10/PM 2.5 = particulate matter less than 10 or less than 2.5 microns; GHG (CO_2e) = greenhouse gas

Source: Section 5.1, Air Quality, Appendix 5.1A

5.1.4.4.1 Greenhouse Gas Emissions

GHG emissions have been estimated for both the Construction and Operation Phases of the PESC. Table 5.1-6 of Section 5.1.4.4 presents the GHG emissions for Operation. Appendix 5.1C shows the GHG emissions for on and off-site Construction.

5.1.4.5 Hazardous Air Pollutants

See Section 5.9, Public Health, for a detailed discussion and quantification of hazardous air pollutant (HAP) emissions from the PESC and the results of the health risk assessment (HRA).

5.1.4.6 Construction

The construction phase of the PESC is expected to take approximately 51 months (followed by several months of start up and commissioning). Construction-related emissions are based on the 12-month period during the construction process which has activities that will produce the highest emissions. Construction emissions at the Pecho site are consistent with emissions encountered at most construction sites including:

- Combustion of fuel in vehicles onsite (direct)
- Fugitive dust from vehicle travel on unpaved roads onsite (direct)
- Fugitive dust from wind erosion, land clearing, and material movement onsite (direct)
- Combustion of fuel in vehicles and equipment offsite (indirect)
- Fugitive dust from vehicle travel on paved and unpaved roads offsite (indirect)

Detailed construction emissions used to establish construction related impacts are in Appendix 5.1B.

Emissions used in annual dispersion models are based on the worst-case consecutive 12-month period, which was identified as months 18 through 29. Some construction activities that occur in a given month do not occur in all 12 months, so emissions used in dispersion models with 24-hour and shorter averaging periods were entered for the two worst-case individual months, which were identified as months 18 and 26. The worst-case month was chosen to represent the modeled ambient air concentration. Additional details are contained in Appendix 5.1C.

SLOCAPCD's CEQA Air Quality Handbook was reviewed for assessing and mitigating construction impacts. Table 5.1-7 identifies the thresholds of significance for construction operations.

Table 5.1-7: SLOCAPCD CEQA Thresholds of Significance for Construction Operations

Pollutant	Daily	Quarterly Tier 1	Quarterly Tier 2
NOx + ROG	137 lb	2.5 tons	6.3 tons
DPM	7 lb	0.13 tons	0.32 tons
Fugitive PM10	N/A	2.5 tons	N/A
GHG	Amortized and combined with operational emissions		

Worst case estimated emissions for construction of PESC are anticipated to be:

- NOx + ROG = 3.57 tpy or 0.9 tons per quarter
- DPM = 0.18 tpy or 0.05 tons per quarter
- Fugitive PM10 = 7.55 tons per year or 1.9 tons per quarter

The daily thresholds of significance do not apply because this project will last more than one quarter. Emissions for construction will not exceed Tier 1 or 2 NOx + ROG or DPM quarterly thresholds so no additional measures or off-site mitigation is required. Emissions for construction will not exceed the Tier 1 fugitive PM10 quarterly threshold so no additional measures or off-site mitigation is required. Because no Tier 2 quarterly thresholds are exceeded, a construction activity management plan and off-site mitigation are not required.

There are no sensitive receptors within 1,000 feet of the proposed construction site so special consideration is not needed to consider additional mitigation options as it relates to sensitive receptors.

The following diesel idling restrictions will be adhered to:

- On-road vehicles must comply with CCR Title 13 Section 2485 which states that vehicles with a gross vehicle weight greater than 10,000 pounds shall not idle greater than 5 minutes and shall not operate a diesel-fueled auxiliary power system of greater than 5 minutes within 100 feet of a restricted area.
- Off-road equipment must comply with Section 2449(d)(3) of the California Air Resources Board's off-road diesel regulation which limits idling to 5 minutes. Signs must be posted at the job site to remind drivers of the idling limit.

Before construction, a geologic investigation may be required to determine if there is naturally occurring asbestos-containing material present and either file for an exemption request or comply with requirements outlined in the Air Resources Board Toxic Control Measure.

Any portable equipment and engines 50 hp and greater used during construction activities require California statewide portable registration issued by the Air Resources Board. It is anticipated that the construction contractor selected will be responsible for maintaining these registrations.

Construction emissions have been estimated using excel worksheets rather than the CalEEMod model (See Appendix 5.1B)

Standard construction mitigation measures are proposed to be implemented for this project which includes:

- Maintain all construction equipment in proper tune according to manufacturer's specifications.
- Fuel all off-road and portable diesel-powered equipment with ARB-certified motor vehicle diesel fuel (non-taxed version suitable for use off-road).
- Use diesel construction equipment meeting ARB's Tier 2 certified engines or cleaner off-road heavy-duty diesel engines and comply with the State Off-Road Regulation.
- Use on-road heavy-duty trucks that meet the ARB's 2007 or cleaner certification standard for on-road heavy-duty diesel engines and comply with the State On-Road Regulation.

- Construction or trucking companies with fleets that do not have engines in their fleet that meet the engine standards identified in the above two measures (e.g., captive or NOx exempt area fleets) may be eligible by proving alternative compliance.
- All on and off-road diesel equipment shall not idle for more than 5 minutes. Signs shall be posted in the designated queuing areas and or job sites to remind drivers and operators of the 5-minute idling limit.
- Diesel idling within 1,000 feet of sensitive receptors is not permitted.
- Staging and queuing areas shall not be located within 1,000 feet of sensitive receptors.
- Electrify equipment when feasible.
- Substitute gasoline-powered in place of diesel-powered equipment, where feasible.
- Use alternatively fueled construction equipment on-site where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.

Although not required by CEQA, the construction equipment is anticipated to comply with Tier 3 and Tier 4 off-road and 2010 on-road standards where possible.

Because this project will have a grading area larger than 4-acres, fugitive dust will be managed so visible emissions do not exceed 20% opacity by using the following mitigation strategies:

- Reduce the amount of the disturbed area where possible.
- Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible.
- All dirt stockpile areas should be sprayed daily as needed.
- Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible following the completion of any soil disturbing activities.
- Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading should be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established.
- All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the APCD.
- All roadways, driveways, sidewalks, etc. to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.
- Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site.
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between the top of load and top of trailer) following CVC Section 23114.

- Install wheel washers where vehicles enter and exit unpaved roads onto streets or wash off trucks and equipment leaving the site.
- Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water should be used where feasible.
- All fugitive dust mitigation measures shall be shown on grading and building plans.
- The contractor or builder shall designate a person or persons to monitor the fugitive dust emissions and enhance the implementation of the measures as necessary to minimize dust complaints, reduce visible emissions below 20% opacity, and prevent the transport of dust offsite. Their duties shall include holidays and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the APCD Compliance Division before the start of any grading, earthwork, or demolition.

Based on the temporary nature, and the time frame for construction, these measures will reduce construction emissions and impacts to levels that are less than significant. Appendix 5.1C presents the evaluation of construction-related emissions as well as data on the construction-related ambient air quality impacts.

Construction emissions, from onsite and offsite activities, are not expected to exceed the SLOCAPCD CEQA significant impact thresholds. Mitigations typically imposed by the CEC as well as the construction modeling analysis indicate these emissions, as well as emissions from other criteria pollutants, will result in less than significant impacts to air quality.

This project will not require a federal air construction or operating permit and does not require the Federal Government to engage in, support in any way or provide financial assistance for, license or permit, or approve this project, therefore; the provisions of general conformity under 40 CFR Part 93 Subpart B do not apply to the PESC.

5.1.5 Best Available Control Technology Evaluation

5.1.5.1 Current Control Technologies

BACT will be met by purchasing engines certified to meet EPA Tier 4 emissions for the applicable size and type of engine. Based on the proposed engines for Pecho operation, the following emission limits must be met (Bay Area Air Quality Management District BACT Guideline):

- NOx ≤ 0.5 grams per brake horsepower-hour (g/bhp-hr)
- SO_2: combust diesel fuel with a sulfur content no greater than 15 ppm
- CO ≤ 2.6 g/bhp-hr
- PM ≤ 0.02 g/bhp-hr
- Non-Methane Hydrocarbons (NMHC) ≤ 0.14 g/bhp-hr

5.1.5.2 Proposed Best Available Control Technology

The emergency generators installed at PESC will conform to EPA Tier 4 emission standards and BACT limits noted in the previous section. Meeting BACT is considered appropriate mitigation for emissions for emergency generators. The SLOCAPCD air permit that will be required for the construction and operation of these generators

will include conditions/monitoring requirements such as logging hours of operation, keeping records of sulfur content of the fuel combusted, and performing manufacturer-recommended maintenance to verify that the emissions are mitigated.

5.1.6 Air Quality Impact Analysis

This section describes the results, in both magnitude and spatial extent of ground-level concentrations resulting from emissions from PESC. The maximum-modeled concentrations were added to the maximum background concentrations to calculate a total impact.

Dispersion modeling methods follow EPA approved methods established in 40 CFR Part 51 Appendix W. Detailed description of the air modeling process, model options, and parameters are presented in Appendix 5.1D. Modeling input and output files have is presented in Appendix 5.1E (electronic modeling files on CD-ROM). It will be provided to the APCD and CEC Staff under separate cover.

5.1.6.1 Climate and Meteorology

The climate of the area surrounding PESC is influenced by the ocean and surrounding terrain. PESC is in a valley approximately 6 km east of the Pacific Ocean in California's Southern Coast mountain ranges. Hollister Peak (elevation 428 meters) is approximately 1.8 km to the southeast of PESC. More significant elevated terrain exists approximately 7 km to the northeast and the southwest. Summers are comfortable, arid, and clear. Winters are cold, wet, and partly cloudy. The average high temperatures range from 74°F in the summer to 62°F in the winter, and average low temperatures range from 56°F in the summer to 44°F in the winter. The wetter season occurs from the end of November to the beginning of April. The dew point generally does not exceed 60°F. The wind is most often out of the west and averages between 7.6 and 9.9 mph (weatherspark). More specific details on wind direction are presented in the wind rose in Appendix 5.1D. Meteorological data obtained from the CARB website for San Luis Obispo Regional Airport is representative of the Pecho site and was used in the air quality modeling analyses (See Appendix 5.1E).

5.1.6.2 Dispersion Modeling

The AERMOD model (version 21112) was used to estimate ground-level concentrations for the PESC. Base elevations and receptor hill heights were determined using USGS Digital Elevation Map data with a resolution of 1 arcsecond and processed using AERMAP (version 18081). Building downwash was included in the model and processed using Building Profile Input Program (BPIP) version 04274. The purpose of the AERMOD modeling analysis was to evaluate compliance with the Significant Impact Levels (SILs), CAAQS, and NAAQS.

AERMOD is a steady-state plume dispersion model that simulates transport and dispersion from multiple points, area, or volume sources based on updated characterizations of the atmospheric boundary layer. AERMOD uses Gaussian distributions in the vertical and horizontal for stable conditions, and in the horizontal for convective conditions; the vertical distribution for convective conditions is based on a bi-Gaussian probability density function of the vertical velocity. For elevated terrain AERMOD incorporates the concept of the critical dividing streamline height, in which flow below this height remains horizontal, and flow above this height tends to rise over terrain. The PRIME algorithm is used to account for building wake effects.

AERMOD input data options will be set to default except for the NO_2 model for construction which is discussed below. The "rural" option was selected for the modeling as the predominant land use around the Pecho site

because the area within 3 km is less than 50 percent medium and high-intensity land use based on visual observation of aerial photos.

Default model options for temperature gradients, wind profile exponents, and calm processing, which includes final plume rise, stack-tip downwash, and elevated receptor (complex terrain) heights option (AERMOD Implementation Guide).

Wet and dry particle depletion was enabled for the PM10 and PM2.5 construction models assuming a particle density of 2.65 g/cm^3.

5.1.6.2.1 NO_2 Modeling Procedures

All NO_2 concentrations were estimated using the Ambient Ratio Method Version 2 (ARM2), which is a regulatory default option and commonly used in practice. The default in-stack NO_2/NOx ratio of 0.5 and maximum conversion ratio of 0.9 were used for both 1-hr and annual averaging periods for the operating scenario. An in-stack ratio of 0.4 and a maximum conversion ratio of 0.9 were used for the construction scenario. See Appendix 5.1D for justification on the use of a lower in-stack ratio.

5.1.6.3 Additional Model Selection

Additional models/programs described below were used to quantify pollutant impacts on the surrounding environment based on the emission sources operating parameters and their locations.

- The Building Profile Input Program for PRIME (BPIP-PRIME, current version 04274) was used to incorporate the concepts and procedures expressed in the Good Engineering Practice (GEP) technical support document by incorporating building downwash and projected building widths.
- HARP Air Dispersion Modeling and Risk Tool (version 21081) were used to estimate human health risks related to cancer, chronic non-cancer, and acute health effects. More discussion about HARP is contained in Section 5.9, Public Health.

5.1.6.4 Good Engineering Practice Stack Height Analysis

Good Engineering Practice (GEP) stack height represents the stack height above which the associated building does not influence the plume and is estimated as the greater of 65 meters or the height based on EPA formulas for the various onsite and offsite structures and their locations and orientations to the PESC stacks. GEP stack heights were calculated for each proposed stack and were all such that building downwash will be applied to the stacks.

BPIP-PRIME was used to generate the wind-direction-specific building dimensions for input into AERMOD. Figure 5.1-2 shows the structures included in the BPIP-PRIME downwash analysis.

5.1.6.5 Receptor Grid Selection and Coverage

Receptor, building, and source base elevations and receptor hill heights were determined from the U.S. Geological Survey (USGS) National Elevation Dataset (NED) using 1-arcsecond (approximately 30-meter) spacing. All coordinates were referenced to Universal Transverse Mercator (UTM) North American Datum 1983 (NAD83), Zone 10. The NED files used with AERMAP extended beyond the receptor grid boundaries as appropriate for calculating the hill slope factors.

Cartesian coordinate receptor grids are used to provide adequate spatial coverage surrounding the Pecho area for assessing ground-level pollution concentrations, identifying the extent of significant impacts, and identifying maximum impact locations. The receptor grids used in this analysis are listed below.

- Receptors were placed along the proposed PESC ambient boundary (fence line) with 10-meter spacing.
- Receptors extending outwards from the ambient boundary in all directions at least 500 meters from with 50-meter receptor spacing.
- Receptors extending from 500 meters to 2 kilometers with 100-meter spacing.
- Receptors extending from 2 kilometers to 5 kilometers with 200-meter spacing.
- Receptors extending from 5 kilometers to 10 kilometers with 500-meter spacing.

In addition, sensitive, residential, and population receptors in the vicinity of Pecho were located as described below:

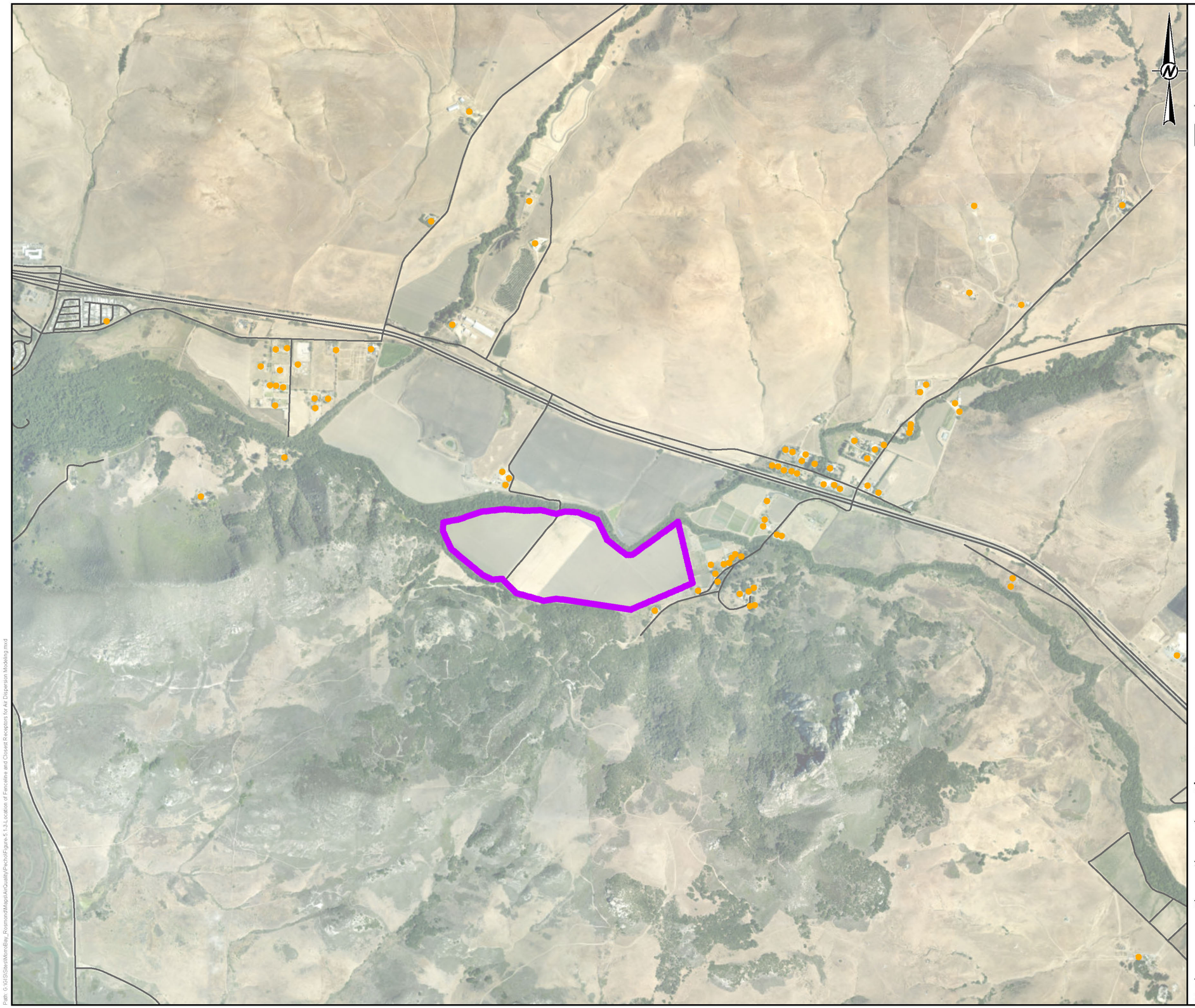
- Sensitive Receptors: Sensitive receptors were placed where the population is potentially more susceptible to adverse effects from emitted pollutants. Sensitive receptor locations include schools [kindergarten through grade 12 (K-12)], daycare centers, nursing homes, retirement homes, health clinics, hospitals, playgrounds, and athletic facilities. Seventeen (17) sensitive receptors were identified within 10 kilometers (km) of the PESC. The nearest sensitive receptor SR-PECH-13 (Bayside Care Center) is approximately 2.3 km northwest of the PESC site.
- Residential Receptors: Discrete receptors were located at the nearest residences to the Pecho site. Google Maps was used to identify the locations of residential receptors. The nearest residential receptor is RD-PECH-15 located approximately 45 meters from the property line of the PESC.
- Population (census) Receptors: These receptors were placed to represent population centroids. The Hotspots Analysis and Reporting Program (HARP) has a database that can export population centroid receptors and their corresponding populations to a csv file. Population receptors within 10 km of the PESC were exported from HARP and imported into the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) as discrete receptors.

A total of 9,159 receptors were included in one combined AERMOD run. Table 5.1-8 shows the distribution of the five types of receptors mentioned above.

Table 5.1-8: Air Dispersion Modeling Receptors

Receptor #	ID	Type of Receptor	Number of Receptors
1 to 297	FC-PECH-01 to FC-PECH-297	Fenceline Receptors	297
298 to 314	SR-PECH-01 to SR-PECH-17	Sensitive	17
315 to 443	RD-PECH-01 to RD-PECH-129	Residential	129
444 to 7932	GR-PECH-01 to GR-PECH-7489	Grid Receptors	7489
7933 to 9159	CS-PCH-01 to CS-PECH-1227	Population Receptors	1,227

Concentrations within the ambient boundary are not estimated. Figures 5.1-3 and 5.1-4 display the receptor grids used in the modeling assessment within a 10km radius of the site. All receptors included in this analysis are presented in Appendix 5.1F.



LEGEND

- RESIDENTIAL RECEPTORS
- FENCELINE RECEPTORS
- ROAD
- PECHO SITE

0 1,000 2,000 Feet

REFERENCE

COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
HYDROSTOR, INC.

PROJECT
PECHO ENERGY STORAGE CENTER

TITLE
LOCATION OF FENCE LINE AND RESIDENTIAL RECEPTORS FOR AIR DISPERSION MODELING

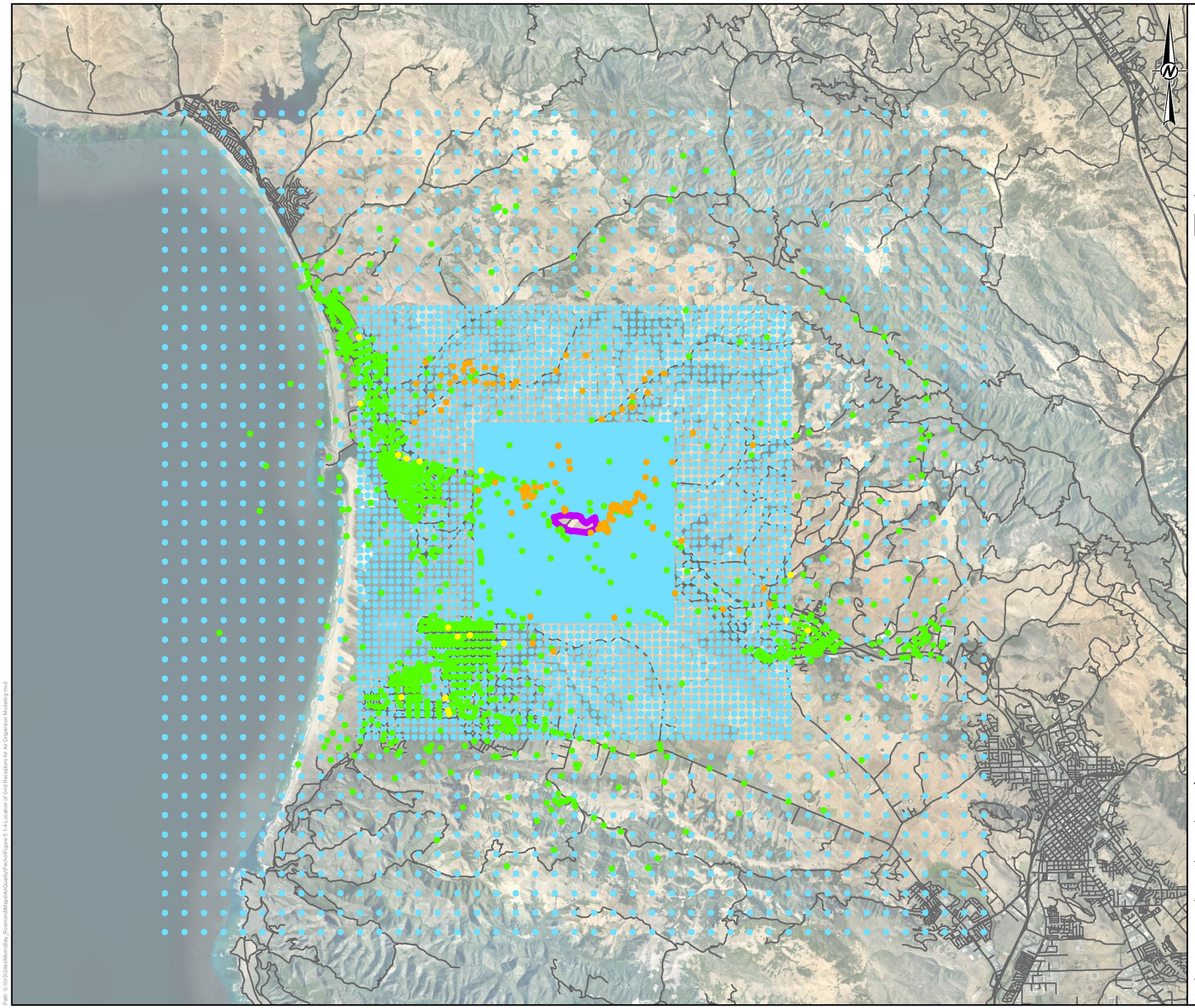
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-11
PREPARED	MR
DESIGN	MR
REVIEW	DH
APPROVED	DH

PROJECT No. 21465954 | CONTROL --- | Rev. --- | FIGURE **5.1-3**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM ANSI B

Path: G:\GIS\Sites\MonroBay_Rosmond\Maps\AirQuality\Pecho\Figure-5.1-3-Location of Fenceline and Closest Receptors for Air Dispersion Modeling.mxd



LEGEND

- SENSITIVE RECEPTORS
- RESIDENTIAL RECEPTORS
- POPULATION (CENSUS) RECEPTORS
- FENCELINE RECEPTORS
- GRID RECEPTORS
- ROAD
- PECHO SITE

0 5,000 10,000 Feet

REFERENCE

COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
HYDROSTOR, INC.

PROJECT
PECHO ENERGY STORAGE CENTER

TITLE
LOCATION OF RECEPTORS FOR AIR DISPERSION MODELING

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-11
PREPARED	MR
DESIGN	MR
REVIEW	DH
APPROVED	DH

PROJECT No.	CONTROL	Rev.	FIGURE
21465954	---	---	**5.1-4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

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Path: G:\GIS\Sites\MorroBay_Rosmond\Maps\AirQuality\Pecho\Figure 5.1-4 Location of Grid Receptors for Air Dispersion Modeling.mxd

5.1.7 Meteorological Data Selection

The proposed PESC site is located in eastern San Luis Obispo County in the San Luis Obispo Air Pollution Control District. PESC is about six kilometers from the Pacific Ocean just east of the City of Morro Bay, California in a valley in California's Southern Coast Mountain ranges. Hollister Peak (elevation 428 meters) is approximately 1.8 km to the southeast of PESC. More significant elevated terrain exists approximately 7 km to the northeast and the southwest. Land use characteristics along with terrain considerations were considered to determine which meteorological and air quality data set is most representative of the project area.

Meteorological data used for this model was obtained from the CARB. The data set represents surface data for the period 2009-2013 collected at the San Luis Obispo County Regional Airport which is located at a base elevation of 61 meters and approximately 20 km to the southeast of the PESC and located in the same valley as PESC. This location was selected due to its proximity and similar surface terrain. The surface and upper-air data were processed by CARB using AERMET version 14134.

5.1.7.1 Background Air Quality

In 1970, the U.S. Congress instructed EPA to establish standards for air pollutants, which were of nationwide concern. This directive resulted from the concern of the impacts of air pollutants on the health and welfare of the public. The resulting CAA set forth air quality standards to protect the health and welfare of the public. Two levels of standards were promulgated, primary standards and secondary standards. Primary NAAQS are "those which, in the judgment of the administrator [of EPA], based on air quality criteria and allowing an adequate margin of safety, are requisite to protect the public health (state of the general health of community or population)." The secondary NAAQS are "those which in the judgment of the administrator [of EPA], based on air quality criteria, are requisite to protect the public welfare and ecosystems associated with the presence of air pollutants in the ambient air." To date, NAAQS have been established for seven criteria pollutants as follows: SO_2, CO, ozone, NO_2, PM10, PM2.5, and lead.

Criteria pollutants are those that have been demonstrated historically to be widespread and have the potential to cause adverse health effects. EPA developed comprehensive documents detailing the basis of, or criteria for, the standards that limit the ambient concentrations of these pollutants. The State of California has also established Ambient Air Quality Standards (AAQS) that further limit the allowable concentrations of certain criteria pollutants. A review of the established air quality standards is undertaken by both EPA and the State of California periodically. As a result of the periodic reviews, the standards have been updated and amended over the years following adoption.

Each NAAQS or CAAQS is comprised of two basic elements: a numerical limit expressed as an allowable concentration, and an averaging time that specifies the period over which the concentration value is to be measured. Table 5.1-9 presents the current standards.

Table 5.1-9: California and National Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS (form)	NAAQS (form)
Ozone	1-hr	0.09 ppm	N/A
Ozone	8-hr	0.07 ppm	0.07 ppm
PM10	24-hr	50 µg/m^3 (H1H)	150 µg/m^3 (H6H)
PM10	Annual	20 µg/m^3	N/A
PM2.5	24-hr	N/A	35 µg/m^3 (98th percentile)
PM2.5	Annual	50 µg/m^3	12 µg/m^3 (3-year average)
CO	1-hr	20 ppm (H1H)	35 ppm (H2H)
CO	8-hrs	9.0 ppm (H1H)	9 ppm (H2H)
NO_2	1-hr	180 ppb (H1H)	100 ppb (98th percentile)
NO_2	Annual	30 ppb	53 ppb (3-year average)
SO_2	1-hr	250 ppb (H1H)	75 ppb (99th percentile)
SO_2	3-hrs	N/A	500 ppb (H2H)
SO_2	24-hrs	40 ppb (H1H)	N/A
SO_2	Annual	N/A	N/A
Lead	30-days	1.5 µg/m^3	N/A
Lead	3-months	N/A	0.15 µg/m^3
Sulfates	24-hr	25 µg/m^3	N/A
Hydrogen Sulfide	1-hr	0.03 ppm	N/A
Vinyl Chloride	24-hr	0.01 ppm	N/A

Source: Ambient Air Quality Standards (CARB 2016)

CAAQS = California Ambient Air Quality Standards; NAAQA = National Ambient Air Quality Standards; hr = hour; ppm = parts per million; PM10 = particulate matter less than 10 microns; µg/m^3 = micrograms per cubic meter; H1H = highest first high; N/A = not applicable; H6H = highest sixth high; PM2.5 = particulate matter less than 2.5 microns; CO = carbon monoxide; H2H = highest second high; NO_2 = nitrous oxide; ppb = parts per billion; SO_2 = sulfur dioxide.

Brief descriptions of health effects for the main criteria pollutants are as follows.

Ozone (O_3): Ozone is a reactive pollutant that is not emitted directly into the atmosphere, but rather is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving volatile organic compounds (VOC) and NOx. VOC and NOx are therefore known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources but is formed downwind of sources of VOC and NOx under the influence of wind and sunlight. Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. In addition to causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide (CO): CO is a non-reactive pollutant that is a product of incomplete combustion. Ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic and are also influenced by meteorological factors such as wind speed and atmospheric mixing. Under inversion conditions, CO concentrations may be distributed more uniformly over an area out to some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as fetuses.

Particulate Matter (PM10 and PM2.5): Both PM10 and PM2.5 represent fractions of particulate matter, which can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations, such as demolition and construction activities, contribute to increases in local PM10 concentrations, while others, such as vehicular traffic, affect regional PM10 concentrations.

EPA acknowledges that particulate matter can potentially cause the following health effects: premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms.

Nitrogen Dioxide and Sulfur Dioxide: (NO_2 and SO_2)**:** NO_2 and SO_2 are two gaseous compounds within a larger group of compounds, NOx, and SOx, respectively, which are products of the combustion of fuel. NOx and SOx emission sources can elevate local NO_2 and SO_2 concentrations, and both are regional precursor compounds to particulate matter. As described above, NOx is also an ozone precursor compound and can affect regional visibility. (NO_2 is the “whiskey brown-colored” gas readily visible during periods of heavy air pollution.) Elevated concentrations of these compounds are associated with an increased risk of acute and chronic respiratory disease.

SO_2 and NO_2 emissions can be oxidized in the atmosphere to eventually form sulfates and nitrates, which contribute to acid rain. Large power facilities with high emissions of these substances from the use of coal or oil are subject to emissions reductions under the Phase I Acid Rain Program of Title IV of the 1990 CAA Amendments. Power facilities, with individual equipment capacity of 25 MW or greater that use natural gas or other fuels with low sulfur content, are subject to the Phase II Program of Title IV. The PESC will not be required to obtain an acid rain permit because the only power generation units that emit regulated air pollutants are less than 25 MW.

Lead: Gasoline-powered automobile engines used to be the major source of airborne lead in urban areas. Excessive exposure to lead concentrations can result in gastrointestinal disturbances, anemia, and kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. The use of lead additives in motor vehicle fuel has been eliminated in California and lead concentrations have declined substantially as a result.

CARB has established and maintains a network of sampling stations, called the State and Local Air Monitoring Stations (SLAMS) network, that works in conjunction with local air pollution control districts and air quality management districts to monitor ambient pollutant levels. The SLAMS network in San Luis Obispo County consists of ten stations that monitor various pollutant concentrations until 2020. San Luis Obispo - Higuera St monitoring station was closed in 2021. SLOCAPCD is responsible for monitoring air quality in the San Luis

Obispo County portion of the South-Central Coast Air Basin to determine whether pollutant concentrations meet CAAQS and NAAQS. Note the monitoring stations in San Luis Obispo County don't register the parameter carbon monoxide. Therefore, it was selected the closest monitoring station located in different county to get the background for this parameter.

San Luis Obispo - Higuera St. (San Luis Obispo County), Morro Bay (San Luis Obispo County), Nipomo - Regional Park (San Luis Obispo County), Nipomo - Guadalupe Road (San Luis Obispo County), and Lompoc-South H Street (Santa Barbara County) monitoring stations are the closest stations and have the most representative monitoring data to the Pecho site, approximately 9.4, 2.3, 27.2, 25.4 and 52.5 miles away, respectively. These stations belong to the South-Central Coast Air Basin. The mentioned monitored stations register the following parameters:

- San Luis Obispo - Higuera St.: O_3, PM10, and PM2.5.
- Morro Bay: O_3
- Nipomo - Regional Park: O_3, NO_2, PM10, and PM2.5.
- Nipomo - Guadalupe Road: SO_2, PM10, and PM2.5.
- Lompoc- South H Street: O_3, CO, NO_2, PM10, and PM2.5.

Due to its proximity to the PESC, the Morro Bay station data was used to summarize ambient concentrations of O_3. San Luis Obispo - Higuera St. station was used to summarize PM10, and PM2.5 concentrations. Nipomo - Regional Park and Nipomo - Guadalupe Road stations were used to summarize NO_2 and SO_2 concentrations, respectively. As it was discussed before, Lompoc- South H Street station was used to summarize CO concentrations because San Luis Obispo County don't register this parameter. Appendix 5.1G provides a summary of measured ambient air quality concentrations by year and site for the period 2018-2020.

The maximum representative background concentrations for the most recent 3-year period (2018-2020) are summarized in Table 5.1-10. Data from these sites are a reasonable representation of background air quality for the project area. The background values represent the highest values reported for the most representative air quality monitoring site during any single year of the most recent three-year period for the CAAQS assessments. These CAAQS maxima are conservatively used for some of the NAAQS modeling assessments (CO and SO_2), while the appropriate values for the NAAQS, according to the format of the standard, are used for the remainder of the NAAQS modeling assessments (NO_2, PM10, and PM2.5).

Table 5.1-10: Measured Ambient Air Quality (Background)

Pollutant	Basis	Averaging Time	Value	Units	Measured Background ($\mu g/m^3$)
O_3	CAAQS-1st High	1-hr	0.07	ppm	140.91
	CAAQS-1st High	8-hr	0.06	ppm	113.51
	NAAQS-4th High	8-hr	0.05	ppm	103.73
NO_2	CAAQS-1st High	1-hr	25.00	ppb	47.00
	NAAQS-98th percentile	1-hr	18.00	ppb	33.84
	CAAQS/NAAQS	Annual	1.95	ppb	3.67

Pollutant	Basis	Averaging Time	Value	Units	Measured Background ($\mu g/m^3$)
CO	CAAQS/NAAQS -1st High	1-hr	2.50	ppm	2857.14
	CAAQS/NAAQS -1st High	8-hr	0.90	ppm	1000.00
SO_2	CAAQS/NAAQS -1st High	1-hr	2.00	ppb	5.23
	NAAQS -1st High	3-hr	2.00	ppb	5.23
	CAAQS/NAAQS -1st High	24-hr	1.20	ppb	3.14
PM10	CAAQS-1st High	24-hr	131.00	$\mu g/m^3$	131.00
	NAAQS -2nd High	24-hr	95.00	$\mu g/m^3$	95.00
	CAAQS	Annual	17.21	$\mu g/m^3$	17.21
PM2.5	NAAQS-98th percentile	24-hr	25.33	$\mu g/m^3$	25.33
	CAAQS/NAAQS	Annual	6.33	$\mu g/m^3$	6.33

x at San Luis Obispo - Higuera St. (San Luis Obispo County), Morro Bay (San Luis Obispo County), Nipomo - Regional Park (San Luis Obispo County), Nipomo - Guadalupe Road (San Luis Obispo County), and Lompoc- South H Street (Santa Barbara County) monitoring stations (2018-2020). See Appendix 5.1G for details on which readings are associated with the listed sites.
$\mu g/m^3$ = micrograms per cubic meter; O_3 = ozone; CAAQS = California Ambient Air Quality Standards; hr = hour; ppm = parts per million; NAAQS = National Ambient Air Quality Standards; NO_2 = nitrogen dioxide; ppb = parts per billion; CO = carbon monoxide, SO_2 = sulfur dioxide, PM10 PM2.5

5.1.7.1.1 Air Quality Analyses

The following sections present the analyses for determining the changes to ambient air quality concentrations in the region of PESC. These analyses are comprised of a screening assessment to determine the worst-case emissions and stack parameters for the two engines. Cumulative multisource modeling assessments, which are used to analyze the PESC plus nearby existing sources, are not proposed because the only air emission sources present are intended for emergency use. After consultation with the CEC and appropriate agencies, if such an analysis is required, it will be performed later during the air permitting process. The screening analysis for construction operations is included in Appendix 5.1C.

5.1.7.1.2 Screening Analysis

Operational characteristics of the engines, such as emission rate, exit velocity, and exit temperature were obtained from the manufacturer's specifications. The modeling process includes modeling project emissions and comparing the estimated concentration to the SILs. If the SILs are not exceeded, then it is concluded that the project impacts are insignificant and no further analysis is typically required; however, this analysis also compares project emissions to the CAAQS and NAAQS for completeness.

The following averaging times and forms were used to compare to the SILs:

- NO_2 1-hr & PM2.5 24-hr: 5-year average of the 100th percentile (H1H)
- NO_2 and PM2.5 annual: 5-year average of the annual maximum
- CO 1-hr & 8-hr, PM10 24-hr, SO_2 1-hr & 3-hr & 24-hr: highest first high

The following averaging times and forms were used to compare to the CAAQS:

- NO_2 1-hr, CO 1-hr & 8-hr, SO_2 1-hr & 24-hr, and PM10 24-hr: highest first high
- NO_2, PM10, and PM2.5 annual: highest annual value in 5 years

The following averaging times and forms were used to compare to the NAAQS:

- NO_2 1-hr and PM2.5 24-hr: 5-year average of the 98th percentile (H8H)
- SO_2 1-hr: 5-year average of the 99th percentile (H4H)
- NO_2 and PM2.5annual: 5-year average of the annual maximum
- CO 1-hr & 8-hr, SO_2 3-hr & 24-hr: highest second high
- PM10 24-hr: 6th highest across 5 years.

Table 5.1-11 shows the stack parameters and emission rates for each emergency diesel generator. Detailed emission calculations are included in Appendix 5.1A.

Table 5.1-11: Stack Parameters and Emission Rates for Each Generator

Source	Stack Height (m)	Exhaust Gas Temperature (K)	Exhaust Velocity (m/s)	Stack Inside Diameter (m)	Emission Rates (g/s)			
					PM10/PM2.5	NOx	SO2	CO
Each Emergency Diesel Generator	3.962	654.550	123.315	0.457	0.0416 (average daily rate) 0.00095 (average annual rate)	1.0393 (maximum rate) 0.02373 (average annual rate)	0.0114 (maximum rate)	5.4043 (maximum rate)

m = meter; K = Kelvin; PM10 = particulate matter less than 10 microns; PM2.5 = particulate matter less than 2.5 microns; NOx = nitrogen dioxides; SO_2 = sulfur dioxide; CO = carbon monoxide
Source: Section 5.1, Air Quality, Appendix 5.1A, and 5.1D.

5.1.7.2 Operations Impact Analysis

Modeled concentrations are compared to the SILs in Table 5.1-12. All maximum facility impacts occurred at the ambient boundary and the estimated concentrations are all below the applicable SILs. For annual averaging periods, each engine was assumed to be capable of operating up to its assumed 200 hours per year limit. For 24-hr and shorter averaging periods, only one engine is assumed to be operating.

Table 5.1-12: Air Quality Impact Results– Significant Impact Levels

Pollutant	Basis	Averaging Time	Maximum Concentration (µg/m³)	Class II SIL (µg/m³)
NO_2	NAAQS -1st High [a]	1-hr	-	7.5
	NAAQS-Maximum	Annual	0.15	1.0
CO	NAAQS -1st High	1-hr	1043.18	2,000.0
	NAAQS -1st High	8-hr	282.88	500.0
SO_2	NAAQS-1st High, 5-year average	1-hr	1.76	7.86
	NAAQS-1st High	3-hr	0.92	25.0
	NAAQS -1st High	24-hr	0.26	5.0
PM10	NAAQS-1st High	24-hr	0.96	5.0
	NAAQS- Maximum	Annual	0.007	1.0
PM2.5	NAAQS-1st High, 5-year average	24-hr	0.62	1.2
	NAAQS-5-year average	Annual	0.006	0.3

Note(s): CAAQS are not listed because the SIL does not apply to CAAQS.

[at] an emergency diesel generator will operate for less than 200 hours total (per both) generators during a single year, impacts were not assessed for the 1-hour NO2 NAAQS SIL per EPA guidance due to classification as intermittent sources.
µg/m3 = micrograms per cubic meter; NO_2 = nitrogen dioxide; NAAQS = National Ambient Air Quality Standards; hr = hour; CO = carbon monoxide SO_2 = sulfur dioxide; PM10 = particulate matter less than 10 microns; PM2.5 = particulate matter less than 2.5 microns.

Source: Section 5.1, Air Quality, Appendix 5.1D.

Maximum PESC concentrations are compared to the CAAQS and NAAQS in Table 5.1-13. Maximum combined concentrations (modeled + background) are less than all the CAAQS and NAAQS except for the PM10 CAAQS. The exceedances of the CAAQS for PM10 are due to high background concentrations, which already exceed the CAAQS (the area is already designated as State nonattainment for the PM10 CAAQS). As noted above, the facility is projected to have maximum impacts less than the SILs for both 24-hour and annual PM10 (the only pollutant with background concentrations above the AAQS). Thus, PESC would not significantly contribute to the current exceedances of the PM10 CAAQS.

Table 5.1-13: Air Quality Impact Results– Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Concentration (µg/m^3)	Background (µg/m^3)	Total (µg/m^3)	Ambient Air Quality Standards (µg/m^3)	
					CAAQS	NAAQS
NO_2	1-hr (highest)	133.76	47.00	180.76	339	-
	1-hr (98th percentile)[a]	see below	see below	see below	-	188
	Annual Maximum	0.15	3.67	3.82	57	100
CO [b]	1-hr (highest)	1,043.18	2,857.14	3,900.32	23,000	40,000
	8-hr (highest)	282.88	1,000.00	1,282.88	10,000	10,000
SO_2[b]	1-hr (highest)	2.20	5.23	7.43	655	--
	1-hr (99th percentile)	1.40	5.23	6.62	--	196
	3-hr (highest)	0.92	5.23	6.14	--	1,300
	24-hr (highest)	0.26	3.14	3.40	105	--
PM10	24-hr (highest)	0.96	131.00	131.96	50	--
	24-hr (6th highest)	0.60	95.00	95.60	-	150
	Annual maximum	0.007	17.21	17.22	20	-
PM2.5	24-hr (98th percentile)	0.36	25.33	25.69	-	35
	Annual maximum	0.007	6.33	6.34	12	-
	5-year average annual	0.006	6.33	6.34	-	12

Source: Section 5.1, Air Quality, Appendix 5.1D and 5.1G.
[a] Modeling for 1-hr NO_2 NAAQS is not required because these units are emergency generators and are therefore classified as "intermittent", EPA Memorandum, March 1, 2011.

[b] Results for SO_2 and CO are reported as the H1H even though the NAAQS allows other forms of compliance. Using the H1H is a more conservative approach.
µg/m3 = micrograms per cubic meter; NO_2 = nitrogen dioxide; NAAQS = National Ambient Air Quality Standards; hr = hour; CO = carbon monoxide; SO_2 = sulfur dioxide; PM10 = particulate matter less than 10 microns; PM2.5 = particulate matter less than 2.5 microns.
Source: Section 5.1, Air Quality, Appendix 5.1D and 5.1G.

5.1.7.3 Pecho Commissioning Impact Analysis

Commissioning of the engines is not anticipated to have any additional impacts beyond what has been considered for operation, so a separate commissioning impact analysis is not provided.

5.1.7.3.1 Fumigation Analysis

Shoreline fumigation analyses are not relevant more than 3 km from a large body of water, so shoreline fumigation was not run. Inversion break-up fumigation was considered; however, the AERSCREEN model will only consider fumigation for point sources with release heights 10 meters or more above ground level. Because the emergency generator stacks are less than 10 meters above ground level, an inversion break-up fumigation model cannot be run.

5.1.8 Laws, Ordinances, Regulations, and Statutes

The relevant LORS that affect public health and apply to the PESC and the conformity of the PESC to each of the LORS are presented in this section.

5.1.8.1 Specific LORS Discussion

5.1.8.1.1 Federal LORS

Federal LORS applicability is discussed in the list below. Parts of Title 40 of the Code of Federal Regulations (40 CFR) Subchapter C that has no practical applicability to PESC is not discussed.

- 40 CFR Part 50 (NAAQS): All stationary sources of emission are required to meet the National Ambient Air Quality Standards (NAAQS). PESC modeling discussed in Section 5.1.7.2 demonstrates compliance with the NAAQS.
- 40 CFR Part 52.21 (PSD): PESC will not be considered a major source under Prevention of Significant Deterioration.
- 40 CFR Part 60 (NSPS): The following New Source Performance Standard(s) (NSPS) apply to PESC:
  - Subpart A (General Provisions) applies to the PESC if any of the listed subparts apply. Because NSPS Subpart IIII applies, portions of Subpart A apply which are listed in NSPS Subpart IIII Table 8.
  - Subpart IIII (Standards for Stationary Compression Ignition Internal Combustion Engines) applies to the two diesel engines proposed that will drive emergency generators. Compliance will be demonstrated by purchasing an engine that is certified to applicable emission standards and by following applicable operating and best management practices. The operation will be limited to 100 hours per year for maintenance and readiness testing. Fuel must contain no more than 15 ppm sulfur. The air permitting process described in Section 5.1.2 will document compliance with this rule.
  - No other NSPSs apply
- 40 CFR Part 61 (NESHAP): No Part 61 National Emission Standards for Hazardous Air Pollutants (NESHAP) apply to PESC.
- 40 CFR Part 63 (NESHAP for Source Categories): The following Part 60 NESHAPs apply to PESC:
  - Subpart A (General Provisions) applies to the PESC if any of the listed subparts apply. Because NESHAP Subpart ZZZZ applies, portions of Subpart A apply but due to the limited nature of compliance requirements of Subpart ZZZZ, Subpart A has no practical applicability.
  - Subpart ZZZZ (NESHAP for Stationary Reciprocating Internal Combustion Engines) applies to the two diesel engines proposed that will drive emergency generators. The only requirement under Subpart

ZZZZ is that the units comply with the requirements of NSPS Subpart IIII. The air permitting process described in Section 5.1.2 will document compliance with this rule.

- 40 CFR Part 63 (CAM): Compliance Assurance Monitoring (CAM) does not apply because no emission unit has an uncontrolled pollutant specific emission rate above Part 70 major source thresholds and no add-on pollution control equipment is proposed.
- 40 CFR Part 68 (RMP): PESC will not require a Risk Management Plan.
- 40 CFR Part 70 (Operating Permits): Because PESC will not have permitted emissions from stationary sources that exceed Part 70 major source thresholds, a major source operating permit under Part 70 is not required (sometimes referred to as a Title V permit).
- 40 CFR Part 71 (Federal Operating Permits): The SLOCAPCD has delegated permitting authority over the geographic region PESC is proposed, therefore Part 71 does not apply.
- 40 CFR Part 72-75 (Acid Rain): PESC will not require an acid rain permit.
- 40 CFR Part 82 (Protection of Stratospheric Ozone): PESC anticipates having a licensed third party handle any ozone-depleting substances, if applicable. Proper documentation will be kept for such activity.
- 40 CFR Part 93 (General Conformity): As discussed in this Section 5.1.4.6, this project is not subject to general conformity.
- 40 CFR Part 98 (Mandatory GHG Reporting): PESC is not anticipated to have actual GHG emissions from operations that exceed 25,000 metric tons per year, therefore reporting will not be required under Part 98.

5.1.8.1.2 State LORS

- California Health & Safety Code (CHSC) Part 6 Sections 44360 – 44366 [Air Toxics “Hot Spots” Information and Assessment]: The PESC will be subject to Part 6 because it will release substances listed in the rule from the combustion of diesel fuel from the emergency generators. Pecho will participate in the requirement to prepare an inventory and health risk analysis (as applicable). The analysis presented in Section 5.9, Public Health shows that emissions from the PESC will be below the significance levels for operation and that the cancer burden is reasonable for risk due to construction activities.
- CHSC 41700 [public nuisance]: Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or which endanger the comfort, repose, health, or safety of the public, or that damage business or property. The project will acquire an air permit from SLOCAPCD for emergency generators that will identify any operating restrictions. The operations of these generators are not expected to generate a public nuisance.
- California Code of Regulations (CCR) Title 17 Section 70200 [California Ambient Air Quality Standards]: Emissions from Pecho operations and construction show compliance with the CAAQS using air dispersion models. PESC modeling discussed in Section 5.1.7.2 demonstrates compliance with the NAAQS.
- CCR Title 13 Section 2485 [on-road vehicle idling]: Diesel-fueled commercial motor vehicles with a gross weight of 10,000 pounds or more may not idle for more than 5 minutes or use a diesel-fueled auxiliary power system for greater than 5 minutes within 100 feet of a restricted area.

- CCR Title 13 Section 2449(d)(2) [off-road vehicle idling]: Diesel-fueled off-road engines with a rating of 25 hp or more may not idle for more than 5 minutes except under certain circumstances.

5.1.8.1.3 APCD LORS

San Luis Obispo County Air Pollution Control District (SLOCAPCD) LORS applicability is discussed in the list below.

- A statement on SLOCAPCD's website under "Permit Information" states that BACT is required for all emergency engines greater than or equal to 1000 horsepower and must meet EPA Tier 4 standards. The proposed emergency generators at PESC will be certified to meet Tier 4 requirements and will meet BACT.
- SLOCAPCD Rule 202 [permits]: The reciprocating engines driving emergency generators at the PESC will require an authority to construct before commencing construction, and a permit to operate the air emission units. Proper permits will be obtained before constructing and operating these units. The process of obtaining such permits is discussed in Section 5.1, Air Quality.
- SLOCAPCD Rule 204 [requirements]:
  - Control Technology: The proposed emergency generators will emit less than 25 lb/day of all regulated pollutants except for NOx, CO, and VOC. BACT will be used for NOx, CO, and VOC so the control technology requirements are met.
  - Offsets: Emissions of reactive organic gasses (ROG), NOx, SOx, and PM10 each individually will be less than 25 tons per year (tpy), and CO emissions will be less than 250 tpy, therefore offsets are not required.
- SLOCAPCD Rule 216 [part 70] & 221 [part 70 PTE limitations]: The air emission units at PESC will accept annual operating limitations such that the limited potential to emit (PTE) is less than thresholds that would classify the facility as a major source under part 70. Compliance will be enforced through the operating permit.
- SLOCAPCD Rule 218 [federal requirements for HAP]: This rule only applies to sources classified as a major source of HAP. The PESC will not be classified as a major source of HAP so this rule will not apply.
- SLOCAPCD Rule 219 [toxics new source review]: This rule only applies to facilities where the air emission sources would have emissions of air toxics that result in greater than one excess cancer per million population or the health hazard index is greater than or equal to 0.10 for acute or chronic non-cancer effects. Cancer and non-cancer risks from the operation of PESC are shown to be less than these thresholds and therefore, this rule does not apply.
- SLOCAPCD Rule 220 [PSD]: Air emissions at PESC will be limited such that the facility will not be subject to Prevention of Significant Deterioration (PSD).
- SLOCAPCD Rule 223 [power plants]: This rule applies to power plants with a gross electrical generating capacity of 50 MW or more. The air emission sources at PESC will not have the ability to generate 50 MW or more; however, the advanced air storage process will have a capacity exceeding 50 MW. It is not entirely clear if this rule will have applicability to this project, but if it does, the only requirement is that the air

pollution control officer (APCO) shall consider the Application for Certification (AFC) to be equivalent to an application for Authority to Construct and that the application must meet the same requirements.

- SLOCAPCD Rule 224 [major NSR]: This rule only applies to sources that will be classified as a major source under New Source Review (NSR). Emissions at PESC will be limited so that the facility is not classified as a major source under NSR.
- SLOCAPCD Rule 401 [visible emissions]: Emissions at PESC must not exceed a shade as dark or darker than No. 1 on the Ringelmann Chart. The diesel generators proposed are anticipated to comply with this requirement and enforcement will be through the air permit.
- SLOCAPCD Rule 403 [PM emissions]: PESC will operate internal combustion engines which are not subject to this rule.
- SLOCAPCD Rule 404 [sulfur compound emissions]: PESC engines will be subject to a limit of 0.2% by volume sulfur compounds, must emit less than 200 lb/hr of sulfur compounds, and liquid fuel must contain no more than 0.5% sulfur. Compliance will be demonstrated by combusting diesel fuel in the generators that will contain no more than 0.0015%.
- SLOCAPCD Rule 405 [nitrogen oxides emissions]: PESC engines will be subject to a limit of 140 lb/hr of nitrogen oxides. The maximum NOx emission rate from each generator is 8.2 lb/hr.
- SLOCAPCD Rule 406 [carbon monoxide emissions]: PESC will operate internal combustion engines which are not subject to this rule.
- SLOCAPCD Rule 601 [new source performance standards]: SLOCAPCD has incorporated by reference 40 CFR Part 60 which is discussed in the federal rules section.

5.1.8.2 Agency Jurisdiction and Contacts

Table 5.1-14 presents data on the following:

- Air quality agencies that may or will exercise jurisdiction over air quality issues resulting from the power facility
- The most appropriate agency contacts for Pecho
- Contact address and phone information
- The agency involvement in required permits or approvals

Table 5.1-14: Agency, Contacts, Jurisdictional Involvement, Required Permits for Air Quality

Regulatory Agency	Regulatory Contact	Jurisdictional Area	Permit Status
CEC	CEC-TBD 1516 Ninth Street Sacramento, CA 95814	Primary reviewing and certification agency.	Will certify the facility under the energy siting regulations and CEQA. Certification will contain a variety of conditions pertaining to emissions and operation.
SLOCAPCD	Gary Willey, Air Pollution Control Officer 3433 Roberto Court San Luis Obispo, CA 93401 (805) 781-5912	Prepares DOC for CEC, Issues ATC, and Permit to Operate, Primary air regulatory and enforcement agency.	DOC will be prepared subsequent to AFC submittal.
CARB	LinYing Li 1001 I Street, 19th Floor Sacramento, CA 95814 (916) 322 1721	Oversight of APCD stationary source permitting and enforcement program	CARB staff will provide comments on applicable AFC sections affecting air quality and public health. CARB staff will also have the opportunity to comment on draft ATC.
EPA Region 9	Deborah Jordan, Acting Regional Administrator EPA Region 9 75 Hawthorne St. San Francisco, CA 94105 (415) 947-8000	Oversight of all APCD programs, including permitting and enforcement programs. PSD permitting authority for EKAPCD.	EPA Region 9 staff will receive a copy of the DOC. EPA Region 9 staff will have the opportunity to comment on draft ATC

5.1.8.3 Permit Requirements and Schedules

A description of the air permitting process is in Section 5.1.2.

5.1.9 References

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