DOCKETED

Docket Number:	16-SPPE-01
Project Title:	AltaGas Pomona Energy
TN #:	210803-8
Document Title:	Appendix 4.1D
Description:	Application for Small Power Plant Exemption Volume 2
Filer:	Sabrina Savala
Organization:	AltaGas Pomona Energy, Inc.
Submitter Role:	Applicant
Submission Date:	3/22/2016 12:28:10 PM
Docketed Date:	3/21/2016

Appendix 4.1D
Air Quality Modeling Protocol

Tom Andrews

From:	Tom Andrews
Sent:	Friday, January 08, 2016 2:39 PM
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Subject:	Pomona Repower Project - AQ Modeling Plan
Attachments:	Pomona_Repower_Project _Modeling_Protocol_2016-01-06.doc

Gerry/Wenjun:

Enclosed is the air quality modeling plan for the proposed Pomona Repower Project. Please note that the most current SCAQMD prepared meteorological dataset available for this project area is a five-year dataset from 2008–2012 processed in AERMET version 14134 to generate AERMOD-compatible inputs (a newer met. set will not be available from the SCAQMD for a year or so). If you have any questions or comments, please do not hesitate to contact us.

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Air Dispersion Modeling and Health Risk Assessment Protocol

Pomona Repower Project
Pomona, California

Submitted to:

South Coast Air Quality Management District (for an Application for Permit to Construct/Permit to Operate)

California Energy Commission (for a Small Power Plant Exemption)

prepared for:

AltaGas Pomona Energy Inc.

January 2016

prepared by:

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Air Dispersion Modeling and Health Risk Assessment Protocol
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1. INTRODUCTION

This protocol describes the modeling procedures that will be used to determine the ambient air impacts from the Pomona Repower Project (also referred to herein as “PRP” or “the Project”). These procedures will be used in the ambient air quality impact assessment and screening health risk assessment that will be submitted to the South Coast Air Quality Management District (SCAQMD, or District) as part of an application for Permit to Construct/Permit to Operate, and to the California Energy Commission as part of an application for a Small Power Plant Exemption.

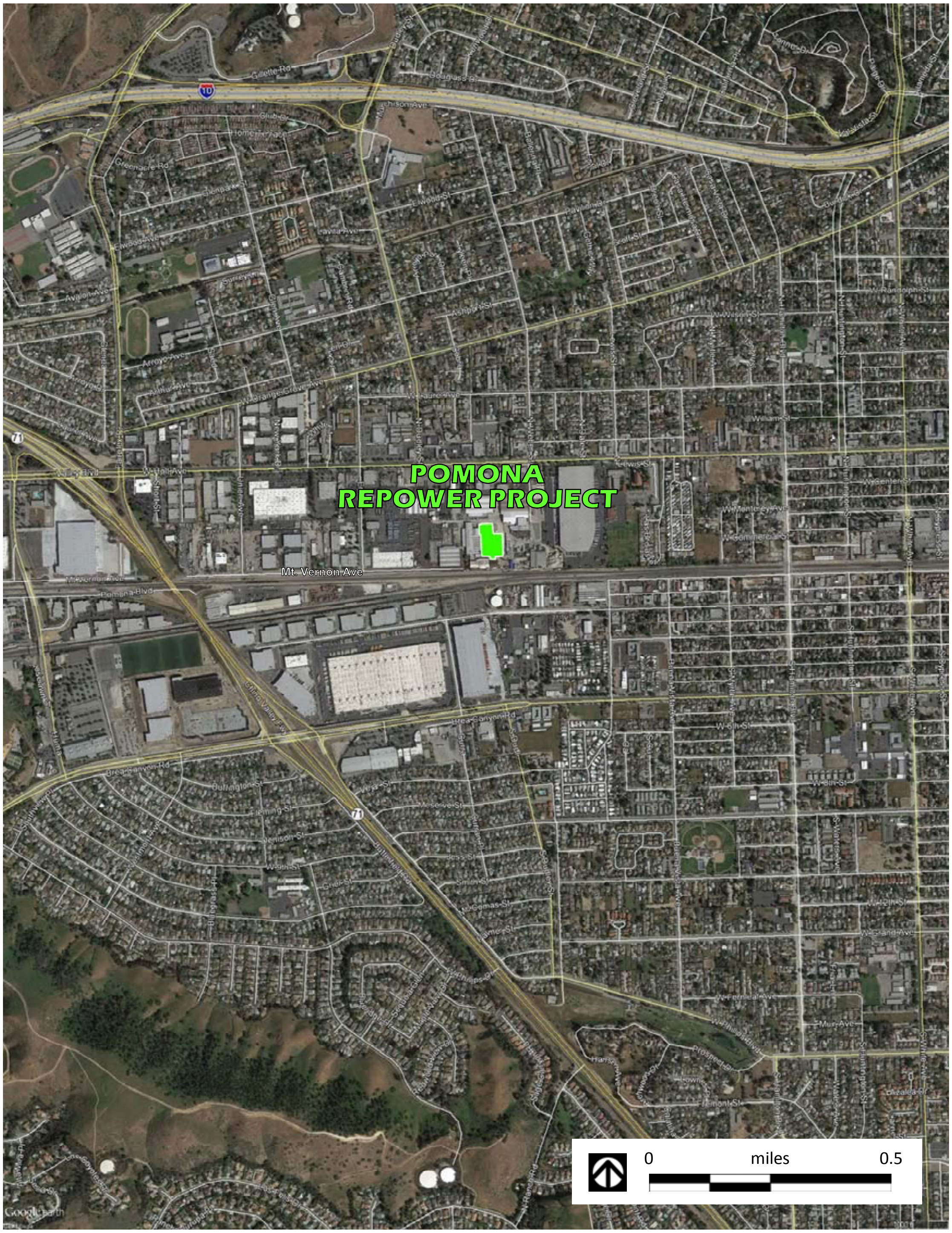
2. FACILITY DESCRIPTION AND SOURCE INFORMATION

The Pomona Repower Project ("PRP" or Project) would replace one existing LM5000 combined cycle turbine at the 49.5 MW San Gabriel Cogeneration Facility with a new state-of-the-art LMS100PA natural-gas fired simple-cycle combustion turbine generator and associated auxiliaries. The existing turbine will be decommissioned and removed, and certain existing ancillary facilities will either be removed to accommodate the development of PRP, or will be repurposed for future use in connection with the Project. In addition, a new wet cooling tower will be included as part of the project. PRP is located in the City of Pomona, within Los Angeles County, and is approximately 1.4 miles northwest of the Pomona city center, east of the intersection of Interstate 10 and Highway 71. Figure 1 shows the general location of the Project.

The proposed new combustion turbine generator will be equipped with Best Available Control Technology (BACT). BACT will include water injection, selective catalytic reduction (SCR), an oxidation catalyst, and the use of clean-burning natural gas fuel. The operating schedule for the new unit will vary and may range from no operation during the winter months, to 24 hours of operation per day during the summer months. The modeling analysis will be performed for the worst-case (maximum expected equipment operation) operating hour, operating day, and operating year. The modeling analysis will include a complete description of the new equipment, including the worst-case hourly, daily, and annual operating schedules used for the analysis.

The Proposed project is not expected to trigger Prevention of Significant Deterioration (PSD) review for criteria pollutants.

Figure 1
Location of the Proposed Project



3. DISPERSION MODELING PROCEDURES

The air quality modeling analysis will follow the U.S. Environmental Protection Agency (USEPA) AERMOD Implementation Guide (USEPA, 2015a), USEPA's "Guideline on Air Quality Models" (USEPA, 2005), and SCAQMD Modeling Guidance for AERMOD.

3.1 AERMOD Modeling

The following USEPA air dispersion models are proposed for use to quantify pollutant impacts on the surrounding environment based on the emission sources' operating parameters and their locations:

- American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) model, also known as AERMOD (Version 15181);
- Building Profile Input Program – Plume Rise Model Enhancements (BPIP-PRIME, Version 04274); and
- AERSCREEN (Version 15181).

The main air dispersion modeling will be conducted with the latest version of AERMOD, USEPA's preferred/recommended dispersion model for new source review and PSD air quality impact assessments. AERMOD can account for building downwash effects on dispersing plumes. Stack location and height and building locations and dimensions will be input to BPIP-PRIME. The first part of BPIP-PRIME determines and reports on whether a stack is being subjected to wake effects from a structure or structures; the second part calculates direction-specific building dimensions for each structure, which are used by AERMOD to evaluate wake effects. The BPIP-PRIME output is formatted for use in AERMOD input files.

AERMOD requires hourly meteorological data consisting of wind direction and speed (with reference height), temperature (with reference height), Monin-Obukhov length, surface roughness length, heights of the mechanically and convectively generated boundary layers, surface friction velocity, convective velocity scale, and vertical potential temperature gradient in the 500-meter layer above the planetary boundary layer.

Standard AERMOD control parameters will be used, including stack tip downwash, non-screening mode, non-flat terrain, and sequential meteorological data check. The stack-tip downwash algorithm will be used to adjust the effective stack height downward following the methods of Briggs (1972) for cases where the stack exit velocity is less than 1.5 times the wind speed at stack top. The urban option will be used by invoking the URBANOPT option, based on the project's urban location.[1]

3.1.1 Ambient Ratio Method and Ozone Limiting Method

Annual nitrogen dioxide (NO_2) concentrations will be calculated using the Ambient Ratio Method (ARM), originally adopted in Supplement C to the Guideline on Air Quality Models (USEPA, 1995) with a revision issued by USEPA in September 2014 (USEPA, 2014c). The Guideline allows a nationwide default of 75% for the conversion of nitric oxide (NO) to NO_2 on an annual basis and the calculation of NO_2/NOx ratios.

If NO_2 concentrations need to be examined in more detail, the Ozone Limiting Method (OLM) (Cole and Summerhays, 1979), Plume Volume Molar Ratio Method (PVMRM) (Hanrahan, 1999), or PVMRM2 implemented in AERMOD (USEPA, 2015b), will be used.

Both OLM and PVMRM have been available in AERMOD for many years and their usage is accepted by the SCAQMD without further justification. In AERMOD Version 15181, EPA introduced a new Plume Volume Molar Ration Method 2 (PVMRM2) non-DFAULT/BETA option that uses total dispersion coefficients instead of relative dispersion coefficients for stable conditions, and relative dispersion coefficients for unstable conditions. The new PVMRM2 option incorporates additional modifications relative to the PVMRM option, including the use of downwind distance instead of radial distance from the source to a receptor to calculate the plume volume and moles of NOx (USEPA, 2015b). These adjustments to the calculation of plume volume are intended to mitigate potential overprediction of NO_2 conversion in multisource applications, especially during stable meteorological conditions. Currently, the use of PVMRM2 is approved on a case-by-case basis by the SCAQMD. If the PVMRM2 option is used for the final modeling for the project, the Applicant will obtain approval by the SCAQMD prior to its use.

Hourly ozone data will be needed to calculate ambient NO_2 concentrations using AERMOD OLM, PVMRM, or PVMRM2 methods. Contemporaneous hourly ozone data collected at the nearby Pomona monitoring station will be used to calculate hourly NO_2 concentrations from modeled hourly NOx concentrations.

Part of the NOx in the gas turbine exhaust is converted to NO_2 during and immediately after combustion. The remainder of the NOx emissions is assumed to be in the form of NO.

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[1] The rural vs. urban option in AERMOD is primarily designed to set the fraction of incident heat flux that is transferred into the atmosphere. This fraction becomes important in urban areas having an appreciable "urban heat island" effect due to a large presence of land covered by concrete, asphalt, and buildings. Land use within 3 kilometers [km] of the facility is primarily classified as urban based on the Auer Method; therefore, AERMOD will be run in the "Urban" dispersion mode with a population input of 9,862,049, as defined for Los Angeles County in the District's modeling guidance.

For the new gas turbine, we will use the NO_2/NOx ratios for the analysis (discussed in more detail below) provided by the turbine vendor: 30% during normal operating hours, 40% during startup/shutdown periods, and 40% during commissioning tests when SCR is not fully operational. As the exhaust leaves the stack and mixes with the ambient air, the NO reacts with ambient ozone (O_3) to form NO_2 and molecular oxygen (O_2). The OLM / PVMRM / PVMRM2 algorithms assume that at any given receptor location, the amount of NO that is converted to NO_2 by this oxidation reaction is proportional to the O_3 concentration in the plume after mixing with the ambient air. If the O_3 concentration is less than the NO concentration, the amount of NO_2 formed by this reaction is limited. However, if the O_3 concentration is greater than or equal to the NO concentration, all of the NO is assumed to be converted to NO_2.

A detailed discussion of OLM / PVMRM / PVMRM2 modeling and how the modeling results and monitored background NO_2 will be combined is provided in Sections 3.6.3 and 3.6.4.

3.1.2 Options for Low Wind Conditions

BETA options are included in AERMOD Version 15181 for addressing concerns regarding model performance under low wind speed conditions, including the LOWWIND1, LOWWIND2, and LOWWIND3 options on the MODELOPT keyword. The LOWWIND1 BETA option increases the minimum value of sigma-v from 0.2 to 0.5 m/s and "turns off" the horizontal meander component. The LOWWIND2 BETA option increases the minimum value of sigma-v from 0.2 to 0.3 m/s, but incorporates the meander component with some adjustments. Under the LOWWIND2 option, an upper limit of 0.95 is applied to the meander factor (FRAN). The LOWWIND3 BETA option increases the minimum value of sigma-v from 0.2 to 0.3 m/s, uses the FASTALL approach to replicate the centerline concentration accounting for horizontal meander, but utilizes an effective sigma-y and eliminates upwind dispersion (USEPA 2015b). The low wind options in AERMOD are to address issues with model overprediction under low wind speed conditions. Currently, the usage of these low wind options are approved on a case-by-case basis by the SCAQMD. If these low wind options are used in the final modeling performed for the project, the Applicant will request and obtain approval from the SCAQMD prior to their use.

3.1.3 $PM_{2.5}$

$PM_{2.5}$ impacts will be modeled in accordance with USEPA guidance (USEPA, 2010a).[2] A detailed discussion of how modeled $PM_{2.5}$ impacts will be evaluated is provided in Section 3.6.

3.2 Fumigation Modeling

The AERSCREEN (USEPA, 2015c) model will be used to evaluate inversion breakup fumigation and shoreline fumigation impacts for short-term averaging periods (24 hours

[2] While there is a May 20, 2014 EPA guidance document regarding secondary $PM_{2.5}$ formation, this guidance was not cited because it is specific to projects that trigger PSD review; thus, it is not applicable to the Proposed project.

or less), as appropriate. The methodology in "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised" (USEPA, 1992b) will be followed for these analyses. Combined impacts for all sources under fumigation conditions will be evaluated, based on USEPA modeling guidelines.

3.3 Health Risk Assessment Modeling

A health risk assessment (HRA) will be performed according to California Air Resources Board (CARB) guidance and SCAQMD's Risk Assessment Procedures for Rules 1401 and 212, Version 8.0. The HRA modeling will be prepared using CARB's Hotspots Analysis and Reporting Program 2 (HARP2) computer program (Version 15197, July 2015) and AERMOD. HARP2 will be used to assess cancer risk as well as non-cancer chronic and acute health hazards. Listed below are the risk assessment options that will be exercised in the modeling, in accordance with the SCAQMD's Risk Assessment Procedures.

- *Deposition velocity – 0.02 m/sec.*
- *A "warm" climate, typical for Southern California is assumed for the dermal exposure pathway.*
- *For noncancer chronic risk estimates, the "OEHHA Derived Method" risk analysis method is used. In this approach, the inhalation pathway is always considered a driving pathway, the next two dominant (driving) exposure pathways use the high-end point-estimates of exposure, while the remaining exposure pathways use mean point estimates.*
- *For residential cancer risk estimates, the "OEHHA (Derived) Method" risk analysis method is used. In this method, if inhalation is one of the top two dominant pathways, the method uses the breathing rate at 95th percentile of exposure for < 2 years of age, and the breathing rate at the 80th percentile exposure for > 2 years of age. If inhalation is not the top two dominant pathways, it uses mean. For worker cancer risk, the "OEHHA Derived Method" risk analysis method is used.*
- *Pathways considered for residential exposure include inhalation, soil ingestion, dermal absorption, homegrown produce, and mother's milk.*
- *Pathways considered for worker exposure include inhalation, soil ingestion, and dermal absorption.*
- *The residential cancer risk estimates are based on 30-year exposures; the worker cancer risk estimates are based on 25-year exposures.*

3.4 Meteorological Data

The District has prepared a five-year meteorological dataset (2008–2012) already processed in AERMET (version 14134) to generate AERMOD-compatible meteorological data for air dispersion modeling.[3] The surface meteorological data were recorded at the meteorological monitoring station in Pomona, and the upper air data were recorded at the San Diego Miramar Station (No. 03190). Figure 2 below shows the relative locations of the project site and the meteorological monitoring station in Pomona. Quarterly and annual composite wind roses for the 2008–2012 Pomona meteorological dataset are included as Appendix C.

EPA defines the term "on-site data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Specifically, the meteorological data requirement originates in the Clean Air Act at Section 165(e)(1), which requires an analysis "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility."

This requirement and EPA's guidance on the use of on-site monitoring data are also outlined in the "On-Site Meteorological Program Guidance for Regulatory Modeling Applications" (1987a). The representativeness of the data depends on (a) the proximity of the meteorological monitoring site to the area under consideration, (b) the complexity of the topography of the area, (c) the exposure of the meteorological sensors, and (d) the period of time during which the data are collected.

Representativeness has also been defined in "The Workshop on the Representativeness of Meteorological Observations" (Nappo et. al., 1982) as "the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application."

Representativeness is best evaluated when sites are climatologically similar, as are the project site and the Pomona meteorological monitoring station. Representativeness has additionally been defined in the PSD Monitoring Guideline (USEPA, 1987b) as data that characterize the air quality for the general area in which the proposed project would be constructed and operated. Because of the close proximity of the Pomona meteorological data site to the proposed project site (distance between the two locations is approximately 2 ½ km), the same large-scale topographic features that influence the meteorological data monitoring station also influence the proposed project site in the same manner.

There are few locations where upper air data are available; when looking at the representativeness of upper air data, the most important factors are distances relative to large urbanized areas and coastal zones. The San Diego Miramar upper air monitoring station was selected because it is the nearest station with complete and representative upper air data for the five-year period. The San Diego Miramar upper air station is located in an urban area in the coastal zone, approximately 146 km (91 miles) from the project site. Because the San Diego Miramar air station and Project site are both located

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[3] SCAQMD Meteorological Data for AERMOD, *www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod*.

in urban areas within the coastal zone, the upper air data collected at the Miramar monitoring station are representative of Project site conditions.

3.5 Receptor Grids

Receptor and source base elevations will be determined from USGS National Elevation Dataset (NED) data in the GeoTIFF format at a horizontal resolution of 1 arc-second (approximately 30 meters). All coordinates will be referenced to UTM North American Datum 1983 (NAD83), Zone 11. The AERMOD receptor elevations will be interpolated among the elevation nodes according to standard AERMAP procedure. For determining concentrations in elevated terrain, the AERMAP terrain preprocessor receptor-output (ROU) file option will be chosen.

Cartesian coordinate receptor grids will be used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. A 250-meter resolution coarse receptor grid will be developed and will extend outwards at least 10 km (or more if necessary to establish the significant impact area).

For the full impact analyses, a nested grid will be developed to fully represent the maximum impact area(s). The receptor grid will be constructed as follows:

1. One row of receptors spaced 20 meters apart along the facility's fence line;[4]

2. Four tiers of receptors spaced 25 meters apart, extending 100 meters from the fence line;

3. Additional tiers of receptors spaced 100 meters apart, extending from 100 meters to 1,000 meters from the fenceline; and

4. Additional tiers of receptors spaced 250 meters apart, out to at least 10 km from the most distant source modeled, not to exceed 50 km from the project site.

Additional refined receptor grids with 25-meter resolution will be placed around the maximum first-high or maximum second-high coarse grid impacts and extended out 1,000 meters in all directions. Concentrations within the facility fenceline will not be calculated.

The Regions to be imported in Geographical Coordinates for the USGS National Elevation Dataset (NED) data are bounded as follows:

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[4] According to SCAQMD modeling guidance for AERMOD, 20 meter receptor spacing must be used along the project boundary if the project area is < 4 acres. A 20 meter fence line receptor grid will be used, as the project area is < 4 acres.

- South West corner: UTM Zone 11 (NAD 83) 418,350.0m, 3,758,750.0m; and
- North East corner: UTM Zone 11 (NAD 83) 438,850.0m, 3,779,250.0m.

3.6 Ambient Air Quality Impact Analyses (AQIA)

Emissions from the proposed project will result from combustion of fuel in the new gas turbine. This emission source will be modeled as a point source. The expected emission rates will be based on vendor data and conservative assumptions of equipment performance.

The purpose of the ambient air quality impact analysis is to demonstrate compliance with applicable ambient air quality standards. Both USEPA and the District have regulations that prohibit construction of a project that will cause or contribute to violations of applicable standards.

Based on USEPA guidance related to the federal PSD program, if, for a given pollutant and averaging time, a project's impact is below the Significant Impact Levels (SILs) shown in Table 1, the project's impact is deemed to be de minimis, and no further analysis is required. SCAQMD's Rule 1303 includes concentrations of NO_2, CO, and PM_{10} that are considered to be significant changes in air quality concentration for individual permit units. Based on discussions with District staff, if the background monitoring data collected during the past five years show levels below the federal/state air quality standards, there is no need to compare modeled impacts to these SCAQMD significance thresholds. Based on recent monitoring data in the project area, PM_{10} is the only pollutant for which the Rule 1303 significance thresholds need to be analyzed in the SCAQMD. Also, the District staff allows these significance thresholds to be analyzed on a permit unit basis. Therefore, if maximum modeled PM_{10} impacts from each permit unit do not exceed the concentrations shown in Table 2, the District will determine that the permit unit's impact is not expected to cause or contribute to an exceedance of the most stringent federal or state PM_{10} AAQS.

However, if the modeled impacts exceed any of the significance thresholds displayed in Table 1 or 2,[5] the project has the potential to cause or contribute to a violation of the ambient air quality standard at the times and locations where the threshold is exceeded. In that case, the analysis must consider the contribution of other sources to the ambient concentration. If the supplemental analysis indicates that there will be a potential violation of an ambient air quality standard, and the project's impact at the time and place of the violation is significant, then the project may not be approved unless the project's impact is reduced.

[5] Table 1 concentrations apply to the entire project; Table 2 concentrations apply to each permit unit.

Table 1 **Significant Impact Levels for Air Quality Impacts in Class II Areas (µg/m³)**					
	Averaging Period				
Pollutant	Annual	24-hour	8-hour	3-hour	1-hour
NO_2	1	--	--	--	7.5[a]
SO_2	1	5	--	25	7.8[b]
CO	--	--	500	--	2000
PM_{10}	1	5	--	--	--
$PM_{2.5}$[c]	0.3	1.2	--	--	--

a. USEPA has not yet defined SILs for one-hour NO_2 and SO_2 impacts. However, USEPA has suggested that, until SILs have been promulgated, interim values of 4 ppb (7.5 µg/m³) for NO_2 and 3 ppb (7.8 µg/m³) for SO_2 may be used [USEPA (2010c); USEPA (2010d)]. These values will be used in this analysis as interim SILs.

b. USEPA (2010e), p. 64891.

c. In January 2013, the D.C. Circuit Court of Appeals ruled that the $PM_{2.5}$ SILs could not be used as a definitive exemption from the requirements to perform $PM_{2.5}$ preconstruction monitoring or a $PM_{2.5}$ increments analysis or AQIA. However, USEPA's March 2013 interpretation of the Court's decision indicated that the SILs can be used as guidance.

Table 2 **Significant Change in Air Quality Concentration (µg/m³) SCAQMD Rule 1303**					
	Averaging Period				
Pollutant	Annual	24-hour	8-hour	3-hour	1-hour
PM_{10}	1	2.5	--	--	--

An air quality impact analysis is required for certification by the CEC and to support the air quality impact analysis and screening HRA that are required by the District. Each agency has its own criteria for preparation of the air quality impact analysis; however, the criteria used by the CEC and the District are similar enough that the same basic analysis, with some variations, will satisfy both agencies.

3.6.1 Step 1: Project Impact

The first step in the compliance demonstration is to determine, for each pollutant and averaging period, whether the proposed new equipment for the project has the potential to cause a significant ambient impact at any location, under any operating or meteorological conditions. As indicated in the NSR Workshop Manual,[6] "[i]f the significant net emissions increase from a proposed source would not result in a significant ambient impact anywhere, the application is usually not required to go beyond a preliminary

[6] USEPA (1990), p. C.51.

analysis in order to make the necessary showing of compliance for a particular pollutant." The USEPA and SCAQMD significance levels for air quality impacts are shown in Tables 1 and 2, respectively. If the maximum modeled impact for any pollutant and averaging period is below the appropriate significance level in this table, no further analysis for that pollutant/averaging period is necessary.[7]

Based on the following USEPA (2010e) guidance, no further analysis is necessary for any location where the modeled impacts from the project alone are below the significance thresholds.

> *The primary purpose of the SILs is to identify a level of ambient impact that is sufficiently low relative to the NAAQS or increments that such impact can be considered trivial or de minimis. Hence, the EPA considers a source whose individual impact falls below a SIL to have a de minimis impact on air quality concentrations that already exist. Accordingly, a source that demonstrates that the projected ambient impact of its proposed emissions increase does not exceed the SIL for that pollutant at a location where a NAAQS or increment violation occurs is not considered to cause or contribute to that violation. In the same way, a source with a proposed emissions increase of a particular pollutant that will have a significant impact at some locations is not required to model at distances beyond the point where the impact of its proposed emissions is below the SILs for that pollutant. When a proposed source's impact by itself is not considered to be "significant," EPA has long maintained that any further effort on the part of the applicant to complete a cumulative source impact analysis involving other source impacts would only yield information of trivial or no value with respect to the required evaluation of the proposed source or modification.*[8]

For $PM_{2.5}$, the highest average of the maximum annual averages and of the 24-hour averages modeled over the five years of meteorological data will be compared with the SILs in Table 1 to determine whether the modeled $PM_{2.5}$ project impacts are significant.[9] For other pollutants, the highest modeled concentrations will be compared with the SILs. In addition, as discussed above, the maximum modeled PM_{10} impacts from each permit unit will be compared to the concentrations shown in Table 2 to determine whether impacts are expected to cause or contribute to an exceedance of the most stringent federal or state PM_{10} AAQS.

For pollutants with modeled project impacts below the significance thresholds, a summary table will show the maximum modeled project impacts plus background concentrations. Although this information is not required by District rules or federal modeling guidance, it will be provided as part of the CEQA analysis.

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[7] With the potential exception of the $PM_{2.5}$ SILs. See USEPA (2010e), p. 64891.
[8] USEPA (2010e), p. 64891.
[9] USEPA (2010a), p. 6.

3.6.2 Step 2: Project Plus Background

Pollutants/averaging periods that are not screened out in Step 1 are required to undergo a full air quality impact analysis. In Step 2, the ambient impacts of the project are modeled and added to background concentrations. The results are compared to the relevant state and federal ambient standards.

The second step of the compliance demonstration is required to show that the proposed new project, in conjunction with existing sources, will not cause or contribute to a violation of any ambient air quality standard. As discussed in more detail below, the impacts of existing sources are represented by the existing ambient air quality data collected at the monitoring stations shown in Table 3. In accordance with Section 8.2.1 of Appendix W to 40 CFR Part 51:

> *Background concentrations are an essential part of the total air quality concentration to be considered in determining source impacts. Background air quality includes pollutant concentrations due to: (1) Natural sources; (2) nearby sources other than the one(s) currently under consideration; and (3) unidentified sources. Typically, air quality data should be used to establish background concentrations in the vicinity of the source(s) under consideration.*

If a Step 2 analysis is required, the modeled impacts from the proposed project will be added to the representative background concentration for comparison with the California and National Ambient Air Quality Standards (CAAQS and NAAQS). In accordance with USEPA guidelines,[10] the highest second-highest modeled concentrations will be used to demonstrate compliance with the short-term federal standards (except for the statistically based federal one-hour NO_2 and SO_2, and 24-hour $PM_{2.5}$, standards) and the highest modeled concentration will be used to demonstrate compliance with the federal annual standards and all state standards. If the predicted total ground-level concentration is below the state or federal ambient air quality standard for each pollutant and averaging period, no further analysis is required for that pollutant and averaging period.

3.6.3 Compliance with Statistically Based Standards

For the one-hour average federal NO_2 standard for the District and CEC analyses, the comparison of impacts with the new federal one-hour standard will be done in accordance with Appendix W of Part 51 of Title 40 of the CFR "Guideline on Air Quality Models" and the tiered process presented in the CAPCOA guidance document "Modeling Compliance of the Federal 1-Hour NO_2 NAAQS" (CAPCOA, 2011), [11] together with

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[10] USEPA (2005), 11.2.3.2 and 11.2.3.3.

[11] "This modeling protocol is meant to define the stepwise approach necessary to satisfy the requirements in General Guidance for Implementing the 1-Hour NO_2 National Ambient Air Quality Standard in Prevention of Significant Deterioration Permits, Including an Interim NO_2 Significant Impact Level and the Applicability of Appendix W Modeling Guidance for 1-Hour NO_2 National Ambient Air Quality Standard. Nothing in this protocol should be taken as overriding guidance contained in those two memoranda, or

clarification as provided by the 2011 Tyler Fox memorandum (USEPA, 2011a) and the September 30, 2014 clarification memo (USEPA, 2014c). Appendix W of Part 51 of Title 40 of the CFR "Guideline on Air Quality Models" has codified three methods that can be used to estimate NO_2 concentration [Tier 1 - Total Conversion, Tier 2 - Ambient Ratio Method or ARM, Tier 3 - Ozone Limiting Method (OLM), Plume Volume Molar Ratio Method (PVMRM) or (PVMRM2)]. According to USEPA guidance (USEPA, 2011a):

> *While the limited scope of the available field study data imposes limits on the ability to generalize conclusions regarding model performance, these preliminary results of hourly NO_2 predictions for Palau and New Mexico show generally good performance for the PVMRM and OLM/OLMGROUP ALL options in AERMOD. We believe that these additional model evaluation results lend further credence to the use of these Tier 3 options in AERMOD for estimating hourly NO_2 concentrations, and we recommend that their use should be generally accepted provided some reasonable demonstration can be made of the appropriateness of the key inputs for these options, the in-stack NO_2/NOx ratio and the background ozone concentrations.*

As discussed above, for the new gas turbine the in-stack NO_2/NOx ratios will be based on information provided by the turbine vendor. Background ozone concentrations in the project area will be represented by five years of ozone data (2008–2012) collected at Pomona concurrently with the meteorological data. The Pomona ozone monitor is approximately 2 ½ km from the project and is most representative of the ambient conditions at the project. Based on these factors, we propose to use the Tier 3, "OLMGROUP ALL," or "PVMRM", option for modeling 1-hour NO_2 concentrations. As discussed above, while PVMRM2 is a possible alternative modeling option, the Applicant will obtain approval from the SCAQMD prior to its use.

For demonstrating compliance with the statistically based federal one-hour NO_2 standard, CAPCOA's 2011 guidance document (CAPCOA, 2011) provides 11 progressively more sophisticated methods for combining modeled NO_2 concentrations with background (or monitored) NO_2. These methods, outlined below, were developed to allow demonstration of compliance using the lowest amount of resources necessary. Each tier is a progressively more sophisticated and comprehensive analysis that reduces the level of conservatism without reducing the level of assurance of compliance.

1. Significant Impact Level (SIL) – no background required
2. Max modeled value + max monitored value
3. Max modeled value + 98^{th} pctl monitored value
4. 8^{th} highest modeled value + max monitored value
5. 8^{th} highest modeled value + 98^{th} pctl monitored value

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Appendix W of Part 51 of Title 40 of the Code of Federal Regulations (40 CFR 51, Appendix W)." (SJVAPCD, 2010b)

6. (5 yr avg of 98th pctl modeled value) + max monitored value
7. (5 yr avg of 98th pctl of modeled value) + 98th pctl monitored value
8. 5 yr avg of 98th pctl of (modeled value + monthly hour-of-day – 1st high)
9. 5 yr avg of 98th pctl of (modeled value + seasonal hour-of-day – 3rd high)
10. 5 yr average of 98th pctl of (modeled value + annual hour-of-day - 8th high)
11. Paired-Sum: 5 yr avg of 98th pctl of (modeled value + background)

Applicable definitions are provided below.

- *Significant Impact Level (SIL)* is defined as a de minimis impact level below which a source is presumed not to cause or contribute to an exceedance of a NAAQS (see Table 1 above).

- *Max modeled value* is defined as the maximum concentration predicted by the model at any given receptor in any given year modeled.

- *8th highest modeled value* is defined as the highest 8th-highest concentration derived by the model at any given receptor in any given year modeled.

- *5 yr avg of the 98th pctl* is defined as the highest of the average 8th highest (98th percentile) concentrations derived by the model across all receptors based on the length of the meteorological data period or the X years average of 98th percentile of the annual distribution of daily maximum one-hour concentrations across all receptors, where X is the number of years modeled. (In Appendix W, USEPA recommends using five years of meteorological data from a representative National Weather Service site or one year of on-site data.)

- *Monthly hour-of-day* is defined as the three-year average of the 1st highest concentrations (Maximum Hourly) for each hour of the day.

- *Seasonal Hour-Of-Day* is defined as the three-year average of the 3rd highest concentrations for each hour of the day and season.

- *Annual hour-of-day* is defined as the three-year average of the 8th highest concentration for each hour of the day.

- *Paired-Sum* **(**5 yr avg of the 98th pctl) is the merging of the modeled concentration with the monitored values paired together by month, day, and hour. The sum of the paired values is then processed to determine the X-year average of the 98th percentile of the annual distribution of daily maximum one-hour concentrations across all receptors, where X is the number of years modeled.

For the demonstration of compliance with the federal one-hour NO_2 standard, we will perform analyses at as many of the following tiers as are needed to demonstrate compliance with the state and federal ambient air quality standards: Tier 1, Tier 2, Tier 7, Tier 9, and Tier 11. Tier 9 will be mainly used to assess project impacts (Seasonal hour of day approach) using 5-year (2008 to 2012) concurrent hourly ozone data and 3-year average (2012-2014) seasonal hour of day NO_2 data. In addition, to account for recently permitted nearby stationary sources that may not be reflected in the background NO_2 data, we will review the list of projects provided by the SCAQMD (the request for these projects is discussed in Section 3.10) and model the impacts from projects with a NOx net emission increase greater than 5 tons/year (excluding intermittently operated equipment per USEPA guidance).[12]

The demonstration of compliance with the federal one-hour SO_2 standard will follow the same steps, except that it will utilize the 99th percentile predicted one-hour average SO_2 concentrations instead of the 98th percentile.

For the 24-hour average federal $PM_{2.5}$ standard for the District and CEC analyses, the comparison of impacts with the federal 24-hour average standard will be done in accordance with USEPA March 23, 2010 guidance (USEPA, 2010a). This guidance calls for basing the initial determination of compliance with the standard on the five-year average of the highest modeled annual and 24-hour averages, combined with background concentrations based on the form of the standards (the three-year average of the annual $PM_{2.5}$ concentrations and the three-year average of the 98th percentile 24-hour averages).[13] If a more detailed assessment of $PM_{2.5}$ impacts is required, a Tier 2 analysis will be performed. USEPA's March 23, 2010 memo provides minimal guidance regarding this type of more detailed analysis, saying only "a Second Tier modeling analysis may be considered that would involve combining the monitored and modeled $PM_{2.5}$ concentrations on a seasonal or quarterly basis, and re-sorting the total impacts across the year to determine the cumulative design value."[14] Such an analysis would be discussed with the District and CEC staff prior to implementation.

3.6.4 State One-Hour NO_2 Standard

Compliance with the state one-hour NO_2 standard will be demonstrated using OLM, PVMRM, or PVMRM2 (if approved by the District) and the highest project area background NO_2 levels, rather than 98th percentile concentrations, consistent with the form of the state standard.

3.7 Background Ambient Air Quality Data

Background ambient air quality data for the project area will be obtained from the monitoring sites most representative of the conditions that exist at the proposed project site. The Pomona monitoring station is the nearest station with background data for NO_2, O_3, and CO; the Glendora monitoring station is the nearest for PM_{10}; $PM_{2.5}$ data is from the Azusa monitoring station; and the Los Angeles (Central) North Main St monitoring stations is the nearest for SO_2. Modeled concentrations will be added to these

[12] USEPA (2011a), p. 10.
[13] USEPA (2010a), p. 9.
[14] USEPA (2010a), p. 8.

representative background concentrations to demonstrate compliance with the CAAQS and NAAQS.

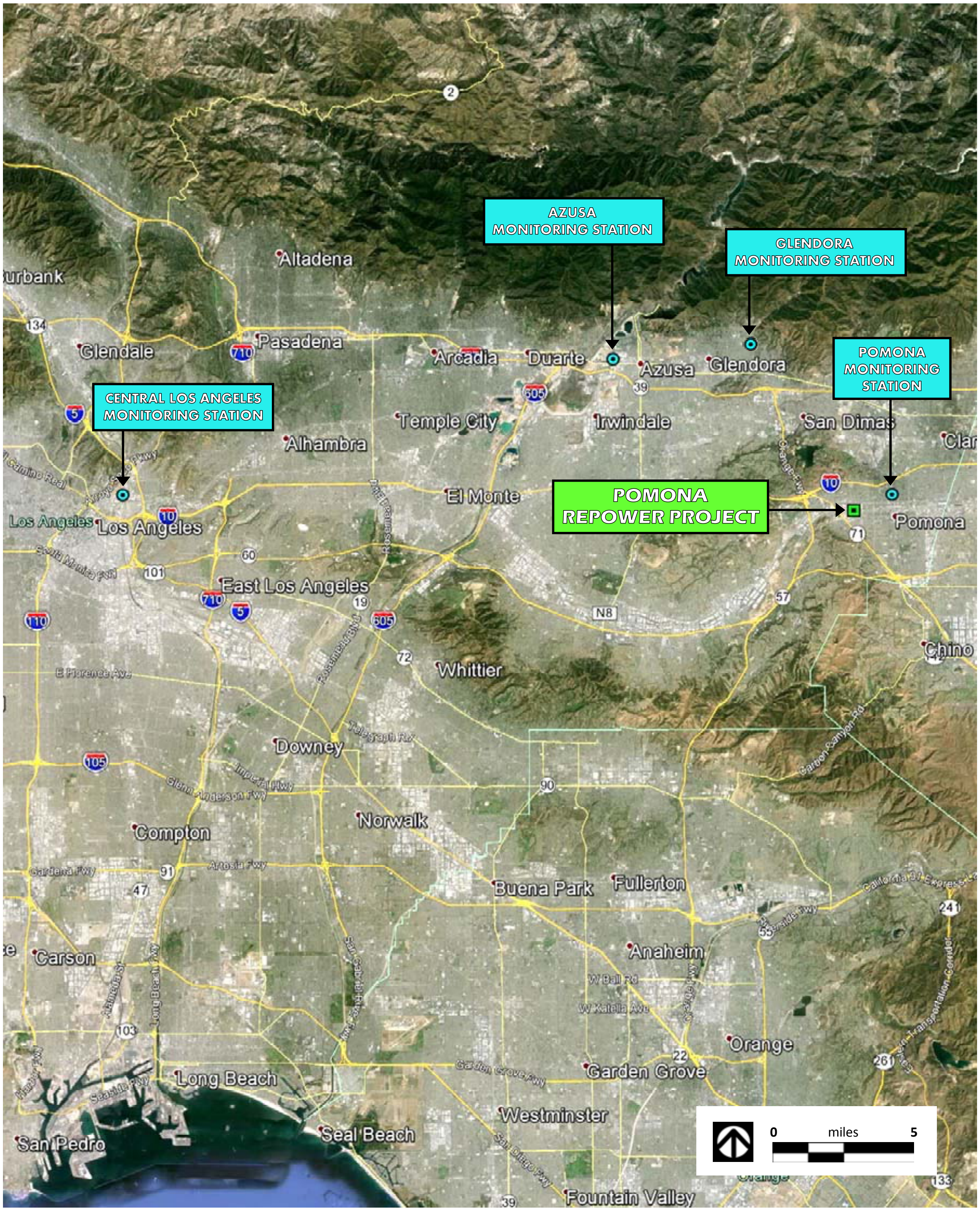
Table 3 shows the monitoring stations we propose to use as they provide the most representative ambient air quality background data. They are the nearest monitoring stations to the project site and have similar site characteristics. Figure 2 identifies the monitoring station locations.

Table 3
Representative Background Ambient Air Quality Monitoring Stations

Pollutant(s)	Monitoring Station	Distance to Project Site
CO, O_3, and NO_2	Pomona	1.6 miles
SO_2	Los Angeles (Central) North Main Street	26 miles
PM_{10}	Glendora	7 miles
$PM_{2.5}$	Azusa	10 miles

For annual NO_2, 24-hour and annual SO_2, annual $PM_{2.5}$ (state standard) and all PM_{10} and CO averaging periods, the highest values monitored during the 2012 – 2014 period will be used to represent ambient background concentrations in the project area. The one-hour average NO_2 analyses will be performed as described above. For analyses of federal 24-hour and annual $PM_{2.5}$ impacts, the three-year average of the 98th percentile 24-hour monitored levels, and the maximum three-year annual average, for the period between 2010 and 2014, respectively, will be used to represent project area background because these values correspond to the method used for determining compliance with the federal $PM_{2.5}$ standards and are consistent with the guidance cited above.

Figure 2
Monitoring Station Locations



3.7.1 Missing Data Protocol

Modeling project-generated one-hour NO_2 concentrations using the Tier 3, OLM/PVMRM/PVMRM2 methods requires the use of ambient monitored O_3 concentrations. Because these Tier 3 methods use the ambient ozone concentration for a particular hour to limit the conversion of NO to NO_2, it is important to have ozone concentrations for every hour. It is also important that any missing hourly ozone concentrations be filled in with a value that does not underestimate the ozone concentration for that hour, to avoid underestimating the resulting NO_2 concentration. In addition, computation of total hourly NO_2 concentrations requires use of the ambient monitored hourly NO_2 concentrations from the nearest monitoring station. As is the case for the hourly ozone data, it is important to have a background NO_2 value for every hour that does not underestimate actual background.

Five year (2008-2012) ambient hourly O_3 concentrations and 3 year average (2012-2014) seasonal hour of day NO_2 concentrations for the project area has been provided by the SCAQMD based on data collected at the monitoring station in Pomona. These datasets exceed USEPA's 90% completeness criterion (that is, more than 90% of the data values are present for each month).

3.8 Health Risk Assessment

A health risk assessment will be performed according to the Office of Environmental Health Hazard Analysis "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments" (OEHHA, 2015). The HRA modeling will be prepared using CARB's Hotspots Analysis and Reporting Program 2 (HARP2) computer program (Version 15197, July 2015). The HARP2 model will be used to assess cancer risk as well as non-cancer chronic and acute health hazards. The following HARP2 default options will be used for the health risk assessment:

- Home grown produce selected (0.137 for the fraction for leafy, exposed, protected, and root vegetables);
- Dermal absorption selected (0.02 m/s deposition rate);
- Soil ingestion selected (0.02 m/s deposition rate); and
- Mother's milk selected (0.02 m/s deposition rate).

In addition to the grid receptors identified above, discrete receptors will also be placed at the following locations:

- Any sensitive locations (e.g., child care facilities, schools, hospitals, prisons, libraries, etc.) at a distance of up to one mile from the project site; and
- Nearby residences and off-site workers.

3.9 Construction/Demolition Air Quality Impact Assessment for the CEQA Analysis

The potential ambient impacts from air pollutant emissions during the construction/demolition activities associated with the proposed project will be evaluated by air quality modeling that will account for the project site location and the surrounding topography; the sources of emissions during construction, including vehicle and equipment exhaust emissions; and fugitive dust.

Types of Emission Sources – Construction of the proposed project will include phases such as site preparation; construction of foundations; and installation of the new gas turbine/associated equipment. The demolition of existing structures/equipment will include phases such as dismemberment of above ground structures and removal of concrete slabs. The construction/demolition impacts analysis will include a schedule for the various construction/demolition phases.

Fugitive dust emissions from the construction/demolition phases of the proposed project result from the following activities:

- Excavation and grading at the project site;
- Onsite travel on paved and unpaved roads and across the unpaved construction areas;
- Aggregate and soil loading and unloading operations;
- Raw material transfer to and from material stockpiles;
- Wind erosion of areas disturbed during construction/demolition activities;
- Dismemberment of above ground structures; and
- Removal of concrete slabs.

Engine exhaust will be emitted from the following sources:

- Heavy equipment used for excavation, grading, construction of new structures, and demolition of existing structures;
- Water trucks used to control construction/demolition dust emissions;
- Diesel- and gasoline-fueled welding machines, generators, air compressors, and water pumps;
- Gasoline-fueled pickup trucks and Diesel-fueled flatbed trucks used onsite to transport workers and materials around the construction/demolition site;
- Transport of mechanical and electrical equipment to the project site; and
- Transport of raw materials to and from stockpiles.

Emissions from a peak activity day will be modeled. Annual average emissions over the construction period will also be calculated and modeled for comparison with annual standards.

Existing Ambient Levels – The background data discussed earlier will be used to represent existing ambient levels for the construction analysis as well as the analysis of the impacts of project operations.

Model Options – The AERMOD OLM, PVMRM or PVMRM2[15] option will be used to estimate ambient impacts from construction/demolition emissions. The modeling options and meteorological data described above will be used for the modeling analysis. A NO_2/NOx ratio of 11% will be used for modeling Diesel construction/demolition equipment, as specified in CAPCOA's 2011 guidance document (CAPCOA, 2011).

The construction/demolition site will be represented as both a set of volume sources and a separate set of area sources in the modeling analysis. Emissions will be divided into three categories: exhaust emissions, mechanically generated fugitive dust emissions, and wind-blown fugitive dust emissions. Exhaust emissions and mechanically generated fugitive dust emissions (e.g., dust from wheels of a scraper) will be modeled as volume sources with heights of 6 meters (for exhaust emissions) and 3 meters (for mechanically generated dust). Wind-blown fugitive dust emissions and sources at or near the ground that are at ambient temperature and have negligible vertical velocity will be modeled as area sources with release heights of 1 meter.

Combustion Diesel PM_{10} emission impacts from construction/demolition equipment will be evaluated to demonstrate that the cancer risk from construction/demolition activities will be below ten in one million at all receptors.

For the construction/demolition modeling analysis, the receptor grid will begin at the property boundary and will extend approximately one kilometer in all directions. The receptor grid will be laid out as follows:

1. One row of receptors spaced 20 meters apart along the facility's fence line;
2. Four tiers of receptors spaced 25 meters apart, extending 100 meters from the fence line; and
3. Additional tiers of receptors spaced 60 meters apart, extending from 100 meters to 1,000 meters from the fenceline.

It is unlikely that maximum construction/demolition impacts will occur more than one kilometer away from the project boundary. However, we will ensure that the maximum impacts are captured in our modeling analysis.

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[15] As mentioned in section 3.1.1, PVMRM2 will only be invoked upon the approval for its usage from the permitting agency.

3.10 Cumulative Air Quality Impact Analysis

To address CEC requirements, a cumulative air quality modeling impacts analysis of the project's typical operating mode will be performed in combination with other stationary emissions sources within a six-mile radius that have received Permits to Construct since January 1, 2014, or are in the permitting process. For each criteria pollutant, facilities having an emission increase of less than five tons per year are generally considered to be *de minimis*, and these facilities may be excluded from the cumulative impacts analysis. Information on any recently constructed/permitted sources that might be appropriate for a cumulative air quality impact analysis (as defined above) will be requested from the SCAQMD.

Upon receipt of sufficient information from the local air agencies to allow air dispersion modeling of the recently constructed/permitted non-project sources to be included in the cumulative air quality impact analysis, AERMOD will be used in a procedure similar to that described earlier in this protocol.

3.11 Nitrogen Deposition Analysis

As part of the Small Power Plant Exemption filed with the CEC, it will be necessary to include a nitrogen deposition analysis. Nitrogen deposition is the input of NOx and ammonia (NH_3) derived pollutants, primarily nitric acid (HNO_3), from the atmosphere to the biosphere. Nitrogen deposition can lead to adverse impacts on sensitive species including direct toxicity, changes in species composition among native plants, and enhancement of invasive species.

We will perform a nitrogen deposition modeling analysis examining the impacts on nearby areas classified as critical habitat and/or areas containing sensitive biological resources. The analysis will compare the nitrogen deposition associated with the nitrogen emissions from the project with established nitrogen disposition significance thresholds. The AERMOD model will be used for this analysis. However, as discussed in the CEC staff's assessment of nitrogen deposition impacts for the Huntington Beach Energy Project, AERMOD tends to produce conservatively high predictions of nitrogen deposition rates (CEC, 2014). The assessment of significance for nitrogen deposition impacts will consider appropriate adjustments to background nitrate concentrations as well as emissions offsets provided for the project. If the maximum modeled nitrogen deposition impacts are determined to be significant, the Applicant will work with Staff to evaluate whether additional mitigation measures are needed.

4. REPORTING

The results of the criteria pollutant and TAC modeling will be integrated into the application documents, and will include the information listed below.

- Project Description – Site map and site plan along with descriptions of the emitting equipment and air pollution control systems.

- Model Options and Input – Model options, screening and refined source parameters, criteria pollutant and TAC emission rates, meteorological data, and receptor grids used for the modeling analyses.

- Air Dispersion Modeling – Dispersion modeling results will include the following:

  - Plot plan showing emission points, nearby buildings (including dimensions), cross-section lines, property lines, fence lines, roads, and UTM coordinates;

  - A table showing building heights used in the modeling analysis;

  - Summaries of maximum modeled impacts; and

  - Model input and output files, including BPIP-PRIME and meteorological files as well as hourly ozone and NO_2 files used in demonstrating compliance with the 1-hour NO_2 standard, in electronic format on a compact disc, together with a description (README file) of all filenames.

- HRA – The HRA will include the following:

  - Descriptions of the methodology and inputs to the construction and operation AERMOD runs;

  - Tables of TAC emission rates and health impacts;

  - Figures showing sensitive receptor locations; and

  - Model input and output files in electronic format on a compact disc, together with a description (README file) of all filenames.

5. REFERENCES

Atkinson, Dennis and Russell F. Lee (1992). "Procedures for Substituting Values for Missing NWS Meteorological Data for Use in Regulatory Air Quality Models." *http://www.epa.gov/scram001/surface/missdata.txt.*

Briggs, G.A. (1972). "Discussion on Chimney Plumes in Neutral and Stable Surroundings." Atmos. Environ. 6:507-510.

California Air Pollution Control Officers Association (CAPCOA) guidance document (2011). "Modeling Compliance of the Federal 1-Hour NO2 NAAQS." *http://www.valleyair.org/busind/pto/Tox_Resources/CAPCOANO2GuidanceDocument10-27-11.pdf*.

California Energy Commission (CEC) (2014). Final Staff Assessment for the Huntington Beach Energy Project, Appendix BIO-1, May 2014.

Cole, Henry S. and John E. Summerhays (1979). "A Review of Techniques Available for Estimating Short-Term NO_2 Concentrations," Journal of the Air Pollution Control Association, Volume 29, Number 8, pages 812-817, August 1979.

Hanrahan, P.L., 1999. "The plume volume molar ratio method for determining NO2/NOx ratios in modeling. Part I: Methodology," J. Air & Waste Manage. Assoc., 49, 1324-1331.

Nappo, C. J. et al. (1982). "The Workshop on the Representativeness of Meteorological Observations," June 1981, Boulder, Co. Bull. Amer. Meteor. Soc., Vol. 63, No. 7, pp. 761-764. American Meteorological Society, Boston, MA.

Office of Environmental Health Hazard Analysis (OEHHA) (2015). "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments," February 2015.
http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf.

San Joaquin Valley Air Pollution Control District (SJVAPCD) (2007). "Guidance for Air Dispersion Modeling."
http://www.valleyair.org/busind/pto/Tox_Resources/Modeling%20Guidance%20W_O%20Pic.pdf.

South Coast Air Quality Management District (SCAQMD). "SCAQMD Modeling Guidance for AERMOD."

http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/modeling-guidance

South Coast Air Quality Management District (SCAQMD) (2005). "Risk Assessment Procedures for Rule 1401 and 212" *http://www.aqmd.gov/docs/default-source/planning/risk-assessment/riskassprocjune15.pdf?sfvrsn=2*

U.S. Environmental Protection Agency (USEPA) (1985). "Guideline for Determination of Good Engineering Practice Stack Height," (Technical Support Document for the Stack Height Regulations) - Revised. EPA-450/4-80-023R.

USEPA (1987a). "Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)," Office of Air Quality Planning and Standards, Research Triangle Park, NC, EPA-450/4-87-007, May 1987.

USEPA (1987b). "On-Site Meteorological Program Guidance for Regulatory Modeling Applications."

USEPA (1987c). "Supplement A to the Guideline on Air Quality Models (Revised)."

USEPA (1990). "New Source Review Workshop Manual − Draft." Office of Air Quality Planning and Standards, Research Triangle Park, NC.

USEPA (1992a). "Procedures for Substituting Values for Missing NWS Meteorological Data for Use in Regulatory Air Quality Models." Office of Air Quality Planning and Standards, Research Triangle Park, NC. July 7, 1992.

USEPA (1992b). "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised," Report 454/R-92-019.

USEPA (1995). "Supplement C to the Guideline on Air Quality Models (revised)." Office of Air Quality Planning and Standards, Research Triangle Park, NC.

USEPA (1998). "Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long-Range Transport Impacts," Air Quality Modeling Group (MD-14), Research Triangle Park. National Park Service - Air Resource Division, Denver, Colorado. USDA Forest Service - Air Quality Program, Fort Collins, Colorado. U.S. Fish and Wildlife Service Air Quality Branch, Denver, Colorado.

USEPA (2000). "Meteorological Monitoring Guidance for Regulatory Modeling Applications," EPA-454/R-99-005. Office of Air Quality Planning & Standards, Research Triangle Park, NC. (PB 2001-103606) *www.epa.gov/scram001/*.

USEPA (2005). 40 CFR Part 51, Appendix W. "Guideline on Air Quality Models," Last update November 9, 2005.

USEPA (2008). "AERSURFACE Users Guide," EPA-454/B-08-001. Office of Air Quality Planning and Standards, Research Triangle Park, NC. January 2008. *http://www.epa.gov/scram001/7thconf/aermod/aersurface_userguide.pdf.*

USEPA (2010a). OAQPS, Memo from Stephen D. Page, Director, to USEPA Regional Modeling Contacts and others, "Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS," March 23, 2010.

USEPA (2010b). OAQPS, Memo from Tyler Fox, Leader, Air Quality Modeling Group, to USEPA Regional Air Division Directors, "Applicability of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard," June 28, 2010.

USEPA (2010c). OAQPS, Memo from Stephen D. Page, Director, to USEPA Regional Air Division Directors, "Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program," June 29, 2010.

USEPA (2010d), OAQPS, Memo from Stephen D. Page, Director, to USEPA Regional Air Division Directors, "Guidance Concerning the Implementation of the 1-hour SO_2 NAAQS for the Prevention of Significant Deterioration Program," August 23, 2010.

USEPA (2010e). 75 FR 64864, "Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5)—Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC)," October 20, 2010.

USEPA (2011a). OAQPS, Memo from Tyler Fox, Leader, Air Quality Modeling Group, to USEPA Regional Air Division Directors, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard," March 1, 2011.

USEPA (2011b). Technology Transfer Network, Support Center for Regulatory Atmospheric Modeling, Air Quality Models, AERMOD Release 14134 and latest guidance (Draft user's guide addenda dated May 16, 2014. http://www.epa.gov/ttn/scram/.

USEPA (2014a). EPA NO_2 / NOx In-Stack Ratio (ISR) Database, *http://www.epa.gov/ttn/scram/no2_isr_database.htm.*

USEPA (2014b). "New NO_2 Modeling Guidance," August 12, 2014. Available at *http://www.epa.gov/ttn/scram/webinar/AERMOD_14134-NO2_Memo/20140812-Webinar_Slides.pdf.*

USEPA (2014c). "Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the N02 National Ambient Air Quality Standard," September 30, 2014. Available at *http://www.epa.gov/ttn/scram/guidance/clarification/NO2_Clarification_Memo-20140930.pdf*

USEPA (2015a). Office of Air Quality Planning and Standards (OAQPS), AERMOD Implementation Workgroup, "AERMOD Implementation Guide," Last Revised: August 3, 2015.

USEPA (2015b). "Addendum User's Guide for the AMS/EPA Regulatory Model - AERMOD," June, 2015. Available at *http://www.epa.gov/ttn/scram/dispersion_prefrec.htm*

USEPA (2015c). "AERSCREEN User's Guide" July, 2015. Available at: *http://www3.epa.gov/scram001/models/screen/aerscreen_userguide.pdf*

Tom Andrews

From: William Walters <Wwalters@aspeneg.com>
Sent: Wednesday, February 10, 2016 12:45 PM
To: Tom Andrews
Cc: Bemis, Gerry@Energy (Gerry.Bemis@energy.ca.gov)
Subject: Pomona Repower Project Modeling Protocol Comments
Attachments: PRP Modeling protocol comments.docx

Tom,

The Pomona Repower Project Modeling Protocol review comments are attached. Most deal with ensuring there is a proper level of documentation/description within the SPPE application. The more major comments deal with the issue of project phases and cumulative impacts modeling and the proper ambient monitoring station use for background. The comments that are posed as questions generally need to be addressed in the SPPE application documentation as well. We are not asking for a revised version of the protocol to be submitted.

If you'd like to respond to any of the issues raised or answer any of the questions raised in a response e-mail that would be fine. But we also expect these issues and questions to be addressed in the SPPE documentation as requested or as appropriate. In particular, the question regarding the availability of complete hourly ozone and NO2 data that corresponds with the met file is something of interest. If such data is used in the modeling analysis and there is no corresponding pollutant data available from Pomona or only data in a subset of the available met data set year range, then representativeness of the pollutant data set(s) and SCAQMD's approval of that data set(s) needs to be explained in the SPPE application documentation.

I'm available to answer any questions you have related to these review comments. Regards,

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Pomona Repower Project Modeling Protocol Review Comments

Air Quality

Page 2, Section 2 Facility Description and Source Information, paragraph 1: *The existing turbine will be decommissioned and removed, and certain existing ancillary facilities will either be removed to accommodate the development of PRP, or will be repurposed for future use in connection with the Project.*

Comments:

Comment 1 - The facility description does not mention if any of the repurposed ancillary equipment would have air pollutant emissions, such as repurposed emergency engines, and if so how those repurposed sources would be addressed in the air dispersion modeling analysis. Please confirm that none of the repurposed stationary equipment would have air pollutant emission, or identify how those emitting sources will be addressed in the air dispersion modeling analysis (criteria pollutant modeling analysis and HRA).

Applicant Response: The only emission sources associated with the project are the new gas turbine and new cooling tower.

Comment 2 – The facility description does not mention if there would be any emergency engines (fire pump or emergency generator). Please confirm that the project does not include any new stationary equipment with air pollutant emissions other than that specified in Section 2.

Applicant Response: See above response.

Comment 3 - The modeling protocol does not mention if any baseline modeling of the existing facility emissions would be performed. If the emissions from the existing units will be used for air dispersion modeling purposes, AltaGas should consult with the District and Energy Commission to determine the emission rates to be modeled.

Applicant Response: There is no plan to perform air quality modeling of the existing equipment at the facility.

Page 2, Section 2 Facility Description and Source Information, paragraph 1:
In addition, a new wet cooling tower will be included as part of the project.

Comment:

This one sentence is the only mention of the cooling tower in the modeling protocol. Cooling tower exhaust temperatures are a function of the ambient temperature and relative humidity, and they range from being thermally buoyant to non-buoyant depending on ambient conditions. AERMOD does not allow for variable exhaust temperature inputs, so please identify how the exhaust condition will be selected for AERMOD to best model the cooling tower exhaust impacts.

Applicant Response: The project engineering firm has provided the typical exhaust characteristics for the cooling tower at site conditions. These exhaust parameters will be used for the cooling tower air quality modeling.

Page 2, Section 2 Facility Description and Source Information, paragraph 2: *The modeling analysis will be performed for the worst-case (maximum expected equipment operation) operating hour, operating day, and operating year.*

Comment:

The modeling analysis should be performed using the worst-case permitted operation, assuming that is greater than the worst-case “maximum expected equipment operation”.

Applicant Response: The AQ modeling will be performed based on the maximum potential to emit for the new gas turbine (hourly, daily, annual emissions). The Applicant expects that the SCAQMD permit will include permit conditions that reflect these maximum potential to emit levels.

Page 7 and 8, Section 3.4 Meteorological Data, 1st paragraph: *The District has prepared a five-year meteorological dataset (2008–2012) already processed in AERMET (version 14134) to generate AERMOD-compatible meteorological data for air dispersion modeling.*

Comment:

Some description of the rationale and description of the acceptability of using the noted AERMET Version 14134 processed meteorological data, rather than the latest AERMET Version 15181 processed data, should be provided. On page 4 it notes that the latest version of AERMOD would be used, and at least one local air district is now requiring modeling analyses use AERMET Version 15181 processed data (SJVAPCD); therefore, a short discussion of why the latest version of this module within the AERMOD modeling program is not being should be provided with the modeling analysis documentation provided in the SPPE Application. Additionally, the AERMAP version number was not provided in the protocol, can you please confirm the latest version of AERMAP will be used and note the version of AERMAP used in the modeling analysis documentation provided with the SPPE Application.

Applicant Response: The meteorological data was provided and processed by SCAQMD[1] using AERMET version 14134. The SCAQMD is not planning on processing the meteorological data for the project site using the most current version of AERMET for a number of months. Therefore, for the PRP the SCAQMD recommend that we use the SCAQMD provided meteorological data (processed using AERMET version 14134) in AERMOD version 15181. Regarding the version of AERMOP used for the project, the most current version of AERMOP (version 11103) was used in processing the terrain data for the PRP air quality impact analysis.

Page 14, Section 3.7 Background Ambient Air Quality Data, 2nd full paragraph: *Background ozone concentrations in the project area will be represented by five years of ozone data (2008–2012) collected at Pomona concurrently with the meteorological data.*

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[1] http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/aermod-table-1.

Comment:

Has it been confirmed that a complete hourly ozone data set from the Pomona monitoring station is available? Also, if the applicant chooses to use CAPCOA's Tier 11 approach to demonstrate compliance with the federal 1-hour NO_2 standard has it been confirmed that a complete hourly NO_2 data set from the Pomona monitoring station is available?

Applicant Response: The SCAQMD provided a complete hourly ozone data set for the Pomona monitoring station. With regards to background NO_2 data, CAPCOA's Tier 9 approach (i.e., seasonal hour of day background NO_2 levels) was used for the Pomona Repower Project (PRP) air quality modeling analysis. These NO_2 background levels were also provide by the SCAQMD based on data collected at the Pomona monitoring station.

Page 17, Section 3.7 Background Ambient Air Quality Data, 1st full paragraph: *Table 3 shows the monitoring stations we propose to use as they provide the most representative ambient air quality background data.*

Comment:

Table 3 is not presenting the nearest monitoring stations as the representative stations for SO_2, PM2.5 and PM10. For SO_2 Table 3 lists the Central Los Angeles monitoring station at 26 miles from the site as being the representative station; however, the Fontana-Arrow Highway station is closer at approximately 16.5 miles from the project site and the Riverside Rubidoux monitoring station is also closer at approximately 21 miles from the project site. For PM10 and PM2.5 Table 3 lists the Glendora and Azusa Monitoring stations that are noted to be 7 and 10 miles from the project site, respectively; however, the Ontario-1408 Francis Street monitoring station is closer at approximately 5 miles from the projects site. Please provide adequate rationale on why the nearest monitoring sites are not considered representative for SO_2, PM10 and PM2.5. Energy Commission reserves the right to use background values from stations that we think are most representative of the project site.

Applicant Response: For background SO_2 and $PM_{2.5}$ levels, the data collected at the Fontana-Arrow Highway monitor and Ontario-1408 Francis Street monitoring station, respectively, will be used for the ambient air quality analysis. For background PM_{10} levels, based on the coordinates for the Ontario-1408 Francis Street monitoring station (site ID 60710025), this monitoring station is located at 1408 E Francis Street which is approximately 8.7 miles east of the project site. At approximately 7 miles from the project site, Glendora monitoring station appears to be the nearest PM_{10} monitoring station to the project site. Therefore, the background PM_{10} data collected at the Glendora station will be used for the air quality analysis.

Page 22, Section 3.10 Cumulative Impacts Analysis, 1st paragraph: *To address CEC requirements, a cumulative air quality modeling impacts analysis of the project's typical operating mode will be performed in combination with other stationary emissions sources within a six-mile radius that have received Permits to Construct since January 1, 2014, or are in the permitting process.*

Comment:

It is unclear if the project's demolition phase would proceed project construction or would happen after construction and overlap with project operation. Please clarify the schedule and any schedule overlaps for demolition of the existing facilities, project construction, and project operation. If the existing gas turbines operations or the demolition phase overlaps the project's operation phase, then the project's demolition phase and/or existing gas turbine operations should be included with the project operations in the cumulative impacts modeling analysis as a potential worst-case cumulative scenario. If the existing gas turbine operation continues during the project's construction phase then that overlap should be modeled in the cumulative impacts analysis as a potential worst-case cumulative scenario.

Applicant Response: Based on the small size of the project site, it will be necessary to remove the existing equipment prior to the start of construction on the new equipment. Therefore, there will be no overlap between demolition/construction activities. In addition, there will be no overlap between the operation of the existing unit and demolition/construction activities.

Various Pages, SCAQMD approval of various optional modeling methods:

Comment:

In three places it notes that SCAQMD approval may need to be obtained for modeling options; specifically for the use of the PVMRM2 or the low winds AERMOD modeling options. All SCAQMD approvals for any non-default modeling options need to be provided in the modeling analysis documentation provided with the SPPE application.

Applicant Response: None of the non-default modeling options discussed in the modeling protocol were used in the air quality modeling analysis performed for the PRP.

<u>Public Health</u>
Page 7, Section 3.3 Health Risk Assessment Modeling, 1st paragraph: *The HRA modeling will be prepared using CARB's Hotspots Analysis and Reporting Program 2 (HARP2) computer program (Version 15197, July 2015) and AERMOD.*

Comment:

The HARP2 modeling platform, which contains more than one program, can be used in multiple ways to complete the health risk assessment. Some of these ways include:

1. Using the HARP2 Air Dispersion Modeling & Risk Assessment Tool (ADMRT) including using the version of AERMOD embedded in the program.
2. Using the ADMRT program but performing the AERMOD modeling outside of ADMRT and using the post file outputs of AERMOD as inputs in the risk calculation portion of the ADMRT program.
3. Using the HARP2 Risk Assessment Standalone Tool (RAST) to calculate risk using AERMOD post file outputs as inputs to the RAST program.

The explicit method of HARP2 program(s) use needs to be identified in the HRA documentation provided with the SPPE application.

Applicant Response: The health risk assessment for the PRP was performed according to option number 2 above - *Using the ADMRT program but performing the AERMOD modeling outside of ADMRT and using the post file outputs of AERMOD as inputs in the risk calculation portion of the ADMRT program.*

Page 19, Section 3.8 Health Risk Assessment, paragraph 1: *A health risk assessment will be performed according to the Office of Environmental Health Hazard Analysis "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments" (OEHHA, 2015)*

Comment:

This duplicates the text in Section 3.4 without providing additional information on what project emissions are to be included in the HRA. Please identify if the project's short-term emissions impacts (demolition, construction, and initial commissioning) are proposed to be included in the HRA, given the new OEHHA guidance (Section 8.2.10 Cancer Risk Evaluation of Short Term Projects) regarding short-term project cancer risk determination. Also, for the long-term operation emissions health risk impact analysis please explain how the ongoing short-term event emissions (gas turbine start-up and shutdown) would be incorporated into the acute, chronic, and cancer risk assessments.

Applicant Response: The construction/demolition health risk assessments for the PRP were performed according to the OEHHA guidance for cancer risk evaluations for short term projects. With regards to short term acute impacts, a separate set of health risk assessment (HRA) modeling runs were performed for gas turbine startups and shutdowns. For long-term gas turbine operational impacts, the gas turbine startup and shutdown emissions are included in the annual non-criteria pollutant emission calculations for the gas turbine (see SPPE Appendix 4.1I) and are accounted for in the HRA modeling runs performed for the PRP.