DOCKETED

Docket Number:	15-AFC-01
Project Title:	Puente Power Project
TN #:	204219-16
Document Title:	4.9 Public Health
Description:	N/A
Filer:	Sabrina Savala
Organization:	NRG Oxnard Energy Center, LLC
Submitter Role:	Applicant
Submission Date:	4/16/2015 10:44:09 AM
Docketed Date:	4/15/2015

4.9 PUBLIC HEALTH

This section describes the public health effects from the Puente Power Project (P3 or project). The project area discussed in this section refers to all areas of temporary and permanent disturbance associated with the construction and operation of the new plant and ancillary systems, and the construction laydown areas. No new offsite linear facilities are required for P3.

The sections below provide an overview of the affected environment; an evaluation of the environmental consequences of the proposed project to public health; a cumulative impact analysis; identification of mitigation measures that will avoid and reduce project impacts to less-than-significant levels; and applicable laws, ordinances, regulations, and standards (LORS).

Impacts associated with the project's emissions of criteria pollutants (i.e., pollutants for which federal or California ambient air quality standards [AAQS] have been promulgated) are described in Section 4.1, Air Quality. Potential public exposure to accidental releases of hazardous materials during operation is addressed in Section 4.5, Hazardous Materials Handling. To ensure worker safety during operations and construction, safe work practices will be followed as described in Section 4.16, Worker Safety and Fire Protection.

4.9.1 Affected Environment

The proposed project will replace two aging gas-fired steam-generating units (Units 1 and 2) at the existing Mandalay Generating Station (MGS) with a new state-of-the-art General Electric (GE) Frame 7HA.01 natural-gas–fired simple-cycle combustion turbine generator (CTG) and associated auxiliaries. In addition, the existing diesel emergency generator engine will be replaced with a new emergency engine, and the existing diesel emergency fire pump engine will be shut down. With the exception of certain infrastructure that will be re-purposed for P3 use, the remainder of the facility will remain unchanged, including the continued operation of one natural-gas–fired peaker combustion turbine (Unit 3), and associated ancillary facilities.

P3 will be developed on approximately 3 acres of previously disturbed vacant brownfield land within the existing boundaries of MGS. The location of the project is shown on Figure 2.3-1. The site is bordered by sand dunes and the Pacific Ocean to the west; McGrath Lake State Park and land owned by SunCal to the north; industrial uses to the north, south, and east; and agricultural uses farther to the east.

The California Energy Commission (CEC) defines sensitive receptors as infants and children, the elderly, the chronically ill, and any other members of the general population who are more susceptible to the effects of exposure to environmental contaminants than the population at large. For the purpose of this analysis, sensitive receptors are defined as the locations occupied by groups of individuals who may be more susceptible to health risks from a chemical exposure: schools (public and private), daycare facilities, convalescent/nursing homes, retirement homes, health clinics, and hospitals. Because sensitive individuals may be located at any residential site, risk-based standards apply to existing residences and places where residences may be built without a change in zoning, as well as sensitive receptors. If project impacts are protective of sensitive individuals at the point of maximum impact, they are protective at all locations. Identification of sensitive receptors is typically done to ensure that notice of possible impacts is provided to the community.

In accordance with guidance from the CEC, a search was conducted for sensitive receptors within 3 miles of the P3 site. Daycare, hospital, park, preschool, and school receptors found within 3 miles are listed in Appendix J and shown on Figures 4.9-1 and 4.9-2. The nearest sensitive receptor to the P3 site is the Leite Family Child Care facility on Reef Way, approximately 1 mile (5,500 feet) to the southeast (EDR, 2015).

The closest existing residential neighborhood is the Oxnard Shores Mobile Home Park, approximately 0.75 mile (or approximately 3,900 feet) to the south. The North Shore at Mandalay Bay residential development is scheduled to commence vertical construction in 2016. The closest distance from the proposed P3 stack to this development boundary is approximately 0.47 mile to the southeast (approximately 2,460 feet).

Air quality and health risk data presented by the California Air Resources Board (CARB) in the 2009 Almanac of Emissions (the most recent CARB Almanac of Emissions available containing toxic air contaminants [TACs]) and Air Quality for the Simi Valley – Ventura County air monitoring station show that during the period from 1990 through 2007, the average concentrations for the top ten TACs have been substantially reduced (with the exception of formaldehyde), and the associated health risks for the South Central Coast Air Basin are showing a steady downward trend as well. CARB-estimated emissions inventory values for the top 10 TACs for 2008 and ambient levels and associated potential risks for 2007 are presented in Table 4.9-1 for the air basin.

Concerning the current incidence of cancer and respiratory illnesses and diseases in the vicinity of the proposed project, the local public health department—the Ventura County Health Care Agency Public Health division—provides information on its website regarding community health and demographic information for community members (Ventura County, 2015a). Asthma diagnosis rates in Ventura County for adults are below the state average, but slightly higher than average for children in Ventura County. The percentage of adults who have been diagnosed with asthma was 10.9 percent in 2011-2012, compared with 14 to 17.7 percent of the population statewide (Ventura County, 2015b). The rate for children was 16.5 percent, compared with 15.4 percent statewide for the same time period (Ventura County, 2015c). According to the Centers for Disease Control and Prevention (CDC), asthma is triggered by a variety of factors, including dust, pollen, smoke, smog, and even cockroaches (CDC, 2015a).

Lung and Bronchus Cancer incidence rates in the county during 2007-2011 were 44.7 per 100,000 population, which is a slightly lower incidence rate than in the entire state (49.5 per 100,000 population) (CDC, 2015b).

An additional respiratory illness for the area is the disease of Valley Fever (Coccidioidomycosis), which is found in six southwestern states, including California. In California, the highest Valley Fever rates have been recorded in Merced, Madera, Fresno, Tulare, Kern, Monterey, Kings, and San Luis Obispo counties (CDC, 2014). Ventura County is a suspected endemic area for Coccidioidomycosis, according to the CDC (CDC, 2015c). In Ventura County, Valley Fever tends to be more prevalent in the Simi Valley area, with higher incidences occurring in 2004 that may be attributed to wildfires in the area and the ensuing landslides. In a recent study of 15 counties impacted by Valley Fever between 2007 and 2011, Ventura County had 300 total reported cases, with 65 of those occurring in Oxnard (MacLean, n.d.).

4.9.2 Environmental Consequences

This section discusses the sources and different kinds of air emissions associated with the construction and operation of P3 (see Section 4.1, Air Quality, for additional information on these emissions sources), the methodology used in performing the screening-level health risk assessment (HRA), and the results of this risk assessment. Other potential public health risks associated with the proposed project are discussed in other chapters as follows:

- Potential exposure to wastes generated by the proposed project is discussed in Section 4.14, Waste Management;
- Potential exposure to the hypothetical accidental release of aqueous ammonia on site or during offsite transport is discussed in Section 4.5, Hazardous Materials Handling; and

- Potential safety and health impacts relative to the work environment of project employees are discussed in Section 4.16, Worker Health and Safety.

Emissions associated with the operation of the proposed project will consist of combustion by-products from the natural-gas-fired turbine and from routine testing of the diesel emergency engine. After dispersion to ground-level, inhalation is the main pathway by which air pollutants can potentially cause public health impacts. Other pathways, including ingestion of soil, fish, home-grown produce, mother's milk, and dermal absorption, also were evaluated.

To evaluate potential health risks during project operation, the measures of these risks are first described in terms of the types of public health effects and the significance criteria and thresholds for those effects.

4.9.2.1 Significance Criteria

Significance criteria exist for both carcinogenic and non-carcinogenic risks, and are discussed separately.

4.9.2.1.1 Cancer Risk

Cancer risk is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are assumed to have no threshold below which there would be no human health impact. Any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk (i.e., a linear, no-threshold model). For previous power plant projects, the CEC has used an incremental cancer risk greater than 10 in one million as a significance threshold for public health. The 10-in-one-million risk level is also used by the Air Toxics "Hot Spots" (Assembly Bill [AB] 2588) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources.

Animal studies or human epidemiological studies (often based on workplace exposures) are used to estimate the relationship between the dose of a particular carcinogen and the resulting excess cancer risk. The cancer potency factor for that carcinogen is the slope of that dose-response relationship. Cancer risk is estimated by multiplying the dose of a particular carcinogen by its cancer potency factor. The dominant exposure pathway is inhalation; however, additional exposure pathways are considered in this screening HRA.

4.9.2.1.2 Non-Cancer Risk

Non-cancer health effects can be either long-term (chronic) or short-term (acute). In determining potential non-cancer health risks from air toxics, it is assumed there is a dose of the TAC below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). A non-cancer health risk is measured in terms of a health hazard quotient, which is the calculated maximum exposure (concentration) of each TAC divided by its REL. Health hazard quotients for TACs affecting the same target organ are typically summed, with the resulting totals expressed as health hazard indices for each organ system. A health hazard index of less than 1.0 is considered by the regulatory agencies to be a less-than-significant health risk. For this HRA, as a conservative assumption that will tend to overpredict risk, all hazard quotients were summed regardless of target organ.

This methodology leads to a conservative (upper-bound) assessment. RELs used in the hazard index calculations were those published in the CARB/Office of Environmental Health Hazard Assessment (OEHHA) listing, updated as of July 9, 2014 (CARB, 2014).

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body. Because chemical accumulation to toxic levels typically occurs

slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no-effect chronic exposure level for a non-carcinogenic air toxic is the chronic REL. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. Chronic RELs have been established for 8-hour and 1-year periods. The chronic health hazard indices were calculated as the sum of the chronic health hazard quotients, each of which is calculated as the chronic TAC concentration for the appropriate averaging period, divided by the chronic REL of the TAC.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of no more than 24 hours. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the duration of exposure is shorter. Because acute toxicity is predominantly manifested in the upper respiratory system at threshold exposures, all acute health hazard quotients are typically summed to calculate the acute health hazard index. This method leads to an upper-bound assessment.

The maximum 1-hour average concentrations of each TAC with acute health effects is divided by the specific TAC's acute 1-hour REL, to obtain the 1-hour health hazard quotient for health effects caused by relatively high, short-term exposure to air toxics. RELs used in the hazard index calculations were those published in the most recent CARB/OEHHA listing (CARB, 2014).

4.9.2.1.3 Valley Fever

Valley Fever is primarily encountered in the southwestern states, especially Arizona and California. It is caused by the inhalation of spores of the fungus *Coccicioides immities*, which are released during soil-disturbing activities (i.e., construction activities or mudslides) or wind erosion. Typically, trenching, excavation, and construction workers will have the highest exposure due to increased contact with spores during earth-disturbing activities. Symptoms of Valley Fever are similar to the flu. The disease usually affects the lungs, and people with weakened immune systems, pregnant women, and the elderly may be at a higher risk. There is currently no vaccine available for Valley Fever, and treatment typically consists of anti-fungal medications and rest. Valley Fever is not preventable; however, certain mitigation measures (soil wetting) can reduce the chance of infection (CDC, 2014). Currently, no significance criteria exist for Valley Fever.

4.9.2.2 Construction Impacts

Construction of P3, from site preparation and grading to commercial operation, is expected to take place over a period of approximately 21 months.

No significant public health effects are expected during construction/decommissioning. Strict construction practices that incorporate safety and compliance with applicable LORS will be followed. In addition, mitigation measures to reduce air emissions from construction impacts will be implemented as described in Appendix C-6.

Valley Fever spores have the potential to be released into the air as a result of grading and excavating activities during construction. Because the spores disperse similarly to dust, mitigation measures used to control dust would be effective to control spore dispersal. Dust mitigation measures are identified in Appendix C-6.

Temporary air emissions from construction/decommissioning are presented in detail in Appendix C-6, followed by a criteria pollutant air dispersion analysis demonstrating that AAQS will not be exceeded during construction of the project, with the exception of the 24-hour and annual state particulate matter 10 microns in diameter or less (PM_{10}) standards. For this pollutant and averaging periods, existing background concentrations already exceed state standards.

The dominant emission with potential health risk is diesel particulate matter (DPM) from combustion of diesel fuel in construction equipment (e.g., cranes, dozers, excavators, graders, front-end loaders, backhoes). DPM emissions from on-site construction/decommissioning are summarized in Appendix C-6.

The detailed HRA calculations in Appendix C-6 demonstrate that the potential cancer risk of DPM emissions during project construction will not exceed the significance threshold of 10 in one million. This HRA was performed in accordance with OEHHA (2015) guidance, which requires adjusting the 70-year lifetime exposure risk for the actual exposure period of 21 months. The resulting maximum off-property cancer risk would be approximately 2.8 in one million.

Ambient air modeling for PM_{10}/particulate matter 2.5 microns in diameter or less ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) was performed as described in Section 4.1.3 and Appendix C-4. Construction-related criteria pollutant emission impacts are temporary and localized, resulting in no long-term significant health impacts to the public.

Small quantities of hazardous waste may be generated during construction of the project. Hazardous waste management plans will be in place so the potential for public exposure is minimal. Refer to Section 4.14, Waste Management, for more information. No acutely hazardous materials will be used or stored onsite during construction (see Section 4.5, Hazardous Materials Handling). To ensure worker safety during construction, safe work practices will be followed (see Section 4.16, Worker Health and Safety).

4.9.2.3 Operations Impacts

Potential human health impacts associated with the project stem from exposure to air emissions from operation of the new CTG, routine testing of the new emergency diesel generator engine, and cumulative impacts associated with continued operation of existing Unit 3. The non-criteria pollutants emitted from the proposed project include certain volatile organic compounds and polycyclic aromatic hydrocarbons (PAHs) from the combustion of natural gas, ammonia from the selective catalytic reduction oxides of nitrogen control system, and DPM from combustion of diesel fuel in the emergency engine. These pollutants are listed in Table 4.9-2, and the detailed emission summaries and calculations are presented in Appendix C-8.

For criteria pollutants, the proposed project will include the use of Best Available Control Technology, as required under Ventura County Air Pollution Control District (VCAPCD) rules. Emissions of criteria pollutants will not cause or contribute significantly to violations of the national or California AAQS, as discussed in Section 4.1, Air Quality.

Air dispersion modeling results (see Section 4.1.3.3) indicate that P3 will not cause or contribute to violations of state or federal air quality standards, with the exception of the 24-hour and annual state PM_{10} standards. For this pollutant and these averaging periods, existing background concentrations already exceed state/federal standards, and the incremental contributions from the project are not significant (project PM_{10} impacts would be below federal significant impact levels). These standards are intended to protect the general public with a wide margin of safety. Therefore, the proposed project will not have a significant impact on public health from emissions of criteria pollutants.

The screening HRA was prepared using the latest version of CARB's Hotspots Analysis and Reporting Program, Version 2 (HARP2) model (CARB, 2015), the CARB July 2014 health database (CARB, 2014), and the OEHHA Hot Spots Program Guidance Manual (OEHHA, 2015).

4.9.2.4 Public Health Impact Study Method

Emissions of non-criteria pollutants from the project were analyzed using emission factors previously approved by CARB and the U.S. Environmental Protection Agency (USEPA). Included in Appendix C-8 are the detailed non-criteria pollutant emission calculations for the proposed new CTG and emergency engine and the existing units at MGS. In addition to an analysis of the acute/chronic/cancer risk impacts during the normal operation of the new equipment (CTG/emergency engine), the CEC requires an analysis of the acute impacts during CTG startups/shutdowns and during the commissioning phase of a new CTG. Therefore, the detailed non-criteria pollutant calculations in Appendix C-8 include separate non-criteria emission calculations for each of these three cases (normal operation, startups/shutdown, commissioning).

As shown in the calculations in Appendix C-8, compared to normal operating levels, the hourly non-criteria pollutant emission levels will be higher during CTG startups/shutdowns and during the commissioning period. Hourly non-criteria pollutant emissions will be elevated during these two operating cases because the oxidation catalyst system (which controls organic compounds, including non-criteria pollutants) may not be operating at all times during these periods. During a CTG startup/ shutdown, the oxidation catalyst system may not be fully functional during the entire hour in question because the proper catalyst operating temperature was not reached for a portion of the hour. During the commissioning phase of a new CTG, there will be test runs performed prior to the installation/operation of the oxidation catalyst system. The HRA performed for the proposed project includes an analysis of the impacts during gas CTG startups/shutdowns and the commissioning period. Because it will be necessary to continue to operate the existing Units 1 through 3 at the MGS during the commissioning period of the new CTG, the HRA for the commissioning period also includes the impacts for the existing Units 1 through 3.

Air-dispersion modeling combines the emissions with site-specific terrain and meteorological conditions to analyze short-term and long-term arithmetic mean concentrations in air for use in the HRA. The USEPA-recommended air dispersion model, AERMOD, was used along with 5 years (2009–2013) of representative meteorological data from the Oxnard airport meteorological station. The new Risk Assessment Standalone Tool that is part of the HARP2 model was used with the air dispersion modeling output from the required air dispersion model, AERMOD, to perform the risk assessment. The HARP2 model was used to assess cancer risk, as well as non-cancer chronic and acute health hazards. In addition to inhalation, the HARP2 modeling included the additional pathways for dermal absorption, soil ingestion, mother's milk ingestion, home-grown produce ingestion, and fish ingestion.

4.9.2.4.1 Risk Analysis Method

The criteria pollutant modeling analysis was performed using the AERMOD model, the 5-year meteorological data set described above, specific receptor grids, and the stack parameters for the combustion equipment (see Section 4.1, Air Quality). The highest annual, 8-hour, and 1-hour average concentrations were used to determine cancer risk and chronic health hazard index, chronic 8-hour health hazard index, and acute 1-hour health hazard index, as appropriate. Health risks potentially associated with the estimated concentrations of pollutants in air were characterized in terms of potential lifetime cancer risk (for carcinogenic substances), or comparison with RELs for non-cancer health effects (for non-carcinogenic substances).

Health risks were evaluated for a hypothetical Maximum Exposed Individual (MEI) at the Point of Maximum Impact (PMI), as well as risks to the MEI at residential locations (MEIR). The cancer risk to the MEI at the PMI is referred to as the Maximum Incremental Cancer Risk (MICR). Human health risks associated with emissions from the project are unlikely to be higher at any other location than at the PMI. If there is no significant impact associated with concentrations in air at the PMI, it is unlikely that there would be significant impacts in any other location. Health risks were also evaluated at the nearest

residence. The PMI (and therefore the MICR) is not necessarily associated with actual exposure to a residential location because in many cases the PMI is in an uninhabited area. Therefore, the MICR is generally higher than the cancer risk to the nearest resident. Both risks are based on 24-hour-per-day, 365-day-per-year, 70-year-lifetime exposure, as specified in the recent guidelines published by the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD, 2015).

Health risks potentially associated with concentrations of carcinogenic pollutants in air were calculated as estimated excess lifetime cancer risks. The total cancer risk at any specific location is found by summing the contributions from each carcinogen.

The inhalation cancer potency factors and RELs used to characterize health risks associated with modeled concentrations in air are taken from the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* (CARB, 2014) and are presented in Table 4.9-3.

4.9.2.5 Characterization of Risks from Toxic Air Pollutants

The estimated potential maximum cancer risks associated with the operation of the proposed project are shown in Table 4.9-4. The maximum carcinogenic risk is well below the CEC's 10–in-one-million threshold of significance used for recent projects.

Cancer risks potentially associated with the project also were assessed in terms of cancer burden. Cancer burden is a hypothetical upper-bound estimate of the additional number of cancer cases that could be associated with emissions from the project. Cancer burden is calculated as the maximum product of any potential carcinogenic risk greater than 1 in one million, and the number of individuals at that risk level. Because the MICR is above the 1-in-one-million threshold in an area extending approximately 50 meters east of the project fence line within the existing transmission yard, and because there are no residential receptors in this small area, the potential cancer burden is zero.

The maximum potential acute non-cancer health hazard index associated with operation of the proposed project is shown in Table 4.9-4. The acute non-cancer health hazard index for all target organs falls below 1.0, the CEC threshold of significance used for recent projects.

Similarly, the maximum potential chronic and 8-hour chronic non-cancer health hazard indices associated with operation of the proposed project are also shown in Table 4.9-5. These chronic non-cancer health hazard indices fall below 1.0, the CEC threshold of significance used for recent projects.

The estimates of cancer- and non-cancer risks associated with chronic or acute exposures are below thresholds used for regulating emissions of TACs to the air. Historically, exposure to any level of a carcinogen has been considered to have a finite risk of inducing cancer. There is no threshold for carcinogenicity. Because risks at low levels of exposure cannot be quantified directly by either animal or epidemiological studies, mathematical models have estimated such risks by extrapolation from high to low doses. This modeling procedure is designed to provide a highly conservative estimate of cancer risks based on the most sensitive species of laboratory animal for extrapolation to humans (i.e., the assumption being that humans are as sensitive as the most sensitive animal species). Therefore, the risk is not likely to be higher than risks estimated using inhalation cancer potency factors, and is most likely lower, and could even be zero (USEPA, 1991).

The analysis of potential cancer risk described in this section employs methods and assumptions generally applied by regulatory agencies for this purpose. Given the importance of assuring public health, this analysis uses highly conservative methods and assumptions, meaning they tend to overpredict the potential for adverse effects.

Conservative methodology and assumptions include those summarized below.

- The analysis includes representative weather data over a period of 5 years to ensure that the least-favorable conditions producing the highest ground-level concentration of power plant emissions are included. The analysis then assumes that these worst-case weather conditions, which in reality occurred only once in 5 years, will occur continuously for 70 years.

- The project is assumed to operate at hourly, daily, and annual emission conditions that produce the highest ground-level concentrations.

- The location of the highest ground-level concentration of project emissions is identified, and the analysis then assumes that a sensitive individual resides at this location 24 hours a day, 7 days a week over the entire 70-year period, even though these assumptions are physically impossible.

Taken together, these methods and assumptions create a scenario that is more potentially adverse to human health than conditions that exist in the real world. For example, if the worst-case weather conditions could occur only on a winter evening, but the worst-case emission rates could occur only on a summer afternoon, the analysis nonetheless assumes that these events occur at the same time. The point of using these conservative assumptions is to consciously overstate the potential impacts of the project. No one individual will experience exposures as great as those assumed for this analysis. By determining that even this highly overstated exposure will not be significant, the analysis provides a high degree of confidence that the much lower exposures that actual persons will experience will not result in any significant increase in cancer risk. In short, the analysis ensures that there will not be any significant public health impacts at any location, under any weather condition, under any operating condition.

4.9.2.6 Summary of Impacts

Results from the HRA based on emissions modeling indicate that there will be no significant incremental public health risks from construction or operation of the project. Results from criteria pollutant modeling for routine operations indicate that potential ambient concentrations of NO_2, CO, SO_2, and PM_{10}/$PM_{2.5}$ would not exceed ambient air quality standards, with the exception of the state 24-hour average PM_{10} standard. For this pollutant, existing background concentrations already exceed applicable standards, although the project would not add a significant contribution (project PM_{10} impacts would be below federal significant impact levels). The AAQS protect public health with a margin of safety for the most sensitive subpopulations (Section 4.1).

4.9.3 Cumulative Impacts Analyses

As discussed in Section 4.1.4.1, a cumulative impact analysis was performed for criteria pollutants. This analysis examined regional and localized criteria pollutant cumulative impacts, including the impacts for existing, new, and reasonably foreseeable projects in the area. In contrast with the approach used to estimate impacts for criteria pollutants, the significance thresholds developed for TACs are set with sufficient stringency to preclude the potential for any significant cumulative impacts. Therefore, a separate cumulative impacts analysis for TACs is not required.

4.9.4 Mitigation Measures

The project has been designed to minimize TAC emissions and impacts. No mitigation measures are needed for the project TAC emissions because the potential air quality and public health impacts are less than significant.

Because Valley Fever spores may be spread as a result of dust emissions, a variety of dust mitigation measures will be in place during the construction of the project to minimize potential risk during grading or disturbance of soils. A summary of the construction dust mitigation measures and best management practices is provided in Appendix C-6.

4.9.5 Laws, Ordinances, Regulations, and Standards

The proposed project will be constructed and operated in accordance with all LORS applicable to Public Health. Federal, state, and local LORS applicable to Public Health are discussed below and summarized in Table 4.9-5, Applicable Laws, Ordinances, Regulations, and Standards.

4.9.5.1 Federal

4.9.5.1.1 Clean Air Act

The Clean Air Act requires large projects (new or modified sources at major stationary sources) to go through a federal permitting process that ensures the project will not cause or contribute to a violation of a National Ambient Air Quality Standard (NAAQS). The emissions from P3 are below the thresholds for applicability of the federal permitting requirements, and P3 will not be required to obtain a Prevention of Significant Deterioration (PSD) permit.

4.9.5.1.2 40 Code of Federal Regulations (CFR) Part 68 (Risk Management Plan)

Facilities storing or handling significant amounts of acutely hazardous materials are required to prepare and submit risk management plans (RMPs). One regulated substance, aqueous ammonia, will continue to be stored onsite and be present in quantities exceeding the applicability thresholds. The existing RMP for MGS will be updated to include P3 and associated equipment.

4.9.5.2 State

4.9.5.2.1 Health and Safety Code 25249.5 et seq. (Safe Drinking Water and Toxic Enforcement Act of 1986—Proposition 65)

Activities that expose the public to significant levels of chemicals that are carcinogenic or that can cause reproductive harm must provide warnings. Based on an HRA that follows CARB/OEHHA guidelines, non-criteria pollutant emission rates and resulting doses and carcinogenic risks will not exceed thresholds that require Proposition 65 exposure warnings.

4.9.5.2.2 Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; CCR Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)

Facilities storing or handling significant amounts of acutely hazardous materials are required to prepare and submit RMPs. One regulated substance, aqueous ammonia, will continue to be stored onsite and be present in quantities exceeding the applicability thresholds. The existing RMP for MGS will be updated to include P3 and associated equipment.

4.9.5.2.3 Health and Safety Code Sections 44360 to 44366 (Air Toxics "Hot Spots" Information and Assessment Act—AB 2588)

Under this program, facilities with emissions of TACs are prioritized based on emissions. If the facility's priority score is high enough, the facility is required to prepare an HRA. High-risk facilities may be required to provide notification to neighbors, or to develop and implement a risk reduction plan.

Based on the emission estimates described in this report, P3 will not be a high-priority facility.

4.9.5.3 Local

4.9.5.3.1 Rule 73 – National Emission Standards for Hazardous Air Pollutants.

VCAPCD Rule 73 incorporates by reference the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) program. This program establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by USEPA as causing or contributing to the adverse health effects of air pollution, but for which NAAQS have not been established) from major sources of HAPs in specific source categories. These standards are implemented at the local level with federal oversight. Only the NESHAPs for gas turbines, which limit formaldehyde emissions from a gas turbine, are potentially applicable to a new power plant project. However, as shown in Section 4.1, the gas turbine NESHAP is not expected to be applicable to the proposed project, because P3 would not be a major source of HAPs (i.e., less than 10 tpy of one HAP or 25 tpy of all HAPs). Thus, the NESHAP requirements will not be addressed further.

4.9.6 Involved Agencies and Agency Contacts

Table 4.9-6 provides contact information for agencies involved with public health.

4.9.7 Permits Required and Permit Schedule

Agency-required permits related to public health are listed in Table 4.9-7; these include an RMP for hazardous materials and the VCAPCD Determination of Compliance (DOC). Upon approval of the AFC by the CEC, the DOC serves as the VCAPCD Authority to Construct. These requirements are discussed in detail in Sections 4.1 (Air Quality) and 4.5 (Hazardous Materials Handling).

4.9.8 References

CARB (California Air Resources Board), 2009. California Almanac of Emissions and Air Quality – 2009 Edition. Available online at: http://www.arb.ca.gov/aqd/almanac/almanac09/almanac09.htm.

CARB (California Air Resources Board), 2014. Consolidated table of OEHHA/ARB approved risk assessment health values. Available online at: http://www.arb.ca.gov/toxics/healthval/contable.pdf. Accessed July 3, 2014.

CARB (California Air Resources Board), 2015. HARP Model, Version 2. Available online at: http://www.arb.ca.gov/toxics/harp/harp.htm. March.

CDC (Centers for Disease Control and Prevention), 2014. Valley Fever Fact Sheet. Available online at: http://www.cdph.ca.gov/HealthInfo/discond/Documents/VFGeneral.pdf. Accessed April 2, 2015.

CDC (Centers for Disease Control and Prevention), 2015a. Common Asthma Triggers. Available online at: http://www.cdc.gov/asthma/triggers.html. Accessed February 5, 2015.

CDC (Centers for Disease Control and Prevention), 2015b. State Cancer Profiles. Available online at: http://statecancerprofiles.cancer.gov/incidencerates/index.php?stateFIPS=06&cancer=047&race=00&sex=0&age=001&type=incd&sortVariableName=rate&sortOrder=default. Accessed February 5, 2015.

CDC (Centers for Disease Control and Prevention), 2015c. Fungal pneumonia: a silent epidemic Coccidioidomycosis (valley fever) Fact Sheet. Available online at: http://www.cdc.gov/fungal/pdf/cocci-fact-sheet-california-final-508c.pdf. Accessed February 5, 2015.

.

EDR (Environmental Data Resources), 2015. Puente Power Project Offsite Receptor Report. February.

MacLean, M.D., M.S., Michael, n.d. The Epidemiology of Coccidioidomycosis – 15 California Counties, 2007-2011, produced for the California Coccidioidomycosis Collaborative. Available online at: https://www.vfce.arizona.edu/resources/pdf/The_Epidemiology_of_Coccidioidomycosis_%20Collaborative_County_Report.pdf. Accessed February 5, 2015.

OEHHA (Office of Environmental Health Hazard Assessment), 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, California Environmental Protection Agency. August.

SJVUAPCD (San Joaquin Valley Unified Air Pollution Control District), 2015. Final Draft Staff Report, Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document, March 18, 2015. Available online at: http://www.valleyair.org/notices/Docs/2015/3-18-15_risk/final-draft-risk-policy-sr.pdf.

USEPA (U.S. Environmental Protection Agency), 1991. Risk Assessment for Toxic Air Pollutants: A Citizen's Guide. EPA 450/3-90-024. March 1991. Available online at: http://www.epa.gov/ttn/atw/3_90_024.html.

Ventura County (Ventura County Public Health Division), 2015a. Available online at: http://www.healthmattersinvc.org/index.php. Accessed February 5, 2015.

Ventura County (Ventura County Public Health Division), 2015b. Adults with Asthma. Available online at: http://www.healthmattersinvc.org/modules.php?op=modload&name=NS-Indicator&file=indicator&iid=7913031. Accessed February 5, 2015.

Ventura County (Ventura County Public Health Division), 2015c. Children and Teens with Asthma. Available online at: http://www.healthmattersinvc.org/modules.php?op=modload&name=NS-Indicator&file=indicator&iid=8228237. Accessed February 5, 2015.

Table 4.9-1
Top Ten TACs Emitted by All Sources in the South Central Coast Air Basin

TAC	2008 Emissions (tons/year)[1,2]	2013 Levels and Risks, Simi Valley, Ventura County[3]	
		Annual Average Mean Concentration (ppbv)	Potential Carcinogenic Risk[4] (in 1 million)
Acetaldehyde	161	0.85	4
Benzene	246	0.193 (2011)	18 (2011)
1,3-Butadiene	68	0.031 (2011)	12
Carbon tetrachloride	0	0.088 (2011)	23 (2011)
Chromium, hexavalent	<0.01	0.03 ng/m^3	5
Para-Dichlorobenzene	33	0.15 (2006)	10 (2006)
Formaldehyde	380	2.42	18
Methylene chloride	157	0.106 (2011)	0.4 (2011)
Perchloroethylene	71	0.03 (2011)	1 (2011)
Diesel particulate matter[5]	436	2.4 $\mu g/m^3$ (2000)	

Notes:

1 CARB, 2009.
2 2008 data are the most current emission data available.
3 There are no ambient monitors in Oxnard that measure air toxics, so data from the Simi Valley, Ventura County ambient monitor in the SCCAB are provided as a conservative estimate of background concentrations and health risks. TAC and Risk data from CARB Annual Toxic Site Summaries, http://www.arb.ca.gov/adam/toxics/toxics.html.
4 Health Risk represents the number of excess cancer cases per million people based on a 70-year exposure to the annual average concentration. Health risk represents only the compounds listed in this table and only those with data for the year. There may be other significant compounds for which monitoring and health risk information is not available. The para-dichlorobenzene concentration and risk in 2006 is used for 2013. Para-dichlorobenzene was composed of values below the level of detection for the later years; therefore, CARB stopped monitoring for para-dichlorobenzene in March 2007.
5 The diesel particulate matter concentrations are estimates for the SCCAB based on receptor modeling and are available only for selected years.

CARB = California Air Resource Board
$\mu g/m^3$ = micrograms per cubic meter
ng/m^3 = nanograms per cubic meter
ppbv = parts per billion by volume
SCCAB = South Central Coast Air Basin

Table 4.9-2 **Pollutants Emitted to the Air from P3**	
Criteria Pollutants	**Non-criteria Pollutants (Continued)**
Carbon monoxide	Formaldehyde
Oxides of nitrogen	Hexane
Particulate matter	Naphthalene
Oxides of sulfur	Propylene
Volatile organic compounds	Propylene oxide
	Toluene
Non-criteria (Toxic) Pollutants	Xylene
Ammonia	Hexane
Acetaldehyde	PAHs
Acrolein	Benzo(α)anthracene
1,3-Butadiene	Benzo(α)pyrene
Benzene	Benzo(β)fluoranthene
Dichlorobenzene	Benzo(k)fluoranthene
Diesel Exhaust Particulate Matter	Chrysene
Ethylbenzene	Dibenz(a,h)anthracene
	Indeno(1,2,3-cd)pyrene

Table 4.9-3
Toxicity Values Used to Characterize Health Risks

Toxic Air Contaminant	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Chronic Inhalation REL ($\mu g/m^3$)	Acute Inhalation REL ($\mu g/m^3$)
Acetaldehyde	0.010	140 300 (8-hour)	470 (1-hour)
Acrolein	—	0.35 0.7 (8-hour)	2.5 (1-hour)
Ammonia	—	200	3,200
Benzene	0.10	3 3.0 (8-hour)	27 (1-hour)
1,3-Butadiene	0.60	2.0 9.0 (8-hour)	660 (1-hour)
Diesel PM	1.1	5.0	—
Ethylbenzene	0.0087	2,000	—
Formaldehyde	0.021	9.0 9 (8-hour)	55 (1-hour)
Hexane	—	7,000	—
Naphthalene	0.12	9.0	—
PAHs (as BaP for HRA)	3.9	—	—
Propylene	—	3,000	—
Propylene oxide	0.013	30	3,100
Toluene	—	300	37,000
Xylene	—	700	22,000

Source: CARB, 2014.

BaP = benzo (a) pyrene
HRA = health risk assessment
mg/kg-d = milligrams per kilogram day
$\mu g/m^3$ = microgram per cubic meter
PAH = polycyclic aromatic hydrocarbons
PM = particulate matter
REL = recommended exposure limit

Table 4.9-4
Summary of Potential Health Risks

Receptor	Carcinogenic Risk (per million)	Cancer Burden	Acute Health Hazard Index	Chronic/8-hr Chronic Health Hazard Indices
New Equipment Normal Operation (CTG/emergency engine) and Unit 3				
Maximally Exposed Individual (MEI) at PMI	1.2×10^{-6}[a]	0[c]	1.6×10^{-2}	$2.1 \times 10^{-4}/8.5 \times 10^{-5}$
Maximally Exposed Individual Resident (MEIR)	2.3×10^{-7}[a]		6.1×10^{-3}	$8.9 \times 10^{-5}/6.3 \times 10^{-5}$
Maximally Exposed Individual Worker (MEIW)	1.0×10^{-7}[b]		1.6×10^{-2}	N/A[d]$/8.5 \times 10^{-5}$
New CTG Startups/Shutdowns				
MEI (acute impact only)	N/A	N/A	2.1×10^{-2}	N/A
New CTG Commissioning Period (includes impacts for existing MGS Units 1 through 3)				
MEI (acute impact only)	N/A	N/A	1.6×10^{-2}	N/A
Significance Level	10	1.0	1.0	1.0

Notes:

a. Based on High Point Method, which results in the maximum cancer risk.
b. The worker is assumed to be exposed at the work location 8 hours per day, instead of 24; 245 days per year, instead of 365; and for 40 years, instead of 70.
c. Cancer burden is zero because offsite cancer risk above 1.0 per million only occurs in receptors located within existing transmission yard (a small area with no residential receptors).
d. Because of the exposure correction discussed in footnote b, a 70-year-based chronic health hazard index is not applicable to a worker.

CTG = combustion turbine generator
MEI = maximum exposed individual
MEIR = maximum exposed individual resident
MEIW = maximum exposed individual worker
MGS = Mandalay Generating Station
N/A = not applicable

Table 4.9-5
Summary of LORS – Public Health

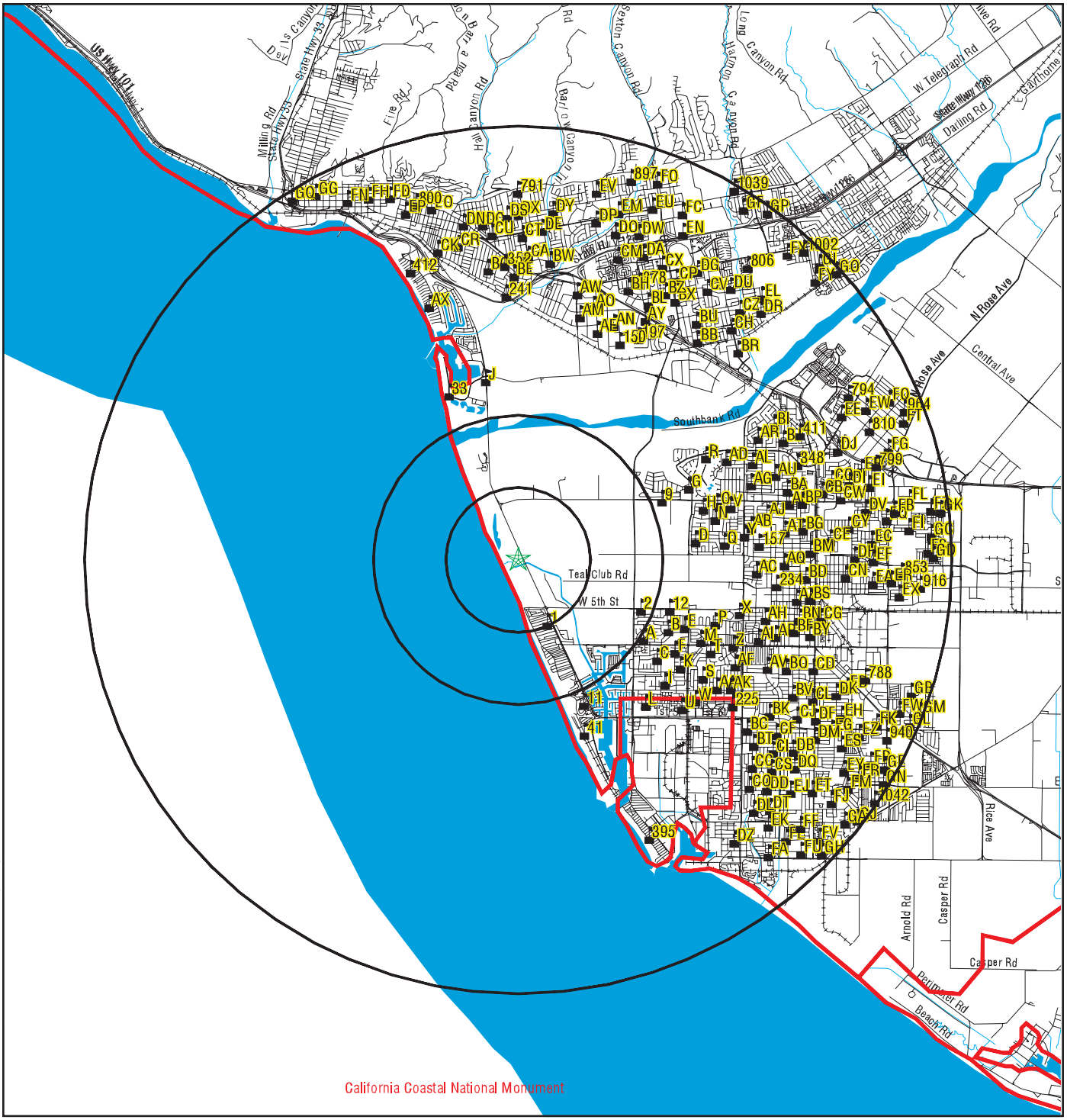
LORS	Administering Agency	Applicability	AFC Section
Federal			
Clean Air Act	U.S. Environmental Protection Agency (USEPA) Region 9, California Air Resources Board (CARB), and Ventura County Air Pollution Control District (VCAPCD)	Requires large facilities to provide offsets and demonstrate that new emissions will not cause or contribute to violation of a federal ambient air quality standard	Section 4.9.5.1
40 Code of Federal Regulations Part 68 (Risk Management Plan)	USEPA Region 9 and Ventura County Environmental Health Division	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans	Section 4.9.5.1 Section 4.5 Hazardous Materials
State			
Health and Safety Code 25249.5 et seq. (Safe Drinking Water and Toxic Enforcement Act of 1986—Proposition 65)	California Office of Environmental Health Hazard Assessment (OEHHA)	Activities resulting in doses or carcinogenic risks above specified thresholds require Proposition 65 exposure warnings.	Section 4.9.5.2
Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; CCR Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)	Ventura County Environmental Health Division	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans	Section 4.9.5.2 Section 4.5 Hazardous Materials
Health and Safety Code Sections 44360 to 44366 (Air Toxics "Hot Spots" Information and Assessment Act—AB 2588)	VCAPCD and CARB	Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments.	Section 4.9.5.2
Local			
VCAPCD Rule 73 (National Emission Standards for Hazardous Air Pollutants	VCAPCD with CARB oversight	Requires units to comply with federal NESHAP standards.	Section 4.9.5.3

Table 4.9-6
Involved Agencies and Agency Contacts

Issue	Agency	Contact/Title	Telephone/E-mail
Public exposure to air pollutants	CARB	Michael Tollstrup Chief, Project Assessment Branch CARB	(916) 323-8473 mtollstr@arb.ca.gov
	Ventura County Air Pollution Control District	Kerby Zozula Manager, Engineering Division VCAPCD	(805) 645-1421 kerby@vcapcd.org
Public exposure to chemicals known to cause cancer or reproductive toxicity	Cal-EPA, Office of Environmental Health and Hazard Assessment (OEHHA)	Cynthia Oshita or Susan Luong OEHHA	(916) 322-2068 (Oshita) (916) 327-3015 (Luong)
Public exposure to accidental releases of hazardous materials	California Office of Emergency Services	Trevor Anderson Senior Emergency Services Coordinator Governor's Office of Emergency Services	(916) 845-8788 Trevor.anderson@caloes.ca.gov
	Oxnard Certified Unified Program Agency (CUPA)	Miguel Trujillo Oxnard CUPA	(805) 385-8364

Table 4.9-7
Public Health Permits Required and Permit Schedule

Responsible Agency	Permit/Approval	Schedule
Authority to Construct/ Determination of Compliance	Ventura County Air Pollution Control District	District must issue a Preliminary Determination of Compliance within 180 days after issuing the Application Completeness Determination Letter.
Risk Management Plan (California Accidental Release Program)	Ventura County Environmental Health Division	Risk Management Plan application must be approved before arrival of hazardous materials on site.



04/02/15 hk U:\Graphics\NRG Puente Power Project\Fig4s.indd

Source: Environmental Data Resources (EDR) 2015. Puente Power Project Offsite Receptor Report. February 6, 2015.

- Target Property (Puente Power Project)
- Roads
- Waterways
- Environmental or Public Receptor
- Federal Lands Linear Features
- Federal Lands Area

0 2 4 MILES

SENSITIVE RECEPTORS WITHIN 6 MILES – EDR REPORT

NRG
Puente Power Project
Oxnard, California

April 2015

FIGURE 4.9-1

U:\GIS\NRG_Ventura\Projects\Fig4_9_2_Supplemental_receptors.mxd 4/10/2015 12:01:26 PM

Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

Puente Power Project (P3) Site

Mandalay Generating Station Property

6-mile Boundary of P3 Site

Receptors

Hospital

School

Senior Facility

SENSITIVE RECEPTORS WITHIN 6 MILES – SUPPLEMENTAL

NRG
Puente Power Project
April 2015 Oxnard, California

FIGURE 4.9-2