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8.6 Public Health

This section presents an assessment of risks to human health potentially associated with operation of the proposed facility, focusing on chemical pollutants that could be emitted or released. Air pollutants for which California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS) have been established are also addressed in Section 8.1 of this document.

The principal concerns for public health are associated with emissions of chemical substances to the air during routine operation of the proposed facility. Chemical substances in air that potentially pose risks to human health include byproducts from the combustion of natural gas. These chemical substances, which were addressed in a health risk assessment (presented in Appendix 8.1C) include:

- Acetaldehyde
- Acrolein
- Benzene
- Formaldehyde
- Toluene
- Xylene

Combustion byproducts with established CAAQS or NAAQS, including oxides of nitrogen (NO_x), carbon monoxide and fine particulate matter, are addressed in the Ambient Air Quality section (see Section 8.1.3). However, some discussion of the potential health risks associated with these substances is presented in this section. Human health risks potentially associated with accidental releases of stored acutely hazardous materials at the proposed facility (aqueous ammonia) are also discussed in this section.

8.6.1 Laws, Ordinances, Regulations, and Standards

An overview of the regulatory process for public health issues is presented in this section. The relevant LORS that affect public health and that are applicable to this project are identified in Table 8.6-1. Table 8.6-1 also summarizes the primary agencies responsible for public health, as well as the general category of public health concern regulated by each agency. The conformity of the project to each LORS applicable to public health is also presented in this table, as are references to the section locations within this report where each of these issues is addressed. Points of contact with the primary agencies responsible for public health are identified in Table 8.6-2.

TABLE 8.6-1
Summary of Primary Regulatory Jurisdictions for Public Health

LORS	Public Health Concern	Primary Regulatory Agency	AFC Conformance Section
Clean Air Act	Public exposure to air pollutants	USEPA Region IX CARB SMAQMD	Based on results of risk assessment as per CAPCOA guidelines, toxic contaminants do not exceed acceptable levels. (Section 8.6.3.2) Emissions of criteria pollutants will be minimized by applying BACT to the facility. Increases in emissions of criteria pollutants will be fully offset. (Section 8.6.4.1)
Health and Safety Code 25249.5 *et seq*. (Safe Drinking Water and Toxic Enforcement Act of 1986—Proposition 65)	Public exposure to chemicals known to cause cancer or reproductive toxicity	Office of Environmental Health and Hazard Assessment (OEHHA)	Based on results of risk assessment as per CAPCOA guidelines, toxic contaminants do not exceed thresholds that require exposure warnings. (Section 8.6.3.2)
40 CFR Part 68 (Chemical Accident Prevention)	Public exposure to acutely hazardous materials	USEPA Region IX Sacramento County Office of Emergency Services (OES)	A vulnerability analysis will be performed to assess potential risks from a spill or rupture of the aqueous ammonia storage tank. (Section 8.6.3.3) An RMP will be prepared prior to commencement of facility operations. (Section 8.6.4.3)
Health and Safety Code Sections 25531 to 25541 (19 CCR, Division 2, Chapter 4.5)	Public exposure to acutely hazardous materials	Sacramento County EMD/HMD CARB SMAQMD	A vulnerability analysis will be performed to assess potential risks from a spill or rupture of the aqueous ammonia storage tank. (Section 8.6.3.3)
Health and Safety Code Sections 44360 to 44366 (Air Toxics "Hot Spots" Information and Assessment Act—AB 2588)	Public exposure to toxic air contaminants	CARB SMAQMD	Based on results of risk assessment as per CAPCOA guidelines, toxic contaminants do not exceed acceptable levels. (Section 8.6.3.2)

BACT	Best Available Control Technology
CalARP	California Accidental Release Prevention (CalARP) Program
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CFR	Code of Federal Regulations
EMD/HMD	Environmental Management Department/Hazardous Materials Division
RMP	Risk Management Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
USEPA	United States Environmental Protection Agency

TABLE 8.6-2
Summary of Agency Contacts for Public Health

LORS	Public Health Concern	Primary Regulatory Agency	Regulatory Contact
Clean Air Act	Public exposure to air pollutants	USEPA Region IX	Jack Broadbent (415) 744-1219
		CARB	Beverly Werner (916) 322-3984
		SMAQMD	(916) 874-4800
Health and Safety Code 25249.5 *et seq*. (Safe Drinking Water and Toxic Enforcement Act of 1986—Proposition 65)	Public exposure to chemicals known to cause cancer or reproductive toxicity	Office of Environmental Health and Hazard Assessment (OEHHA)	Cynthia Oshita or Susan Long (916) 445-6900
40 CFR Part 68 (Chemical Accident Prevention)	Public exposure to acutely hazardous materials	USEPA Region IX	Jack Broadbent (415) 744-1219
		Sacramento County Office of Emergency Services (OES)	(916) 874-4670
Health and Safety Code Sections 25531 to 25541 (19CCR, Division 2, Chapter 4.5)	Public exposure to acutely hazardous materials	Sacramento County EMD/HMD	Ralph Roberts (916) 875-8476
		SMAQMD	(916) 874-4800
Health and Safety Code Sections 44360 to 44366 (Air Toxics "Hot Spots" Information and Assessment Act—AB 2588)	Public exposure to toxic air contaminants	CARB	Beverly Werner (916) 322-3984
		SMAQMD	(916) 874-4800

CARB California Air Resources Board
CCR California Code of Regulations
CFR Code of Federal Regulations
EMD/HMD Environmental Management Department/Hazardous Materials Division
SMAQMD Sacramento Metropolitan Air Quality Management District
USEPA United States Environmental Protection Agency

8.6.2 Affected Environment

The Project will be a nominal 1,000 MW combined-cycle generating facility, using natural gas-fired combustion turbines, a steam turbine, and associated infrastructure. The site is located 25 miles southeast of Sacramento, south of Twin Cities Road, and north of Clay East Road, approximately 1.75 miles east of the intersection of Twin Cities Road and Clay East Road. It lies within Sacramento County, approximately 4 miles north of the San Joaquin County line, and 5 miles west of the Amador County line. The pattern of land use in this area of Sacramento County is generally agricultural, with incorporated and unincorporated low-density urban/suburban areas. The project site is located on a 30-acre parcel owned by the District. The parcel is currently being used for cattle grazing. No crops, irrigation, or special cultivation are conducted on the project site. The land use designation for the site is Public/Quasi-Public with a Resource Conservation overlay.

No existing recreational, scenic, natural resource protection, natural resource extraction, educational, or religious land uses exist within one mile of the project site. The project site is approximately 2 miles west of Rancho Seco Park, which is owned and operated by the District. Rancho Seco's Park's recreational facilities include fishing, boating, swimming, and camping. No other recreational facilities exist in the vicinity of the project site. According to the Sacramento County General Plan (1993), no additional recreational or park facilities are planned for the area. There are no sensitive receptor facilities (such as schools, daycare facilities, convalescent centers, or hospitals) in the vicinity of the project site. A few residences (primarily farmers) are located in the vicinity of the site, and a sparsely populated residential area begins approximately 0.75 mile to the west. Sensitive receptors within a 3-mile radius of the project site are described in the hazardous materials section, Section 8.12, and shown on Figure 8.6-1.

Figure 8.6-2 shows the terrain within a 10-mile radius of the project site, including land elevations greater than the combustion turbine exhaust stack height of 160 feet. This figure serves as an index for the nine 7.5-minute Quad maps, five copies of which will be submitted to the California Energy Commission independently of Volume 1 of this AFC.

8.6.3 Environmental Consequences

Environmental consequences potentially associated with the project include potential human exposure to chemical substances emitted into the air. The human health risks potentially associated with these chemical substances were evaluated in a health risk assessment (presented in Appendix 8.1C). The chemical substances potentially emitted to the air from the proposed facility include ammonia, volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs) from the combustion turbines, and ammonia and trace metals from the cooling tower. These chemical substances are listed in Table 8.6-3.

TABLE 8.6-3
Chemical Substances Potentially Emitted to the Air from CPP

Criteria Pollutants
Carbon monoxide
Oxides of nitrogen
Particulate matter
Noncriteria Pollutants (Toxic Pollutants)
Ammonia
Acetaldehyde
Acrolein
1,3-Butadiene
Benzene
Ethylbenzene
Formaldehyde
Hexane
Propylene
Propylene oxide
Toluene
Xylene
Polycyclic aromatic hydrocarbons (PAHs)
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene

TABLE 8.6-3
Chemical Substances Potentially Emitted to the Air from CPP

Chrysene
Dibenz(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Naphthalene
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Silver
Zinc

8.6.3.1 Criteria Pollutants

Emissions of criteria pollutants will adhere to NAAQS or CAAQS as discussed in the Ambient Air Quality section (see Section 8.1.4). The proposed facility also will include emission control technologies necessary to meet the required emission standards specified for criteria pollutants under Sacramento Metropolitan Air Quality Management District (SMAQMD) rules. Offsets will be required for emissions of criteria pollutants that exceed specified thresholds, to assure that the project will not result in an increase in total emissions in the vicinity. Finally, air dispersion modeling results (presented in the Ambient Air Quality section, Section 8.1.5.1.2) show that emissions will not result in concentrations of criteria pollutants in the air that exceed ambient air quality standards (either NAAQS or CAAQS). These standards are intended to protect the general public with a wide margin of safety. Therefore, the project is not anticipated to have a significant impact on public health from emissions of criteria pollutants.

8.6.3.2 Toxic Pollutants

Potential impacts associated with emissions of toxic pollutants to the air from the proposed facility were addressed in a health risk assessment, presented in Appendix 8.1C. The risk assessment was prepared using guidelines developed under the AB 2588 Air Toxics "Hot Spots" Information and Assessment Act (CAPCOA, 1993).

Emissions of toxic pollutants potentially associated with the proposed facility were estimated using emission factors approved by the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (USEPA). Concentrations of these pollutants in air potentially associated with the emissions were estimated using dispersion modeling. Modeling allows estimation of both short-term and long-term average concentrations in air for use in a risk assessment, accounting for site-specific terrain and meteorological conditions. Health risks potentially associated with the estimated concentrations of pollutants in air were characterized in terms of excess lifetime cancer risks (for carcinogenic substances), or comparison with reference exposure levels for noncancer health effects (for noncarcinogenic substances).

Health risks were evaluated for a hypothetical maximum exposed individual (MEI). The hypothetical MEI is an individual assumed to be located at the point where the highest

concentrations of air pollutants associated with facility emissions are predicted to occur, based on air dispersion modeling. Human health risks associated with emissions from the proposed facility are unlikely to be higher at any other location than at the MEI location. If no significant impact is associated with concentrations in air at the MEI location, it is unlikely there would be significant impacts in any other location in the vicinity of the facility.

Health risks potentially associated with concentrations of carcinogenic pollutants in air were calculated as estimated excess lifetime cancer risks. The excess lifetime cancer risk for a pollutant is estimated as the product of its concentration in air and a unit risk value. The unit risk value is defined as the estimated probability of a person contracting cancer as a result of constant exposure to an ambient concentration of 1 $\mu g/m^3$ over a 70-year lifetime. In other words, it represents the increased cancer risk associated with continuous exposure to a concentration of the pollutant in the air over a 70-year lifetime. Evaluation of potential noncancer health effects from exposure to short-term and long-term concentrations in air was performed by comparing modeled concentrations in air with reference exposure levels (RELs). An REL is a concentration in air at or below which no adverse health effects are anticipated. RELs are based on the most sensitive adverse effects reported in the medical and toxicological literature. Potential noncancer effects were evaluated by calculating a ratio of the modeled concentration in air and the REL. This ratio is referred to as a hazard quotient. The unit risk values and RELs used to characterize health risks associated with modeled concentrations in air were obtained from the *Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines* (CAPCOA, 1993), and are presented in Table 8.6-4.

TABLE 8.6-4
Toxicity Values Used to Characterize Health Risks

Compound	Unit Risk Factor $(\mu g/m^3)^{-1}$	Chronic Reference Exposure Level ($\mu g/m^3$)	Acute Reference Exposure Level ($\mu g/m^3$)
Acetaldehyde	2.7E-06	9.00E+00	--
Acrolein	--	2.00E-02	2.50E+00
Ammonia	--	1.00E+02	2.1E+03
Arsenic	3.3E-03	5.10E-01	--
Benzene	2.9E-05	7.10E+01	--
1,3-Butadiene	1.7E-04	--	--
Cadmium	4.2E-03	3.50E+00	--
Chromium	1.4E-01	2.00E-03	--
Copper	--	2.40E+00	--
Ethylbenzene	--	--	--
Formaldehyde	6.0E-06	3.60E+00	3.7E+02
Hexane	--	--	--
Lead	8.00E-05	1.50E+00	--
Mercury	--	--	3.00E+01

TABLE 8.6-4
Toxicity Values Used to Characterize Health Risks

Compound	Unit Risk Factor $(\mu g/m^3)^{-1}$	Chronic Reference Exposure Level ($\mu g/m^3$)	Acute Reference Exposure Level ($\mu g/m^3$)
Naphthalene	--	--	--
Nickel	--	--	--
Polycyclic aromatic hydrocarbons	1.7E-03	--	--
Propylene	--	--	--
Propylene oxide	3.7E-06	3.00E+01	1.00E+03
Silver	--	--	--
Toluene	--	2.00E+02	--
Xylene	--	3.00E+02	4.4E+03
Zinc	--	3.50E+01	--

Source: CAPCOA, 1993.

8.6.3.2.1 Toxic Air Pollutant Risks

The excess lifetime cancer risk associated with concentrations in air estimated for the MEI location is estimated to be 0.28×10^{-6}. Excess lifetime cancer risks less than 1×10^{-6} are unlikely to represent significant public health impacts that require additional controls of facility emissions. Risks higher than 1×10^{-6} may or may not be of concern, depending on several factors, including the conservatism of assumptions used in risk estimation, size of the potentially exposed population, and toxicity of the risk-driving chemicals. Risks associated with pollutants potentially emitted from the proposed facility are presented by exposure pathway in Table 8.6-5. Further description of the methodology used to calculate health risks associated with emissions to the air is presented in Appendix 8.1C. As described previously, human health risks associated with emissions from the proposed facility are unlikely to be higher at any other location than at the MEI location. If no significant impact is associated with concentrations in air at the MEI location, it is unlikely that there would be significant impacts at any other location in the vicinity of the proposed facility.

Cancer risks potentially associated with facility emissions 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 proposed facility. Cancer burden is calculated as the product of excess lifetime cancer risk and the number of individuals at that risk level. A worst-case estimate of cancer burden was calculated assuming that 25 percent of the population of Sacramento County was exposed to the MEI risk. As described previously, human health risks associated with emissions from the proposed facility are unlikely to be higher at any other location than at the MEI location. Therefore, the risks for all of these individuals would be lower (and in most cases, substantially lower) than 0.28×10^{-6}. The estimated cancer burden was less than one, indicating that emissions from the proposed facility would not be associated with any increase in cancer cases in the previously defined population. As stated previously, the methods used in this calculation considerably overstate the potential cancer burden, further

suggesting that facility emissions are unlikely to represent a significant public health impact in terms of cancer risk.

TABLE 8.6-5
Summary of Excess Lifetime Cancer Risks for the Maximum Exposed Individual

	Increased Lifetime Cancer Risk by Exposure Pathway			
Emission Source	**Inhalation of Ambient Air**	**Soil Ingestion**	**Dermal Contact with Soil**	**Total by Source**
Gas Turbines	6.54×10^{-8}	1.96×10^{-9}	1.19×10^{-9}	6.85×10^{-8}
Cooling Tower	9.66×10^{-8}	1.14×10^{-7}	2.42×10^{-9}	2.13×10^{-7}
Total Pathway Risk	1.62×10^{-7}	1.16×10^{-7}	3.61×10^{-9}	
Total Risk	**0.28 in one million**			

The chronic noncancer hazard quotients associated with concentrations in air estimated for the MEI location were well below one for all target organs. A noncancer hazard quotient less than one is unlikely to represent a significant impact to public health. Chronic noncancer hazard quotients associated with inhalation of pollutants potentially emitted from the proposed facility are presented in Table 8.6-6. The chemicals providing the largest contribution to noncancer risks associated with facility emissions are acrolein and ammonia, from combustion sources. The chronic noncancer hazard indices associated with non-inhalation exposure pathways are well below one for all target organs. Chronic noncancer hazard indices for non-inhalation exposure pathways are presented in Table 8.6-7. A noncancer REL is not available for lead. However, lead exposures are well below typical estimates of average daily exposures estimated for lead (ATSDR, 1996).

TABLE 8.6-6
Summary of Chronic Noncancer Hazard Quotients (Inhalation Exposure Pathway) for the Maximum Exposed Individual

	Target Organ[a]							
Emission Source	**Resp**	**CV/BL**	**CNS**	**Skin**	**Repro**	**Kidn**	**GI/LV**	**Immun**
Cooling Tower	<0.0001	<0.0001	<0.0001	<0.0001	NA	NA	NA	NA
Gas Turbines	0.0131	<0.0001	0.0001	0.01	<0.0001	<0.0001	<0.0001	NA
Total Chronic Hazard Quotient	0.0131	<0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001	
Total, All Pathways	**0.0231**							

[a] CNS central nervous system
CV/BL cardiovascular/blood
GI/LV gastrointestinal/liver
Immun immunological system
Kidn renal system
Repro reproductive system
Resp respiratory
NA – not applicable

TABLE 8.6-7
Summary of Chronic Noncancer Hazard Quotients (Non-Inhalation Exposure Pathway) for the Maximum Exposed Individual

Chemical	Total Dose from Non-Inhalation Exposure Pathways (mg/kg-d)	REL[a] (mg/kg-d)	Hazard Quotient (Total Dose/REL)
Arsenic	7.78×10^{-8}	3×10^{-4}	2.59×10^{-4}
Lead	5.34×10^{-9}	--	--
PAHs (including Naphthalene)	2.23×10^{-8}	--	--

[a] REL noncancer Reference Exposure Level

The acute noncancer hazard quotients associated with concentrations in air are shown in Table 8.6-8. The noncancer hazard quotients for all target organs fall below one. The chemicals providing the largest contribution to acute noncancer health risks are ammonia and acrolein. As described previously, a hazard quotient less than one is unlikely to represent significant impact to public health. Further description of the methodology used to calculate health risks associated with emissions to the air is presented in Appendix 8.1C. As described previously, human health risks associated with emissions from the proposed facility are unlikely to be higher at any other location than at the MEI location. If no significant impact is associated with concentrations in air at the MEI location, it is unlikely that there would be significant impacts in any other location in the vicinity of the facility.

TABLE 8.6-8
Summary of Acute Noncancer Hazard Quotients for the Maximum Exposed Individual

	Modeled 1-hr Concentration ($\mu g/m^3$)				Acute Inhalation Hazard Index	
Pollutant Name	Combustion Sources	Cooling Tower	Acute REL, ($\mu g/m^3$)	Toxicological Endpoints	Combustion Sources	Cooling Tower
Acrolein	1.18E-02		1.90E-01	Eye irritation	6.18E-02	
Ammonia	4.35E+01		3.20E+03	Eye and respiratory irritation	1.36E-02	
Arsenic		1.87E-03	1.90E-01	Reproductive/ Developmental		9.83E-03
Benzene	1.06E-02		1.30E+03	Reproductive/ Developmental	8.15E-06	
Copper		8.71E-04	1.00E+02	Respiratory Irritation		8.71E-06
Formaldehyde	6.54E-01		9.40E+01	Eye irritation	6.96E-03	
Propylene oxide	9.42E-02		3.10E+03	Eye and respiratory irritation	3.04E-05	
Toluene	4.23E-01		3.70E+04	CNS (mild); Eye and respiratory irritation	1.14E-05	
Xylenes	2.08E-01		2.20E+04	Eye and respiratory irritation	9.45E-06	
Total Acute Hazard Index					**0.092**	

8.6.3.2.2 Characterization of Risks from Toxic Air Pollutants

The estimates of excess lifetime cancer risks and noncancer risks associated with chronic or acute exposures fall below thresholds used for regulating emissions of toxic pollutants to the air. Historically, exposure to any level of a carcinogen has been considered to have a finite risk of inducing cancer. In other words, there is no threshold for carcinogenicity. Since risks at low levels of exposure cannot be quantified directly by either animal or epidemiological studies, mathematical models have been used to extrapolate 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 man is as sensitive as the most sensitive animal species). Therefore, the true risk is not likely to be higher than risks estimated using unit risk factors and is most likely lower, and could even be zero (USEPA, 1986; USEPA, 1996).

An excess lifetime cancer risk of 1×10^{-6} is typically used as a threshold of significance for potential exposure to carcinogenic substances in air. The excess cancer risk level of 1×10^{-6} which has historically been judged to be an acceptable risk originates from efforts by the Food and Drug Administration (FDA) to use quantitative risk assessment for regulating carcinogens in food additives in light of the zero tolerance provision of the Delany Amendment (Hutt, 1985). The associated dose, known as a "virtually safe dose" (VSD) has become a standard used by many policy makers and the lay public for evaluating cancer risks. However, a recent study of regulatory actions pertaining to carcinogens found that an acceptable risk level can often be determined on a case-by-case basis. This analysis of 132 regulatory decisions, found that regulatory action was not taken to control estimated risks below 1×10^{-6} (one-in-one million), which are called *de minimis* risks. *De minimis* risks are historically considered risks of no regulatory concern. Chemical exposures with risks above 4×10^{-3} (four-in-ten thousand), called *de manifestis* risks, were consistently regulated. *De manifestis* risks are typically risks of regulatory concern. The risks falling between these two extremes were regulated in some cases, but not in others (Travis et al, 1987).

The estimated lifetime cancer risks to the MEI are less than 1×10^{-6}, and the aggregated cancer burden associated with this risk level is less than one excess cancer case. These risk estimates were calculated using assumptions that are highly health conservative. Evaluation of the risks associated with the facility emissions should consider that the conservatism in the assumptions and methods used in risk estimation considerably overstate the risks from facility emissions. Based on the results of this risk assessment, there are no significant public health impacts anticipated from emissions of toxic pollutant to the air from the proposed facility.

8.6.3.3 Hazardous Materials

Hazardous materials will be used and stored at the facility. The hazardous materials stored in significant quantities on-site and descriptions of their uses are presented in Section 8.12. Use of chemicals at the proposed facility will be in accordance with standard practices for storage and management of hazardous materials. Normal use of hazardous materials, therefore, will not pose significant impacts to public health. While mitigation measures will be in place to prevent releases, accidental releases that migrate off-site could result in potential impacts to the public.

California Health and Safety Code Sections 25531 to 25541 and Code of Federal Regulations (CFR) Title 40 Part 68 (under the Clean Air Act) establish emergency response planning

requirements for acutely hazardous materials. The regulations (19 CCR, Division 2, Chapter 4.5 [CalARP]) require preparation of a Risk Management Plan (RMP), which is a comprehensive program to identify hazards and predict the areas that may be affected by a release of an acutely hazardous material (AHM). AHMs to be used at the proposed facility include aqueous ammonia as discussed in Section 8.12. Aqueous ammonia may generate hazardous gases that could migrate off-site when released.

A vulnerability analysis will be performed during the AFC process to assess potential risks to humans at various distances from the site if a spill from or rupture of the aqueous ammonia storage tank were to occur.

8.6.3.4 Operation Odors

Small amounts of ammonia used to control oxides of nitrogen (NO_x) emissions may escape up the exhaust stack, but would not produce operational odors. The expected exhaust gas ammonia concentration, known as ammonia "slip," will be less than 10 parts per million (ppm). After mixing with the atmosphere, the concentration at ground level will be far below the detectable odor threshold of 5 ppm that the Compressed Gas Association has determined to be acceptable. Therefore, potential ammonia emissions are not expected to create objectionable odors. Other combustion contaminants will not be present at concentrations that could produce objectionable odors.

8.6.4 Mitigation Measures

8.6.4.1 Criteria Pollutants

Emissions of criteria pollutants will be minimized by applying Best Available Control Technology (BACT) to the facility. BACT for the combustion turbine includes the combustion of natural gas.

The proposed project location is in an area that is designated by the state as nonattainment for ozone and particulate matter (PM). Therefore, all increases in emissions of NO_x, VOC, particulate matter with an aerodynamic diameter less than a nominal 10 micrometers (PM_{10}), and sulfur oxides (SO_x) must be fully offset if emissions exceed specified trigger limits. The combination of using BACT and providing emission offsets as needed will result in no net increase in criteria pollutants. Therefore, further mitigation of emissions are not required to protect public health.

8.6.4.2 Toxic Pollutants

Emissions of toxic pollutants to the air will be minimized through the use of natural gas as the only fuel at the proposed facility.

8.6.4.3 Hazardous Materials

Mitigation measures for hazardous materials are presented below and discussed in more detail in Section 8.12. Potential public health impacts from the use of hazardous materials are only expected to occur as a result of an accidental release. The plant has many safety features designed to prevent and minimize impacts from the use and accidental release of hazardous materials. The CPP will include the following design features:

- Curbs, berms, and/or concrete pits will be provided where accidental release of chemicals may occur.
- A fire protection system will be installed to detect, alarm, and suppress a fire, in accordance with the applicable laws, ordinances, regulations, and standards (LORS).
- Construction of the aqueous ammonia storage system will be in accordance with applicable LORS.

An RMP for the CPP facility will be prepared prior to commencement of facility operations. The RMP will estimate the risk presented by handling ammonia at the facility. The RMP will include a hazard analysis, off-site consequence analysis, seismic assessment, emergency response plan, and training procedures. The RMP process will accurately identify and propose adequate mitigation measures to reduce the risks associated with accidental ammonia releases.

A safety program will be implemented and will include safety training programs for contractors and operations personnel, including instructions on 1) the proper use of personal protective equipment, 2) safety operating procedures, 3) fire safety, and 4) emergency response actions. The safety program will also include programs on safely operating and maintaining systems that use hazardous materials. Emergency procedures for CPP personnel include power plant evacuation, hazardous material spill cleanup, fire prevention, and emergency response.

Areas subject to potential leaks of hazardous materials will be paved and bermed. Incompatible materials will be stored in separate containment areas. Containment areas will be drained to either an oily waste collection sump or to the wastewater neutralization tank. Also, piping and tanks exposed to potential traffic hazards will be additionally protected by traffic barriers.

8.6.5 References

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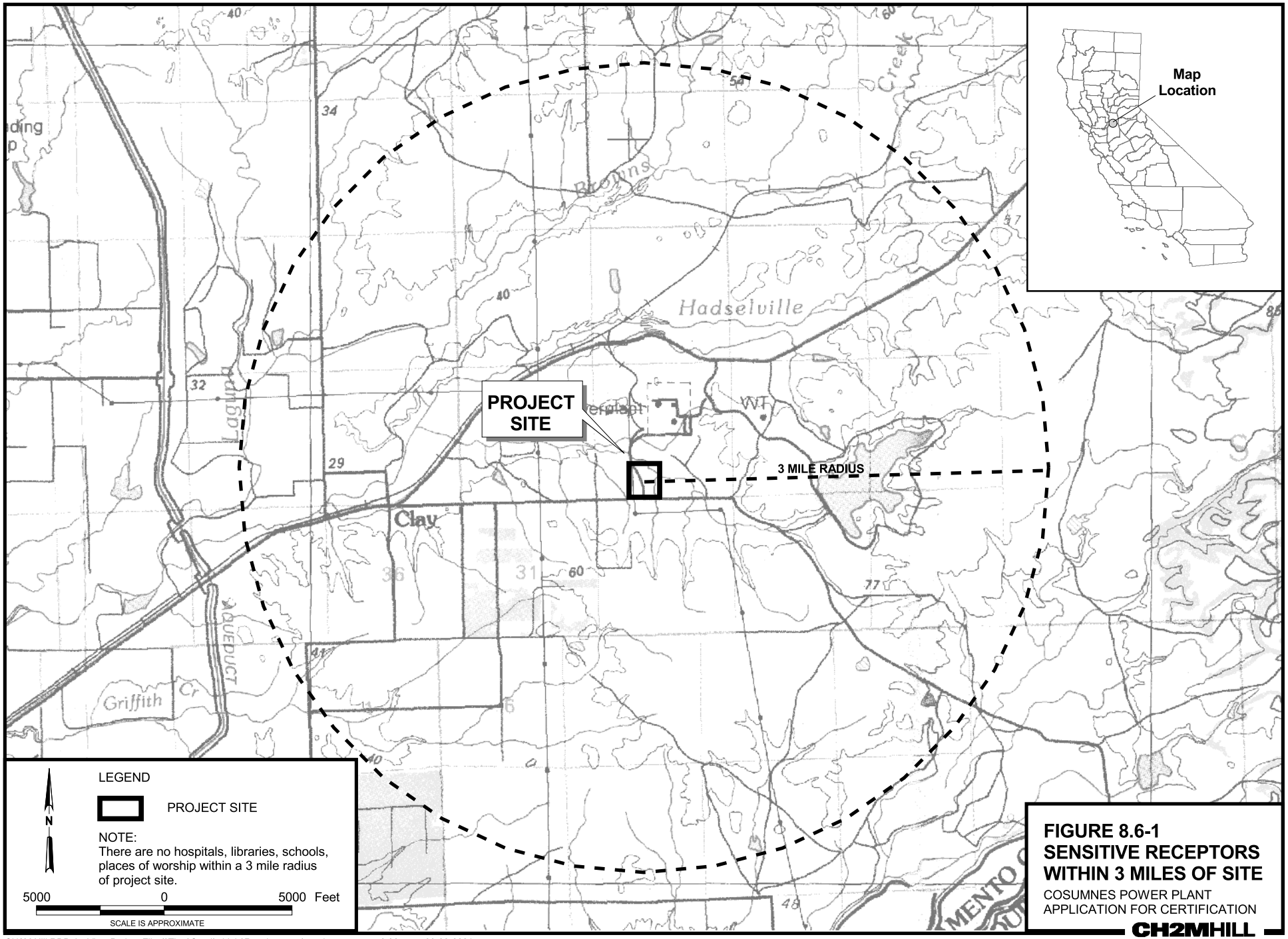

FIGURE 8.6-1
SENSITIVE RECEPTORS WITHIN 3 MILES OF SITE
COSUMNES POWER PLANT
APPLICATION FOR CERTIFICATION

CH2MHILL

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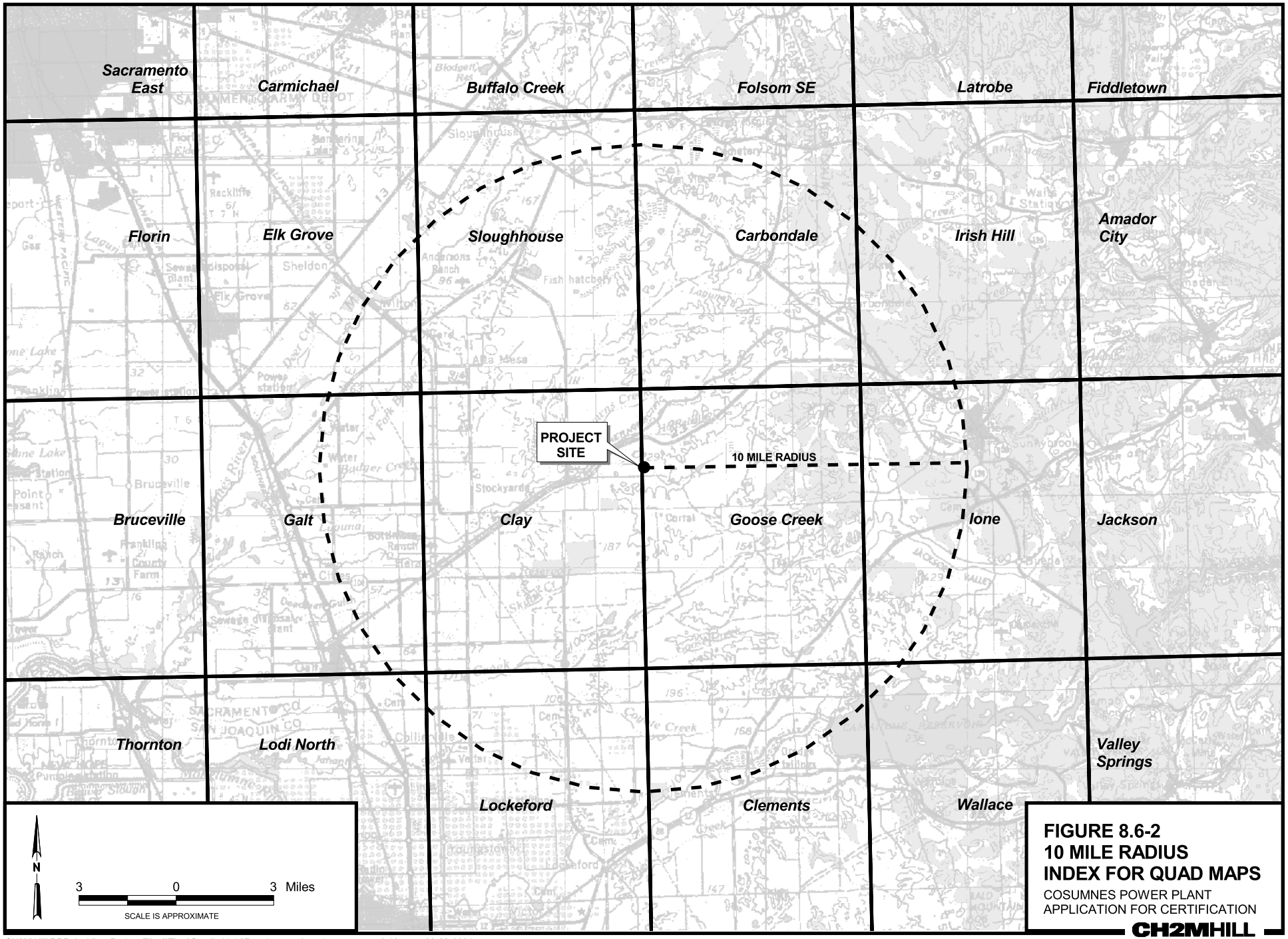

FIGURE 8.6-2
10 MILE RADIUS
INDEX FOR QUAD MAPS

COSUMNES POWER PLANT
APPLICATION FOR CERTIFICATION

CH2MHILL

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