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6.1 AIR QUALITY

This SPPE Application is for the construction and operation of the ECGS Unit 3 Repower Project. The Project will be owned and operated by IID ("the Applicant") and will utilize the existing staffing at the ECGS. IID is an irrigation district established under Division 11 of the California water code, Sections 20500 et seq., that provides electrical power, non-potable water, and farm drainage services to the lower southeastern portion of the California desert, primarily in Imperial County. ECGS Unit 3 will continue to serve the growing electrical load demands of the region. The Project consists of replacing the existing CE boiler with a GE Frame 7EA dry low NO_x CTG and HRSG to supply steam to the existing Westinghouse STG. The generator output from the Unit 3 Repower Project will be stepped-up to transmission voltage and interconnected to the existing IID El Centro Switching Station also located within the ECGS Site.

Most of the existing ECGS systems will continue to be used with only minor modifications. Systems that will continue to be used include the STG, cooling system, water treatment system, water supply system, control room, fire system, ammonia system, site access during operations, and electrical El Centro Switching Station.

The Project consists of two major Project areas:

- Project Site – new Unit 3 CTG/HRSG, minor modifications to the existing Unit 3 cooling tower, replacement of the Unit 3 condenser, minor modifications to Unit 3 STG, the 92 kV electrical interconnection and modifications to the existing gas interconnection facilities.
- Temporary Construction Area – construction parking, construction trailers, and construction laydown area.

The total Project disturbance will be 12.5 acres, all of which is within the ECGS Site.

This analysis of the potential air quality impacts of the Unit 3 Repower Project at the ECGS in El Centro, Imperial County, California, has been conducted according to CEC power plant siting requirements. The analysis also addresses ICAPCD permitting requirements for Determination of Compliance/Authority to Construct (DOC/ATC). The details of the analysis are contained in the following sections:

- Section 6.1.1, Affected Environment, describes the local environment surrounding the ECGS. The most representative meteorological data, including wind speed and direction, temperature, relative humidity, and precipitation, and the most representative recent ambient concentration measurements for criteria air pollutants are summarized.
- Section 6.1.2, Environmental Consequences, evaluates the Project's maximum potential air quality impacts due to the Project's emissions of nitrogen oxides (NO_x), carbon monoxide (CO), sulfur oxides (SO_x), reactive organic compounds (ROC), particulate matter less than 10 micrometers in diameter (PM_{10}), and particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$). Emission estimates are presented for these pollutants for Project construction and operation over a range of operating modes, including commissioning, startups and shutdowns. The modeling analysis conducted for nitrogen dioxide (NO_2), CO, sulfur dioxide (SO_2), and PM_{10} is presented; the results show that the Project will not cause or significantly contribute to exceedances of the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS).

- Section 6.1.3, Cumulative Impacts, addresses the cumulative impacts of the Project emissions with other potential new sources of air pollution in the El Centro area.
- Section 6.1.4, Mitigation Measures, describes the Project emission offsets strategy, including ERCs that are proposed to offset Project sources.
- Section 6.1.5, Laws, Ordinances, Regulations, and Standards, describes all applicable LLORS. This section also provides an analysis of BACT for combined cycle natural gas-fired turbines, and explains how the use of dry low emissions combustors and SCR with ammonia injection meet NO_x requirements for BACT, and how the use of an CO oxidation catalyst meets the CO BACT requirements.
- Section 6.1.6, Involved Agencies and Agency Contacts, lists the agency personnel contacted during preparation of the air quality assessment.
- Section 6.1.7, Permits and Permitting Schedule, lists the air quality permits required for the Project and provides a permit schedule.
- Section 6.1.8, References, lists the references used to conduct the air quality assessment.

Some air quality data are presented in other sections of this SPPE Application, including an evaluation of toxic air pollutants (see Section 6.8, Public Health and Safety) and information related to the fuel characteristics, heat rate, and startup and operating limits (see Section 2.0, Project and Facility Description).

6.1.1 Affected Environment

This section describes the regional climate and meteorological conditions that influence the transport and dispersion of air pollutants, as well as the existing air quality within the Project region. The data presented in this section are representative of the Project Site.

The Unit 3 Repower Project will be implemented at the existing ECGS at 485 East Villa Avenue in the northeast portion of the City of El Centro, California. The Project Site is within approximately 24 miles (39 kilometers) of complex terrain (i.e., elevations exceeding the proposed Unit 3 stack height of 100 feet), and is surrounded by generally vacant or agricultural land to the east, northeast, and north. The City of El Centro lies to the northwest, west, southwest, south, and southeast. Topography within a 6- and 10-mile radius of the Project Site is shown on Figure 6.1-1, Topography within a 6- and 10-mile Radius of the Project Site. The nearest residence is approximately 0.5 mile (800 meters) due west of the new Unit 3 CTG/HRSG location but approximately 400 meters west of the ECGS fenceline. The nearest Class I area is Joshua Tree National Park (JTNP), the closest part of which is about 62 miles (98 kilometers) north from the ECGS.

6.1.1.1 Meteorology and Climate

Imperial County is classified as having a desert climate characterized by low precipitation, hot summers, mild winters, low humidity, and strong temperature inversions. It is separated from the coastal regions by the San Jacinto and Santa Rosa mountain ranges to the northwest and west. To the north (approximately 108 miles), the San Gorgonio Pass represents a passageway between the interior and coastal portions of southern California. The area's climatic conditions

are strongly influenced by the large-scale sinking and warming of air in the semi-permanent subtropical high-pressure center over the eastern Pacific. This high-pressure system effectively blocks out most mid-latitude storms, except in winter when the ridge is weaker and farther south. The coastal mountains on the western edge of the Imperial Valley also have a major influence on climate, serving as a meteorological boundary that effectively removes moisture from the marine air flowing from the Pacific. An annual wind rose representing data collected during the years 1991 to 1995 is presented on Figure 6.1-2, Windrose for all Months 1991-1995, Imperial County Airport. Wind roses for all calendar quarters are provided in Appendix B, Air Quality Data, Attachment A, Quarterly Wind Roses for Imperial County Airport.

The generally flat terrain of the valley floor in the Salton Sea area, combined with the strong temperature differentials created by intense solar heating, produce moderate winds and deep thermal convection currents. The combination of subsiding air, protective mountains, and distance from the ocean all combine to severely limit precipitation. The valley area experiences surface inversions in the early morning hours almost every day of the year, causing air stagnation. These inversions are usually broken by noon due to solar heating.

Temperature and precipitation means and extremes from the nearest long-term National Weather Service (NWS) station in El Centro over a 30-year period (1971-2000) are presented in Table 6.1-1, Average Temperatures and Precipitation in Imperial County (1971-2000). The coordinates of this weather station are: latitude 32°46'N, longitude 115°34'W. The hottest month, July, has an average maximum temperature of 107.0ºF and an average minimum temperature of 75.8°F. The coldest month, December, has an average maximum temperature of 69.7°F, and an average minimum temperature of 40.5°F.

TABLE 6.1-1
AVERAGE TEMPERATURES AND PRECIPITATION IN IMPERIAL COUNTY (1971-2000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average Max Temperature (°F)	70.2	74.5	79.3	86.1	94.0	103.4	107.0	105.7	101.1	90.9	78.1	69.7	88.3
Average Min Temperature (°F)	41.3	44.9	48.7	53.5	60.6	68.4	75.8	76.6	70.6	59.2	47.3	40.5	57.3
Precipitation (in)	0.51	0.36	0.31	0.05	0.03	0.01	0.06	0.32	0.36	0.35	0.17	0.43	2.96

Notes:
°F = degrees Fahrenheit
in = inches
Max = maximum
Min = minimum
Source: El Centro 2 SSW Weather Station of US Weather Service

During winter, the semi-permanent, subtropical high-pressure system over the Pacific Ocean moves south, allowing the passage of frontal systems that bring most of the area's annual precipitation, which totals about 3 inches on average. Monthly mean precipitation amounts at El Centro range from 0.51 inch in January to 0.01 inch in June. During summer, migrating storm

systems are blocked by the semi-permanent Pacific high, and rain associated with these storms is scarce. Relative humidity levels are generally very low. In the summer, relative humidity averages 30 to 50% in the early morning and 10 to 20% in the afternoon.

Desert regions are inclined to be windy since little friction is generated between the moving air and the low, sparse vegetation cover. In addition, the rapid daytime heating of the lower layer of air over the desert leads to convective activity. This exchange between lower and upper air tends to accelerate surface winds during the warm part of the day when convection is at a maximum. During the winter months the surface heating is not as intense, and the rapid cooling of the surface layers at night retards this exchange of momentum. As a result, winds are generally calmer in winter, except during the passage of frontal storm systems. During all seasons, the prevailing wind direction is predominantly from the west and west-southwest.

6.1.1.2 Existing Air Quality

All ambient air quality data presented in this section were published by the California Air Resources Board (CARB) on the ADAM Web site and/or by USEPA on the AIRS data Web site. Ambient air concentrations of ozone (O_3), NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$ and airborne lead are recorded at monitoring stations throughout Imperial County, with each monitoring station generally recording measurements for a subset of these criteria pollutants. Therefore, existing air quality conditions at the ECGS are necessarily represented using data from several different monitoring stations. The monitoring stations have been generally positioned to represent area-wide ambient conditions, rather than the localized impacts of any particular facility or area. In remote, rural areas of the county, pollutant concentrations are not expected to vary significantly from one location to the next since the emission sources are few and widely distributed. However, concentrations of pollutants emitted by industrial and vehicular sources are generally higher in the more populated areas of El Centro and Calexico than in the rest of the county.

The nearest air quality monitoring station to the Project Site is the El Centro – 9th Street, which measures O_3, NO_2, CO, PM_{10}, and $PM_{2.5}$. This station is located 1.5 miles southwest of the ECGS. The Calexico Ethel Street station, 11 miles to the southeast, is the nearest monitoring location where ambient SO_2 concentrations are measured. Data from both of these stations are considered to be reasonably representative of background air pollutant levels at the Project Site and are used for this purpose in the modeling analyses described later in this section.

Ozone (O_3)

Ozone. Ozone is an end product of complex reactions between ROC and NO_x in the presence of intense ultraviolet radiation. ROC and NO_x emissions from vehicles and stationary sources, combined with daytime wind flow patterns, mountain barriers, a persistent temperature inversion, and intense sunlight, result in high ozone concentrations. For purposes of state and federal air quality planning, the entire Salton Sea Air Basin, which includes Imperial County, has been designated a nonattainment area for O_3.

Table 6.1-2, Existing Ozone Levels at El Centro -9th Street, shows the background ozone levels at the El Centro – 9th Street station for the period 2001-2005. As seen in the table, the 1-hour O_3 NAAQS of 0.12 ppm was exceeded two times in 2001 and two times in 2003, with a maximum concentration of 0.135 ppm recorded in 2001. The more stringent state O_3 CAAQS of 0.09 ppm has been exceeded in each year of the monitoring record (19 times each in 2002 and 2003).

TABLE 6.1-2
EXISTING OZONE LEVELS AT EL CENTRO – 9th STREET

El Centro – 9th Street Station	2001	2002	2003	2004	2005
Maximum 1-Hour Average Concentration (ppm)	0.135	0.122	0.130	0.096	0.122
Number of Days Exceeding California 1-Hour Standard (0.09 ppm)	13	19	19	1	8
Number of Days Exceeding Federal 1-Hour Standard (0.12 ppm)	2	0	2	0	0
Maximum 8-Hour Average Concentration (ppm)	0.092	0.098	0.092	0.080	0.097
Number of Days Exceeding Federal 8-Hour Standard (0.08 ppm)[1]	2	9	8	0	5
% Data Capture by Year	60	99	98	95	98

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html)
USEPA AIRS Web site (www.epa.gov/air/data/index.html)

[1] Number of days with an 8-hour average exceeding federal standard concentration of 0.08 ppm. The regulatory standard is to maintain 0.08 ppm as a 3-year average of the fourth-highest daily maximum. Therefore, number of days exceeding standard concentration is not the number of violations of the standard for the year.

ppm = parts per million

The federal 8-hour O_3 NAAQS requires that the 3-year average of the fourth-highest concentration values for consecutive years be maintained at or below 0.08 ppm. Therefore, the number of days in each year with maximum 8-hour concentrations above the standard concentration in Table 6.1-2, Existing Ozone Levels At El Centro -9th Street, does not equate to the number of violations. However, the highest 3-year (2001-2003) average of the fourth-highest 8-hour concentrations at the El Centro – 9th Street station was 0.087 ppm, which is higher than the allowable 0.08 ppm, as was the equivalent value for 2003-2005 (0.085 ppm).

Nitrogen Dioxide (NO_2)

NO_2 is formed primarily from reactions in the atmosphere between NO (nitric oxide) and O_2 or O_3. NO is formed in high-temperature combustion processes, when the nitrogen and O_2 in the combustion air combine. Although NO is considered less harmful to human health than NO_2, it can be converted to NO_2 in the atmosphere within a matter of hours, or even minutes, under certain conditions. The control of NO and NO_2 emissions is also important because of the role of both compounds in the atmospheric formation of ozone.

Historical data presented in Table 6.1-3, NO_2 Levels at El Centro – 9th Street, show maximum and average NO_2 levels at the El Centro station for the years 2001 through 2005. This station is the closest monitoring location to the Project Site for NO_2 concentrations. For purposes of both state and federal air quality planning, the Salton Sea Air Basin is in attainment with regard to NO_2. During the last 5 years, there have been no violations of the CAAQS 1-hour standard (0.25 ppm) at the El Centro station. The highest 1-hour concentration recorded during this period was 0.096 ppm in 2002. The table also shows that there were no violations of the annual NAAQS (0.053 ppm) at this station during the last 5 years.

TABLE 6.1-3
NO_2 LEVELS AT EL CENTRO – 9th STREET

El Centro – 9th Street Station	2001	2002	2003	2004	2005
Maximum 1-Hour Average Concentration (ppm)	0.082	0.096	0.071	0.067	0.065
Annual Average Concentration (ppm)	0.019	0.011	0.012	0.013	0.011
Days Over State Standard (0.25 ppm, 1-hour)	0	0	0	0	0
Percent Data Capture by Year	41	46	77	78	98

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html)
USEPA AIRS Web site (www.epa.gov/air/data/index.html)
ppm = parts per million
NO_2 = nitrogen dioxide
% = percent

Carbon Monoxide

CO is a product of incomplete combustion, and is emitted principally from automobiles and other mobile sources of pollution, although it is also a product of combustion from stationary sources (both industrial and residential) burning fossil fuels. Peak CO levels occur typically during winter months due to a combination of higher emission rates and stagnant weather conditions.

Table 6.1-4, CO Levels at Imperial County Monitoring Stations, shows the available data on maximum 1- and 8-hour average CO levels recorded at the El Centro – 9th Street station (the closest station providing CO monitoring data) during the period from 2001 to 2005. As indicated by this table, the maximum 1-hour average CO levels comply with the NAAQS and CAAQS (30.0 ppm and 20.0 ppm, respectively) and the maximum 8-hour values comply with the NAAQS and CAAQS of 9.0 ppm. However, the maximum values occurring at the El Centro monitoring stations have occasionally approached these standards rather closely in recent years. The maximum 1- and 8-hour CO concentrations in the last 5 years have been 16.0 ppm and 6.1 ppm, respectively, both in 2001.

TABLE 6.1-4
CO LEVELS AT IMPERIAL COUNTY MONITORING STATIONS

El Centro – 9th Street	2001	2002	2003	2004	2005
Maximum 1-Hour Average (ppm)	16.0	6.4	14.3	0.3	0.3
Maximum 8-Hour Average (ppm)	6.1	2.9	2.6	0.3	0.3
Days Over the 1-Hour California Standard (20 ppm)	0	0	0	0	0
Days Over the 8-Hour California Standard (9 ppm)	0	0	0	0	0
Days Over the 8-Hour Federal Standard (9 ppm)	0	0	0	0	0
Percent Data Capture by Year	87.9	94.7	68	12	47

TABLE 6.1-4
CO LEVELS AT IMPERIAL COUNTY MONITORING STATIONS

Calexico – Ethel Street	2001	2002	2003	2004	2005
Maximum 1-Hour Average (ppm)	17.4	15.6	11.8	12.4	9.4
Maximum 8-Hour Average (ppm)	12.33	11.56	8.76	10.33	5.43
Days Over the 1-Hour California Standard (20 ppm)	0	0	0	0	0
Days Over the 8-Hour California Standard (9 ppm)	6	4	0	1	0
Days Over the 8-Hour Federal Standard (9 ppm)	6	3	0	1	0
% Data Capture by Year	99	100	98	97	94
Calexico - East	**2001**	**2002**	**2003**	**2004**	**2005**
Maximum 1-Hour Average (ppm)	18.0	12.4	11.5	12.6	9.7
Maximum 8-Hour Average (ppm)	8.00	7.41	8.53	7.41	7.76
Days Over the 1-Hour California Standard (20 ppm)	0	0	0	0	0
Days Over the 8-Hour California Standard (9 ppm)	0	0	0	0	0
Days Over the 8-Hour Federal Standard (9 ppm)	0	0	0	0	0
% Data Capture by Year	97	93	95	97	97

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html)
USEPA AIRS Web site (www.epa.gov/air/data/index.html)
% = percent
CO = carbon monoxide
ppm = parts per million

CO concentration data at El Centro – 9th Street were reported for the 2004 and 2005 monitoring years, but these data do not appear to be valid. Accordingly, data from the two other Imperial County CO monitoring stations have been included in Table 6.1-4, CO Levels at Imperial County Monitoring Stations, in addition to the El Centro-9th Street information.

The Calexico Ethel Street and Calexico East stations are located on the US-Mexico border, and are respectively about 10 miles south-southeast and 14 miles southeast of the El Centro – 9th Street monitoring station (see Figure 6.1-3, Locations of Imperial County Air Quality Monitoring Stations). Apparently, the much larger urban area of Calexico and Mexicali that straddles the border has resulted in consistently higher CO levels in this area than in El Centro, especially with regard to 8-hour average concentrations. Accordingly, the incomplete data record for El Centro - 9th Street is believed to be more representative of local conditions near ECGS and the highest 1- and 8-hour concentrations from that station (through 2003) have been selected to represent background CO levels in the dispersion modeling simulations described later in this section.

Sulfur Dioxide

SO_2 is produced by the combustion of any sulfur-containing fuel. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Natural gas contains nearly negligible sulfur, while fuel oils may contain much larger amounts. Because of the complexity of the chemical reactions that convert SO_2 to other compounds (such as sulfates), peak

concentrations of SO_2 occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography. The Salton Sea Air Basin is considered to be in attainment for SO_2 for purposes of state and federal air quality planning.

Background SO_2 data are provided in Table 6.1-5, SO_2 Levels at Calexico - Ethel Street, the only monitoring station in Imperial County that collects SO_2 data. The maximum 1-hour average SO_2 levels presented in Table 6.1-5 show that the CAAQS of 0.25 ppm has not been exceeded in the past 5 years; the maximum 1-hour value during this period was nearly an order of magnitude below the standard (0.003 ppm in 2001). The 3-hour federal secondary standard of 0.5 ppm has not been exceeded, and the maximum measured concentrations for this averaging time was only 0.003 ppm in 2004.

TABLE 6.1-5
SO_2 LEVELS AT CALEXICO - ETHEL STREET

Calexico – Ethel Street Station	2001	2002	2003	2004	2005
Highest 1-hour average (ppm)	0.003	0.002	0.001	0.003	0.001
Highest 3-hour average (ppm)	0.003	0.001	0.001	0.003	0.001
Highest 24-hour average (ppm)	0.002	0.001	0.001	0.003	0.001
Annual Average (ppm)	0.001	0.001	0.001	0.001	0.001
Days Over 1-hour State Standard (0.25 ppm)	0	0	0	0	0
Days Over 24-hour State Standard (0.04 ppm)	0	0	0	0	0
Days Over 3-hour Federal Standard (0.5 ppm)	0	0	0	0	0
Days Over 24-hour Federal Standard (0.14 ppm)	0	0	0	0	0
Days Over the Annual Federal Standard (0.03 ppm)	0	0	0	0	0
% Data Capture by Year	89.9	92	99	99	80

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html)
USEPA AIRS Web site (www.epa.gov/air/data/index.html)
% = percent
SO_2 = sulfur dioxide
ppm = parts per million

The SO_2 data in Table 6.1-5, SO_2 Levels at Calexico-Ethel Street, show that neither the 24-hour CAAQS of 0.04 ppm nor the 24-hour NAAQS of 0.14 ppm has been exceeded or closely approached in the past 5 years. The highest recorded 24-hour average concentration was 0.003 ppm in 2004. The annual SO_2 monitoring data in the table demonstrate that the annual arithmetic mean concentrations have also been well below the NAAQS of 0.03 ppm for all years, with average concentrations remaining consistently at 0.001 ppm.

Particulate Matter

Particulates in the air are caused by a combination of windblown fugitive dust; particles emitted from combustion sources (usually carbon particles); and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, SO_x, and NO_x. In 1984, CARB adopted standards for PM_{10}, and phased out the total suspended particulate (TSP) standards that had previously been in effect. PM_{10} standards were substituted for TSP standards because PM_{10} corresponds to the size range of respirable particulates related to human health effects. In 1987, USEPA also

replaced national TSP standards with PM_{10} standards. For air quality planning purposes, the Salton Sea Air Basin is considered to be in nonattainment of both federal and state PM_{10} standards. However, the state demonstrated that Imperial County would have met the federal standard if not for emissions coming into the area from outside the United States.

Table 6.1-6, PM_{10} Levels at El Centro – 9th Street, shows the maximum PM_{10} levels recorded at the El Centro monitoring station during the period from 2001 through 2005 and the available information on arithmetic annual averages for the same period (the arithmetic annual average is simply the arithmetic mean of all daily observations within a calendar year). PM_{10} is monitored based on differing state and federal protocols in California. The state standard is referenced to gravimetric or beta attenuation sampling methods, while federal standards are based on an inertial separation and gravimetric analysis. This accounts for the differing 24-hour concentrations listed in Table 6.1-6 for the state and federal samplers.

TABLE 6.1-6
PM_{10} LEVELS AT EL CENTRO – 9th STREET

El Centro – 9th Street	2001	2002	2003	2004	2005
Maximum H1H Daily Average (federal sampling protocol) ($\mu g/m^3$)[1]	383	263	180	135	81
Maximum H2H Daily Average (federal sampling protocol) ($\mu g/m^3$)[1]	85	84	107	88	62
Maximum H1H Daily Average (state sampling protocol) ($\mu g/m^3$)[2]	375	254	181	132	65
Maximum H2H Daily Average (state sampling protocol) ($\mu g/m^3$)[2]	83	85	140	84	53
Annual Arithmetic Mean (based on federal sampling) ($\mu g/m^3$)[1]	46	46	46	38	34
Annual Arithmetic Mean (based on state sampling) ($\mu g/m^3$)[2]	ID	45.6	48.6	ID	ID
Number of Days Exceeding Federal Standard	1	1	1	0	0
Estimated Number of Days Exceeding California Standard	16	18	25	7	3
% Data Capture by Year	87	96	93	80	89

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html)
USEPA AIRS Web site (www.epa.gov/air/data/index.html)

Notes:
[1]Data from EPA AIRS site
[2]Data from CARD ADAM site
H1H = high first high
H2H = high second high
ID = Insufficient data available to determine valid annual average concentration
$\mu g/m^3$ = micrograms per cubic meter
% = percent
PM_{10} = particulate matter less than 10 micrometers in diameter

At the El Centro station, the maximum 24-hour PM_{10} levels exceed the 24-hour CAAQS of 50 micrograms per cubic meter ($\mu g/m^3$) many times per year, although the federal 24-hour standard was either not exceeded or exceeded only once in each of the last 5 years. The maximum concentration was 383.0 $\mu g/m^3$ (federal testing) in 2001. The highest annual arithmetic mean concentration recorded at El Centro was 48.6 $\mu g/m^3$ in 2003. The highest first high (H1H) daily concentration over the past 5 years will be used to represent background air quality in the modeling analysis, but it is important to note the dramatic reduction in monitored values over the past 5 years. Also, there is a significant drop-off between the H1H and the highest second high (H2H) monitored concentration in 2001 through 2004. It is possible that

there were high wind events during these 24-hour periods. It might be more appropriate to use the H2H values in the modeling analysis, but H1H values are used.

Fine Particulates

The $PM_{2.5}$ data in Table 6.1-7, $PM_{2.5}$ Levels at El Centro – 9th Street (the closest station providing $PM_{2.5}$ monitoring data), show that the federal 24-hour average NAAQS of 65 µg/m^3 has been exceeded only once in the past 5 years (2004). The maximum 24-hour $PM_{2.5}$ background concentration of 74.2 µg/m^3 was measured at the El Centro monitoring station in 2004. Annual arithmetic mean concentrations of $PM_{2.5}$ at the El Centro monitoring station were reported only for 2003 and 2004. The next closest station that maintains annual average data is the Indio – Jackson Street station. However, since that station is located in an urban area over 85 miles north of the Salton Sea, the data are not representative of the Project study area. Annual data available for two of the past 5 years from the Calexico – Ethel Street station indicate that it has exceeded the federal standard of 15 µg/m^3 and California standard of 12 µg/m^3 in both 2002 and 2004, with a maximum concentration of 16.1 µg/m^3 in 2004.

TABLE 6.1-7
($PM_{2.5}$ LEVELS AT EL CENTRO – 9th STREET

El Centro – 9th Street	2001	2002	2003	2004	2005
Maximum Daily Average (federal sampling protocol) (µg/m^3)[1]	24	29	26	74	58
Maximum Daily Average (state sampling protocol) (µg/m^3)[2]	23.5	28.9	26.0	74.2	21.8
Federal Annual Arithmetic Mean (µg/m^3)[1]	8.9	9.3	9.2	9.7	9.4
State Annual Arithmetic Mean (µg/m^3)[2]	ID	ID	9.2	9.7	ID
Number of Days Exceeding Federal Standard (65 µg/m^3)	0	0	0	1	0
% Data Capture by Year	79	80	94	90	53

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html)
USEPA AIRS Web site (www.epa.gov/air/data/index.html)
Notes:
[1]Data from EPA AIRS site
[2]Data from CARD ADAM site
ID = Insufficient data available to determine valid annual average concentration
µg/m^3 = micrograms per cubic meter
% = percent
$PM_{2.5}$ = particulate matter less than 2.5 emissions micrometers in diameter

Airborne Lead

Lead pollution has historically been emitted predominantly from fuel combustion sources. However, legislation in the early 1970s required gradual reduction of the lead content of gasoline. Coupled with the introduction of unleaded gasoline in 1975, lead levels have been dramatically reduced throughout the U.S., and violations of the ambient standards for this pollutant have been virtually eliminated.

Table 6.1-8, Lead Levels at Calexico – Ethel Street, shows the recorded 24-hour and quarterly lead concentration averages at the Calexico – Ethel Street station for the years 2001 through 2005. Both state and federal standards limit long-term average lead concentrations to 1.5 µg/m^3, although NAAQS pertains to a quarterly average, while CAAQS applies to a 30-day average.

The maximum-recorded 24-hour level was 0.14 µg/m^3 during 2003. The maximum quarterly average at the Calexico – Ethel Street station was 0.02 µg/m^3 in 2001, and 2003-2005. Both maxima are far below the state and federal standards for lead.

TABLE 6.1-8
LEAD LEVELS AT CALEXICO – ETHEL STREET

Calexico – Ethel Street, Imperial County	2001	2002	2003	2004	2005
Maximum 24- hour Average (µg/m^3)	0.05	0.06	0.14	0.04	0.07
Maximum Quarterly Average (µg/m^3)	0.02	0.01	0.02	0.02	0.02

Sources: CARB ADAM Web site (www.arb.ca.gov/adam/welcome.html)
USEPA AIRS Web site (www.epa.gov/air/data/index.html)
µg/m^3 = micrograms per cubic meter

Particulate Sulfates

Particulate sulfates are the product of further oxidation of SO_2. Sulfate compounds consist of primary and secondary particles. Primary sulfate particles are directly emitted from open pit mines, dry lakebeds, and desert soils. Fuel combustion is another source of sulfates, both primary and secondary. Secondary sulfate particles are produced when SO_x emissions are transformed into particles through physical and chemical processes in the atmosphere. Particles can be transported long distances. The Salton Sea Air Basin is in attainment with the state standard for sulfates; there is no federal standard for this pollutant.

Other State-Designated Criteria Pollutants

Along with sulfates, California has designated hydrogen sulfide and visibility-reducing particles as criteria pollutants, in addition to the federal criteria pollutants. The Salton Sea Air Basin remains unclassified for both pollutants.

6.1.2 Environmental Consequences

This section evaluates the potential air quality impacts of the Project. Project impacts would be considered significant if the pollutant concentrations resulting from the Project, when combined with background concentrations, exceed an ambient air quality standard. Emissions estimates for all aspects of both construction and operation of the Project are presented. Dispersion model selection and the selection of model input data are also described (i.e., emissions scenarios and release parameters, building wake effects, meteorological data, and receptor locations) and analysis results are presented.

6.1.2.1 Construction Emissions

The primary emission sources during construction will include exhaust from heavy construction equipment and vehicles and fugitive dust generated in areas disturbed by grading, excavating, and erection of facility structures. The construction schedule calls for a portion of the existing ECGS Site to be disturbed during various construction phases. The construction effort will include replacement of some existing equipment with new equipment.

Construction equipment and vehicle exhaust emissions were estimated using equipment lists, fuel usage estimates, and construction scheduling information provided by the Project design engineering firm and provided in Section 2, Project Description (see Appendix B, Air Quality Data, Attachment B, Supporting Information for Estimation of Project Construction Emissions). Equipment-specific emissions factors were used to estimate mass emissions for all criteria pollutants from diesel- and gasoline-fueled construction equipment (USEPA 2004; USEPA 1995a, b). Assumptions that were included in calculating Project construction emissions included a 20-month construction period, an 8-hour workday and a 5-day workweek. The Project engineering contractor provided a list of equipment needed during each month of the construction effort, which is provided in Section 2, Project Description. This list served as the basis for estimating pollutant emissions throughout the term of construction, and helped to identify the periods of probable maximum short-term emissions. An ultra-low fuel sulfur content of 0.0015% by weight (15 ppm) was assumed for all diesel construction equipment operations.

Fugitive dust emissions resulting from onsite soil disturbances were estimated using USEPA emission factors for bulldozing and dirt-pushing, travel on unpaved roads and handling/storage of aggregate materials. A dust control efficiency of 90% for Project Site and Temporary Construction Area activities was assumed to be achieved for these activities by frequent watering when required.

Emissions from on-road delivery trucks and worker commute trips were estimated using emission factors developed by means of the EMFAC 2002 model, with inputs representing Imperial County. The majority of the construction workers were assumed to commute to the Project Site from the greater El Centro area.

Detailed spreadsheets are provided in Appendix B, Air Quality Data, Attachment B, Supporting Information for Estimation of Project Construction Emissions, showing the calculation of emissions from all Project construction activities and equipment. Table 6.1-9, Daily Maximum Construction Emissions of Criteria Pollutants, and Table 6.1-10, Total Project Construction Emissions of Criteria Pollutants, respectively, present the estimated maximum daily emissions and total emissions of air pollutants over the entire 20-month construction project.

TABLE 6.1-9
DAILY MAXIMUM CONSTRUCTION EMISSIONS OF CRITERIA POLLUTANTS (lbs/day)

Activity	ROC	CO	NO_x	PM_{10}	SO_x
On-site Combustion Emissions					
Construction – Diesel Equipment	6.88	40.12	69.93	4.24	0.09
Construction – Gasoline Equipment	2.17	75.85	0.86	0.04	0.49
Construction – Trucks	0.04	0.15	0.65	0.02	0.00
Construction Combustion Subtotal (lbs)	***9.09***	***116.12***	***71.43***	***4.30***	***0.58***
On-site Fugitive Dust Emissions					
Vehicle Travel on Unpaved Road and Parking Lot	-	-	-	6.28	-
Grading/Bulldozing	-		-	2.46	-

TABLE 6.1-9
DAILY MAXIMUM CONSTRUCTION EMISSIONS OF CRITERIA POLLUTANTS (lbs/day)

Activity	ROC	CO	NO_x	PM_{10}	SO_x
Earth Loading/Storage	-	-	-	0.014	-
Subtotal of On-site Emissions (lbs)	***9.09***	***116.12***	***71.43***	***13.04***	***0.58***
Off-site On-Highway Emissions					
Passenger Vehicle - Combustion Emissions	2.76	23.52	2.64	0.10	0.00
Delivery Truck - Combustion Emissions	0.03	0.13	0.54	0.03	0.00
Passenger Vehicle - Paved Road Dust	-	-	-	16.50	-
Delivery Truck - Paved Road Dust	-	-	-	2.40	-
Subtotal of Off-Site Emissions (lbs)	***2.79***	***23.65***	***3.18***	***19.03***	***0.01***
Total Max. Daily Emissions (lbs)	**11.9**	**139.8**	**74.6**	**32.1**	**0.59**

Notes:
- = not applicable
CO = carbon monoxide
lbs = pounds
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
ROC = reactive organic compounds
SO_x = sulfur oxide(s)

TABLE 6.1-10
TOTAL PROJECT CONSTRUCTION EMISSIONS OF CRITERIA POLLUTANTS

Activities	ROC	CO	NO_x	PM_{10}	SO_x
On-site Combustion Emissions (lbs)					
Construction – Diesel	380.2	2,275.4	3,700.6	225.2	4.5
Construction – Gasoline	138.6	5,345.0	49.8	1.9	38.5
Construction – Trucks	0.9	3.5	14.8	0.4	0.0
On-site Fugitive Dust Emissions (lbs)					
Vehicle Travel on Unpaved Road and Parking Lot	-	-	-	1,501.9	-
Grading /Bulldozing	-	-	-	147.4	-
Earth Loading/Storage	-	-	-	0.5	-
Subtotal of On-Site Emissions (lbs)	***519.7***	***7,623.9***	***3,765.2***	***1,877.4***	***43.1***
Offsite On-Highway Emissions (lbs)					
Passenger Vehicle - Combustion Emissions	1,186.8	10,113.6	1,135.2	42.1	2.0
Delivery Truck - Combustion Emissions	1.1	4.4	18.8	1.3	0.0
Passenger Vehicle - Paved Road Dust	-	-	-	7,096.7	-
Delivery Truck - Paved Road Dust	-	-	-	123.6	-
Subtotal of Off-site Emissions (lbs)	***1,187.9***	***10,118.0***	***1,154.0***	***7,263.8***	***2.0***
Total Project Emissions (lbs)	**1,707.6**	**17,741.9**	**4,919.2**	**9,141.2**	**45.1**
Total Project Emissions (tons)	**0.85**	**8.87**	**2.46**	**4.57**	**0.02**

Notes:
- = not applicable
CO = carbon monoxide
lbs = pounds
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
ROC = reactive organic compounds
SO_x = sulfur oxide(s)

6.1.2.2 Operational Emissions

The most important emission source of the Project will be the new Unit 3 CTG/HRSG burning natural gas fuel exclusively. Maximum short-term operational emissions from the CTG/HRSG were estimated from a comparative evaluation of potential emissions corresponding to normal operating conditions (including HRSG duct-firing), maintenance emissions, commissioning, and CTG startup/shutdown conditions. The long-term operational emissions from the CTG/HRSG were estimated by summing the emissions contributions from normal operating conditions (including duct-firing), maintenance emissions, and CTG startup/shutdown conditions. Estimated annual emissions of air pollutants for the CTG/HRSG have been calculated based on 7,980 hours of normal operation, up to 20 hours of maintenance (operation without SCR and CO oxidation catalyst), and up to 150 startup and shutdown events.

The criteria pollutant emission rates provided by the CTG/HRSG vendor for three load conditions (50%, 75%, and 100%) at three ambient temperatures (115°F, 73°F, and 40°F) are presented in Table 6.1-11A, 1-Hour Operating Emission Rates for CTG/HRSG Operating Load Scenarios - No Duct Firing, and Table 6.1-11B, 1-Hour Operating Emission Rates for CTG/HRSG Operating Load Scenarios - With Duct Firing. Separate emissions data are presented for the 100% load cases with the evaporative cooler on and off (for ambient temperatures of 115°F and 73°F only). Taken together, the combined scenarios in these two tables bound the expected normal operating range of the CTG/HRSG at the Project Site.

The Project will also include the continued operation of the existing Unit 3 cooling tower. A higher annual water circulation rate, and more efficient drift eliminators, will result in a relatively small change in the PM_{10} emissions from this unit relative to recent years. No other emissions sources at ECGS will change directly as a result of the Project.

TABLE 6.1-11A
1-HOUR OPERATING EMISSION RATES FOR CTG/HRSG OPERATING LOAD SCENARIOS – NO DUCT FIRING

Load	Exhaust Flow (acfm)	Exit Velocity (m/s)	Exit Temp (°F)	NO_x Normal (lbs/hr)	NO_x Maintenance (lbs/hr)	CO Normal (lbs/hr)	CO Maintenance (lbs/hr)	SO_2 Normal (lbs/hr)	SO_2 Maintenance (lbs/hr)	ROC Normal (lbs/hr)	ROC Maintenance (lbs/hr)	PM_{10} Normal (lbs/hr)	PM_{10} Maintenance (lbs/hr)
100%													
115°F On	751,916	21.62	320	5.78	30.00	7.90	51.00	1.72	1.72	1.08	1.80	5.00	5.00
115°F Off	694,103	19.95	320	5.20	27.00	7.28	47.00	1.57	1.57	0.96	1.60	5.00	5.00
73°F On	790,219	22.72	322	6.29	32.00	8.41	54.00	1.84	1.84	1.08	1.80	5.00	5.00
73°F Off	770,302	22.14	322	6.09	31.00	8.25	53.00	1.78	1.78	1.08	1.80	5.00	5.00
40°F	832,859	23.94	326	6.73	34.00	8.89	57.00	1.94	1.94	1.20	2.00	5.00	5.00
75%													
115°F	601,272	17.3	317	5.33	24.00	6.56	41.00	1.41	1.41	0.84	7.00	5.00	5.00
73°F	620,641	17.8	318	5.78	26.00	6.88	43.00	1.49	1.49	0.84	7.00	5.00	5.00
40°F	647,881	18.6	319	6.00	27.00	7.17	52.00	1.57	1.57	0.96	8.00	5.00	5.00
50%													
115°F	504,217	14.5	316	4.22	19.00	5.54	317.00	1.14	1.14	1.73	51.00	5.00	5.00
73°F	512,264	14.7	316	4.67	21.00	5.62	156.00	1.21	1.21	1.72	25.00	5.00	5.00
40°F	522,692	15.0	316	4.89	22.00	5.85	76.00	1.28	1.28	1.71	12.00	5.00	5.00

Notes: Maintenance rates are uncontrolled emission rates.

% = percent
acfm = actual cubic feet per minute
CO = carbon monoxide
CTG = combustion turbine generator
lbs/hr = pounds per hour
m/s = meters per second
NO_x = nitrogen oxide(s)
°F = degrees Fahrenheit
HRSG = heat recovery steam generator
Off – evaporative cooler off
On – evaporative cooler on
PM_{10} = particulate matter less than 10 microns in diameter
ROC = reactive organic compounds
SO_2 = sulfur dioxide

TABLE 6.1-11B
1-HOUR OPERATING EMISSION RATES FOR CTG/HRSG OPERATING LOAD SCENARIOS – WITH DUCT FIRING

Load	Exhaust Flow (acfm)	Exit Velocity (m/s)	Exit Temp (°F)	NO_x Normal (lbs/hr)	NO_x Maintenance (lbs/hr)	CO Normal (lbs/hr)	CO Maintenance (lbs/hr)	SO_2 Normal (lbs/hr)	SO_2 Maintenance (lbs/hr)	ROC Normal (lbs/hr)	ROC Maintenance (lbs/hr)	PM_{10} Normal (lbs/hr)	PM_{10} Maintenance (lbs/hr)
100%													
115°F On	751,916	21.62	320	6.67	34.62	8.16	52.65	1.72	1.72	1.10	1.84	5.00	5.00
115°F Off	694,103	19.95	320	6.09	31.62	7.54	48.65	1.57	1.57	0.98	1.64	5.00	5.00
73°F On	790,219	22.72	322	7.11	36.20	8.64	55.50	1.84	1.84	1.10	1.84	5.00	5.00
73°F Off	770,302	22.14	322	6.91	35.20	8.48	54.50	1.78	1.78	1.10	1.84	5.00	5.00
40°F	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
No duct firing at 40°F.
acfm = actual cubic feet per minute
CO = carbon monoxide
CTG = combustion turbine generator
HRSG = heat recovery steam generator
lbs/hr = pounds per hour
m/s = meters per second
NO_x = nitrogen oxide(s)
ºF = degrees Fahrenheit
Off – evaporative cooler off
On – evaporative cooler on
PM_{10} = particulate matter less than 10 microns in diameter
ROC = reactive organic compounds
SO_2 = sulfur dioxide

The expected emissions and durations associated with individual CTG startup and shutdown events are summarized in Table 6.1-12, Criteria Pollutant Emissions for New Unit 3 CTG Startups and Shutdowns. Based on vendor information, the CTG startup is expected to take 130 minutes and the CTG shutdown will take 60 minutes to be completed. The startup includes CTG/HRSG purge (20 minutes), CTG startup (20 minutes), CTG load ramp up (30 minutes), HRSG warmup (45 minutes), and SCR warmup (15 minutes). The shutdown includes CTG load ramp-down (30 minutes) and shutdown (30 minutes). The startup CTG/HRSG purge event does not produce pollutant emissions; therefore, the event is not listed in the table below. Because hours that include startup and shutdown events will have higher NO_x, CO and ROC emissions than the normal operating condition with functioning SCR and CO oxidation catalyst, they were incorporated (as applicable) into the worst-case short- and long-term Unit 3 emissions estimates in the model simulations pertaining to these pollutants.

TABLE 6.1-12
CRITERIA POLLUTANT EMISSIONS FOR NEW UNIT 3 CTG STARTUPS AND SHUTDOWNS[1]

Pollutant	Startup 130 minutes				Shutdown 60 minutes	
	Startup Total lbs per Event	CTG Ramp up Total lbs per Event	HRSG Warmup Total lbs per Event	SCR Warmup Total lbs per Event	Shutdown Total lbs per Event	CTG Ramp down Total lbs per Event
NO_X	21.00	39.33	24.00	4.79	25.00	39.33
CO	38.00	28.25	40.50	7.80	45.00	28.25
ROC	0.55	0.72	1.35	0.36	0.65	0.72
SO_2	0.52	0.79	1.18	0.39	0.79	0.79
PM_{10}	1.67	2.50	2.50	1.25	2.50	2.50

Notes:
[1]The data in this table pertain to a cold start. All turbine starts will have emissions less than or equal to the values for cold starts.
CO = carbon monoxide
CTG = combustion turbine generator
HRSG = heat recovery steam generator
lbs = pounds
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
ROC = reactive organic compounds
SO_2 = sulfur dioxide

Table 6.1-13, Criteria Pollutant Sources and Emission Totals for the Worst-Case Plant-Wide Emissions Scenarios Corresponding to all Averaging Times, shows the equipment operations and pollutant emissions used to develop the worst-case emissions scenarios for each averaging time and pollutant combination addressed in the ambient air quality standards. Some notes regarding the selection of these scenarios and the resulting emission calculations are provided below.

TABLE 6.1-13
CRITERIA POLLUTANT SOURCES AND EMISSION TOTALS FOR THE WORST-CASE PLANT-WIDE EMISSIONS SCENARIOS CORRESPONDING TO ALL AVERAGING TIMES

Averaging Time	Operating Equipment	Pollutant	SOURCES	
			New Unit 3 CTG/HRSG	Refurbished Unit 3 Cooling Tower
			Emissions in pounds – Entire Period	
1-hour	Maximum emissions for NO_x and SO_2 would occur during CTG commissioning. Maximum emissions for CO are uncontrolled emissions during the 50% load and 115°F scenario.	NO_x	100	0
		CO	317	0
		SO_2	1.94	0
3-hour	Maximum emissions for SO_2 would occur during CTG commissioning.	SO_2	1.94	0
8-hour	Maximum emissions for CO would occur during commissioning.	CO	600	0
24-hour	Maximum SO_2 and PM_{10} emissions would occur for the uncontrolled 100% load and 40°F scenario. Cooling tower PM_{10} emissions are based on normal operations.	PM_{10}	120	13.68
		SO_2	46.56	0
Annual	Annual emissions are based on number of hours at each temperature and load scenario Unit 3 will be operating with and without duct-firing. Cooling tower emissions are based on normal operations.	NO_x	74,353	0
		PM_{10}	42,125.5	4,681
		SO_2	15,040	0

Notes:
CO = carbon monoxide
ºF = degrees Fahrenheit
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
% = percent
SO_2 = sulfur dioxide

SO_2 emission rates were calculated assuming 100% conversion of the fuel sulfur to SO_2. The maximum gas turbine SO_2 emission rates for the 1-hour, 3-hour, 24-hour, and annual averaging periods were conservatively calculated assuming a natural gas fuel sulfur concentration of 0.75 grains per 100 standard cubic feet (scf) of natural gas, the maximum allowed under the SCGC tariff.

Worst-case 1-hour NO_x and SO_2, 3-hour SO_2, and 8-hour CO emission rates for the turbine correspond to commissioning operations (i.e., possible operation without the benefit of SCR and CO oxidation catalyst emissions controls). The maximum 1-hour CO emissions occur during uncontrolled CTG operations at 100% load at 115°F ambient temperature.

The scenario selected to represent conservative but potential maximum 24-hour average emission rates for SO_2 and particulate matter assumes two startups, two shutdowns, and two hours operating in maintenance mode, with the remainder of the day in normal full-load operating mode (includes duct-firing).

Annual emissions of all pollutants were calculated assuming 150 startups and 150 shutdown events in addition to 20 hours of maintenance operation, and based on the number of hours at each temperature and potential load scenarios at which the CTG/HRSG could operate (with and without duct-firing). Estimated maximum annual emissions for the Project are presented in Table 6.1-14, Projected Annual Unit 3 Emissions - All Pollutants.

TABLE 6.1-14
PROJECTED ANNUAL UNIT 3 EMISSIONS - ALL POLLUTANTS

Pollutant	Emissions (tons/year)[1,2]
SO_2	7.52
NO_x	37.18
ROC	4.79
PM_{10}[3]	23.40
CO	47.51
Lead	Negligible[4]

Notes:

[1]Includes emissions from new Unit 3 CTG/HRSG and Unit 3 cooling tower (PM_{10} only)
[2]CTG emissions based on 150 startups and shutdowns, 20 hours maintenance, and 7,980 hours of normal full-load operations
[3]PM_{10} emissions includes both filterable (front-half) and condensable (back-half) particulates
[4]Lead emissions are 'non-detect' from AP-42 for CTGs
CO = carbon monoxide
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
ROC = reactive organic compounds
SO_2 = sulfur dioxide

Turbine Commissioning

The commissioning of the CTG will entail several relatively short periods of operation prior to and during installation and testing of the SCR and CO oxidation catalyst systems. During these test periods, emissions of NO_x and CO will be higher than the normal operating emissions scenarios previously discussed because these controls will be either partially or completely inoperative.

CTG commissioning activities can be broken down into three separate test periods as described below. The first test occurs prior to SCR and CO oxidation catalyst installations, when the combustor is being tuned (mapping). For this testing phase, NO_x emissions will be higher, because the NO_x emissions control system would not be functioning and because the combustor burners would not be tuned for optimum performance. Similarly, CO emissions would also be higher, because combustor performance would not be optimized and the CO post-combustion control system would not be functioning. The next test occurs when the combustor has been tuned but the SCR and CO oxidation catalyst installations are not complete, and other parts of the CTG operating system are being checked out. Because the control system installation would not be complete, NO_x and CO emissions would again be higher than for normal operations. The

final test occurs with the SCR and CO oxidation catalysts fully operational; however, the potential for elevated NO_x and CO emissions exists during parts of this test as well.

Commissioning activities and expected emissions are discussed in more detail below. At the conclusion of the commissioning period, operational emissions rates will be at the controlled rates discussed previously in this section. The required CEMS for NO_x and CO will be operable throughout the commissioning period to document actual emissions.

The three commissioning test periods are likely to include CTG No Load Tests, testing without SCR operational, and fully controlled commissioning. During the commissioning tests, the worst-case NO_x and CO emission rates for the new Unit 3 CTG are expected to be 100 lbs/hour and 75 lbs/hour, respectively. Actual test durations will vary, but total commissioning emissions for the CTG are not expected to exceed totals based on these worst-case hourly rates over 360 hours of testing for the CTG (i.e., 25,440 lbs of NO_x and 25,080 lbs of CO).

Appendix B, Air Quality Data, Attachment C, Supporting Information for Estimation of Project Operation Emissions, presents supporting technical information and calculation spreadsheets used to develop emissions data for the operational Project.

6.1.2.3 Air Dispersion Modeling

The purpose of the air dispersion modeling analysis is to demonstrate that criteria air pollutant emissions from the Project would not cause or contribute significantly to a violation of a state ambient air quality standard or NAAQS. Potential impacts of non-criteria pollutant emissions from the Project are evaluated in Section 6.8, Public Health and Safety. The criteria pollutant modeling addresses emissions from both construction activities and facility operations after construction. Impacts from construction activities include fugitive dust from grading and excavating disturbed areas and emissions associated with exhaust combustion products from diesel- and gasoline-fueled construction equipment. The impacts from operations are associated with natural gas combustion in the CTG and the existing Unit 3 cooling tower. A fumigation modeling analysis was also performed to predict maximum ground-level concentrations from facility operations under specialized meteorological conditions that may produce short-term elevated ground-level pollutant concentrations.

Separate modeling analyses were performed for the construction and operational emissions associated with the Project because these activities would occur during different time periods. The air quality modeling methodology used for the Project was previously described in a modeling protocol submitted to CEC and ICAPCD (URS 2006). See Appendix B, Air Quality Data, Attachment D, Revised Air Quality Modeling Protocol, for a copy of the protocol. The modeling approaches used to assess various aspects of the Project's potential impacts to air quality are discussed below.

Model and Model Option Selections

The modeling was conducted using USEPA Industrial Source Complex model (ISCST3) (Version 02035) for both construction and operational emissions (USEPA 1995a). The ISCST3 model is appropriate for this Application because it has the ability to assess dispersion of emission plumes from multiple point, area or volume sources in flat, simple, and complex terrain and to utilize sequential hourly meteorological input data. The short-term version of the model

was used for modeling concentrations of pollutants having short-term (i.e., 1-, 3-, 8-, and 24-hour) ambient standards. Modeling for pollutants governed by annual ambient air quality standards (i.e., NO_2, SO_2, and PM_{10}), modeling was conducted using ISCST3 with the PERIOD option to predict annual average impacts. The ISCST3 model was run with the following additional user input specifications:

- Final plume rise
- Stack-tip downwash
- Buoyancy-induced dispersion
- Calms processing
- Default wind profile exponents
- Default vertical potential temperature gradients
- Rural dispersion coefficients

Review of aerial photographs and U.S. Geological Survey (USGS) topographic maps, and site visits indicate that the area surrounding the Project is more than 50% rural. Based on the Auer land use procedure, less than 40% of the area within a 10-kilometer radius of the ECGS could be classified as urban. The City of El Centro is located adjacent to the ECGS facility on the west, southwest, south, and southeast. The remaining 60% of the area within a 10-kilometer radius of the ECGS is rural, and since the Auer classification scheme requires more than the 50% of the area within the 10-kilometers radius around a source to be non-rural for an urban classification, the rural mode was used in the ISCST3 modeling analyses. Figure 6.1-4, Auer Land use Classification within 3 Kilometers of ECGS Unit 3, presents the Auer Land Use analysis for the 10-kilometers radius around the ECGS.

Building Wake Effects

The effect of building wakes (i.e., downwash) on the plumes from the Unit 3 CTG/HRSG stack and Unit 3 cooling tower emissions was evaluated in the modeling for operational emissions in accordance with USEPA guidance (USEPA 1985). Data on the buildings within the ECGS Site that could potentially cause plume downwash effects for the Unit 3 stack were determined for different wind directions using the USEPA Building Profile Input Program – Prime (BPIP-Prime) (Version 98086) (USEPA 1995b). Eleven structures were identified within the ECGS Site to be included in the downwash analysis, specifically:

- New Unit 3 turbine air inlet
- New Unit 3 HRSG
- Existing Unit 2 HRSG
- Existing Unit 3 boiler
- Existing Unit 4 boiler
- New cooling module
- Warehouse building

- Existing steam turbine building
- Existing Unit 2 cooling tower
- Existing Unit 3 cooling tower
- Existing Unit 4 cooling tower

The results of the BPIP-Prime analysis were included in the ISCST3 input files to enable downwash effects to be simulated. The ISCST3 model considers direction-specific downwash using both the Huber-Snyder and Schulman-Scire algorithms, as evaluated in the BPIP-Prime program. Input and output electronic files for the BPIP-Prime analysis are included with those from all other dispersion modeling analyses on the digital versatile discs (DVDs) that are being submitted to accompany this Application.

Meteorological Data

The modeling analyses for the Project used 5 years of hourly meteorological data collected at the nearest long-term meteorological station to the Project Site (i.e., the Imperial County Airport). The Imperial County Airport is located approximately 2.5 miles northwest of the Project Site. Hourly meteorological data from 1991 through 1995 were selected as the 5 consecutive years with the highest data capture currently available for this station (greater than 90% for all years).

The proximity and terrain similarities between the Project Site and the Imperial County Airport station led to the conclusion that the meteorological data are suitable for use in this air quality assessment of emission sources at the ECGS site. Other meteorological stations were examined and determined to be less representative of conditions in the Project study area.

As discussed in Section 6.1.1, Affected Environment, the topography of the Salton Sea - Imperial Valley area is a wide, relatively flat valley with terrain elevations below sea level. The Chocolate Mountains provide the terrain boundaries of the valley to the north, east, and southeast and a number of mountain ranges bound the valley on the west side. The Imperial Valley is approximately 13 miles across at the northern edge of the Salton Sea and expands to more than 54 miles wide along the southern border with Mexico. The Project Site is located in the central portion of the valley approximately 35 to 40 miles south and southwest of the Chocolate Mountains and 25 miles south-southeast of the Salton Sea. The Imperial County Airport is located in the southern central portion of the valley, approximately 19 miles south of the Salton Sea, and 2.5 miles northwest of the Project.

The other significant terrain features surrounding the Imperial County Airport and the Project are the Chocolate Mountains, approximately 30 miles northeast of the airport, and the Sand Hills, approximately 25 miles to the east of the airport. The highest point in the Chocolate Mountains is just below 3,000 feet. The highest point in the Sand Hills is just below 600 feet. The Santa Rosa Mountains, Fish Creek Mountains, and Coyote Mountains form the western terrain boundary of the Imperial Valley. The highest points in these mountains are more than 4,800 feet, more than 2,300 feet, and more than 2,400 feet, respectively. These terrain features are located approximately 44 miles to the northwest, 24 miles to the west-northwest, and 24 miles to the west, respectively, of the airport. These terrain features are located approximately 47 miles to the northwest, 27 miles to the west-northwest, and 27 miles to the west, respectively, of the Project Site.

The terrain immediately surrounding the Imperial County Airport and the Project Site can be categorized as flat, or gradually sloping, desert and irrigated farm lands, with little inhabited lands outside the cities and towns of the area. Thus, the near-field land use is the same and the far-field significant terrain features are very similar. Additionally, there are no significant terrain features in the area between the Imperial County Airport and ECGS that would cause differences in wind or temperature conditions in these areas. Therefore, the 5 years of meteorological data selected from the Imperial County Airport were determined to be representative for the Project.

The next closest meteorological stations with appropriate data for air quality modeling are located in Palm Springs and Blythe. These two stations are automated surface observing systems (ASOS), as is the Imperial County airport site. The Palm Springs station is approximately 92 miles to the northwest of the City of El Centro at the Palm Springs Airport in the Coachella Valley. The topography at this ASOS location is somewhat similar to that in Imperial Valley in that the Coachella Valley is oriented in a northwest to southeast direction. However, the Coachella Valley is approximately 8 miles wide at the Palm Springs Airport. This narrow valley with high terrain on both sides tends to act as a funnel that increases the wind speeds in this area. In fact, the Palm Springs area has hundreds of windmills used to harness this somewhat constant wind energy and convert it to electrical power. The meteorological conditions at the Palm Springs Airport are not similar to the conditions at the Project Site, and thus are not appropriate for use in the permit modeling for the Project.

The Blythe station is located approximately 80 miles to the northeast of the Project Site at the airport. The Blythe ASOS station is located approximately 2 miles west of the Colorado River at the southern edge of the Parker Valley. This Valley is oriented in a north-northeast to south-southwest direction. Terrain features in the Blythe vicinity include the Dome Rock Mountains to the east (across the Colorado River in Arizona), the Big Maria Mountains to the north, the McCoy Mountains to the west-northwest, and the Mule Mountains to the southwest. These significant terrain features would make the meteorological conditions at Blythe quite dissimilar from those at the Project Site. Thus, the data recorded at the Blythe ASOS station would not be appropriate for use in the permit modeling for the Project.

The next closest NWS stations to the Project Site are at the Daggett/Barstow Airport and San Diego Lindberg Airport. Both of these NWS stations are 100 miles or more away (164 miles for Daggett, 120 miles for San Diego) and neither has climate or terrain similar to the conditions at the Project Site. Therefore, these two sites do not have representative meteorological conditions acceptable for use in the permit modeling for the Project.

Data from the Imperial County Airport were recently used to support modeling for the proposed Salton Sea Unit 6 geothermal project Application to CEC, which is located about 25 miles northwest of the Project Site. The 5 years of meteorological data selected from the Imperial County Airport are representative of conditions at the Project Site, and are thus appropriate for use in the impact analysis modeling presented in this Application.

There are only two long-term upper air station for the entire state of California, one station for all of Arizona, and two stations for all of Nevada. The California stations are in Oakland and San Diego, the Arizona station is Tucson, and the Nevada stations are Winnemucca and Desert Rock (near Nellis AFB). The closest upper air station to the Project Site is San Diego about 100 miles to the west of El Centro, but this location is subject to a pronounced marine influence that would not be at all representative of the inland desert conditions of the Project Site. The nearest inland

upper air stations are at Desert Rock and Tucson. The Desert Rock station is located at a higher terrain location and approximately 300 miles north of the Project Site. The Tucson station is located approximately 300 miles to the east but at approximately the same latitude as the Project study area. When the upper air wind patterns are zonal, or parallel to lines of latitude, the conditions at the Tucson station are more representative of conditions at El Centro than those at Desert Rock. Therefore, use of the Tucson upper air data set is appropriate for modeling at ECGS.

Receptor Locations

Receptors were placed at off-property locations to evaluate the impacts of the Project (see Figure 6.1-5, Near-field Model Receptor Grid, and Figure 6.1-6, Far-field Model Receptor Grid). Receptor spacing varies according to distance from the Project property boundary. To ensure that the location of highest impact was identified, the receptor spacing was closest at the Project property boundary and increased with distance from the boundary. Receptors were placed as far as 10 kilometers from the ECGS Site boundary. The following receptor spacing was used in the modeling analysis:

- 25-meters spacing extending around the ECGS Site boundary and out to 1 kilometer beyond the boundary
- 100-meters spacing between 1 and 5 kilometers of the ECGS Site boundary
- 250-meters spacing between 5 and 10 kilometers of the ECGS Site boundary

The receptor locations were designated using Universal Transverse Mercator (UTM) coordinates. Receptor elevations were obtained from the USGS 7.5-minute electronic terrain data.

Construction Impacts Modeling

Section 6.1.2.1, Construction Emissions, describes the development of Project construction emissions estimates. Since construction equipment and operations will move continuously around the Project Site and Temporary Construction Area, the corresponding emissions were represented as composite volume and area sources to realistically represent the emissions released from these sources. Based on projected equipment usage over the 20-month construction period, maximum equipment usage is expected to occur in the fifth month. Accordingly, maximum emissions estimates were developed for short-term averaging times (1 to 24 hours) using the equipment mix for this month. The equipment usage during this month was assumed to be concentrated where the new equipment will be installed and in the Temporary Construction Areas. These emissions were represented in the dispersion model simulations as four uniformly spaced volume sources within the main construction area, 20 volume sources representing the temporary access roads within the ECGS Site, and two area sources for the Temporary Construction Areas. For the modeling to estimate annual impacts, all emissions occurring over the full 20-month construction period were very conservatively assumed to be spread evenly over these same volume or area sources covering the main construction site, access roads, and Temporary Construction Areas.

The ozone-limiting method (OLM) was used to estimate maximum 1-hour NO_2 impacts from the construction activities only. Measured ozone concentration data for the same hours

corresponding to the highest modeled NO_x concentrations were used to estimate the atmospheric conversion of emitted NO to NO_2.

Turbine Impact Screening Modeling

Screening modeling was performed to determine which CTG operating modes and stack parameters produced "worst-case" impacts; (i.e., maximum ground-level concentrations for each pollutant and averaging time). The screening modeling used the ISCST3 (Version 02035) as described in the previous subsections. Building wake information and the receptor grid described above were also used. All 5 years of meteorological data were used in the screening analysis.

The ISCST3 model simulated natural gas combustion emissions from one, 15-foot-diameter (4.572 meters), 100-foot-tall (30.48 meters) stack. The stack was modeled as a point source at its proposed location on the ECGS Site. Table 6.1-15, CTG Screening Model Results – All Scenarios, All Years, summarizes the combustion CTG screening results for the different CTG operating loads and ambient temperatures for each of the 5 years of meteorological input data. CTG vendor data used to derive the stack parameters for the different operating conditions evaluated in this screening modeling analysis are included in Appendix B, Air Quality Data, Attachment C, Supporting Information for Estimation of Project Operation Emissions.

Principal results of the screening modeling were as follows:

- Meteorological data from 1991 produced the highest results for the 1-hour and 3-hour averaging time periods. For NO_2, the worst-case 1-hour condition occurred with 100% load at 115°F ambient temperature. For CO and SO_2, the worst-case 1-hour conditions occurred with 75% load and 40° F ambient temperature.
- Meteorological data from 1991 with the CTG operating at 100% load and 40°F ambient temperature produced the highest ground-level concentrations identified in the screening modeling for the 3-hour averaging time (for SO_2).
- For the 8-hour averaging time, the worst-case ground-level impact occurred with 1992 meteorological data for the case with the CTG operating at 75% load and 40°F ambient temperature (for CO).
- For PM_{10}, the worst-case 24-hour conditions occurred with 50% CTG load and 115°F ambient temperature with 1992 meteorological data. For SO_2, the worst-case 24-hour conditions occurred with 100% load and 40°F ambient temperature using 1994 meteorological data.
- Maximum predicted annual average impacts occurred with 1992 meteorological data and the stack parameters for the 50% load cases, with 115°F ambient temperature for PM_{10}, and 40°F ambient temperature for SO_2 and NO_2.

TABLE 6.1-15
CTG SCREENING MODEL RESULTS – ALL SCENARIOS, ALL YEARS

Scenario			100% Load				75% Load				50% Load		
		Pollutant	115° F Cooler On	115° F Cooler Off	73° F Cooler On	73° F Cooler Off	40° F	115° F	73° F	40° F	115° F	73° F	40° F
1991	1 hour	$NO_x/CO/SO_2$	8.35/10.21/2.17	**9.45**/11.7/2.44	7.0/8.5/1.81	6.82/8.38/1.76	6.56/8.67/1.89	8.36/10.29/2.21	9.04/10.8/2.36	9.38/**13.0/2.48**	6.69/8.78/1.81	7.4/8.9/1.92	7.75/9.27/2.03
	3 hour	SO_2	1.56	1.48	1.61	1.58	**1.64**	1.44	1.52	1.56	1.27	1.33	1.4
	8 hour	CO	5.13	5.08	5.17	5.19	5.04	4.94	5.06	5.91	4.69	4.7	4.83
	24 hour	PM_{10}/SO_2	1.7/0.59	1.83/0.57	1.59/0.59	1.64/0.58	2.01/0.58	2.06/0.58	2.0/0.6	1.93/0.61	2.44/0.56	2.41/0.58	2.34/0.6
	Annual	$NO_x/PM_{10}/SO_2$	0.19/0.14/0.05	0.20/0.16/0.05	0.18/0.13/0.05	0.18/0.13/0.05	0.15/0.12/0.04	0.21/0.2/0.06	0.22/0.19/0.06	0.21/0.18/0.06	0.21/0.25/0.06	0.23/0.25/0.06	0.24/0.24/0.06
1992	1 hour	$NO_x/CO/SO_2$	6.18/7.56/1.6	5.92/7.33/1.53	6.37/7.74/1.65	6.3/7.73/1.62	5.85/7.73/1.68	5.63/6.93/1.49	5.99/7.15/1.56	6.06/8.41/1.6	4.88/6.41/1.32	5.36/6.44/1.39	5.55/6.64/1.36
	3 hour	SO_2	1.47	1.41	1.51	1.48	1.52	1.38	1.45	1.48	1.24	1.3	1.36
	8 hour	CO	5.69	5.61	5.77	5.8	5.7	5.4	5.54	**6.47**	5.09	5.11	5.26
	24 hour	PM_{10}/SO_2	2.32/0.8	2.53/0.79	2.17/0.8	2.24/0.8	2.05/0.8	2.96/0.84	2.86/0.86	2.73/0.87	**3.5**/0.79	3.42/0.83	3.36/0.86
	Annual	$NO_x/PM_{10}/SO_2$	0.25/0.19/0.07	0.26/0.21/0.07	0.24/0.17/0.06	0.25/0.18/0.06	0.21/0.15/0.06	0.29/0.27/0.08	0.29/0.25/0.08	0.28/0.24/0.08	0.28/**0.34**/0.08	0.31/0.33/0.08	**0.32**/0.32/**0.08**
1993	1 hour	$NO_x/CO/SO_2$	6.05/7.4/1.57	5.79/7.16/1.49	6.26/7.61/1.62	6.18/7.58/1.59	5.74/7.58/1.65	5.57/6.93/1.48	5.92/7.07/1.55	5.97/8.3/1.58	4.86/6.38/1.31	5.33/6.42/1.38	5.52/6.6/1.45
	3 hour	SO_2	1.43	1.37	1.47	1.45	1.48	1.36	1.42	1.45	1.21	1.27	1.33
	8 hour	CO	5.59	5.43	5.75	5.73	5.68	5.4	5.32	6.25	4.77	4.79	4.95
	24 hour	PM_{10}/SO_2	1.59/0.55	1.68/0.53	1.53/0.56	1.56/0.56	1.47/0.57	1.83/0.52	1.8/0.54	1.75/0.56	2.12/0.48	2.1/0.51	2.07/0.53
	Annual	$NO_x/PM_{10}/SO_2$	0.19/0.14/0.05	0.19/0.16/0.05	0.17/0.12/0.05	0.18/0.13/0.05	0.15/0.11/0.04	0.22/0.21/0.06	0.22/0.19/0.06	0.21/0.18/0.06	0.22/0.26/0.06	0.24/0.26/0.06	0.25/0.26/0.07
1994	1 hour	$NO_x/CO/SO_2$	6.13/7.5/1.59	5.82/7.2/1.5	6.35/7.72/1.64	6.26/7.69/1.61	5.83/7.7/1.68	5.57/6.86/1.48	5.92/7.07/1.55	5.95/8.26/1.57	4.89/6.42/1.32	5.37/6.46/1.39	5.55/6.64/1.45
	3 hour	SO_2	1.39	1.32	1.43	1.4	1.45	1.27	1.34	1.38	1.13	1.19	1.24
	8 hour	CO	4.87	4.79	5.01	5.0	4.96	4.6	4.75	5.57	4.28	4.31	4.44
	24 hour	PM_{10}/SO_2	2.62/0.91	2.75/0.86	2.53/0.93	2.57/0.92	2.43/**0.94**	2.97/0.84	2.93/0.88	2.86/0.91	3.24/0.74	3.21/0.78	3.18/0.81
	Annual	$NO_x/PM_{10}/SO_2$	0.21/0.15/0.05	0.21/0.17/0.05	0.19/0.14/0.05	0.2/0.14/0.05	0.17/0.12/0.05	0.24/0.22/0.06	0.24/0.21/0.06	0.23/0.19/0.06	0.24/0.28/0.06	0.26/0.28/0.07	0.27/0.27/0.07
1995	1 hour	$NO_x/CO/SO_2$	6.18/7.56/1.6	5.9/7.31/1.52	6.38/7.75/1.65	6.29/7.72/1.62	5.85/7.73/1.68	5.66/6.96/1.5	6.02/7.19/1.57	6.08/8.44/1.61	4.9/6.44/1.32	5.38/6.48/1.4	5.58/6.67/1.46
	3 hour	SO_2	1.35	1.28	1.39	1.37	1.42	1.25	1.31	1.35	1.11	1.16	1.22
	8 hour	CO	5.47	5.33	5.56	5.57	5.48	5.1	5.27	6.16	4.78	4.8	4.94
	24 hour	PM_{10}/SO_2	2.52/0.87	2.64/0.83	2.43/0.9	2.48/0.88	2.34/0.91	2.87/0.81	2.82/0.85	2.75/0.87	3.14/0.72	3.12/0.76	3.09/0.79
	Annual	$NO_x/PM_{10}/SO_2$	0.24/0.18/0.06	0.25/0.2/0.06	0.23/0.16/0.06	0.23/0.17/0.06	0.19/0.14/0.06	0.27/0.26/0.07	0.28/0.24/0.07	0.27/0.23/0.07	0.27/0.32/0.07	0.3/0.32/0.08	0.31/0.31/0.08

Notes:

Bold = highest concentration for that pollutant and averaging time

CO = carbon monoxide
NO_x = nitrogen oxide(s)
ºF = degrees Fahrenheit
PM_{10} = particulate matter less than 10 microns in diameter
SO_2 = sulfur dioxide
% = percent

The screening modeling results shown in Table 6.1-15, CTG Screening Model Results – All Scenarios, All Years, were used to identify the CTG stack parameters that led to the highest predicted ground-level concentration per pound of pollutant emitted for each averaging time. The resulting worst-case CTG operating conditions are summarized in Table 6.1-16, CTG Stack Parameters Corresponding to Maximum Predicted Ground Level Pollutant Concentrations.

TABLE 6.1-16
CTG STACK PARAMETERS CORRESPONDING TO MAXIMUM PREDICTED GROUND LEVEL POLLUTANT CONCENTRATIONS

Pollutant	Averaging Time	Operating Condition
NO_2	1 hour	100% load, year 1991, 115°F
	Annual	50% load, year 1992, 40°F
CO	1 hour	75% load, year 1991, 40°F
	8 hour	75% load, year 1992, 140°F
SO_2	1 hour	75% load, year 1991, 40°F
	3 hour	100% load, year 1991, 40°F
	24 hour	100% load, year 1994, 40°F
	Annual	50% load, year 1992, 40°F
PM_{10}	24 hour	50% load, year 1992, 115°F
	Annual	50% load, year 1992, 115°F

Notes:
CO = carbon monoxide
% = percent
ºF = degrees Fahrenheit
NO_2 = nitrogen dioxide
PM_{10} = particulate matter less than 10 micrometers in diameter
SO_2 = sulfur dioxide

In all subsequent modeling analyses, emissions from the new Unit 3 CTG were modeled using the stack parameters of the worst-case operating scenarios discussed above. However, the maximum emission rates that would occur over any averaging time, whether during CTG commissioning, maintenance operations, normal operations, or a combination of these activities were used in the modeling analyses (see Table 6.1-13, Criteria Pollutant Sources and Emissions Totals for the Worst-Case Plant-Wide Emissions Scenarios Corresponding to all Averaging Times). Model input and output files for the screening modeling analysis are included with those from all other modeling tasks on the Air Quality and Public Health Modeling DVDs that are being provided separately with this Application.

Refined Modeling

A refined modeling analysis was performed to estimate offsite criteria pollutant impacts from operational emissions of the Project. The modeling was performed as described in the previous sections and used 5 years of meteorological data. The new Unit 3 CTG/HRSG was modeled for the worst-case emissions corresponding to each averaging time and the stack parameters determined in the screening analysis (see previous subsection). Emissions from the existing Unit 3 cooling tower were also included in this analysis. Emission rate calculations and

modeling parameters used for the Unit 3 cooling tower are included in Appendix B, Air Quality Data, Attachment C, Supporting Information for Estimation of Project Operation Emissions.

Fumigation Analysis

Fumigation may occur when a plume that was originally emitted into a stable layer of air is mixed rapidly to ground level when unstable air below the plume reaches plume height. Fumigation can cause relatively high ground-level concentrations for some elevated point sources. Fumigation can occur during the breakup of the nocturnal radiation inversion by solar warming of the ground surface (inversion breakup fumigation), or by the transport of pollutants from a stable marine environment to an unstable inland environment (shoreline fumigation).

A fumigation analysis was performed using the USEPA model SCREEN3 (Version 96043). The SCREEN3 model was used to calculate concentrations from inversion breakup fumigation; no shoreline fumigation was performed for the Project Site. A unit emission rate was used (1 gram per second) in the fumigation modeling to represent the plant emissions and the model results were given in terms of predicted maximum concentrations that were then scaled to reflect Unit 3 emissions for each pollutant. The SCREEN3 model was run for the five different load and ambient temperature conditions that created the worst-case operating scenarios and the case that provided the highest off-site fumigation concentration was reported. Inversion breakup fumigation concentrations were calculated for hourly and 3-hour averaging times using the USEPA-approved 1- to 3-hour conversion factor. These multiple-hour model predictions are very conservative, since inversion breakup fumigation is a transitory condition that would most likely affect a given plume for only a few minutes on a given day. Input and output electronic files for the fumigation modeling analysis are included in the modeling DVDs submitted with this Application.

6.1.2.4 Modeling Results - Compliance with Ambient Air Quality Standards

Air dispersion modeling was performed according to the methodology described in Section 6.1.2.3, Air Dispersion Modeling, to evaluate the maximum increase in ground-level pollutant concentrations resulting from the Project emissions, and to compare the maximum predicted impacts, including background pollutant levels, with applicable short-term and long-term CAAQS and NAAQS. The impacts from construction activities and plant operations were analyzed separately because they will occur during different time periods. The same5 year record of hourly meteorological data described in Section 6.1.2.3 was used in the modeling to evaluate both construction and operational impacts. In each case, the ISCST3 model predicted the increases in criteria pollutant concentrations at all receptor concentrations due to Project emissions only. Next, the maximum incremental increases for each pollutant and averaging time were added to the maximum background concentrations, based on air quality data collected at the most representative monitoring stations during the last 5 years (i.e., 2001 through 2005). These background concentrations are presented and discussed in Section 6.1.1.2, Existing Air Quality. The resulting total pollutant concentrations were then compared with the most stringent CAAQS or NAAQS.

Modeled criteria pollutant impacts for the construction and operational phases of the Project are summarized in Table 6.1-17, ISCST3 New Unit 3 and Cooling Tower Only Modeling Results.

TABLE 6.1-17
ISCST3 NEW UNIT 3 AND COOLING TOWER ONLY MODELING RESULTS

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Impact Level[1] ($\mu g/m^3$)	Background[2] ($\mu g/m^3$)	Maximum Total Predicted Concentration ($\mu g/m^3$)	Most Stringent AAQS ($\mu g/m^3$)	UTM Coordinates East (meters)	UTM Coordinates North (meters)
Construction Impacts								
CO	1 hour	1,306	NA	18,400	19,706	23,000	636,720	3,630,273
	8 hour	487.2	NA	6,778	7,265.2	10,000	636,745	3,630,273
NO_2	1 hour[3]	258.2	NA	180.5	438.7	470	636,720	3,630,273
	Annual	2.44	NA	35.9	38.3	100	636,918	3,630,276
PM_{10}	24 hour	19.3	NA	**383**	**402.3**[4]	50	636,547	3,630,270
	Annual	3.33	NA	**48.6**	**51.9**[4]	20	636,596	3,630,271
SO_2	1 hour	2.48	NA	7.86	10.3	655	636,720	3,630,273
	3 hour	1.91	NA	7.80	9.7	1,300	636,794	3,630,273
	24 hour	0.13	NA	7.88	8.0	105	636,745	3,630,273
	Annual	0.004	NA	2.67	2.674	80	636,918	3,630,276
Maximum Unit 3 Operation Impacts								
CO	1 hour[5]	495.5	2,000	18,400	18,896	23,000	637,092	3,630,278
	8 hour[6]	58.2	500	6,778	6,836	10,000	637,017	3,630,277
NO_2	1 hour[5]	155.3	NA	180.5	335.8	470	637,092	3,630,278
	Annual[7]	0.55	1	35.9	36.5	100	636,993	3,630,277
PM_{10}	24 hour[8]	3.5	5	**383**	**386.5**	50	637,017	3,630,277
	Annual[7]	0.35	1	**48.6**	**48.95**	20	636,993	3,630,277
$PM_{2.5}$	24 hour[8,9]	3.5	NA	**74.2**	**77.7**	65	637,017	3,630,277
	Annual[7,9]	0.35	NA	9.7	10.05	12	636,993	3,630,277
SO_2	1 hour[5]	3.0	NA	7.86	10.9	655	637,092	3,630,278
	3 hour[10]	1.6	25	7.80	9.4	1,300	636,943	3,630,276
	24 hour[8]	0.94	5	7.88	8.8	105	637,042	3,630,277
	Annual[7]	0.11	1	2.67	2.78	80	636,993	3,630,277

Bold values above applicable air quality standards

Notes:

[1]Source: 40 CFR 52.21.

[2]Background represents the maximum values measured at El Centro 9th St. (CO, NO_2, $PM_{10}PM_{2.5}$), or Calexico (SO_2) monitoring stations, 2001-2005, depending on pollutant.

[3]Results for 1-hour NO_2 during construction used OLM to estimate NO_2 impacts.

[4]PM_{10} background levels exceed ambient standards.

[5]Maximum hourly impact based on CTG under maintenance or commissioning conditions.

[6]Maximum 8-hour impact based on CTG operating for 1 hour under maintenance conditions, one startup and one shutdown, with remainder of period at normal operating with duct-firing condition.

[7]Annual impact based on 7,980 hours of normal operation, 20 maintenance hours, 150 startups, and 150 shutdowns for CTG.

[8]Maximum 24-hour impact based on two startups, two shutdowns, two hours at maintenance operations, and remainder of period at normal operations with duct-firing, for CTG/HRSG.

[9]All operational Project equipment PM_{10} emissions assumed to be $PM_{2.5}$.

[10] Maximum 3-hour impact based on three hours of maintenance operations.

$\mu g/m^3$ = micrograms per cubic meter
AAQS = Most stringent ambient air quality standard for the averaging period
CO = carbon monoxide
ISCST3 = USEPA Industrial Source Complex model, Version 02035
NA = Not applicable
NO_2 = nitrogen dioxide
OLM = ozone limiting method
PM_{10} = particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter. All PM emissions during operation assumed to be $PM_{2.5}$
PSD = Prevention of Significant Deterioration
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

Construction Impacts

For the construction phase of the Project, the predicted maximum short-term and long-term impacts for all pollutants were predicted to occur on the north plant fenceline of the ECGS Site in the area between the new construction access road and the intersection of this fenceline with a line extending due north from the existing steam turbine building. The model results reflect the generally low release heights (1 to 4 meters) that characterize construction equipment exhausts and dust-generating activities.

As reflected in the construction modeling results in Table 6.1-17, ISCST3 New Unit 3 and Cooling Tower Only Modeling Results, very high PM_{10} background concentrations have been recorded occasionally at Imperial County monitoring stations during recent years. Because of the land use characteristics of this area, it is highly probable that these conditions result either from high wind episodes or from periods with heavy agricultural tillage or burning. The contribution of the proposed construction activities would be minor by comparison with these sources, but would have the potential to temporarily contribute to existing violations of the state and federal PM_{10} standards if construction occurs during a period of high background concentrations.

The highest hourly NO_x concentrations predicted by the ISCST3 model for each year of meteorological data plus the maximum background NO_2 value recorded at the El Centro 9th Street monitoring station in the last 5 years (Table 6.1-3, NO_2 Levels at El Centro – 9th Street) were above the California 1-hour NO_2 standard. However, this result corresponds to an assumption of full conversion of NO to NO_2 in the El Centro emission plumes, which would not occur in the area around El Centro. Therefore, the OLM was applied to the modeled NO_x results to provide a more reasonable characterization of plume chemistry in this area. Hourly ozone data recorded from the El Centro 9th Street monitoring station by ICAPCD for the same 5 years as the input meteorological data were used to identify the ozone concentrations for the same hour in each year of the meteorological input data record when the maximum 1-hour NO_x concentrations due to construction activities were predicted to occur. This ozone concentration was then used with the maximum predicted NO_x concentrations in the OLM calculations. The resulting highest predicted 1-hour NO_2 concentration due to Project construction emissions plus the highest recorded NO_2 background level at the El Centro monitoring station from 2001 through 2005 resulted in a total concentration that is well below the 1-hour California standard. Considering the conservatism of assuming that the highest recorded background NO_2 concentration will occur at the same location and hour for which the maximum Project construction impacts are predicted, it is likely that actual maximum hourly NO_2 concentration will be much lower than the model-predicted value of 438.7 $\mu g/m^3$. Predicted maximum impacts for CO and SO_2 are also less than the most stringent ambient standards.

Operations Impacts

As described previously, the emissions used in the model simulations for the Project operations were selected to ensure that the maximum potential impacts would be addressed for each pollutant and averaging time corresponding to an ambient air quality standard. Thus, the emissions scenario used in the modeling for each averaging time was selected as the highest value for each pollutant that could reasonably be expected to occur, whether during CTG commissioning, maintenance operations without post-combustion controls or normal operations,

including startups and shutdowns. The emissions used for each pollutant and averaging time are explained and quantified in Table 6.1-13, Criteria Pollutant Sources and Emission Totals for the Worst-Case Plant-Wide Emissions Scenarios Corresponding to all Averaging Times.

As shown in the lower part of Table 6.1-17, ISCST3 New Unit 3 and Cooling Tower Only Modeling Results, maximum modeled concentrations due to the operational Unit 3 are below the federal prevention of significant deterioration (PSD) significant impact levels (SILs) for all criteria pollutants, despite the use of worst-case emissions scenarios for all pollutants and averaging times. Although the Project's annual emissions will be well below the levels that trigger PSD review (see Section 6.1.5.2, Prevention of Significant Deterioration Requirements), these SILs are often used as a measure of the potential impacts of proposed new sources in California. Table 6.1-17 also shows that the modeled impacts due to Unit 3 operations would not cause a violation of any NAAQS and would not significantly contribute to the existing violations of the federal and state PM_{10} standards. In addition, as described later, all of the Project's operational emissions of non-attainment pollutants and their precursors will be offset to ensure a net air quality benefit.

Predicted maximum pollutant concentrations resulting from operations of the Project are predicted to occur on the ECGS fence line; i.e., the innermost rank of receptor points. Figure 6.1-7, Locations of Maximum Predicted Ground-Level Pollutant Concentrations for the Operational Project, shows the locations of the maximum predicted operational impacts for all pollutants and averaging times. As shown in this figure, all maximum concentrations are located along the northern fence line of the ECGS.

Fumigation Impacts

Potential worst-case fumigation impacts were modeled as described in Section 6.1.2.3, Air Dispersion Modeling. As shown in Table 6.1-18, Project Operations Fumigation Impact Summary, the resulting incremental concentration predictions for fumigation conditions are all below the maximum operational impacts shown in the lower part of Table 6.1-17, ISCST3 New Unit 3 and Cooling Tower Only Modeling Results.

TABLE 6.1-18
PROJECT OPERATIONS FUMIGATION IMPACT SUMMARY

Pollutant	Source	Inversion Impact ($\mu g/m^3$)	Distance to Maximum Impact (meters)
NO_2 1 hour[1]	Normal Operation Turbine	1.62	12,281
NO_2 1 hour[2]	Maintenance Turbine	8.21	12,281
	TOTAL NO_2 1 hour	9.83	
CO 1 hour[3]	Turbine	71.9	12,281
SO_2 1 hour[4]	Turbine	0.44	12,281
SO_2 3 hour[5]	Turbine	0.40	12,281

Notes:
[1]NO_2 modeled with turbine in normal operation, 0.9 g/s and stack parameters for 100% load at 73°F.
[2]Maintenance turbine NO_2 emission rate of 4.56 g/s and 100% load at 73°F.
[3]CO modeled with turbine in maintenance, 39.94 g/s and stack parameters of 50% load at 40°F.
[4]SO_2 modeled with turbine at 0.24 g/s emissions and 50% load at 40°F.
[5]1-hour SCREEN3 results multiplied by 0.9 to convert to 3 hour.
% = percent
$\mu g/m^3$ = micrograms per cubic meter
CO = carbon monoxide
NO_2 = nitrogen dioxide
SO_2 = sulfur dioxide

Turbine Commissioning

The new Unit 3 CTG of the Project could be operated for up to 360 hours for purposes of commissioning the new generating equipment. Maximum impacts from the emissions of NO_x and CO during CTG commissioning may be evaluated simply using the peak predicted incremental concentrations developed for the screening modeling results reported in Table 6.1-15, CTG Screening Model Results – All Scenarios, All Years. The maximum 1-hour screening impact shown in this table is 13.0 $\mu g/m^3$ per gram per second of emissions (year 1991). Therefore, the maximum 1-hour emission rates of 100.0 lbs/hr (12.6 g/s) of NO_x and 90 lbs/hr (11.34 g/s) of CO during uncontrolled operations (as discussed in 6.1.2.2, Operational Emissions) would produce maximum hourly concentrations during commissioning of 163.8 $\mu g/m^3$ and 147.4 $\mu g/m^3$, respectively. Note that the maximum expected short-term emissions of CO during (uncontrolled) maintenance operations are substantially higher and produce higher ground-level concentrations of this pollutant than commissioning emissions.

The maximum 8-hour screening impact shown in Table 6.1-15, CTG Screening Model Results – All Scenarios, All Years, is 6.47 $\mu g/m^3$ per gram per second of emissions (year 1992). Therefore, the maximum 8-hour averaged CO emission rate of 75 lbs/hr (9.45 g/s) would produce a maximum ground-level concentration during commissioning of 61.1 $\mu g/m^3$ for this averaging time.

Table 6.1-19, Project Commissioning Modeling Results, shows that when these incremental commissioning impacts are added to applicable background concentrations and compared to the most stringent state or national ambient standards, no violations of the ambient air quality standards for these pollutants are predicted to occur during CTG commissioning. It is

unnecessary to evaluate commissioning emissions of the other pollutants addressed by modeling (PM_{10}, $PM_{2.5}$ and SO_2), as these are a function only of the fuel usage rate and are unaffected by the operability or non-operability of the post combustion control systems.

TABLE 6.1-19
PROJECT COMMISSIONING MODELING RESULTS

Pollutant	Averaging Period	Maximum Derived Impact ($\mu g/m^3$)	Background[1] ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	Most Stringent Standard ($\mu g/m^3$)
Commissioning Impacts					
CO	1 hour	147.4	18,400	18,547	23,000
	8 hour	61.1	6,778	6,839	10,000
NO_2	1 hour	163.8	180.5	344.5	470

Notes:
[1] Background represents the maximum value measured at El Centro 9th St. monitoring stations, 2001-2005.
$\mu g/m^3$ = micrograms per cubic meter
CO = carbon monoxide
NO_2 = nitrogen dioxide

Impacts for Nonattainment Pollutants and their Precursors

The emission offset program described in the ICAPCD Rules and Regulations was developed to facilitate net air quality improvement when new sources locate within the district. Project impacts on the concentration levels of nonattainment pollutants (PM_{10} and O_3) and their precursors (NO_x, SO_2, and ROC) will be fully mitigated by emission offsets. The offsets have not been accounted for in the modeled impacts noted above. Thus, the impacts indicated in the foregoing presentation of model results for the Project are significantly overestimated.

Effects on Visibility from Plumes

Combustion sources emit water vapor that sometimes may condense in the atmosphere to form visible plumes. However, the hot, dry conditions existing in El Centro are not conducive to lengthy visible stack plumes, and the historical operation of the existing ECGS units (including the combined cycle Unit 2 which is very similar to the new Unit 3) indicates that such plumes virtually never reach the property boundary. Cooling towers are another potential source of visible moisture plumes, but the Project will utilize the existing Unit 3 cooling tower with some refurbishments, so no new plume source of this type will be created.

Class I Area Impacts

ICAPCD Rule 207D.6.f requires an Applicant for an ATC permit to address the potential of the Project to impact air quality, including visibility, of any Class I federal area. Dispersion, deposition and visibility impairment modeling was performed using the CALPUFF model (Version 5.7 - 030402) to assess impacts at the closest Class I Area, JTNP, the nearest point of which is about 98 kilometers (61 miles) north of ECGS. Even though the Project will not be a PSD facility, CALPUFF modeling procedures incorporating PSD requirements for evaluation of air quality related values were used for this analysis.

The CALPUFF model was run to assess both long-range deposition of nitrogen and sulfur compounds, and potential visibility impairment in JTNP. The source parameters used in the CALPUFF modeling incorporated the same stack parameters as the ISCST3 simulations described previously. The maximum 24-hour NO_x, SO_2, and PM_{10} plant emissions rates were incorporated in the visibility analysis and the annual equipment emission rates were used to evaluate sulfur and nitrogen deposition.

Three receptor rings for JTNP were used - one ring at the closest distance to the park (98.3 kilometers), one ring at the farthest point from the park (176.4 kilometers), and one ring at the point of highest elevation in the park (157 kilometers). The actual elevation at the closest point to the park (609 meters) was used for all receptors along the closest ring. The actual elevation at the farthest point (1,268 meters) was used for all receptors on the farthest ring. The ring through the point of highest terrain in the park used that elevation (1,772 meters) for all receptors on that ring, per Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Impacts (USEPA 1998).

Hourly ozone data were used in the CALPUFF analysis. The recorded data were from the ICAPCD El Centro 9th Street monitoring station from 1991 to 1995 to match the meteorological data used. The background ammonia concentration used in the modeling came from the Federal Land Managers Air Quality Related Values Workgroup, (FLAG) Phase I Report (USFS 2000*)*. The value for arid land (1 part per billion [ppb]) was used for this parameter.

The CALPUFF modeling used an extended meteorological data set for the same 5 years (1991 to 1995) of Imperial County Airport surface data and Tucson upper air data as the ISCST3 modeling. The Imperial County Airport is located approximately 2.5 miles northwest of the Project. The additional parameters include hourly solar radiation used in the chemical transformation calculations and relative humidity used in the visibility calculations. The land use around the Project Site was represented as irrigated agricultural land.

The CALPUFF model output was processed by the CALPOST post-processor program to assess the following impacts of the Project at JTNP - dry deposition, wet deposition, and visibility impairment. The dry deposition calculations incorporate model-predicted contributions of the Project's predicted impacts on SO_2, sulfate ion (SO_4), nitrate ion (NO_3), nitric acid (HNO_3), and NO_x. The wet deposition calculations incorporate the same pollutants except for NO_x. The visibility analysis included the impacts of the Project on nitrates, sulfates, and particulate levels. The JTNP seasonal hygroscopic and non-hygroscopic extinction coefficients were also obtained from the FLAG guidance document.

The deposition fluxes for all nitrogen compounds (dry and wet) were summed, as were all sulfur compound deposition fluxes. The totals were converted from grams per square meter per second to kilograms per hectare per year (kg/ha/yr) of elemental nitrogen or sulfur in the CALPOST post-processing program (Version 5.4 – 030402), using the recommended conversion factors presented in Section 3.3 of the IWAQM guidance document. The deposition results are presented in Table 6.1-20, CALPUFF Visibility and Deposition Results, along with the predicted impacts on visibility. All CALPUFF electronic input and output files are included on a DVD accompanying this Application.

TABLE 6.1-20
CALPUFF VISIBILITY AND DEPOSITION RESULTS

Maximum Extinction Change		Allowable Limit	
1.87%		5%	
Maximum Annual Predicted Nitrogen Deposition	**Allowable Limit**	**Maximum Annual Predicted Sulfur Deposition**	**Allowable Limit**
0.000239 kg/ha/yr	0.005 kg/ha/yr	0.000585 kg/ha/yr	0.005 kg/ha/yr

Notes:
% = percent
kg/ha/yr = kilograms per hectare per year

CALPUFF deposition modeling results indicate that the sulfur deposition rate due to emissions of the Project will be 0.000585 (kg/ha/yr), which is below the Deposition Analysis Threshold (DAT) for individual sources established by the National Park Service (NPS) of 0.005 kg/ha/yr. CALPUFF nitrogen deposition rate is predicted to be 0.000239 kg/ha/yr, a value which is well below the DAT of 0.005 kg/ha/yr. The deposition impacts from the Project in JTNP are thus predicted to be below a level of significance.

The modeling results in Table 6.1-20, CALPUFF Visibility and Deposition Results, indicate that there will zero days during the year for which the Project will cause an incremental change in light extinction equal to or greater than 5% from the background level (the significance threshold for a single source). The highest predicted change in light extinction is 1.87%. Based on these results, the Project will not cause significant visibility degradation at JTNP.

6.1.3 Cumulative Impacts

CEC policy for evaluating cumulative air quality impacts requires modeling to estimate the cumulative impacts of the Project with those of other projects within a 6-mile radius that have received construction permits but are not yet operational, or that are in the permitting process or can be expected to undertake permitting in the near future. Responses to requests to ICAPCD and the Planning Departments of Imperial County and several cities within the County have been used to obtain data on new projects planned within a 6 mile radius from the Project Site. The resulting list of projects is provided in Appendix H, List of Proposed Projects. Figure H-1, Future Projects Within 6 Miles of the Project, shows the relationship of where these future projects will be located and where the Project is located. As shown in this appendix, the great majority of these projects are proposed residential and commercial developments, with a few light industrial projects. Several planned developments involving more substantial industrial sources at Mesquite Lake and Brawley are at least 8 miles from the ECGS. The list of potential projects was submitted to CEC for review and a determination of which new projects, if any, need to be evaluated by cumulative modeling. CEC has subsequently determined that none of these developments will significantly contribute to cumulative impacts with the ECGS Unit 3 Repower Project, but has determined that a cumulative modeling analysis should be performed including emissions from other existing ECGS generating units that will continue to operate in the future. This section presents the resulting cumulative analysis.

Sources at ECGS other than the repowered Unit 3 and the Unit 3 cooling tower that have been included in the cumulative analysis include Unit 2 (GE 7EA CTG with HRSG similar to new repowered Unit 3), Unit 4 (utility boiler), and cooling towers for Units 2 and 4.

6.1.3.1 ECGS Cumulative Source Emissions

Combustion Sources

Information to calculate the criteria pollutant emission rates from existing ECGS Units were obtained from IID. Data from the CEMS on the Units 2 and 4 stacks were available to determine SO_x and NO_x emissions for the past 3 years (2002-2004). Fuel usage data were used to estimate CO, VOC and $PM_{10}/PM_{2.5}$ emission rates using appropriate emission factors from the AP-42 compendium. For each pollutant the average hourly emission rate during operational periods and the average over the entire year were computed to represent short-term (1 to 24 hour) and long-term (annual) emissions. The highest emission values among the 3 years of data were used in the cumulative ISCST3 dispersion modeling. Data used in calculating historical emission rates are provided in Appendix B, Air Quality Data, Attachment C, Supporting Information on Estimation of Project Operation Emissions. No other combustion sources are included in the cumulative modeling analysis. The emission rates used in the cumulative source modeling are presented in Table 6.1-21, Criteria Pollutant Sources and Highest Historical Emission Rates for Units 2 and 4 and Cooling Tower.

TABLE 6.1-21
CRITERIA POLLUTANT SOURCES AND HIGHEST HISTORICAL EMISSION RATES FOR UNITS 2 AND 4 AND COOLING TOWER

Averaging Time	Pollutant	SOURCES			
		Unit 2 CTG/HRSG	Unit 4 Boiler	Unit 2 Cooling Tower	Unit 4 Cooling Tower
		Emissions in pounds per hour			
1-hour	NO_x	25.85	84.70	0	0
	CO	65.60	29.64	0	0
	SO_2	0.50	0.44	0	0
3-hour	SO_2	0.50	0.44	0	0
8-hour	CO	65.60	29.64	0	0
24-hour	PM_{10}	5.30	2.68	0.0714	0.247
	SO_2	0.50	0.44	0	0
Annual	NO_x	12.27	61.06	0	0
	PM_{10}	2.31	1.93	0.0714	0.247
	SO_2	0.21	0.32	0	0

Notes:
CTG = combustion turbine generator
HRSG = heat recovery steam generator
CO = carbon monoxide
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 microns in diameter
SO_2 = sulfur dioxide

Cooling Towers

PM_{10} emission rates for the Unit 2 and Unit 4 cooling tower were calculated in the same manner as the Unit 3 cooling tower emissions, (i.e., based on design circulating water rate, cycles of concentration, source water total dissolved solids [TDS], and drift control efficiencies). Historical data for these parameters were obtained from IID. Cooling tower emission rates are presented with the fuel combustion emissions for Units 2 and 4 in Table 6.1-21, Criteria Pollutant Sources and Highest Historical Emission Rates for Units 2 and 4 and Cooling Tower.

ECGS Cumulative Source Stack Parameters

Stack parameters used in the modeling for Units 2 and 4 (stack exit temperature, stack height, stack diameter, stack flow rate or exit velocity) and the cooling towers were obtained from existing IID operating permits and are presented in Table 6.1-22, Existing ECGS Sources Stack Parameters.

TABLE 6.1-22
EXISTING ECGS SOURCES STACK PARAMETERS

	Stack Diameter	Stack Exit Temperature	Stack Exit Flow Rate	Stack Height
Unit 2 (CTG)	15 feet	321° F	767,039 acfm	100 feet
Unit 4 (Boiler)	8.9 feet	269° F	231,218 acfm	107 feet
Cooling Tower 2 (7 cells)	13.1 feet	100° F	399,402 acfm	41 feet
Cooling Tower 4 (3 cells)	13.1 feet	100° F	399,402 acfm	41 feet

Notes:
acfm = actual cubic feet per minute
CTG = combustion turbine generator
ºF = degrees Fahrenheit

6.1.3.2 Cumulative Modeling Results

Air dispersion modeling was performed according to the methodology described in Section 6.1.2.3, Air Dispersion Modeling, to evaluate the maximum increase in ground-level pollutant concentrations resulting from the combined ECGS emissions, and to compare the maximum predicted impacts, including background pollutant levels, with applicable short-term and long-term CAAQS and NAAQS.

The same 5-year record of hourly meteorological data and receptor grids described in Section 6.1.2.3, Air Dispersion Modeling, were used in the modeling to evaluate cumulative air quality impacts. The maximum concentrations predicted to result from plant-wide ECGS emissions for each pollutant and averaging time were added to the maximum background concentrations, based on air quality data collected at the most representative monitoring stations during the last five years (i.e., 2001 through 2005). These background concentrations are presented and discussed in Section 6.1.1.2, Existing Air Quality. The resulting total pollutant concentrations were then compared with the most stringent CAAQS or NAAQS.

Modeled cumulative criteria pollutant impacts are summarized in Table 6.1-23, ISCST3 Cumulative Modeling Results. As shown in this table, the maximum predicted cumulative pollutant concentrations plus background levels are below the most stringent NAAQS or CAAQS, except for PM_{10} and $PM_{2.5}$. The concentrations for these two pollutants are above the standards due to high monitored background values. Table 6.1-23 demonstrates that ECGS emissions contribute only a small fraction of predicted maximum total concentrations. In addition, IID has committed to providing emissions offsets for the net emissions increases in particulate emissions resulting from the Project.

TABLE 6.1-23
ISCST3 CUMULATIVE MODELING RESULTS

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Impact Level ($\mu g/m^3$)	Background ($\mu g/m^3$)	Maximum Total Predicted Concentration ($\mu g/m^3$)	Most Stringent AAQS ($\mu g/m^3$)	UTM Coordinates	
							East (meters)	North (meters)
Maximum Impacts								
CO	1 hour	502.5	2,000	18,400	18,902.5	23,000	637,092	3,630,278
	8 hour	66.6	500	6,778	6,844.6	10,000	637,042	3,630,277
NO_2	1 hour	190.8	NA	180.5	371.3	470	636,943	3,630,276
	Annual	1.61	1	35.9	37.51	100	637,117	3,630,278
PM_{10}	24 hour	4.30	5	383	387.3	50	637,042	3,630,277
	Annual	0.40	1	48.6	49.0	20	637,017	3,630,277
$PM_{2.5}$	24 hour	4.30	NA	74.2	78.5	65	637,042	3,630,277
	Annual	0.40	NA	9.7	10.1	12	637,017	3,630,277
SO_2	1 hour	3.18	NA	7.86	11.04	655	637,117	3,630,278
	3 hour	1.87	25	7.80	9.67	1,300	636,968	3,630,276
	24 hour	1.10	5	7.88	8.98	105	637,042	3,630,277
	Annual	0.12	1	2.67	2.89	80	636,993	3,630,277

Notes:
$\mu g/m^3$ = micrograms per cubic meter
AAQS = Ambient Air Quality Standards
CO = carbon monoxide
ISCST3 = Industrial Source Complex Short Term 3
NA = not applicable
NO_2 = nitrogen dioxide
PM_{10} = particulate matter less than 10 microns
PSD = prevention of significant deterioration
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

6.1.4 Mitigation Measures – Emissions Offset

The modeling analyses presented in the previous sections of this SPPE estimates the air quality impacts due to the Unit 3 Repower Project sources alone or in combination with other ECGS units that will continue to operate in the future. Not included in these analyses is the fact that the Project will also involve the retirement of the existing Unit 3 boiler, which is being replaced by the new Unit 3 CTG/HRSG, nor the fact that the Unit 3 cooling tower will not be a new emission source. Thus the predicted air quality impacts of the Project have been conservatively overstated. In addition, IID is proposing to provide offsets for project emissions increases, as described below.

ICAPCD Rule 207 requires that Project operational emissions above 137 lbs/day of NO_x, ROC, CO, PM_{10} and SO_x be offset by emission reductions from other sources.

The proposed ECGS Unit 3 Repower Project will consist of a new GE 7EA CTG that will augment its power generation by means of a HRSG with duct firing. This CTG/HRSG unit will replace the existing Unit 3 utility boiler, which will be retired. SCR and a CO oxidation catalyst

will be used to control CTG/HRSG emissions of NO_x and CO, respectively. IID will accept permit conditions limiting the hours of operation for the new unit to 8,475 per year, including 3,000 hours with duct firing, plus 150 annual Unit 3 startups/ shutdowns. Based on these operational limitations and the assumption of full-load CTG operations for 8,000 hours per year (including 20 hours of uncontrolled or "maintenance" operation and 3,000 hours with duct firing at the maximum rate plus 150 CTG startups/ shutdowns), the new unit's maximum emissions of criteria pollutants have been estimated using data provided by the CTG manufacturer, with one exception. PM_{10} emissions from the CTG/HRSG train were estimated based on the results of source test data obtained from the CEC for 7EA CTGs that are operated at power plants at various California locations.

The existing Unit 3 cooling tower will also continue to be a source of PM_{10} after implementation of the Project. The annual potential to emit for this source will increase slightly as a result of the Repower Project because of increased Unit 3 operating hours. However, installation of an improved drift eliminator system will lessen this emissions increase to a small value. The resulting annual emissions and the maximum daily values (based on continuous controlled full-load operation of the CTG with duct firing for 24 consecutive hours) are shown in Table 6.1-24, Estimated Daily and Annual Emission Changes Due to Proposed ECGS Unit 3 Repower Project.

TABLE 6.1-24
ESTIMATED DAILY AND ANNUAL EMISSION CHANGES DUE TO PROPOSED ECGS UNIT 3 REPOWER PROJECT

	NO_x	CO	ROC	PM_{10}	SO_X
Daily Emissions					
Future Daily Unit 3 Gas CTG/HRSG Emissions (lb/day)[1]	144.0	172.08	23.04	120.00	37.68
Future Maximum Unit 3 Cooling Tower Emissions (lb/day)[2]	--	--	--	13.68	--
Historical Average Unit 3 Boiler Emissions (lb/day)[3]	283.95	145.81	9.53	13.20	2.74
Historical Unit 3 Cooling Tower Emissions (lb/day)[4]	--	--	--	31.20	--
Net Change (pounds/day)	*-139.95*	*+26.27*	*+13.51*	*+89.28*	*+34.94*
Annual Emissions					
Future Maximum Unit 3 CTG/HRSG Emissions (tons/year)[5]	37.18	47.51	4.79	21.06	7.52
Future Maximum Unit 3 Cooling Tower Emissions (tons/year)[2]	--	--	--	2.34	--
Historical Average Unit 3 Boiler Emissions (tons/year)[3]	51.82	26.61	1.74	2.41	0.5
Historical Unit 3 Cooling Tower Emissions (tons/year)[4]	--	--	--	2.02	
Net Change (tons/year)	*-14.64*	*+20.90*	*+3.05*	*+18.97*	*+7.02*

Notes:
[1] Daily emissions shown for future Unit 3 CTG/HRSG are for continuous, 100% load operation at 40ºF. Maximum possible daily emissions, including multiple startups with several hours of maintenance operation would be considerably higher, but would occur very rarely (a maximum of 20 maintenance operation hours per year are requested). See discussion in Section 6.1.2.2.
[2] Cooling tower PM_{10} emissions for new Unit 3 calculated based on projected circulating water rate and hours of operation, along with other tower characteristics. See discussion in Section 6.1.2.2.
[3] Historical Unit 3 boiler emissions determined from CEMS data (NO_x and SO_x) and recorded fuel usage with AP-42 emission factors (other pollutants) for year 2000-2004. See discussion in Section 6.1.2.2.
[4] Historical Unit 3 cooling tower emissions determined from 2002-2004 operating data.
[5] Annual emissions estimates based on 5,000 hours per year of normal maximum load Unit 3 CTG/HRSG operations without duct firing, including 20 hours of uncontrolled maintenance operation and 3,000 hours of turbine/HRSG operation with duct firing, in addition to 150 startups/shutdowns.
CO = carbon monoxide
CTG = combustion turbine generator
ECGS = El Centro Generating Station
HRSG = heat recovery steam generator
lb = pounds
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 microns in diameter
ROC = reactive organic compounds
SO_x = sulfur oxide(s)

Since the new CTG/HRSG will replace the existing Unit 3 boiler at ECGS, which will be removed from service, the net change in emissions resulting from the Project will actually be the differences between the emissions of each pollutant resulting from the new Unit 3 and those that have historically occurred with the existing unit, including the cooling tower PM_{10} emissions referenced above. These differences are the emissions quantities that will need to be offset under ICAPCD rules and CEC policy. Accordingly, Table 6.1-24, Estimated Daily and Annual

Emission Changes Due to Proposed ECGS Unit 3 Repower Project, shows the estimated net changes in the daily and annual Unit 3 emissions for each pollutant; i.e., those of the proposed Unit 3 minus those from the existing unit. Table 6.1-25, Historical Unit 3 Emissions of Air Pollutants, shows the historical data for the last 5 years that have been used to represent the emissions from the existing Unit 3 operations.

TABLE 6.1-25
HISTORICAL UNIT 3 EMISSIONS OF AIR POLLUTANTS

Pollutant	2000 (tons)	2001 (tons)	2002 (tons)	2003 (tons)	2004 (tons)	Average for Most Representative 3 Years (2001-2003) tons/year	Average Daily Emissions for Most Representative 3 years (lb/day)
NO_x[1]	92.6	49.1	47.75	58.62	24.39	51.82	283.95
SO_2[1]	1.5	1	0.2	0.3	0.1	0.50	2.74
PM_{10}[2]	4.16	2.27	2.18	2.77	1.18	2.41	13.20
CO[2]	45.94	25.12	24.12	30.59	13.04	26.61	145.81
ROC[2]	3.01	1.64	1.58	2.0	0.85	1.74	9.53

Notes:
[1] NO_x and SO_2 emissions determined directly from CEMS data
[2] PM_{10}, CO and VOC emissions estimated using actual fuel usage data for the indicated years and AP-42 emissions factors for large gas- and oil-fired boilers
CO = carbon monoxide
lb = pounds
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 microns in diameter
ROC = reactive organic compounds
SO_2 = sulfur dioxide

According to CEC policy, mitigation (offsets) will be required for all of the ECGS Unit 3 Repower Project's emissions increases of non-attainment pollutants and their precursors. For this reason, IID proposes to provide enough offsets to cover the full increases in the annual emissions of ROC, PM_{10}, and SO_2 shown in Table 6.1-24, Estimated Daily and Annual Emission Changes Due to Proposed ECGS Unit 3 Repower Project, because of the non-attainment status of Imperial County with respect to state and federal ambient air quality standards for O_3 and PM_{10}. Offsets will not be required for NO_x, as Table 6.1-24 demonstrates that the Repower project will result in a substantial net decrease in annual emissions of this pollutant. Also, per Rule 207.C.2.g, offsets for CO are not required if it can be demonstrated by modeling that the Project's emissions will not cause or contribute to violations of the ambient standards for that pollutant. Modeling results presented in Section 6.1.2.3, Air Dispersion Modeling, provide this demonstration for CO.

All ERCs used to offset the ECGS Unit 3 Repower Project will be from emission reductions at sources located within 50 miles of the Project Site. Thus, per ICAPCD Rule 207C.3, the applicable offset ratio would be 1.2:1. However, CEC normally requires only a 1:1 ratio in cases where the emissions offset threshold of the local air district (in this case, 137 lb/day per ICAPCD Rule 207.C) is not exceeded, which is the case for the ECGS ROC, SO_2 and PM_{10} emissions. ICAPCD has already approved the 1:1 ratio for all pollutants, although the inter-pollutant ratios described above still need to be applied.

Table 6.1-26, IID Credits Currently in the ICAPCD ERC Bank**,** shows the balance of ERCs that IID has banked with ICAPCD after subtraction of the credits that will be used for offsetting the IID Niland Gas Turbine Plant, which is also currently undergoing review by CEC and ICAPCD.

TABLE 6.1-26
IID CREDITS CURRENTLY IN THE ICAPCD ERC BANK

(Amounts in tons)	NO_x	ROC	PM_{10}	SO_2
Credits banked by IID for reductions at combustion sources	77.47	1.28	9.27	52.08
Banked credits purchased from El Toro Export	0	0	15.4[1]	0
Total ERCs held by IID	**77.47**	**1.28**	**24.67**	**52.08**
IID ERCs proposed to offset Niland Gas Turbine Plant Emissions	30.93	1.28	12.16 (9.27 tons from combustion sources plus 5.78 tons of El Toro credits)	0
Remaining ERCs held by IID for reductions at combustion source	**46.54**	**0**	**0**	**52.08**
Remaining ERCs purchased from El Toro Export			**9.62[1]**	

Notes:
[1]Credits generated from dust control cartridges installed at the El Toro Export hay bale compression facility.
ERC = emission reduction credit
ICAPCD = Imperial County Air Pollution Control District
IID = Imperial Irrigation District
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
ROC = reactive organic compounds
SO_2 = sulfur dioxide

Table 6.1-27, Proposed Offset Package for the El Centro Unit 3 Repower Project, shows the emissions offsets package that is proposed by IID to meet the estimated requirements for the ECGS Unit 3 Repower Project. Note that only ERCs that have already been banked with ICAPCD are proposed as offsets for this Project. ICAPCD has confirmed in correspondence to IID that the appropriate inter-pollutant offset ratio for the use of banked NO_x credits to offset the Project's ROC emissions is 2:1, and this value has been used in compiling Table 6.1-27. In the same agreement, ICAPCD has also confirmed that a ratio of 2:1 is appropriate for the use of the credits that resulted from control of fugitive particulate emissions from hay compression operations at El Toro Export, and this ratio has also been assumed in Table 6.1-27.

Note that the proposed offsets package in Table 6.1-27, Proposed Offset Package for the Unit 3 Repower Project, differs from that which has been previously approved by ICAPCD, because of changes in the vendor emissions data for the Unit 3 CTG and the addition of incremental PM_{10} emissions from the Unit 3 cooling tower that were not known at the time of ICAPCD's review. However, the methodology used to estimate the required offsets in this SPPE Application is completely consistent with ICAPCD's requirements, including offset distance ratios and inter-pollutant offset ratios.

TABLE 6.1-27
PROPOSED OFFSET PACKAGE FOR THE UNIT 3 REPOWER PROJECT

Parameter	Tons/Year		
	ROC	PM_{10}	SO_2
Unit 3 Project Net Emissions Increase	3.05	18.97	7.02
Required Credits Based on 1.:1 Ratio[1]	3.05	18.97	7.02
Source(s) of Credits – Banked Credits (Same Pollutant)	None	4.81 tons provided in the form of 9.62 tons of El Toro Export PM_{10} credits (based on a 2:1 ratio for fugitive PM_{10} emission reductions).	7.02 tons of banked SO_2 credits
Source of Credits – Proposed Inter-pollutant Trade[2]	3.05 tons provided in the form of 6.10 tons of banked NO_x credits, based on an inter-pollutant ratio of 2:1	14.16 tons provided in the form of 35.4 tons of banked SO_2 credits (based on an inter-pollutant ratio of 2.5:1)	None

Notes:
[1] Per agreement with ICAPCD, emissions will be offset at a 1:1 ratio because the net increases in emissions for all three pollutants will be less than the offset triggering level of 137 lb/day specified in ICAPCD Rule However, inter-pollutant offset ratios will be applied.
[2] The calculations shown in this table assume that the El Toro credits from control of fugitive emissions can be used to offset Project, PM_{10} emissions at a 2:1 ratio and that banked SO_2 credits can be used to offset Project PM_{10} emissions at a 2.5:1 ratio per the requirements determined by ICAPCD..

ECGS = El Centro Generating Station
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 microns in diameter
ROC = reactive organic compounds
SO_2 = sulfur dioxide

Note that IID proposes to use banked ERCs for SO_2 as a means to offset the majority of the Unit 3 Repower Project emissions increase for PM_{10}. This decision was reached based on our finding that opportunities to generate sufficient "traditional" PM_{10} credits from emission reductions on combustion sources do not exist in Imperial County, and the fact that this approach has been approved for at least nine other power projects undergoing CEC licensing in recent years in the Bay Area, Sacramento County, San Luis Obispo County, San Diego County, San Bernardino County and the San Joaquin Valley. The increased use of this type of inter-pollutant offsets has been approved by regulatory agencies because SO_2 is a precursor to particulate matter (SO_x participate in atmospheric reactions to form the sulfate fraction of both PM_{10} and $PM_{2.5}$). It is also a result of the general lack of PM_{10} ERC opportunities throughout the state and the growing opposition of CEC, CARB and EPA to the use of fugitive dust control measures to offset particulate emissions from fuel combustion. CEC staff assessments for other power generation projects have stated that the use of SO_2 emission reductions to offset Project particulate matter emissions is acceptable when the following conditions are met:

- The Applicant has used all of its banked PM_{10} credits and is unable to secure additional PM_{10} credits internally or from outside sources; and
- An analysis has been performed to determine the appropriate inter-pollutant trading ratio.

IID has held discussions with ICAPCD on the acceptability of using SO_2 ERCs to offset PM_{10} emissions. Based on data from the Project, as well as the precedents set by other recent California power projects, ICAPCD has agreed to a 2.5:1 ratio for the use of banked SO_2 credits

to offset the Project's PM_{10} emissions. In addition, ICAPCD will require the Project's emissions of SO_2 to be offset at a 1:1 ratio, which consumes almost all of the remaining credits for this pollutant currently held by IID. Based on the ERC information shown in Table 6.1-27, Proposed Offset Package for the El Centro Unit 3 Repower Project, IID will be able to meet its entire emissions offset obligations using only ERCs that have already been banked with ICAPCD.

6.1.5 Laws, Ordinance, Regulations, and Standards

The applicable LORS related to the potential air quality impacts from the Project are described below. These LORS are administered (either independently or cooperatively) by USEPA Region IX, CEC, CARB, and ICAPCD.

6.1.5.1 Ambient Air Quality Standards

USEPA, in response to the federal Clean Air Act (CAA) of 1970, established NAAQS in 40 Code of Federal Regulations (CFR) 50. The NAAQS include both primary and secondary standards for six "criteria" pollutants. These criteria pollutants are O_3, CO, NO_2, SO_2, PM_{10}, and Pb. Primary standards were established to protect human health, and secondary standards were designed to protect property and natural ecosystems from the effects of air pollution.

The 1990 Clean Air Act Amendments (CAAA) established attainment deadlines for all designated areas that were not in attainment with the NAAQS. In addition to the NAAQS described above, a new federal standard for $PM_{2.5}$ and a revised O_3 standard were promulgated in July 1997. In 1988, as part of the California Clean Air Act, the State of California adopted the CAAQS that are in some cases more stringent than the NAAQS. The CAAQS and NAAQS are summarized in Table 6.1-28, National and California Ambient Air Quality Standards.

TABLE 6.1-28
NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	CAAQS[1,2]	NAAQS[3,2]	
			Primary	Secondary
O_3	8 hour[4]	0.07 ppm (137 μg/m^3)	0.08 ppm (157 μg/m^3)	Same as primary standard
	1 hour	0.09 ppm (180 μg/m^3)	See footnote "4"	
CO	8 hour	9 ppm (10,000 μg/m^3)	9 ppm (10,000 μg/m^3)	
	1 hour	20 ppm (23,000 μg/m^3)	35 ppm (40,000 μg/m^3)	
NO_2[5]	Annual (arithmetic mean)		0.053 ppm (100 μg/m^3)	Same as primary standard
	1 hour	0.25 ppm (470 μg/m^3)		
SO_2	Annual (arithmetic mean)		0.03 ppm (80 μg/m^3)	
	24 hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	
	3 hour			0.05 ppm (1,300 μg/m^3)
	1 hour	0.25 ppm (655 μg/m^3)		

TABLE 6.1-28
NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	CAAQS[1,2]	NAAQS[3,2]	
			Primary	Secondary
Respirable Particulate Matter (PM_{10})[6]	Annual (arithmetic mean)	20 μg/m^3	50 μg/m^3	Same as primary standard
	24 hour	50 μg/m^3	150 μg/m^3	
Fine Particulate Matter ($PM_{2.5}$)[6,7]	Annual (arithmetic mean)	12 μg/m^3	15 μg/m^3	Same as primary standard
	24 hour		65 μg/m^3	
Sulfates	24 hour	25 μg/m^3		
Visibility Reducing Particles	1 observation	See footnote "8"	No federal standard	No federal standard

Notes:
[1]Title 17, California Code of Regulations, CAAQS for O_3, (as volatile organic compounds), CO, SO_2 (1-hour), NO_2, and particulate matter (PM_{10}), are values that are not to be exceeded. The visibility standard is not to be equaled or exceeded.
[2]Concentrations are expressed first in units in which they were promulgated. Equivalent units are given in parentheses and based on a reference temperature of 25° C and a reference pressure of 760 mm of mercury. All measurements of air quality area to be corrected to a reference temperature of 25° C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of natural gas.
[3]40 CFR 50. NAAQS, other than those for ozone and based on annual averages, are not to be exceeded more than once a year. The 8-hour ozone standard is based on a 3-year average of the fourth-highest daily maximum.
[4]New federal 8-hour ozone and fine particulate matter ($PM_{2.5}$) standards were promulgated by USEPA on July 18, 1997. The federal 1-hour ozone standard was revoked by USEPA on June 15, 2005. California 8-hour standard is expected to be officially implemented in early 2006.
[5]NO_2 is the compound regulated as a criteria pollutant; however, emissions are usually based on the sum of all oxides of nitrogen (NO_x).
[6]CARB established new standards for PM_{10} and $PM_{2.5}$ in June 2002.
[7]Annual federal standard is 3-year average. The 24-hour federal standard is 3-year average of 98th percentile.
[8]In sufficient amount to reduce the prevailing visibility to less than 10 miles when the relative humidity is less than 70%. "Prevailing visibility" is defined as the greatest visibility which is attained or surpassed around at least half of the horizon circle, but not necessarily in continuous sectors.

μg/m^3 = micrograms per cubic meter
CO = carbon monoxide
NAAQS = National Ambient Air Quality Standard
NO_2 = nitrogen dioxide
O_3 = ozone
PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 emissions micrometers in diameter
ppm = parts per million
SO_2 = sulfur dioxide
% = percent

USEPA, CARB, and the local air pollution control districts determine the air quality attainment status of designated areas by comparing local ambient air quality measurements from the state or local ambient air monitoring stations with the NAAQS and CAAQS. Those areas that meet ambient air quality standards are classified as "attainment" areas; areas that do not meet the standards are classified as "nonattainment" areas. Areas that have insufficient air quality data may be identified as unclassifiable areas. These attainment designations are determined on a pollutant-by-pollutant basis. Imperial County has been designated as a federal and state nonattainment area for O_3 and PM_{10}. The District's status for all other criteria pollutants is considered to be attainment. Table 6.1-29, Federal and State Attainment Status for Imperial County, presents the County's attainment status with respect to both the NAAQS and CAAQS.

TABLE 6.1-29
FEDERAL AND STATE ATTAINMENT STATUS FOR IMPERIAL COUNTY

Pollutant	Federal Attainment Status	State Attainment Status
O_3	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Attainment	Unclassified
Lead	Attainment	Unclassified

Notes:
O_3 = ozone
CO = carbon monoxide
NO_2 = nitrogen dioxide
PM_{10} = particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter
SO_2 = sulfur dioxide

As mentioned above, both USEPA and CARB are involved with air quality management in Imperial County, along with ICAPCD. The area of responsibility for each of these agencies is described below.

USEPA has ultimate responsibility for ensuring, pursuant to the CAAA, that all areas of the United States meet, or are making progress toward meeting, NAAQS. The state of California falls under the jurisdiction of USEPA Region IX, which is headquartered in San Francisco. USEPA requires that all states submit State Implementation Plans (SIPs) for nonattainment areas that describe how the NAAQS will be achieved and maintained. USEPA has delegated this attainment responsibility to the CARB.

The CARB, in turn, has delegated attainment responsibility to regional or local air quality management districts (or air pollution control districts), such as ICAPCD. CARB is responsible for attainment of the CAAQS, implementation of nearly all phases of California's motor vehicle emissions program, and oversight of the operations and programs of the regional air districts.

Each air district is responsible for establishing and implementing rules and control measures to achieve air quality attainment within its district boundaries. The air district also prepares an air quality management plan (AQMP) that includes an inventory of all emission sources within the district (both man-made and natural), a projection of future emissions growth, an evaluation of current air quality trends, and any rules or control measures needed to attain the NAAQS. This AQMP is submitted to CARB, which then compiles AQMPs from all air districts within the state into the SIP. The responsibility of the air districts is to maintain an effective permitting system for existing, new, and modified stationary sources, to monitor local air quality trends, and to adopt and enforce such rules and regulations as may be necessary to achieve the NAAQS.

6.1.5.2 Prevention of Significant Deterioration Requirements

In addition to the ambient air quality standards described above, the federal PSD program has been established to protect deterioration of air quality in those areas that already meet NAAQS. Specifically, the PSD program specifies allowable concentration increases for attainment pollutants due to new emission sources or modifications to existing sources. These increases allow economic growth while preserving the existing air quality, protecting public health and welfare, and protecting Class I areas (selected national parks and wilderness areas).

The existing ECGS is a Major Source, as this term is defined in the PSD regulations. As shown in Table 6.1-30, Prevention of Significant Deterioration Threshold Triggers, the incremental increases in the power plant's annual emissions due to the Unit 3 Repower Project will be less than the PSD significance levels for all pollutants except PM_{10}. However, as described previously, the Project study area is designated non-attainment for PM_{10}, so the repower project is not subject to the federal PSD program, which requires a preconstruction review that includes an analysis and implementation of BACT, a PSD increment consumption analysis, an ambient air quality impact analysis, and analysis of air quality related values. Although, not subject to these requirements under the federal program, the Project is nevertheless required by ICAPCD and CEC to apply BACT, conduct dispersion modeling, and evaluate impacts in the nearest Class I areas, as described in Section 6.1.5.10, Imperial County Air Pollution Control District Requirements.

TABLE 6.1-30
PREVENTION OF SIGNIFICANT DETERIORATION THRESHOLD TRIGGERS

Pollutant	Significant Modification Thresholds (tons per year)	Unit 3 Repower Project Emissions Increase (tons per year)	PSD Triggered by Project?
SO_2	40	7.02	No
NO_x	40	-14.64	No
VOC	40	3.05	No
PM/PM_{10}	25/15	18.97	No/No
CO	100	20.90	No
Lead	0.6	(negligible)	No

Project emission increases include all emissions from the proposed CTG and cooling tower.
Notes:
CO = carbon monoxide
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
PSD= prevention of significant deterioration
SO_2 = sulfur dioxide
VOC = volatile organic compound

6.1.5.3 Acid Rain Program Requirements

Title IV of the CAAA applies to sources of air pollutants that contribute to acid rain formation, including sources of SO_2 and NO_x emissions. The ICAPCD has received delegation from USEPA for Title IV implementation under its Title V Operating Permit program in Regulation IX. The

Acid Rain Program provisions of Part 72, Chapter I, Title 40 of the CFR (40 CFR Part 72), with the exception of Sections 72.41 through 72.43, 72.60 through 72.69, 72.74, and 72.91 through 72.93, are incorporated in Rule 901 as part of the Rules and Regulations of the ICAPCD. Allowances of SO_2 emissions are set aside in 40 CFR 73. Affected sources are required to obtain SO_2 allowances, monitor their emissions, and obtain additional SO_2 allowances when a new source is permitted. Sources such as the Project that use pipeline-quality natural gas as the exclusive fuel are exempt from many of the acid rain program requirements. However, IID will be required to estimate SO_2 and CO_2 emissions from the Project and monitor NO_x emissions with a certified CEMS, and thus must submit an acid rain permit application within 12 months after commencement of plant operations.

6.1.5.4 New Source Performance Standards

New Source Performance Standards (NSPS) have been established by USEPA to limit air pollutant emissions from certain types of new and modified stationary sources. The NSPS regulations are contained in 40 CFR 60 and cover many different industrial source categories. Stationary gas turbines are regulated under Subpart GG. The enforcement of NSPS has been delegated to the ICAPCD, and the NSPS regulations are incorporated by reference into the District's Regulation 10. In general, local emission limitation rules or BACT requirements in California are far more restrictive than the NSPS requirements. For example, the controlled NO_x emissions from the Project's stationary natural gas turbines will be less than or equal to 2.5 ppmvd (volume dry) at 15% O_2, significantly below the NSPS limit.

NSPS fuel requirements for SO_2 will be satisfied by the use of natural gas, and emissions and fuel monitoring that will be performed to meet the requirements of BACT will comply with NSPS, acid rain, and other regulatory requirements.

USEPA has recently proposed Subpart KKKK, a new performance standard which, if promulgated, would apply to the Project's stationary natural gas turbines in lieu of Subpart GG and would impose lower limits on NO_x and SO_2. However, the maximum controlled NO_x emission rate from the Project's stationary natural gas turbine of 7.11 lbs/hr at full load with duct firing corresponds to less than 0.055 lbs of NO_x per MW-hour will be well below the proposed Subpart KKKK requirement of 0.39 lbs of NO_x per MW-hour. The Projected maximum SO_2 emissions from the proposed GE 7EA CTG/HRSG are less than 0.015 lbs of SO_2 per MW-hour, which is a small fraction of the proposed Subpart KKKK requirement of 0.58 lbs of SO_2 per MW-hour. Thus, the Project will comply with this revised NSPS, if it is eventually promulgated.

6.1.5.5 Federally Mandated Operating Permits

Title V of the CAA requires USEPA to develop a federal operating permit program that is implemented under 40 CFR 70. This program is administered by ICAPCD under Regulation IX, Rule 900. Each major source, Phase II acid rain facility, and other source types designated by USEPA must obtain a Part 70 permit. Permits must contain emission estimates based on potential-to-emit, identification of all emissions sources and controls, a compliance plan, and a statement indicating each source's compliance status. The permits must also incorporate all applicable federal requirements. The existing Title V Permit for the ECGS will need to be modified following implementation of the Project to incorporate emissions and regulatory requirements pertaining to the new repowered Unit 3. An application for this permit

modification will be due to ICAPCD one year following commencement of the new Unit's operation.

6.1.5.6 Power Plant Siting Requirements

Under the Warren-Alquist Act, the CEC has been charged with assessing the environmental impacts of each new power plant over 50 MW and considering the implementation of feasible mitigation measures to prevent potential impacts. California Environmental Quality Act (CEQA) Guidelines (Title 14, California Administrative Code, Section 15002(a)(3)) state that the basic purpose of CEQA is to "prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible."

The CEC siting regulations require the evaluation of the Project's compliance with all federal, state, and local air quality rules, regulations, standards, guidelines, and ordinances that are applicable to the construction and operation of the Project. A project must demonstrate that its emissions will be appropriately mitigated to ensure that the impacts from the Project are insignificant and will not jeopardize attainment and maintenance of the NAAQS. Cumulative impacts, impacts due to pollutant interaction, and impacts from non-criteria pollutants must also be addressed.

6.1.5.7 Air Toxics "Hot Spots" Program

As required by the California Health & Safety Code Section 4430, all facilities with criteria air pollutant emissions in excess of 10 tons per year are required to submit air toxic "Hot Spots" emissions information. This requirement is applicable only after the start of operation. Section 6.8, Public Health and Safety, indicates that there will be insignificant air toxics impacts from the Project. However, the ECGS air toxics emissions inventory will need to be updated to reflect the retirement of the existing Unit 3 and the changes to the Unit 3 cooling tower.

6.1.5.8 Determination of Compliance, Authority to Construct, and Permit to Operate

Under Regulation II, Rule 201, ICAPCD administers the air quality regulatory program for the construction, alteration, replacement, and operation of new power plants. As part of the SPPE process, the Project will be required to obtain a preconstruction DOC from the ICAPCD. Regulation II, Rule 201 incorporates other ICAPCD rules that pertain to sources that may emit air contaminants through the issuance of air permits (i.e., ATC and Permit to Operate [PTO]). This permitting process allows the ICAPCD to adequately review new and modified air pollution sources to ensure compliance with all applicable prohibitory rules and to ensure that appropriate emission controls are used. Projects that are reviewed under the CEC SPPE process must obtain an ATC from the local air district (in this case, ICAPCD) prior to construction of the new power plant. The ATC remains in effect until the PTO Application is granted, denied, or canceled. Once the Project commences operations and demonstrates compliance with the ATC, ICAPCD will issue a PTO. The PTO specifies conditions that the Project must meet to comply with all applicable air quality rules, regulations, and standards.

6.1.5.9 New Source Review Requirements

The ICAPCD New Source Review (NSR) rule (Regulation II, Rule 207) establishes the criteria for siting new and modified emission sources and this rule is applicable to the Project. ICAPCD has been delegated authority for NSR rule development and enforcement according to the terms of Rule 207. There are three basic requirements within the NSR rules. First, BACT must be applied to any new source with potential emissions above specified threshold quantities. Second, all potential emission increases of nonattainment pollutants or their precursors from the proposed source above specified thresholds must be offset by real, quantifiable, surplus, permanent, and enforceable emission decreases in the form of ERCs. Third, an ambient air quality impact assessment must be conducted to confirm that the Project does not cause or contribute to a violation of a national or CAAQS or jeopardize public health. In addition, Rule 207D.6.f requires that ATC must address the potential to impact air quality (including visibility) in any Class 1 federal area.

6.1.5.10 Imperial County Air Pollution Control District Requirements

Local districts have principal responsibility for developing plans for meeting the NAAQS and CAAQS; developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards; implementing permit programs established for the construction, modification, and operation of sources of air pollution; enforcing air pollution statutes, regulations and prohibitory rules governing non-vehicular sources; and developing programs to reduce emissions from indirect sources. The following paragraphs outline the ICAPCD rules and regulations that apply to the Project.

Rule 109, Source Sampling – Outlines facility design requirements for source sampling from any facility emitting pollutants for which emission limits have been established. IID will construct the facility to meet and comply with ICAPCD requirements of Rule 109.

Rule 111, Equipment Breakdown – This rule details the notification and corrective action requirements necessary in an equipment breakdown situation. As operator of the Project, IID will comply with these requirements.

Rule 201, Permits Required – An ATC and PTO will be required for the Project. IID will submit the required Application materials for these permits to ICAPCD.

Rule 207, New and Modified Stationary Source Review – This rule outlines the emission standards, the offset requirements and conditions, the required demonstrations that the new source or modification will not cause or contribute to violations of the ambient air quality standards, procedures for power plants under the CEC process, methods for calculating Project emissions, and required air quality analysis procedures. Compliance with the specific provisions of this rule is discussed below.

Rule 207.C.1 BACT. An Applicant must apply BACT to any new or modified emissions unit that has a potential to emit 25 lbs per day or more of any nonattainment pollutant or its precursors. For emergency standby equipment, only those emissions that occur during routine operation for equipment maintenance purposes are required to be considered for the purpose of determining whether BACT is required. In addition, a new or modified emission unit with a potential to emit exceeding the following levels must apply BACT (Table 6.1-31, BACT Threshold Triggers for New and Modified Emission Units).

TABLE 6.1-31
BACT THRESHOLD TRIGGERS FOR NEW AND MODIFIED EMISSION UNITS

Pollutant	Pounds per day
CO (CO attainment areas only)	550
Lead	3.3
Asbestos	0.04
Beryllium	0.0022
Mercury	0.55
Vinyl Chloride	5.5
Fluorides	16
Sulfuric Acid Mist	38
Hydrogen Sulfide	55
Total Reduced Sulfur Compounds	55

Notes:
BACT = best available control technology
CO = carbon monoxide

Federal requirements pertaining to control of pollutants subject to PSD review (i.e., attainment pollutants) were promulgated by USEPA in 40 CFR 42.21 (j). This regulation defines BACT as emission limits "based on the maximum degree of reduction for each pollutant." BACT determinations are made on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs. Federal requirements pertaining to control of non-attainment pollutants, or lowest achievable emission rate (LAER), were promulgated by USEPA under 40 CFR 51.165 (a). This regulation defines LAER as the emissions limit based on either: (1) the most stringent emission rate contained in a SIP, unless the [source] demonstrates the rate is not achievable, or (2) the most stringent emissions limitation that is achieved in practice. The federal LAER does not consider the cost impacts of control.

For any emissions unit, BACT for a new emission unit or modification is the more stringent of:

- The most effective emission control device, emission limit, or technique which has been achieved in practice for such class or category of source unless the Applicant demonstrates to the satisfaction of the Air Pollution Control Officer that such limitations are not achievable;
- Any other alternative emission control device, emission control technique, basic equipment, fuel, or process determined to be technologically feasible and cost-effective by the Air Pollution Control Officer; and
- Under no circumstances shall BACT be determined to be less stringent than the emission control required by any applicable provision of laws or regulations of the district, state and federal government, or the most stringent emissions limitation which is contained in the implementation plan of any state, unless the Applicant demonstrates to the satisfaction of the Air Pollution Control Officer that such limitations are not technologically achievable. In no event shall the Application of BACT result in the emissions of any pollutant which exceeds the emissions allowed by any applicable NSPS (40 CFR, part 60) or National Emission Standard for Hazardous Air Pollutants (HAPs)(40 CFR, part 61).

The majority of pollutant emissions from the Project will be from the repowered Unit 3 CTG, which will be fired exclusively on natural gas and be equipped with dry low NO_x combustors and SCR for the control of NO_x emissions and a CO oxidation catalyst for control of CO emissions. Aqueous ammonia at a concentration not to exceed 20% in water will be used as the reagent for the SCR control system. As part of the Project, IID will replace the existing Unit 3 cooling tower drift eliminator system with a new system guaranteed to control drift to a level of 0.001% of the cooling tower circulating water. The BACT levels for the Project CTG and cooling tower are shown in Table 6.1-32, Summary of Proposed BACT. These BACT levels are consistent with those that have already been approved for this Project by ICAPCD.

TABLE 6.1-32
SUMMARY OF PROPOSED BACT

Pollutant	Control Technology	Concentration ppm @ 15% O_2 dry
Unit 3 CTG/HRSG		
NO_x	Dry low emissions combustors and SCR with ammonia injection	2.0[1]
CO	Catalytic oxidation	4[1]
ROC	Catalytic oxidation	2.0[1]
SO_x	Pipeline quality natural gas (no more than 0.75 grains of total sulfur compounds per 100 scf)	NA
PM_{10}	Pipeline quality natural gas	NA
Ammonia Slip		5[1]
Unit 3 Cooling Tower		
PM_{10}	Highly efficient drift eliminator system	<0.001% of circulating water

Notes:
[1]3-hour averaging period
< = less than
BACT = best available control technology
% = percent
CO = carbon monoxide
CTG = combustion turbine generator
HRSG = heat recovery steam generator
NA = not applicable
NO_x = nitrogen oxide(s)
O_2 = oxygen
PM_{10} = particulate matter less than 10 micrometers in diameter
ppm = parts per million
ROC = reactive organic compounds
scf = standard cubic feet
SCR = selective catalytic reduction
SO_x = sulfur oxide(s)

Appendix B, Air Quality Data, Attachment F, Certificates for Banked Emission Reduction Credit to Offset Project Emissions, provides a formal BACT evaluation for the Project and a letter from ICAPCD to IID confirming that the proposed BACT levels shown in Table 6.1-32, Summary of Proposed BACT, are acceptable.

Rule 207.C.2 Offsets. Rule 207C.2 requires that offsets be provided for a new or modified stationary source with a daily potential to emit equal to or exceeding the following levels shown in Table 6.1-33, Offset Requirement Thresholds.

TABLE 6.1-33
OFFSET REQUIREMENT THRESHOLDS

Pollutant	Pounds per day
ROC	137
NO_x	137
SO_x	137
PM_{10}	137
CO (See Section C.2.g.)	137

Notes:
CO = carbon monoxide
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
ROC = reactive organic compound
SO_x = sulfur oxide(s)

As described in Section 6.1.2.2, Operational Emissions, maximum increase in daily emissions resulting from the Project could exceed the 137 lbs per day trigger for NO_x, CO, and PM_{10} for the worst-case operating scenario. However, on an annual basis, the repowered Unit 3 will result in a net decrease in NO_x emissions compared with recent years, and relatively small increases in annual emissions of ROC, SO_2 and PM_{10}. The ERCs required for compliance with Rule 207.C.2 have already been banked by IID with the ICAPCD. The offset package that will be used to offset Project emissions is described in Section 6.1.4, Mitigation Measures, and the certificates of ownership for these ERCs are provided in Appendix B, Air Quality Data, Attachment G, Letter from Imperial County Air Pollution Control District Regarding Approval of Emission Reduction Package. ICAPCD approval of these ERCs to offset Project emissions is provided in Appendix B, Air Quality Data, Attachment G, Letter from Imperial County Air Pollution Control District Regarding Approval of Emission Reduction Package.

Rule 207.D.9 Power Plants. This section applies to all power plants proposed to be constructed in the Air Pollution Control District and for which a Notice of Intention (NOI) or Application for Certification (AFC) has been accepted by the CEC. It describes the actions to be taken by ICAPCD to provide information to CEC and CARB to ensure that the Project will conform to the District's rules and regulations. After the Application has been submitted to CEC and other responsible agencies, including ICAPCD, the Air Pollution Control Officer is required to conduct a DOC review. This determination must consist of a review identical to that which would be performed if an Application for an ATC had been received for the power plant. If the information contained in the Application for the certification does not meet the requirements of this regulation, then the Air Pollution Control Officer, within 20 calendar days of receipt of the AFC, so inform the CEC, and the AFC will be considered incomplete and returned to the Applicant for resubmittal.

Although not expressly covered in Rule 207.D.9, in the case of an Application for SPPE, the CEC license does not functionally serve as the ATC, as is the case with an AFC project. Instead, after determining that the Project can be built without causing any significant adverse impacts, the CEC turns permitting of the small power plant over to ICAPCD, which proceeds with the ATC and PTO processes, as with any new source.

Rule 207.F Ambient Air Quality Standards. In no case may emissions from a new or modified emission unit, cause or make worse the violation of an Ambient Air Quality Standard. The Air Pollution Control Officer may require an Applicant to use an air quality model to estimate the effects of a new or modified emissions unit. Air quality models used for this purpose must be consistent with the requirements contained in the most recent edition of USEPA Guidelines on Air Quality Models, OAQPS 1.2-080 (November, 2005), unless the Air Pollution Control Officer finds that such model is inappropriate for use. After making such a finding, the Air Pollution Control Officer may designate an alternate model only after allowing for public comment and only with the concurrence of CARB and EPA. All modeling costs associated with the siting of a new or modified emissions unit shall be borne by the Applicant.

As described in Section 6.1.2.4, Modeling Results – Compliance with Ambient Air Quality Standards, an air quality modeling analysis has been conducted to demonstrate that the Project will not cause or make worse the violation of any air quality standard.

Rule 209, Implementation Plans – This rule allows that an ATC for a new stationary source or modification, subject to Rule 207, may be granted only if all APCD regulations contained in the SIP are being carried out in accordance with that plan.

Rule 216, Construction of Major Stationary Sources that Emit HAPs – This rule requires all owners and operators of stationary sources that emit HAPs to install BACT for toxic best available control technology (TBACT) to any constructed or reconstructed major source. All TBACT determinations shall be controlled to a level that the Air Pollution Control Officer has determined to be, at a minimum, no less stringent than new source maximum achievable control technology (MACT) as required by the federal CAA.

Rule 301/302, Permit Fees – This rule and the fee schedules in Rule 302 establish the filing and permit review fees for specific types of new sources, as well as annual renewal fees and penalty fees for existing sources.

Rule 309, Air Toxics "Hot Spots" Information and Assessment – Requires annual fees for facilities subject to the AB2588 Program (see Section 6.1.5.7, Air Toxics "Hot Spots" Program).

Rule 400, Fuel Burning Equipment - Oxides of Nitrogen –This rule limits the emission levels of oxides of nitrogen from any source to no more than 140 lbs/hr of NO_x, calculated as NO_2. The Project's maximum hourly NO_x emissions will be well below this level (see Section 6.1.2.1, Construction Emissions).

Rule 401, Opacity of Emissions – This rule applies to the opacity of discharges from any single source. Emissions from the sources of the Project will be below threshold opacity levels described in this rule.

Rule 403, General Limitations on the Discharge of Air Contaminants – This rule applies to the discharge of air contaminants, combustion contaminants, and particulate matter into the atmosphere. The relevant limit for the Project is expressed in Rule 403.B.4, which states that combustion contaminants (meaning particulate matter) from new or existing stationary electrical utility generating units, excepting emergency standby generators, in concentrations at the point of discharge of 0.01 grains per dry standard cubic foot of exhaust gas, calculated to 3% O_2 for boilers, and 15% O_2 for all gas turbines. The proposed new Unit 3 CTG/HRSG train will easily comply with this requirement, with a maximum PM_{10} emission rate of approximately 0.0015 grains per dry standard foot of exhaust gas.

Rule 407, Nuisances – This rule states that there shall be no discharge of such quantities of any pollutant or material which could cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property.

Rule 900, Procedures for Issuing Permits to Operate for Sources Subject to Title V of the Federal CAA Amendments of 1990 – Describes requirements for affected facilities to obtain federal operating permits pursuant to 40 CFR Part 70.

Rule 901, Acid Deposition Control – Describes requirements for power generation facilities subject to the Acid Rain Permits program pursuant to 40 CFR Part 75.

Table 6.1-34, Applicable LORS, summarizes the LORS pertaining to air quality aspects of the Project, and references the subsection where the Project's compliance with each requirement is discussed.

TABLE 6.1-34
APPLICABLE LORS

LORS	Applicability	Section
Federal		
40 CFR 50	NAAQS	Section 6.1.2.4, Modeling Results – Compliance with Ambient Air Quality Standards, and Section 6.1.5.1, Ambient Air Quality Standards
40 CFR 73	Acid rain	Section 6.1.5.3, Acid Rain Program Requirements
40 CFR 60 Subpart GG	NSPS	Section 6.1.5.4, New Source Performance Standards
40 CFR 70	Federally mandated operating permits	Section 6.1.5.5, Federally Mandated Operating Permits
State		
Title 17, California Code of Regulations	CAAQS	Section 6.1.2.4, Modeling Results – Compliance with Ambient Air Quality Standards, and Section 6.1.5.1, Ambient Air Quality Standards
California Administrative Code, Title 14, Section 15002(a)(3)	Power plant siting requirements	Section 6.1.5.6, Power Plant Siting Requirements
California Health and Safety Code Section 4430	Air toxics "Hot Spots" emission inventory	Section 6.1.5.7, Air Toxics "Hot Spots" Program
Local		
ICAPCD Regulation I, Rule 109	Source sampling	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation I, Rule 111	Equipment breakdown	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements

TABLE 6.1-34
APPLICABLE LORS

LORS	Applicability	Section
ICAPCD Regulation II, Rule 201	Permits required	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation II, Rule 207	New and modified stationary source review	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation II, Rule 209	Implementation plans	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation II, Rule 216	Construction of major stationary sources that emit hazardous air pollutants	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation III, Rule 301/302	Permit fees/fee schedules	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation III, Rule 309	Air toxics hot spots information and assessment	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation IV, Rule 400	Oxides of nitrogen	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation IV, Rule 401	Opacity	
ICAPCD Regulation IV, Rule 403	General limitations on the discharge of air contaminants	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation IV, Rule 405	Sulfur compounds emissions standards, limitations and prohibitions	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation IV, Rule 407	Nuisances	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation IX, Rule 900	Procedures for Title V permits	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements
ICAPCD Regulation IX, Rule 901	Acid rain permits	Section 6.1.5.10, Imperial County Air Pollution Control District Requirements

Notes:
CAAQS = California Ambient Air Quality Standards
CFR = Code of Federal Regulations
ICAPCD = Imperial County Air Pollution Control District
LORS = laws, ordinances, regulations, and standards
NAAQS = National Ambient Air Quality Standards
NSPS = New Source Performance Standards

6.1.6 Involved Agencies and Agency Contacts

Agencies and individuals contacted in connection with the air quality assessment of the Project are as follows in Table 6.1-35, Involved Agencies and Agency Contacts.

TABLE 6.1-35
INVOLVED AGENCIES AND AGENCY CONTACTS

Agency	Contact/Title	Telephone
California Energy Commission	Keith Golden Joe Loyer Air Quality Specialists 1516 Ninth Street Sacramento, CA 95814	(916) 654-4287
U.S. Environmental Protection Agency	Allan Zabel Senior Counsel - Air and Toxics U.S. Environmental Protection Agency, Region 9 75 Hawthorne Street (ORC-2) San Francisco, CA 94105 (415) 972-3902	(415) 972-3902
	Joseph Lapka Region 9 Air Permits Office United States Environmental Protection Agency 75 Hawthorne Street San Francisco, CA 94105	415-947-4226
Imperial County Air Pollution Control District	Brad Poiriez Air Pollution Control Senior Manager 150 S. 9th Street El Centro, CA 92243 Reyes M. Romero Deputy Air Pollution Control Officer 150 S. 9th Street El Centro, CA 92243 Jesus A. Ramirez Air Pollution Control Engineer 150 S. 9th Street El Centro, CA 92243	(760) 482-4606

6.1.7 Permits and Permitting Schedule

Under Regulation II of its Rules and Regulations, ICAPCD regulates the construction, alteration, replacement, and operation of new stationary emissions sources and modifications to existing sources. The Project will be required to obtain a preconstruction DOC from the ICAPCD as part of the CEC review of the Project as an SPPE. Following completion of the CEC SPPE review, air quality permitting authority for this Project will be transferred entirely to the ICAPCD.

Regulation II incorporates other District rules pertaining to sources that may emit air contaminants through the issuance of air permits (i.e., ATC and PTO). This permitting process allows the ICAPCD to adequately review new and modified air pollution sources to ensure compliance with all applicable prohibitory rules and to ensure that appropriate emission controls will be used. An ATC allows for the construction of the air pollution source and remains in effect until the PTO Application is granted, denied, or canceled. The ATC should be issued within 3 to 6 months following submittal by the Applicant of a complete Application. Once the Project has completed construction and commences operations, ICAPCD will require

verification that the Project conforms to the ATC Application and then issues a PTO. The PTO specifies conditions that the air pollution source must meet to comply with all air quality standards and regulations and will incorporate applicable DOC requirements

6.1.8 References

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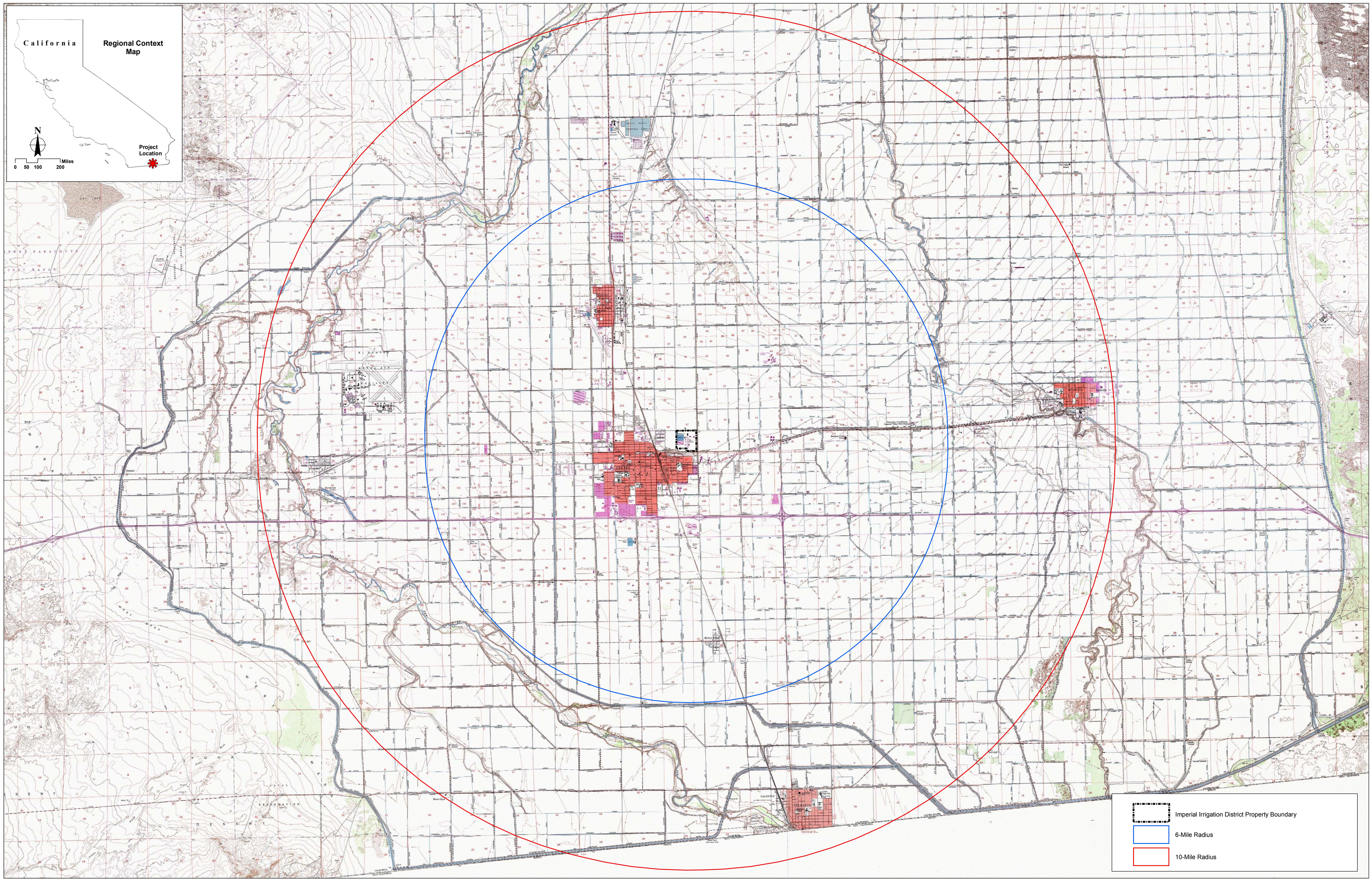

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0 2000 4000 6000 8000 Feet

SCALE: 1" = 4000' (1:48,000)

N

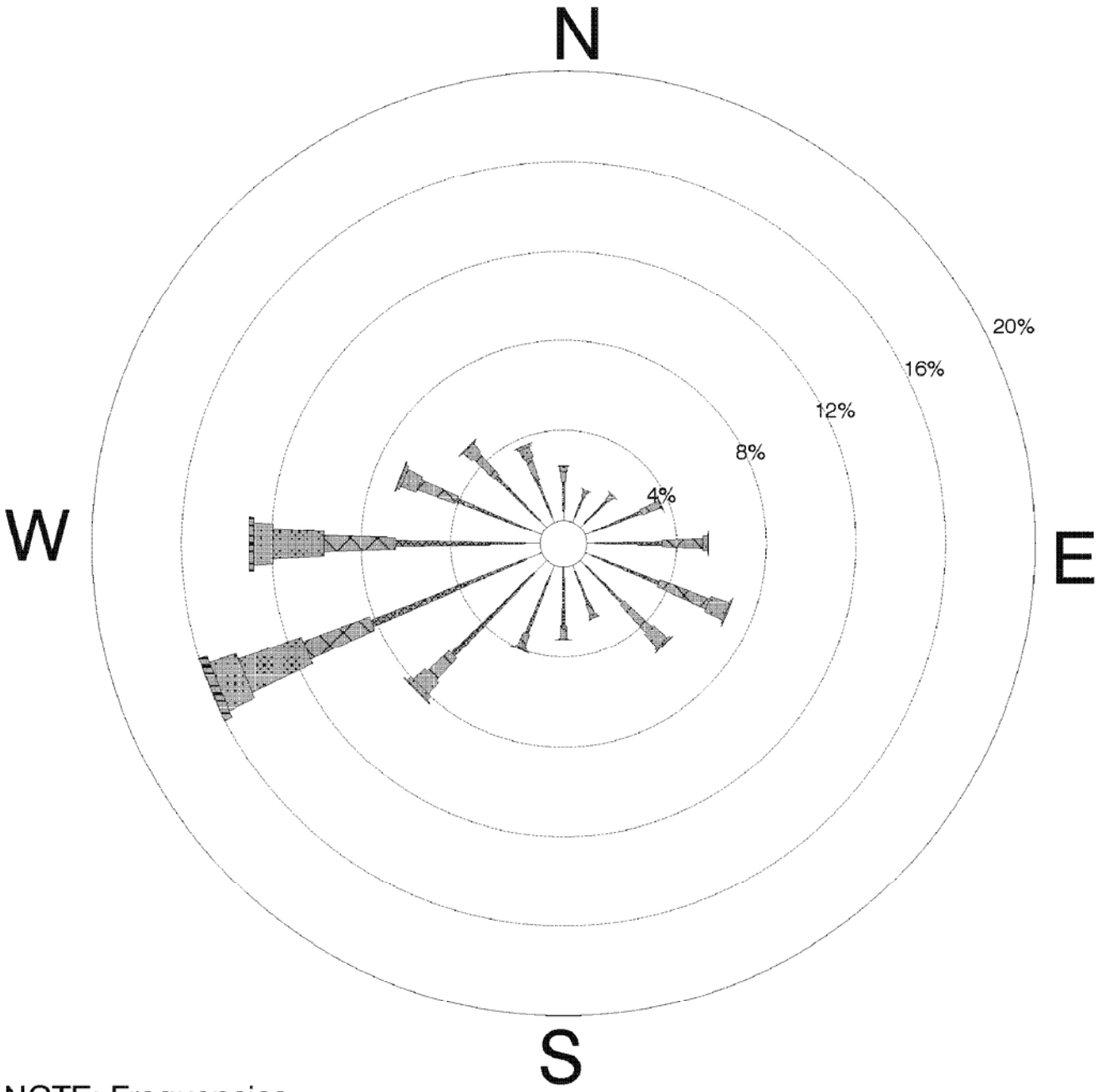
SOURCES:
USGS (7.5 Brawley NW, Brawley, Alamorio, Seeley, El Centro, Holtville West, Holtville East, Mount Signal, Heber, Calexico quads);
Imperial Irrigation District (site plan).

Topography within a 6- and 10-Mile Radius of the Project Site

El Centro Unit 3 Repower Project
Imperial Irrigation District

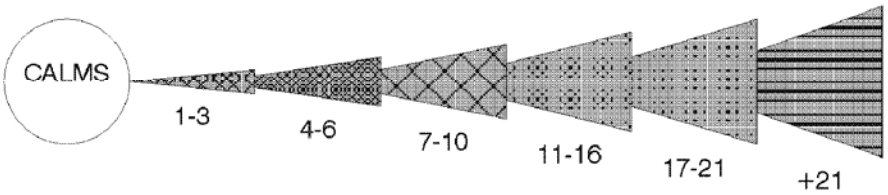
URS

FIGURE 6.1-1



NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 9.94%



Windrose for All Months 1991-1995
Imperial County Airport

El Centro Unit 3 Repower Project
Imperial Irrigation District

URS

FIGURE 6.1-2

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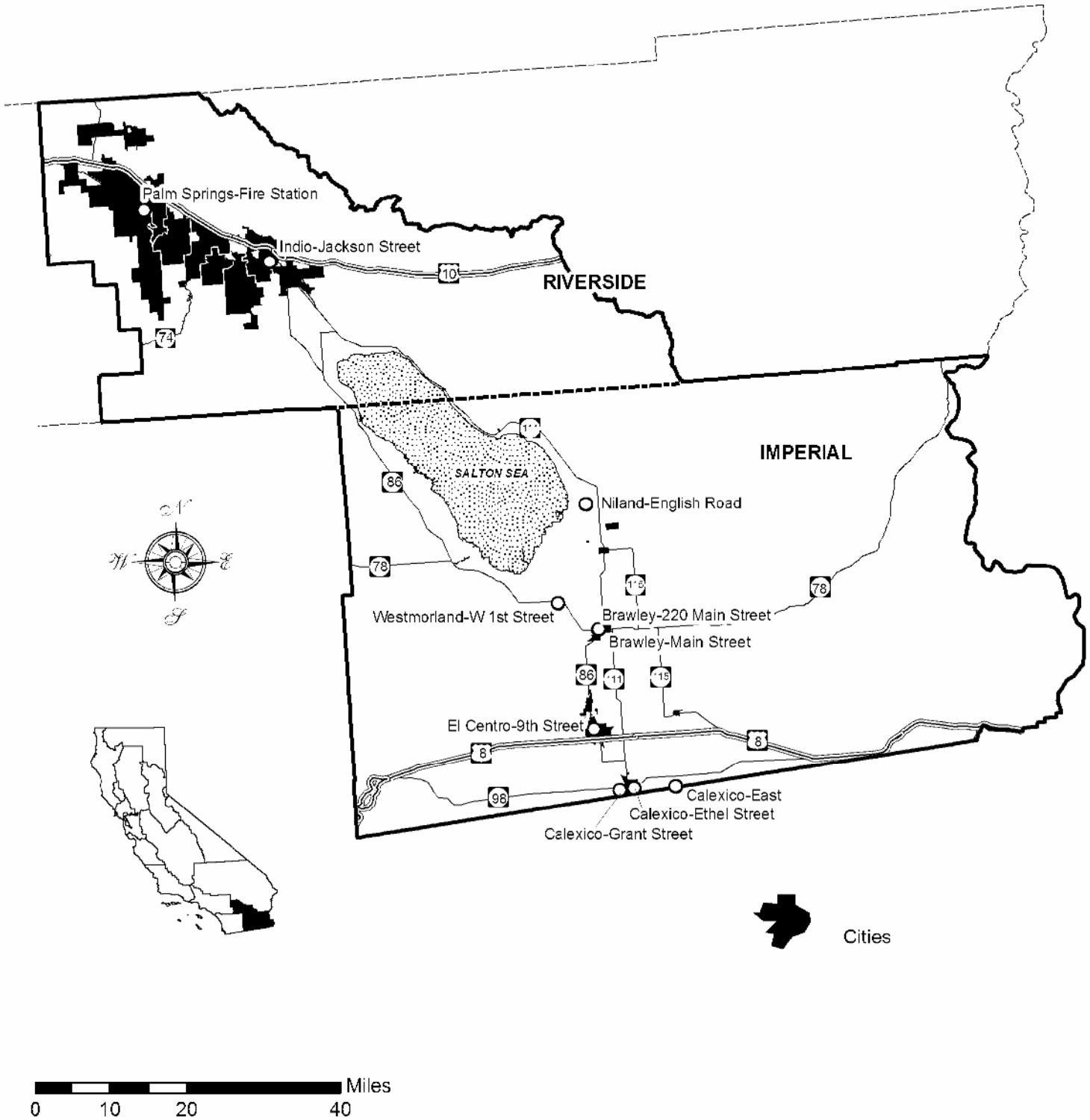

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Locations of Imperial County Air Quality Monitoring Stations

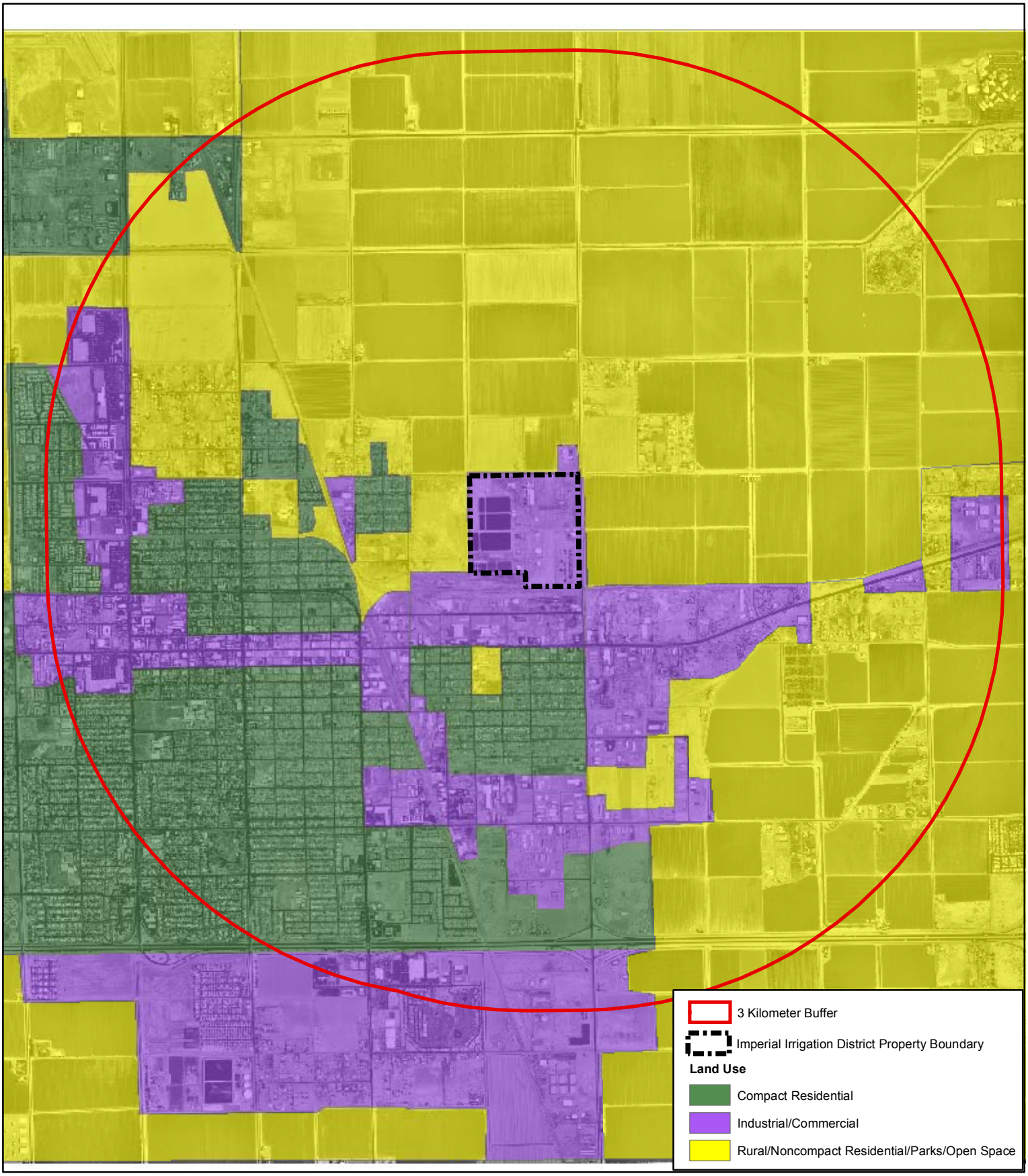
El Centro Unit 3 Repower Project
Imperial Irrigation District

N

SOURCES:
USGS (aerial).

URS

FIGURE 6.1-3



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Auer Land Use Classification within 3 Kilometers of ECGS Unit 3

0 750 1,500 3,000 Feet

SCALE: 1" = 3000'

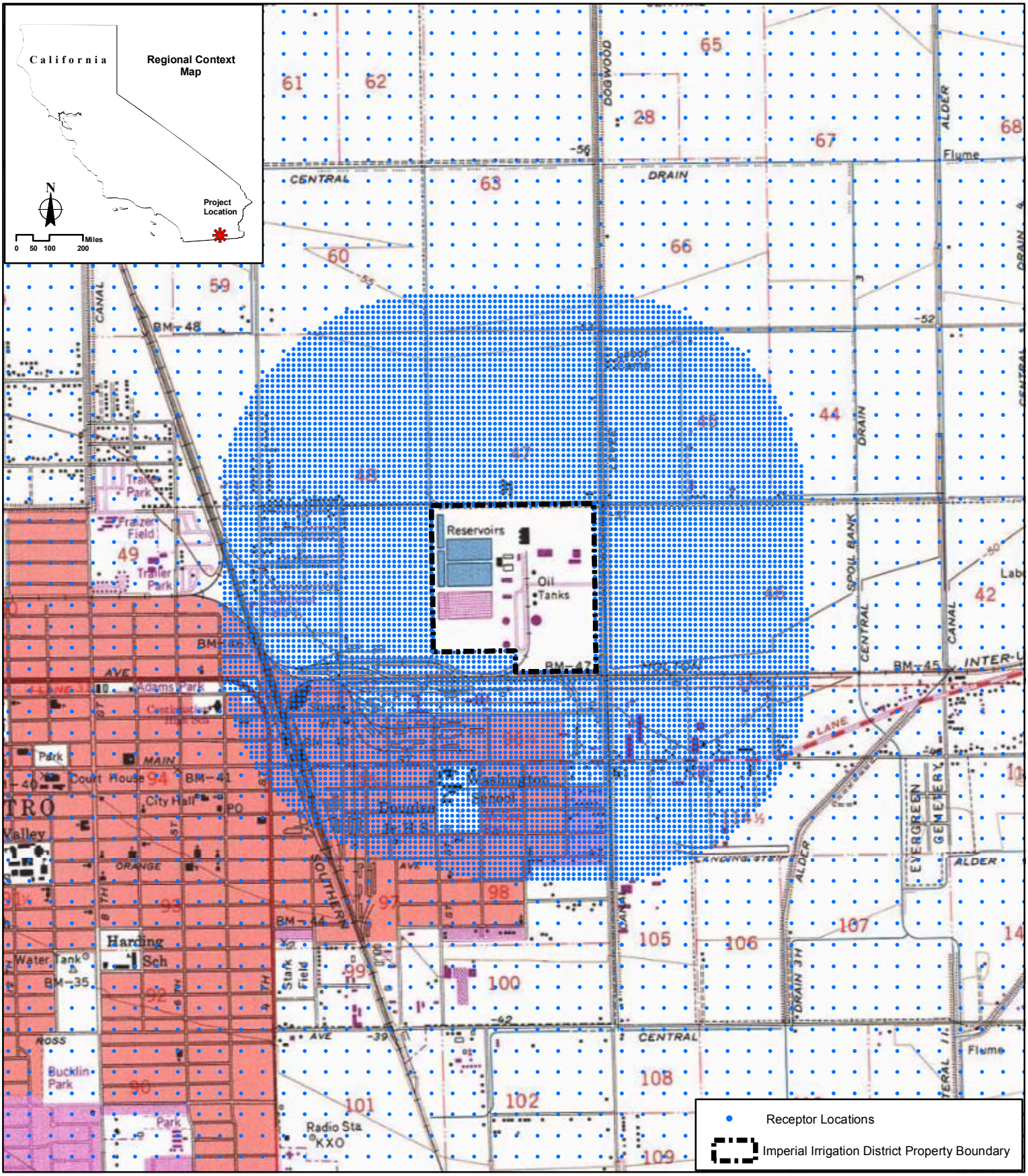
N

SOURCES:
Terraserver (2002 aerials);
Imperial Irrigation District (site plan).

El Centro Unit 3 Repower Project
Imperial Irrigation District

URS

FIGURE 6-1-4



Near-field Model Receptor Grid

El Centro Unit 3 Repower Project
Imperial Irrigation District

0 500 1,000 2,000 Feet
SCALE: 1" = 2000'

N

SOURCES:
USGS (7.5 El Centro quad);
Imperial Irrigation District (site plan).

URS

FIGURE 6.1-5

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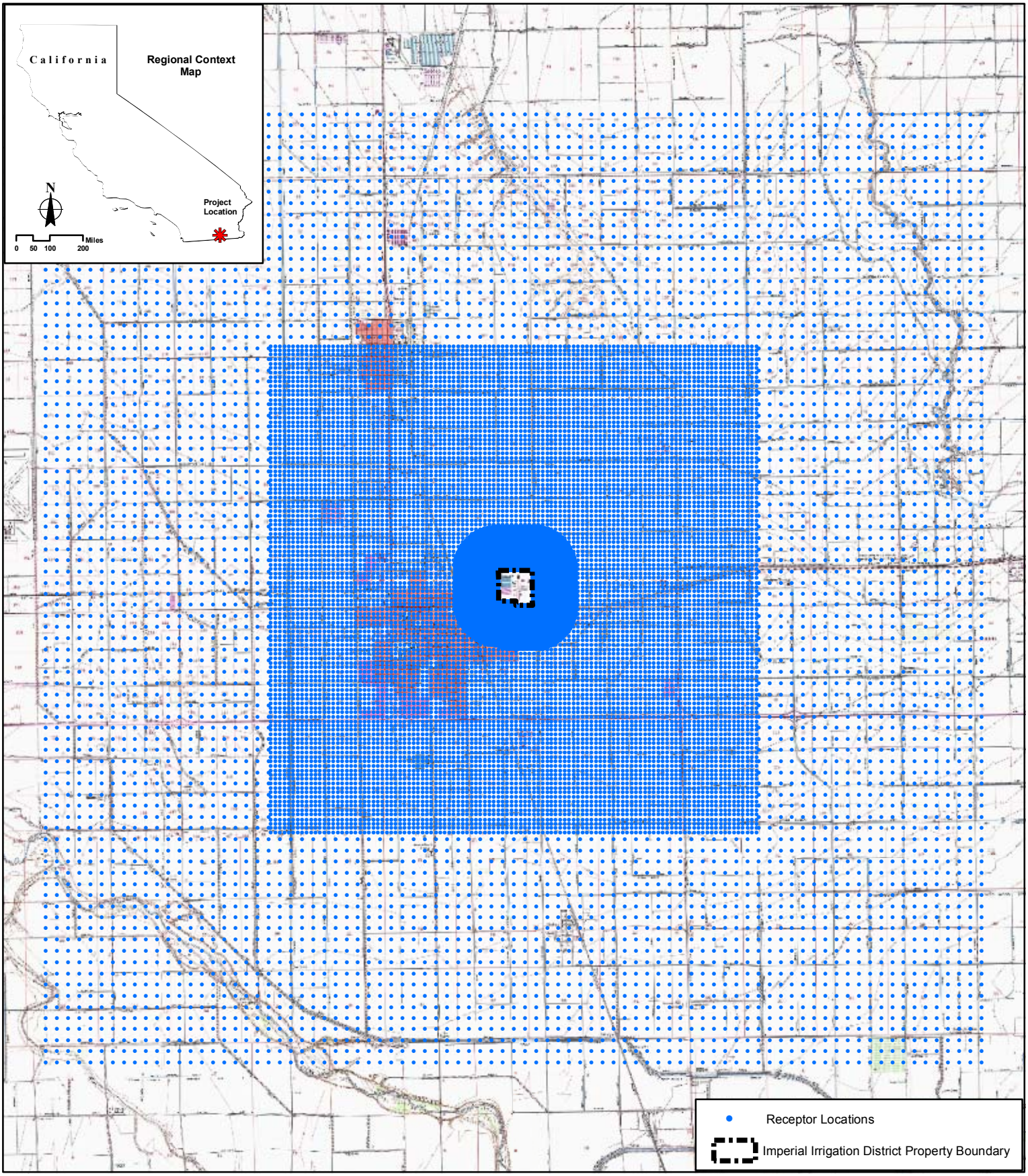


G:\gis\projects\1577\22238279\mxds\far_field_receptors_el_centro_fig6.1-6.mxd

0 2,375 4,750 9,500 Feet

SCALE: 1" = 9500'

N

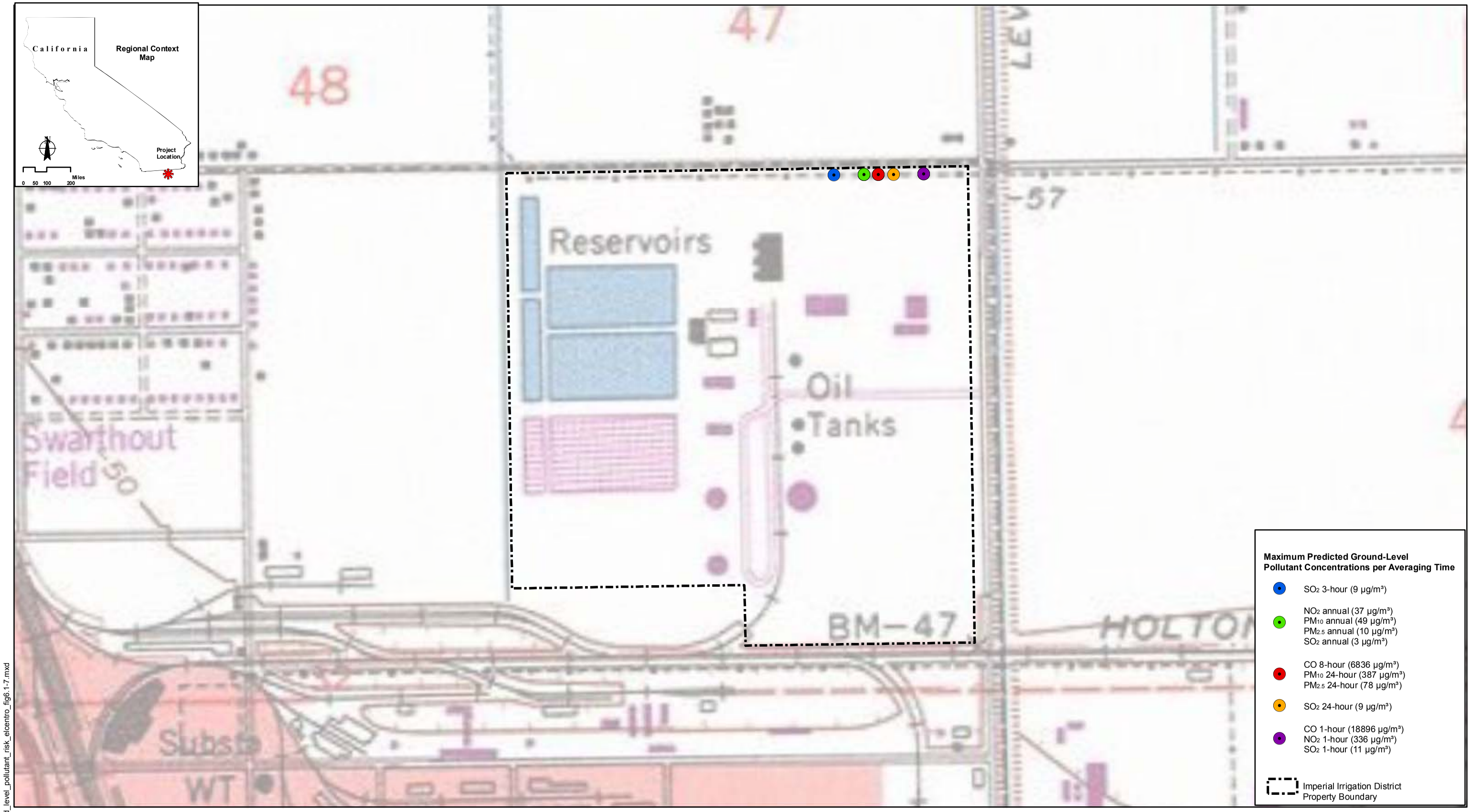
SOURCES:
USGS (7.5 Brawley NW, Brawley, Alamorio, Seeley, El Centro, Holtville West, Holtville East, Mount Signal, Heber, Calexico quads);
Imperial Irrigation District (site plan).

Far-field Model Receptor Grid

El Centro Unit 3 Repower Project
Imperial Irrigation District

URS

FIGURE 6.1-6



0 125 250 500 Feet

SCALE: 1" = 500'

N

SOURCES:
USGS (7.5 El Centro quad);
Imperial Irrigation District (site plan).

Locations of Maximum Predicted Ground-Level Pollutant Concentrations for the Operational Project

El Centro Unit 3 Repower Project
Imperial Irrigation District

URS

FIGURE 6.1-7

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