4.0 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 Introduction

This chapter provides an assessment of potential environmental impacts associated with the LADWP's Installation of a Combined Cycle Generating Facility at the Valley Generating Station. Both project construction and project operational impacts to the affected environment of each resource discussed in Chapter 3 are analyzed in this chapter. Pursuant to CEQA, this chapter focuses on those impacts which are considered potentially significant. An impact has been considered significant if it leads to a "substantial or potentially substantial, adverse change in the environment." The CEQA Guidelines require environmental documents to identify significant environmental effects that may result from a proposed project (CEQA Guidelines §15126.2(a)). Direct and indirect significant effects of a project on the environment should be identified and described, with consideration given to both short- and long-term impacts. The discussion of environmental impacts may include, but is not limited, to the resources involved; physical changes; health and safety problems caused by physical changes; and other aspects of the resource base, including noise, traffic, and water. If significant environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126.4).

CEQA (Public Resources Code, §21000 et seq.) and the CEQA Guidelines, as promulgated by the State of California Secretary of Resources, establish the categories of environmental impacts to be analyzed in a CEQA document. Under the CEQA Guidelines, there are approximately 17 environmental categories in which potential adverse impacts from a project are evaluated. Projects are evaluated against the environmental categories in an environmental checklist and those environmental categories that may be adversely affected by the project (e.g., have potentially significant impacts) are further analyzed in the appropriate CEQA document.

Pursuant to CEQA, an IS, including an environmental checklist, was prepared for the LADWP's Installation of a Combined Cycle Generating Facility at the VGS (Appendix A). The IS was released on May 4, 2001. Of the 17 environmental categories reviewed in the IS, six (air quality, geology/soils, hazards and hazardous materials, hydrology/water quality, noise, and transportation/traffic) were identified as having potentially significant impacts resulting from the implementation of the proposed project.

The following environmental analysis first proceeds by identifying the potentially significantly impacted environmental topic areas. Next, the analysis comprehensively analyzes and estimates the impacts associated with a particular environmental topic from the implementation of the proposed project[1]. Once the impact from a particular environmental topic is estimated, the analysis compares the estimated impact to the SCAQMD's significance thresholds. If an impact is significant, feasible mitigation measures are proposed to minimize the effect of the project on the environment or reduce the effect to a level where it is no longer significant.

4.2 Air Quality

Emissions that can adversely affect air quality originate from various activities. A project generates emissions both during the period of its construction and through ongoing daily operations. Project-related air quality impacts estimated in this environmental analysis will be considered significant if any of the applicable significance thresholds presented in Table 4.2-1 are exceeded. This table includes both emissions and concentration-related significance thresholds. Construction and non-RECLAIM source emissions (i.e., indirect source emissions) are compared to pollutant specific emissions thresholds to determine if the impact is significant.

Table 4.2-1
Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds			
Pollutant	**Construction**	**Operation**	**RECLAIM [c] Sources**
NO_x	100 lbs/day	55 lbs/day	1,542 lbs/day
VOC	75 lbs/day	55 lbs/day	
PM10	150 lbs/day	150 lbs/day	
SO_x	150 lbs/day	150 lbs/day	
CO	550 lbs/day	550 lbs/day	
Lead	3 lbs/day	3 lbs/day	

TAC, Acutely Hazardous Material (AHM), and Odor Thresholds	
Toxic Air Contaminants	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment) Hazard Index ≥ 3.0 (facility-wide)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402

[1] It should be noted that for the six environmental impact areas that were identified as potentially significant and are further evaluated in detail in this ~~Draft~~Final EIR, the environmental impacts analysis for each environmental topic incorporates a "worst-case" approach. This entails maximizing the peak daily construction- and operation-related activities.

Table 4.2-1 (Concluded)
Air Quality Significance Thresholds

Ambient Air Quality for Criteria Pollutants	
NO_2 1-hour average NO_2 annual average	20 µg/m^3 (= 1.0 pphm)[a] 1 µg/m^3 (= 0.05 pphm)[b]
PM10 24-hour PM10 annual geometric mean	2.5 µg/m^3 1.0 µg/m^3
Sulfate 24-hour average	1 µg/m^3
CO 1-hour average CO 8-hour average	1.1 mg/m^3 (= 1.0 ppm) 0.50 mg/m^3 (= 0.45 ppm)

µg/m^3 = microgram per cubic meter; pphm = parts per hundred million; mg/m^3 = milligram per cubic meter; ppm = parts per million; TAC = toxic air contaminant; AHM = Acutely Hazardous Material
a = California 1-hour ambient air quality standard, includes project impact plus background
b = PSD Annual Class II increment for NO_2
c = Since the NO_x emissions significance threshold in Table 4.2-1 is expressed in pounds per day, the facility's Initial 1994 RECLAIM allocation plus NTCs and the facility's annual allocation for the year the project becomes operational, including purchased RTCs, have been converted to pounds per day by dividing by 365 days per year.

Additionally, operational NO_x or SO_x emissions from stationary sources regulated under the RECLAIM program (Regulation XX) will be considered significant if they exceed a facility-specific RECLAIM threshold. It should be noted, however, since electric utilities are exempt from the SO_x RECLAIM program (ref: Rule 2001(i)(2)(A)), this criteria will only apply to NO_x emissions from this project. This RECLAIM threshold is calculated based on the facility's initial 1994 RECLAIM allocation plus nontradeable credits (NTCs), as listed in the RECLAIM Facility Permit, plus the maximum daily operation NO_x emissions significance threshold of 55 pounds per day. A project is considered significant if the project's operational emissions, plus the facility's annual allocation for the year the project becomes operational, including purchased RECLAIM trading credits (RTCs) for that year, are greater than this RECLAIM significance threshold.

As discussed in Section 3.2 of Chapter 3, the Basin is currently designated by U.S. EPA as a nonattainment area for both CO and PM10. As a result, localized impacts for CO and PM10 will be considered significant if they exceed the localized significance thresholds listed in Table 4.2-1. The localized significance thresholds for these nonattainment pollutants are based on the significant change in air quality concentration levels as they appear in Rule 1303, Table A-2.

Although the Basin is currently in attainment for both the CAAQS and NAAQS for NO_2, NO_2 emissions can contribute to significant adverse localized NO_2 impacts and is a precursor pollutant to both ozone and PM10. As a result, localized NO_2 air quality impacts will be considered significant if the project's NO_x emissions cause or contribute to an exceedance of any ambient air quality standard at the nearest sensitive receptor.

Because the Basin has been designated attainment for both the CAAQS and NAAQS for SO_2 since the early 1980s, no significant change in air quality concentration has ever been identified for this pollutant for the purposes of permitting new or modified equipment. Therefore, similar to the approach taken to determine localized NO_2 air quality impacts, localized SO_2 air quality impacts will be considered significant if the incremental increase in SO_2 emissions from the project, when added to existing background air quality concentrations, cause or contribute to an exceedance of any ambient air quality standard for SO_2 at any sensitive receptor location.

4.2.1 Construction Emissions and Impacts

Construction-related emissions can be designated as either onsite or offsite. Onsite emissions generated during construction principally consist of exhaust emissions (NO_X, SO_X, CO, VOC, and PM10) from heavy-duty diesel and gasoline powered construction equipment operation, fugitive dust (PM10) from disturbed soil, and evaporative VOC emissions from asphaltic paving and equipment touch-up painting. Offsite emissions during the construction phase normally consist of exhaust emissions and entrained paved road dust (PM10) from worker commute trips, material delivery trips, and haul truck material removal trips to and from the construction site.

Typically, construction activities are divided into three distinct phases: (1) demolition and land clearing; (2) site preparation; and (3) general construction[2]. For this proposed project, construction-related activities at the project site are anticipated to include the following distinct major components:

- Grading;
- Construction of equipment pads and foundations and paving of access roads and equipment maintenance areas; and
- Equipment installation of combined cycle combustion turbines, HRSGs with associated SCR systems, a STG, a cooling tower, ammonia storage tanks, and associated auxiliary equipment.

Emissions from these activities were estimated using anticipated construction equipment/worker requirements along with emission estimating techniques described in the following:

- SCAQMD CEQA Air Quality Handbook, November 1993;
- U.S. EPA Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition (AP-42);
- U.S. EPA Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, 1992;

[2] A fourth phase, commissioning, involving the initial start-up and tuning of the CTGs was evaluated for peak daily emissions. Based on the emission estimates, commissioning activities do not lead to the maximum peak daily non-operational emissions. A discussion of CTG commissioning, along with emission estimates are presented in Appendix C.

- California Air Resources Board EMFAC2000 on-road motor vehicle emission factor model;
- California Air Resources Board Emission Inventory Methodology 7.9, Entrained Paved Road Dust, 1997; and
- "Open Fugitive Dust PM10 Control Strategies Study," Midwest Research Institute, October 12, 1990.

The reader is referred to Appendix C for additional details on the emission calculation methodologies used to estimate construction-related air quality impacts from the proposed project.

To estimate the "worst-case" peak daily emissions associated with the construction activities, the anticipated schedule, and the types and number of construction equipment were estimated. Additionally, estimates were made of the number of peak daily worker commuting trips and material delivery and removal trips for each of the construction activities. Estimates that were made previously of the construction equipment and manpower requirements for installing five 47-MW combustion turbines (CTs) and associated SCR at LADWP's Harbor Generating Station (HGS) and one 47-MW peaking CT and associated SCR at VGS (Los Angeles Department of Water and Power's Electrical Generation Stations Modifications Project; SCAQMD, 2001) were extrapolated to the increased amount of equipment to be installed for this proposed project. The specific assumptions for each phase of construction are as follows:

- Grading: Based on the size of the area to be graded, it was estimated that peak construction equipment and manpower required for the grading phase of construction would be the same as for grading for installation of the five CTs at HGS.
- Foundations and Paving: Based on the requirements for equipment pads and foundations, it was estimated that peak construction equipment and manpower required for construction of foundations and pads would be the same as for construction of foundations and pads for installation of the five CTs at HGS. Based on the area to be paved, it was estimated that the requirements for paving would be the same as for installation of the peaking CT at VGS.
- Equipment Installation: Based on the amount of equipment to be installed, it was estimated that peak construction equipment and manpower requirements for equipment installation would be 50 percent greater than for installation of the equipment at HGS.

The anticipated schedule, peak daily construction equipment requirements, peak daily construction worker trips, peak daily material delivery truck trips, and peak daily haul truck trips for construction are listed in Table 4.2-2. Construction-related activities are anticipated to occur six days per week, Monday through Saturday, between from 6:00 am to 5:00 pm. Allowing time for shift changes and work breaks, all construction equipment is assumed to operate 10 hours per day except light plants, which are assumed to operate two hours per day.

Table 4.2-2
Construction Schedule, Equipment Requirements and Motor Vehicle Trips

Start and End Construction Month	Type of Equipment (Onsite)	Number of Equipment	Number of Construction Workers (Offsite)	Daily Material Delivery Trips (Offsite)	Daily Haul Truck Trips (Offsite)
Grading					
1-1	Grader Light Plant	1 20	3	0	0
Construction of Foundations and Asphalt Paving					
2-12	Concrete Vibrator Concrete Pump Light Plant Paver	10 10 25 1	253	33	0
Equipment Installation					
11-26	Forklift Backhoe Compressor Light Plant Welder Trencher Plate Compactor Crane	9 3 2 30 15 2 2 6	600	15	3

The information in Table 4.2-2 was used to calculate onsite emissions from construction equipment exhaust and from some fugitive dust PM10 sources (grading and vehicle travel on unpaved surfaces). Estimates of fugitive dust emissions assume that construction activities will comply with SCAQMD Rule 403 - Fugitive Dust, by watering active sites two times per day, which reduces fugitive dust emissions approximately 50 percent. PM10 emissions from storage pile wind erosion were calculated from estimated storage pile surface areas of 3,000 square feet (0.069 acres) during grading. These storage pile areas were estimated from the site configurations.

VOC emissions from asphaltic paving activities were based on an estimated maximum area of 0.59 acres to be paved each day (see Figures 2.3-1 and 2.3-2 in Chapter 2). VOC emissions from architectural coating were based on an estimated maximum daily use of six gallons of paint for touch-up during equipment installation. Equipment shipped to the project site will be pre-painted to manufacturer specifications.

The maximum number of daily motor vehicle trips (e.g., worker commuting, material delivery, and haul trips) anticipated during each construction activity as show in Table 4.2-2 above were used in conjunction with the information provided in Table 4.2-3 below to estimate peak daily emissions from both onsite and offsite motor vehicles from the project site.

Table 4.2-3
Motor Vehicle Classes, Speeds and Daily VMT During Construction

Vehicle Type	Vehicle Class	Speed (mph)	VMT (mi/vehicle-day)
Onsite pickup truck	Medium duty truck, catalyst	15	2-10
Watering truck	Medium heavy-duty truck, diesel	15	1
Material removal haul truck, onsite	Heavy heavy-duty truck, diesel	5	1
Delivery vehicle, onsite	Heavy heavy-duty truck, diesel	5	1
Construction commuter	Light-duty truck, catalyst	35	40
Material removal haul truck, offsite	Heavy heavy-duty truck, diesel	25	40
Delivery vehicle, offsite	Heavy heavy-duty truck, diesel	25	40

Estimated peak daily unmitigated onsite and offsite emissions associated with each construction phase are listed in Table 4.2-4. The emissions associated with a particular source (e.g., construction equipment exhaust, grading, worker commuting, material delivery trips, etc.) for a specific construction activity are shown in Appendix C.

Table 4.2-4
Peak Daily Construction Emissions for
Each Construction Phase (Pre-Mitigation)

Activity	Location	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM10 (lb/day)	Fugitive PM10[a] (lb/day)	Total PM10 (lb/day)
Grading	Onsite	14.0	3.7	27.0	2.5	1.4	3.7	5.1
	Offsite	4.5	0.3	0.3	0.0	0.0	0.1	0.2
	Total	**18.5**	**4.0**	**27.3**	**2.5**	**1.4**	**3.9**	**5.3**
Foundations and Paving	Onsite	151.1	15.0	76.8	6.1	4.4	45.7	50.2
	Offsite	404.3	28.9	83.4	0.0	2.9	108.2	111.1
	Total	**555.4**	**43.8**	**160.2**	**6.1**	**7.3**	**154.0**	**161.3**
Equipment Installation	Onsite	172.2	60.9	332.1	27.6	18.8	0.0	18.8
	Offsite	915.1	60.3	74.9	0.0	1.7	64.8	66.5
Total		**1,087.3**	**121.2**	**407.1**	**27.6**	**20.5**	**64.8**	**85.3**

Because these activities are not anticipated to all take place at the same time, the overall peak daily construction emissions will not be equal to the sum of the peak daily emissions from all of the construction activities. Therefore, the anticipated overlap of activities was evaluated to determine overall peak daily emissions. First, it was conservatively assumed that the peak daily emissions from each overlapping activity would occur at the same time. Next, the activities that are anticipated to occur simultaneously were identified for each month of the entire construction period. The peak daily emissions from the construction activities taking place each month were then added together to estimate the total peak daily emissions during each month. Finally, the month(s) with the highest overall peak daily emissions was identified.

The overall peak daily construction-related emissions are anticipated to occur during simultaneous construction of foundations, paving and equipment installation. The overall "worst-case" peak daily emissions by type of source and a comparison of these emissions to the SCAQMD's CEQA significance thresholds are presented in Table 4.2-5 to determine whether construction-related air quality impacts are significant. As shown in the table, the significance thresholds are anticipated to be exceeded for CO, VOC, NO_X, and PM10 construction-related emissions.

Table 4.2-5
Overall Peak Daily Emissions During Construction (Pre-Mitigation)

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM10 (lb/day)	Fugitive PM10[a] (lb/day)	Total PM10 (lb/day)
Onsite Construction Equipment Exhaust	306.5	50.4	403.8	33.7	23.0	--	23.0
Onsite Motor Vehicles	16.8	2.9	5.1	0.0	0.2	--	0.2
Onsite Fugitive PM10	--	--	--	--	--	45.7	45.7
Asphaltic Paving	--	1.6	--	--	--	--	--
Architectural Coating	--	21.0	--	--	--	--	--
Total Onsite	**323.3**	**75.9**	**408.9**	**33.7**	**23.2**	**45.7**	**69.0**
Offsite Motor Vehicles	1,319.4	89.1	158.4	0.0	4.5	173.0	177.6
Total Offsite	**1,319.4**	**89.1**	**158.4**	**0.0**	**4.5**	**173.0**	**177.6**
TOTAL	**1,642.7**	**165.0**	**567.3**	**33.7**	**27.8**	**218.8**	**246.6**
CEQA Significance Level	*550*	*75*	*100*	*150*	--	--	*150*
Significant? (Yes/No)	**Yes**	**Yes**	**Yes**	No	--	--	**Yes**
a = Totals may not match sum of individual values because of rounding							

4.2.2 Operational Emissions

This section addresses the direct and indirect air quality impacts from the operation of the new and modified equipment associated with the proposed project. Atmospheric dispersion modeling to analyze the impacts of the proposed project and the results of the HRA are also discussed.

4.2.2.1 Direct Operational Emissions

The sources of potential emissions resulting from new equipment installations and modifications to existing units for the proposed project are discussed below.

The installation of the following equipment will result in criteria pollutant and toxic air contaminant emissions:

- Two dual fuel (natural gas and distillate) fired 171.7 MW CTGs with duct burners, two HRSGs with associated SCR, and a steam turbine generator. The CTGs will be provided with controls (e.g., water injection when firing diesel oil or a low NO_X combustor when firing natural gas) that will preliminarily reduce NO_X emissions prior to venting the exhaust to the SCR systems. The CTGs will be provided with SCR systems that will use ammonia and contain a CO catalyst to further reduce NO_X and CO emissions from the CTGs[3]; and

3 It should be noted that, although an SCR system predominately reduces NO_X emissions from combustion processes, the use of ammonia as a reductant causes a slight increase in PM10 precursor emissions. This is due to the fact that not all of the ammonia reacts with the NO_x emissions in the exhaust in the presence of the catalyst. This unreacted ammonia, known as ammonia slippage, is emitted out the exhaust stack. The incremental increase in ammonia emissions from ammonia slippage associated with SCR operation is analyzed in

- One cooling tower provided with 10 cells, with each cell having a 10,560 gallon per minute circulation rate.

The proposed project will also include the installation of two 20,000-gallon ASTs for aqueous ammonia storage and the conversion of one fuel oil tank to distillate service. However, no ammonia emissions are expected from the two new tanks because the tanks will be pressurized and each tank will be provided with a pressure relief valve. In addition, vapor return lines will be used during filling of the tanks.

The new CTGs and HRSGs will operate in various modes that lead to different emission rates. The three operating modes evaluated for impacts in this ~~Draft~~Final EIR are: (1) normal startup; (2) normal operation; and (3) diesel fuel readiness testing. The SCR will only operate in a normal operating mode. Criteria pollutant and toxic air contaminant emissions associated with each of these operating modes were estimated. The combinations of these operating modes that lead to peak daily criteria emissions were identified for comparison with the daily mass emissions significance criteria listed in Table 4.2.1. Additionally, the combinations of the operating modes that lead to peak hourly and daily criteria and toxic air contaminant emissions were identified for use in air quality dispersion modeling for comparison with the ambient air quality and human health risk significance criteria in Table 4.2-1.

The following subsections present emissions data during each of the operating modes. The reader is referred to Appendix C for the details of the emission calculation methodologies used to estimate operation-related air quality impacts from the proposed project. "Worst-case" daily emissions are discussed in Subsection 4.2.3.1. Emissions associated with each operating mode were estimated as discussed in the following subsections.

Normal CTG Startup

During start-up, the CTGs will operate for a period of time without NO_X or CO control. Once stable operating conditions are reached, dry low NO_X combustor operations will begin. Finally, when the SCR/CO catalyst system reaches the appropriate temperature for the catalyst to be effective, ammonia injection will commence and the SCR/CO catalyst systems will become operational. Normal startup will last for four hours (one-half hour of normal operation with all controls). Emission rates for CO, NO_X, and VOC during startup were based on an engineering analysis of available data, which included source test data from startups of the GE gas turbines and summarized in the Application for Certification (AFC) for the Mountainview Power Plant (CEC, 2000). PM10 and SO_X emissions were based on AP-42 emission factors and fuel consumption during the start-up period provided by the combustion turbine manufacturer. Gas turbine exhaust parameters for the minimum operating load point (50 percent) were used to characterize gas turbine exhaust during startup. The toxic air contaminant (except ammonia) emissions during the start-up mode were estimated using CARB-approved emission factors. The estimated criteria

this EIR. Also, PM10 emissions are generated in the SCR reaction chambers when SO_2 in the exhaust stream is converted to SO_3 in the presence of the SCR catalyst. This PM10 source is also analyzed in this EIR.

pollutant and toxic air contaminant emissions from one CTG during normal startup are presented in Tables 4.2-6 and 4.2-7, respectively.

Table 4.2-6
Criteria Pollutant Maximum Hourly and Annual Emissions for One CTG Normal Startup

Pollutant	Maximum Hourly (lb/hr)	Total Emissions During One Start-up (lb per 4-hr start-up)	Annual[a] (lb/yr)
CO	100	326.2	3,914
NO_X	20	78.0	936
PM10	14.7	25.8	310
SO_2	2.49	4.84	58
VOC	4.12	14.6	175
a = Based on 12 normal startups per year for one CTG, each startup lasting four hours			

Table 4.2-7
Toxic Air Contaminant[a] Emission Estimates for One CTG Normal Startup

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual[b] (lb/yr)
1,3-Butadiene	2.14E-04	4.99E-03
Acetaldehyde	2.31E-01	5.39E+00
Acrolein	3.19E-02	7.44E-01
Ammonia	1.33E+01	1.59E+02
Benz(a)anthracene	3.81E-05	8.88E-04
Benzene	2.24E-02	5.23E-01
Benzo(a)pyrene	2.34E-05	5.46E-04
Benzo(b)fluoranthene	1.90E-05	4.44E-04
Benzo(k)fluoranthene	1.85E-05	4.32E-04
Chrysene	4.25E-05	9.90E-04

Table 4.2-7 (Concluded)
Toxic Air Contaminant[a] Emission Estimates for One CTG Normal Startup

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual (lb/yr)
Dibenz(a,h)anthracene	3.96E-05	9.24E-04
Ethylbenzene	3.02E-02	7.04E-01
Formaldehyde	1.55E+00	3.61E+01
Hexane	4.36E-01	1.02E+01
Indeno(1,2,3-cd)pyrene	3.96E-05	9.24E-04
Naphthalene	2.80E-03	6.53E-02
Propylene	1.30E+00	3.03E+01
Propylene Oxide	8.06E-02	1.88E+00
Toluene	1.20E-01	2.80E+00
Xylene (Total)	4.40E-02	1.03E+00

a = SCAQMD Rule 1401 Toxic Air Contaminants
b = Based on 12 normal startups per year for one CTG, each startup lasting four hours

Normal Operating Mode

The normal operating mode is defined as the operation of the CTGs with add-on controls after the completion of the normal startup phase. The emissions of PM10 and SO_2, were estimated using AP-42 emission factors. The emissions of NO_X, CO, VOC, and ammonia were estimated using the SCAQMD's BACT permitting limits, which are 2.5 ppmv for NO_X, six ppmv for CO, two ppmv for VOC, and five ppmv for ammonia slippage (at 15 percent O_2). The toxic air contaminant (except ammonia) emissions during this operating mode were estimated using CARB-approved emission factors. The increased PM10 emissions from the installation of SCR technology were estimated using the SCAQMD Energy Team, Application Processing and Calculations for the installation of a SCR system[4]. The estimated criteria pollutant and toxic air contaminant emissions during normal operation of one CTG are presented in Tables 4.2-8 and 4.2-9, respectively.

[4] There are two sources of PM10 associated with the operation of the CTGs and SCRs. PM10 emissions are generated from the combustion process associated with operation of the CTG. Also, PM10 emissions are generated in the SCR reaction chambers when SO_2 in the exhaust stream is converted to SO_3 in the presence of the SCR catalyst. Both of these PM10 sources are analyzed in this EIR.

Table 4.2-8
Criteria Pollutant Maximum Hourly, Daily and Annual Emissions during Normal Operation of One CTG

Pollutant	Maximum Hourly (lb/hr)	Maximum Daily[a] (lb/day)	Annual[b] (lb/yr)
CO	28.16	675.84	246,600
NO_X	19.32	463.68	169,200
PM10[c]	16.32	391.68	143,000
SO_2	2.13	51.12	18,600
VOC	5.34	128.16	46,800

a = Based on 24 hours of normal operation.
b = Based on operation of 8760 hours per year.
c = Includes PM10 emissions from the conversion of SO_2 to SO_3 in the presence of the SCR catalyst. Assumed 65 percent of the SO_2 converts to SO_3 and all SO_3 converts to ammonium sulfate.

Table 4.2-9
Toxic Air Contaminant[a] Emissions Estimates during Normal Operation of One CTG

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual[b] (lb/yr)
1,3-Butadiene	2.49E-04	2.18E+00
Acetaldehyde	2.68E-01	2.35E+03
Acrolein	3.70E-02	3.24E+02
Ammonia	1.42E+01	1.24E+05
Arsenic	1.05E-04	9.17E+01
Benz(a)anthracene	4.42E-05	3.87E-01
Benzene	2.60E-02	2.28E+02
Benzo(a)pyrene	2.72E-05	2.38E-01
Benzo(b)fluoranthene	2.21E-05	1.94E-01
Benzo(k)fluoranthene	2.15E-05	1.89E-01
Chloroform	2.44E-02	2.13E+02
Chrysene	4.93E-05	4.32E-01
Dibenz(a,h)anthracene	4.60E-05	4.03E-01
Ethylbenzene	3.50E-02	3.07E+02
Formaldehyde	1.79E+00	1.57E+04
Hexane	5.07E-01	4.44E+03
Indeno(1,2,3-cd)pyrene	4.60E-05	4.03E-01
Naphthalene	3.25E-03	2.85E+01
Propylene	1.51E+00	1.32E+04
Propylene Oxide	9.35E-02	8.19E+02
Toluene	1.40E-01	1.23E+03
Xylene (Total)	5.11E-02	4.47E+02

a = SCAQMD Rule 1401 Toxic Air Contaminants
b = Based on operation of 8760 hours per year.

Diesel Fuel Readiness Testing

The CTGs will be tested individually for diesel fuel readiness once per month for 60 minutes. Testing involves operating the CTG while hot (after normal operation) with CO catalyst and water injection controls. The SCR and dry low NO_X combustors will not be operated when the CTG is fueled by diesel fuel.

The emissions of PM10, SO_2, and VOC are estimated using AP-42 emission factors. NO_X emissions were provided by the project proponent. Toxic air contaminant emission estimates for this operating mode were derived from CARB-approved emission factors. The estimated criteria pollutant and toxic air contaminant emissions from one CTG during the diesel fuel readiness testing are presented in Tables 4.2-10 and 4.2-11, respectively.

Table 4.2-10
Criteria Pollutant Maximum Hourly, Daily and Annual Emissions for One CTG Diesel Fuel Readiness Testing

Pollutant	Maximum Hourly (lb/hr)	Maximum Daily[a] (lb/day)	Annual[b] (lb/yr)
CO	26.30	26.30	315.6
NO_X	313	313	3,756.0
PM10	23.22	23.22	278.6
SO_2	98.57	98.57	1,182.8
VOC	5.20	5.20	62.4

a = Based on one 1-hr test per day.

b = Based on 12 diesel fuel readiness tests per year for one CTG

Table 4.2-11
Toxic Air Contaminant[a] Emissions Estimates for One CTG
Diesel Fuel Readiness Testing

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual[b] (lb/yr)
Arsenic	2.81E-03	3.37E-02
Benz(a)anthracene (PAH)	1.19E-03	1.42E-02
Benzene	1.57E-01	1.89E+00
Benzo(a)pyrene (PAH)	1.16E-03	1.39E-02
Benzo(b)fluoranthene (PAH)	1.84E-03	2.20E-02
Benzo(k)fluoranthene (PAH)	1.81E-03	2.17E-02
Beryllium	7.55E-04	9.06E-03
Cadmium	4.52E-03	5.42E-02
Chrysene (PAH)	1.43E-03	1.72E-02
Chromium (Hex)	1.50E-04	1.80E-03
Chromium (total)	5.89E-03	7.07E-02
Copper	1.39E-02	1.66E-01
Dibenz(a,h)anthracene (PAH)	1.15E-03	1.38E-02
Dioxin: 4D Total	5.20E-08	6.24E-07
Dioxin: 5D Total	9.94E-08	1.19E-06
Dioxin: 6D Total	1.25E-07	1.50E-06
Dioxin: 7D Total	2.34E-07	2.80E-06
Dioxin: 8D	1.49E-06	1.78E-05
Formaldehyde	9.80E-01	1.18E+01
Furan: 4F Total	4.64E-07	5.57E-06
Furan: 5F Total	6.49E-07	7.79E-06
Furan: 6F Total	3.35E-07	4.02E-06
Furan: 7F Total	2.32E-07	2.79E-06
Furan: 8F	1.20E-07	1.44E-06
HCL	1.12E+00	1.35E+01
Indeno(1,2,3-cd)pyrene (PAH)	1.15E-03	1.38E-02
Lead	8.45E-03	1.01E-01
Manganese	1.43E-01	1.72E+00
Mercury	3.77E-05	4.52E-04
Naphthalene (PAH)	1.50E-01	1.80E+00
Nickel	6.78E-01	8.14E+00
Selenium	1.17E-04	1.40E-03
Zinc	7.48E-01	8.97E+00

a = SCAQMD Rule 1401 Toxic Air Contaminants
b = Based on 12 diesel fuel readiness tests per year for one CTG

Cooling Tower Normal Operation

The cooling tower has only one mode of operation. PM10 will be the only criteria pollutant emitted during the normal operation of the cooling tower. PM10 and TAC emissions for this operating mode were estimated using the methodology provided in AP-42. The estimated criteria pollutant and toxic air contaminant emissions from the cooling tower are presented in Tables 4.2-12 and 4.2-13.

Table 4.2-12
Criteria Pollutant Maximum Hourly and Annual Emissions for the Cooling Tower

Pollutant	Maximum Hourly (lb/hr)	Maximum Daily (lb/day)	Annual[a] (lb/yr)
PM10	2.95	70.8	25,842
a = Based on continuous operation of 8760 hours per year			

Table 4.2-13
Toxic Air Contaminant[a] Emissions Estimates for the Cooling Tower

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual[b] (lb/yr)
Chloroform	0.0244	214
Toluene	0.0009	8
Arsenic	0.0001	1
a = SCAQMD Rule 1401 Toxic Air Contaminants b = Based on continuous operation of 8760 hours per year		

4.2.2.2 Indirect (Offsite) Mobile Source Operational Emissions

Indirect peak daily offsite operational emissions will not increase from additional trips by tanker trucks delivering aqueous ammonia to the project site. Based on operational requirements for aqueous ammonia, it was estimated that two to three additional aqueous ammonia delivery trips will be made to the VGS each month. The 47-MW peaking CTG that is currently being installed at VGS is anticipated to require one aqueous ammonia delivery trip each month. Since it is unlikely that these additional delivery trips will occur on the same days as the delivery trips that will be required for operation of the 47-MW peaking CTG, the peak daily number of delivery trips and the associated emissions are not anticipated to increase.

Operation of the new equipment will not require additional employees, so there will not be an increase in indirect operational emissions due to additional employee commuting trips.

4.2.2.3 Air Quality Dispersion Modeling

Atmospheric dispersion modeling was conducted to analyze potential localized ambient air quality impacts associated with the proposed project. The air emissions from the proposed project were modeled with no adjustment made for the emission reductions associated with the removal of the existing equipment at the facility. This allows for prediction of the "worst case" impact to ambient air quality at any receptor.

The atmospheric dispersion modeling methodology used is based on generally accepted modeling practices and modeling guidelines of both the U.S. EPA and the SCAQMD. Industrial Source Complex Short Term 3 (ISCST3) dispersion model (Version 00101) (U.S. EPA 1999) was used to model SO_2, CO, and NO_X emission impacts. The EPA approved CTSCREEN model (version number 94111) was used to perform refined PM10 impact analysis in the complex terrain located northeast of the project site.

The results of the preliminary modeling analysis using the ISCST3 model indicated that emissions of SO_2, CO, and NO_X would not result in ambient concentrations exceeding the allowable limits. However, PM10 concentrations were predicted to exceed the allowable limit. The maximum PM10 concentration location was predicted to occur in the complex terrain region northeast of the VGS site. The COMPLEX I model, which is part of the ISCST3 model is automatically used for predicting the concentrations in the complex terrain (see Model Selection section below for additional information on simple and complex terrain). Since the COMPLEX I model tends to over-predict the concentrations in complex terrain, a refined modeling analysis was performed for PM10 emissions using CTSCREEN model (see Model Selection section for additional information on CTSCREEN model).

As discussed in the next subsection (4.2.2.4), the outputs of the ISCST3 dispersion model were used as inputs to conduct a risk assessment for toxic air contaminants using the Assessment of Chemical Exposure for ACE2588 (AB2588) risk assessment model (Version 93288) (California Air Pollution Control Officers Association [CAPCOA] 1993).

Details of how the modeling was performed and the results of the modeling are provided in the following subsections. Output listings of model runs are available for public inspection by contacting the SCAQMD's Public Information Center at (909) 396-2039.

Model Selection

The ISCST3 model (Version 00101) is a U.S. EPA model used for simulating the transport and dispersion of emissions in areas of simple, complex, and intermediate terrain. Simple terrain, for air quality modeling purposes, is defined as a region where the heights of release for all emission sources are above the elevation of the surrounding terrain. Complex terrain is defined as those areas where nearby terrain elevations exceed the release heights of emissions from one or more sources. Intermediate terrain is that which falls between simple and complex terrain. Terrain areas of both simple and complex type exist in the vicinity of the VGS site. It should be noted that the dispersion model used for estimating the concentrations in the complex terrain is a screening model and provides conservative estimates (higher concentrations) of modeled pollutants.

The CTSCREEN model (Version 94111) is the screening mode of CTDMPLUS model, which is a refined point-source Gaussian air quality model developed for use in all stability conditions for complex terrain applications. As stated in the CTDMPLUS users guide, "CTSCREEN and the refined model, CTDMPLUS are the same basic model. The primary difference in their make-up is in the way in which CTSCREEN obtains the meteorological conditions. CTSCREEN yields maximum concentration estimates that are near to, yet on the conservative side of, those that would result from the use of the CTDMPLUS with a full year of on-site meteorological data for the same source-terrain configuration." The CTSCREEN model accounts for the three dimensional nature of the plume and terrain interaction; thus, it requires digitized terrain of the nearby topographical features. The digitization of terrain features was accomplished by using the terrain preprocessors, FITCON and HCRIT. The wind direction used in CTSCREEN is based on the source-terrain geometry, resulting in computation of the highest impacts likely to occur. Other meteorological variables are chosen from possible combinations of a set of predetermined values. CTSCREEN provides maximum concentration estimates that are similar to, but are on the conservative side of, those that would be calculated from the CTDMPLUS model, which employs on-site meteorological data.

Modeling Options

The options used in the ISCST3 dispersion modeling are summarized in Table 4.2-14. U.S. EPA regulatory default modeling options were selected, except for the calm processing option. Since the meteorological data sets developed by the SCAQMD are based on hourly average wind measurements rather than airport observations that represent averages of just a few minutes, the SCAQMD's modeling guidance requires that the calm processing modeling option not be used.

The options used in the CTSCREEN dispersion modeling are summarized in Table 4.2-15.

Table 4.2-14
Dispersion Modeling Options for ISCST3

Feature	Option Selected
Terrain processing selected	Yes
Meteorological data input method	Card Image
Rural-urban option	Urban
Wind profile exponents values	Defaults
Vertical potential temperature gradient values	Defaults
Program calculates final plume rise only	Yes
Program adjusts all stack heights for downwash	Yes
Concentrations during calm period set = 0	No
Aboveground (flagpole) receptors used	No
Buoyancy-induced dispersion used	Yes
Year of surface data	1981
Year of upper air data	1981

Table 4.2-15
Dispersion Modeling Options for CTSCREEN

Feature	Option Selected
Priority Mixing Height	Observed
Set Minimum Wind Speed = 1.0 m/s	Yes
Assume σ_θ or σ_V	σ_V
Scale Wind Speed with Height	Yes
Output Concentration	µg/m^3
Set Conc=0.0 if receptor below stack tip	No
Model Mode	Screening , all hours
Automated Wind Directions	Model Determined
User specified range of wind directions	No
User specified discrete wind directions	No

Meteorological Data for ISCST3

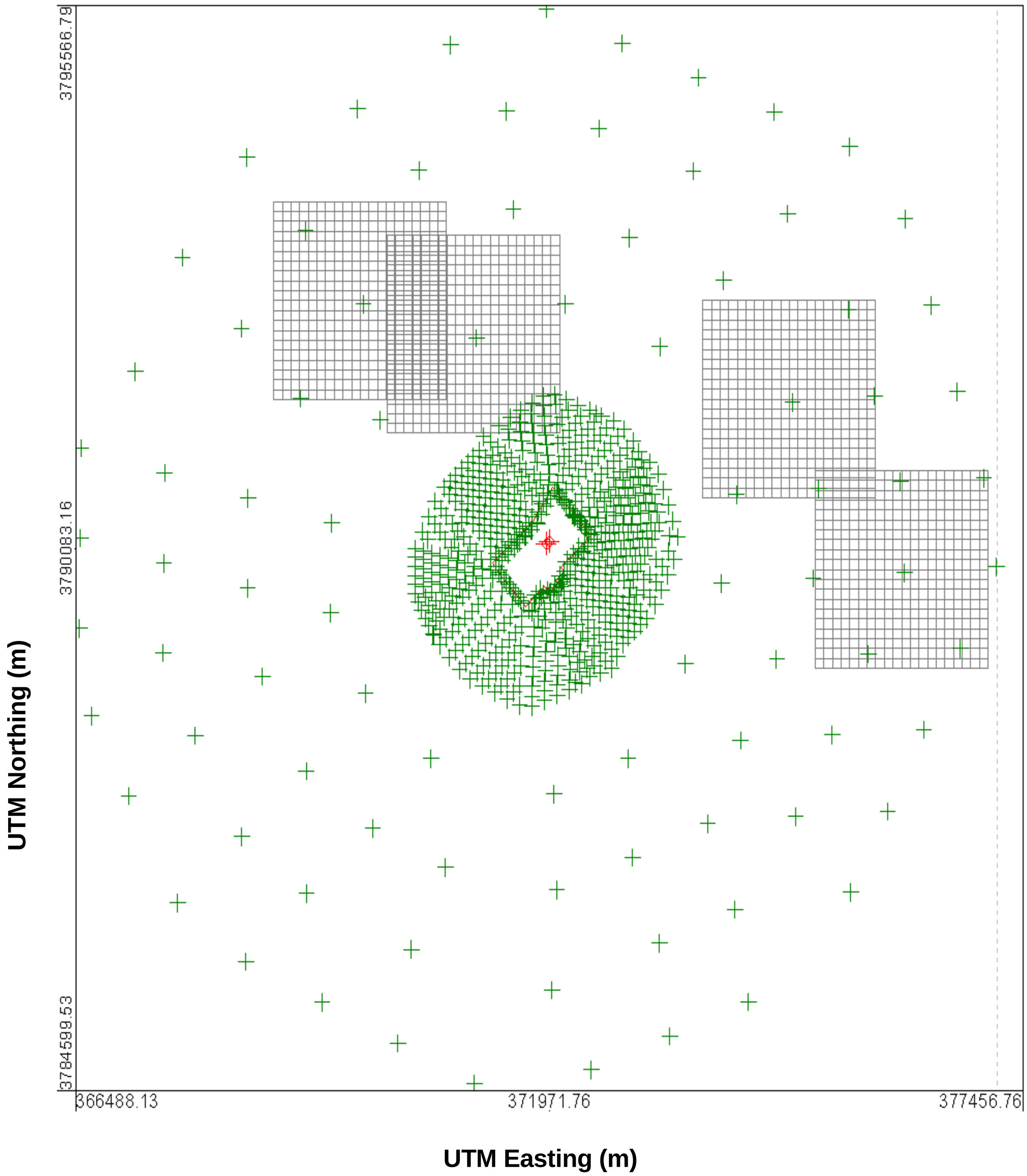
The SCAQMD has compiled a standard set of meteorological data files for use in air quality dispersion modeling in the Basin. Meteorological data file from the Burbank monitoring station (1981) was used for performing the dispersion modeling. In this dataset, the surface wind speeds and directions were collected at the SCAQMD's Burbank monitoring station (Surface Station No. 51100), while the upper air sounding data used to estimate hourly mixing heights were gathered at Ontario International Airport (Upper Air Station No. 99999). Temperatures and sky observation (used for stability classification) were taken from Burbank and Ontario Airport data.

Receptors for ISCST3

Appropriate model receptors must be selected to determine the worst-case modeling impacts. For this modeling, two sets of receptor grids were used for determining the peak impacts for the HRA. A “coarse” grid was used to determine the general area of peak concentration. The coarse grid consisted of three parts: (1) receptors along the perimeter of the facility with a spacing of approximately 100 meters or less; (2) receptors spaced 250 meters apart extending from the property line to approximately 2.5 kilometers from the property line; and (3) receptors spaced 500 meters apart extending from the prior grids to another 2.5 kilometers. No receptors were placed within the VGS site property line.

Once the location of peak concentration for each criteria pollutant and averaging time was identified from the coarse grid simulation, a fine grid of receptors was created centered on the coarse grid peak location. The fine receptor grid covered a two-kilometers by two-kilometers area with receptors at 100 meter spacing. The ISCST3 model was then rerun using this grid spacing to determine the peak concentration for a given pollutant and averaging time. The boundary lines and receptor locations used in the modeling are shown in Figure 4.2-1. As seen in the figure, several fine grids were used to evaluate the peak concentrations for different pollutants and averaging times.

Terrain heights for all receptors were determined from commercially available digital terrain elevations developed by the U.S. Geological Survey by using its Digital Elevation Model (DEM). The DEM data provide terrain elevations with one-meter vertical resolution and 30 meters horizontal resolution based on a Universal Transverse Mercator (UTM) coordinate system. For each receptor location, the terrain elevation was set to the elevation for the closest DEM grid point.



UTM Easting (m)

Figure 4.2-1 VGS Site Boundary and ISCST3 Grid Receptor Locations

The U.S. EPA's guidance was followed to address the potential influence on the ambient air concentrations of structures located near point emission sources. The latest building downwash program (Version 3.15) developed by Lakes Environmental was used to identify the structures required to be included in the ISCST3 model to address building downwash effects. The building downwash program was also used to estimate the direction-specific building dimensions, which are required as inputs by the ISCST3 model, to address the influence of nearby structures on the ambient air concentrations.

Receptors for CTSCREEN

Receptors were generated using the program RECGEN, which places receptors along the terrain contours generated with the FITCON and HCRIT terrain preprocessors. The terrain data was created by digitizing the contours. A sufficient number of points were selected to define the basic shape of each contour. All digitized points were input to the preprocessor programs, FITCON and HCRIT, and a terrain file was generated for use in the CTSCREEN model. RECGEN then used these contours and generated receptors.

Receptors were specified for distances of 500 meters along the terrain contours. Once the location of maximum concentration was determined, a one-km by one-km fine receptor grid with 100 meters spacing was created manually using a text editing program. Terrain elevations were obtained from the same source as for the ISCST3 modeling. The receptor locations used are shown in Figure 4.2-2.

Source Parameters

In order to estimate the "worst-case" ambient concentrations for various averaging periods from the operation of the CTGs and HRSGs, the emissions from the three operating scenarios were combined as presented in Table 4.2-16.

The source parameter inputs and criteria pollutant emissions during normal startup, normal operation, and diesel fuel readiness testing used in the dispersion model are summarized in Tables 4.2-17 through 4.2-19. All sources of emissions were modeled as point sources.

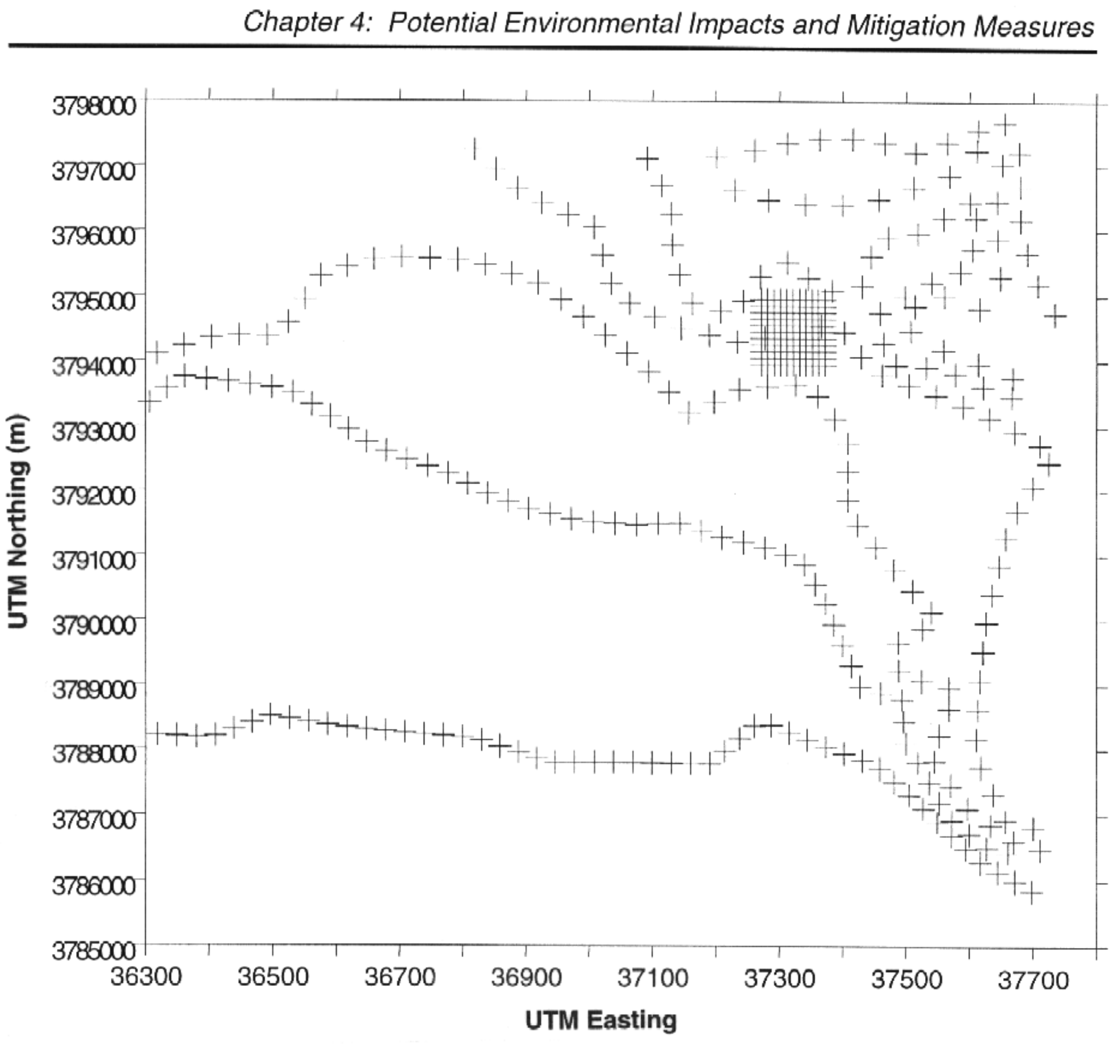


Figure 4.2-2 Coarse and Fine Grid Receptor Locations for CTSCREEN Modeling

Table 4.2-16
Grouping of Operating Scenarios for Air Dispersion Modeling

Pollutant	Averaging Period	Emission Sources Considered for Dispersion Modeling	Operating Conditions Considered for Dispersion Modeling
NO_X	1-hour (hr)	Two CTGs	CTG01 in Diesel Testing, CTG02 in Normal Operation
NO_X	Annual	Two CTGs	Both CTGs in Normal Operating + 12 Diesel Tests
CO	1-hr	Two CTGs	CTG01 in Normal Startup, CTG02 in Normal Operation
CO	8-hr	Two CTGs	CTG01 in Normal Startup, CTG02 in Normal Operation
SO_2	1-hr	Two CTGs	CTG01 in Diesel Testing, CTG02 in Normal Operation
SO_2	3-hr	Two CTGs	CTG01 in Diesel Testing, CTG02 in Normal Operation
SO_2	24-hr	Two CTGs	CTG01 in Diesel Testing, CTG02 in Normal Operation
SO_2	Annual	Two CTGs	Both CTGs in Normal Operation + 12 Diesel Tests
PM10	24-hr	Two CTGs and Cooling Tower	Both CTGs in Normal Operation (23 hours each)+ Cooling Tower in Operation + both CTGs Diesel Tested (1 hour duration)
PM10	Annual	Two CTGs and Cooling Tower	Both CTGs in Normal Operation + Cooling Tower in Operation + 12 Diesel Tests

Table 4.2-17
Dispersion Modeling Source Location and Stack Parameters During Normal Operation

Source ID	Easting (m)	Northing (m)	Elevation (m)	Release Height (m)	Temp (K)	Stack Vel (m/s)	Stack Dia (m)	Emission (g/s)			
								NO_X	SO_2	CO	PM10
CTG01	371935	3790125	282	41.15	358	18.85	6.1	2.436	0.269	3.551	2.058
CTG02	371965	3790150	282	41.15	358	18.85	6.1	2.436	0.269	3.551	2.058
COOLT	372095	3790180	282	16.76	311	7.80	11.0	N/A	N/A	N/A	0.373

m = meters
^oK = Kelvin
m/s = meters/second
g/s = grams/second

Table 4.2-18
Dispersion Modeling Source Location and Stack Parameters
During Normal Startup

Source ID	Easting (m)	Northing (m)	Elevation (m)	Release Height (m)	Temp (K)	Stack Vel (m/s)	Stack Dia (m)	Emission (g/s)			
								NO_X	SO_2	CO	PM10
CTG01	371935	3790125	282	41.15	355	10.19	6.1	2.5	0.1	12.6	1.26
CTG02	371965	3790150	282	41.15	355	10.19	6.1	2.5	0.1	12.6	1.26

Note - Although two turbines are shown in the table, only one turbine will be in normal startup at any time.

Table 4.2-19
Dispersion Modeling Source Location and Stack Parameters
During Diesel Fuel Readiness Testing

Source ID	Easting (m)	Northing (m)	Elevation (m)	Release Height (m)	Temp (K)	Stack Vel (m/s)	Stack Dia (m)	Emission (g/s) [a]			
								NO_X	SO_2	CO	PM10
CTG01	371935	3790125	282	41.15	415	20.0	6.1	39.47	12.43	3.32	2.93
CTG02	371965	3790150	282	41.15	415	20.0	6.1	39.47	12.43	3.32	2.93

Note - Although two turbines are shown in the table, only one turbine will be in diesel fuel readiness testing at any time.
[a] = Based on maximum hourly emissions.

4.2.2.4 Toxic Air Contaminant Health Risk Assessment

The impact of toxic air contaminants was determined by performing a HRA. The impacts that are addressed in the HRA include carcinogenic, chronic noncarcinogenic, and acute noncarcinogenic health risks. Additional details of the HRA are found in Appendix F.

In order to estimate the "worst-case" carcinogenic and noncarcinogenic risks from the operation of the equipment at the VGS, the emissions from the three operating modes (normal operating, normal startup, and diesel readiness testing) discussed previously in Subsection 4.2.2.1 were combined as described below. These combinations were selected as the reasonably foreseeable combination of operations that would result in the highest TAC emissions on an hourly basis, to evaluate acute health risks, and on an annual basis, to evaluate potential chronic health risks. As with the criteria pollutants, discussed above, the air emissions from the proposed project were modeled with no adjustment made for the emission reductions associated with the removal of the existing equipment at the facility. This allows for prediction of the "worst case" impact to ambient air quality at any receptor.

- For estimating the “worst-case” acute hazard index (noncarcinogenic health impact), it was assumed that both CTGs would be operating normally at full load.
- For estimating the “worst-case” chronic hazard index (noncarcinogenic health impact) and the carcinogenic health risk, it was assumed that both CTGs would operate at full load throughout the year (8,760 hours for each CTG), and both CTGs would be tested for diesel fuel readiness during the year (12 tests/year, one test/month, and one hr/test for each CTG).

It may be mentioned that the preliminary estimates of the acute hazard index for the three operating modes described above indicated that the worst-case scenario would be when both the CCTs would be operating in normal mode. Acrolein was identified as the largest contributor to the acute hazard index. Since acrolein will not be emitted during diesel readiness testing, this operational mode was not expected to yield the maximum acute hazard index. In addition, during startup mode the quantity of fuel used and thus the emission rates of air toxics would be less than the normal operation mode and the stack exit parameters would be similar to normal operation. Thus, acute hazard index is expected to be lower during the startup mode in comparison to normal operation mode. A summary of maximum hourly and annual average TAC emission rates is presented in Table F-2.

Methodology

The ACE2588 (Assessment of Chemical Exposure for AB2588) Risk Assessment Model (Version 93288) was used to evaluate the potential health risks from TACs potentially emitted at the VGS site. The ACE2588 model, which is accepted by the CAPCOA, has been widely used for health risk assessments required under the CARB AB2588 Program. The model provides conservative algorithms to predict relative health risks from exposure to carcinogenic, chronic noncarcinogenic, and acute noncarcinogenic pollutants. This multipathway model was used to evaluate the following routes of exposure: inhalation, soil ingestion, dermal absorption, mother's milk ingestion, and plant product (only home grown vegetable gardens) ingestion. Exposure routes from animal product ingestion and water ingestion were not included for this analysis.

The toxicity data in the 93288 version of ACE2588 was revised to include the current data as recommended by the SCAQMD and OEHHA (SCAQMD, 2001; OEHHA, 1999 and 2000). The HRA results obtained based on the CAPCOA HRA guidance are considered to be consistent with those which would be obtained following SCAQMD's Risk Assessment Procedures for Rule 1401 (SCAQMD, 2000).

Hazard Identification

Only TACs identified in the SCAQMD Rule 1401 with potency values or reference exposure levels were included in the HRA. The toxicity values for the identified Rule 1401 TACs emitted from the proposed equipment at the VGS site are included in Appendix F.

Dose-Response Assessment

The dose-response data, used in the HRA, were extracted from the SCAQMD 2000 and 2001 and the OEHHA 1999 and 2000 Guidelines.

Exposure Assessment

Following the CAPCOA guidance, the inhalation, dermal absorption, soil ingestion, and mother's milk pathways were included in a multipathway analysis. Pathways not included in the analysis are water ingestion, fish, crops (except home grown vegetable gardens), and animal and dairy products, which were not identified as a potential concern for the proposed project.

Inhalation pathway exposure conditions were characterized by the use of the ISCST3 dispersion model, as previously discussed.

Residential exposure assumptions, including a 70-year lifetime continuous exposure for the maximum exposed individual (MEI), were included in this analysis. A complete listing of exposure and pathway assumptions and output files are available for public inspection by contacting the SCAQMD's Public Information Center at (909) 396-2039.

4.2.3 Significance of Project Operational Emissions

4.2.3.1 Daily Mass Emissions

The operating scenario that results in the maximum daily mass emissions varies by pollutant. The maximum daily mass emissions, by pollutant, are based on the following operating scenarios:

CO	4-hr start-up plus 20-hours of normal operation for two CTGs.
NO_x	1-hr diesel readiness test plus 23-hours of normal operation for one CTG; 24-hours normal operation for one CTG.
PM10	1-hr diesel readiness test plus 23-hours of normal operation for one CTG; 24 hours normal operation for one CTG; 24-hours normal operation for the cooling tower.
SO_2	1-hr diesel readiness test plus 23-hours of normal operation for one CTG; 24-hours normal operation for one CTG.
VOC	24-hours of normal operation for two CTGs.

Because the existing electrical generating equipment at VGS will be decommissioned when the proposed project is implemented, the emission reductions associated with the existing equipment (see Table 3.2-5) will be subtracted from the project-related emissions. This will represent a "worst case" emissions increase because the average daily historical emissions are subtracted from the maximum peak-daily project emissions.

A summary of the resulting maximum peak-daily operation-related non-RECLAIM mass emissions associated with the project site is shown in Table 4.2-20. A comparison of the daily mass operational emissions to the SCAQMD criteria pollutant significance thresholds is also presented in Table 4.2-20. As shown in Table 4.2-20, operation-related emissions of CO, VOC, SO_x and PM10 exceed the significance criteria identified in Table 4.2-1.

A summary of operational RECLAIM pollutant (NO_X) emissions is shown in Table 4.2-21. As discussed previously at the beginning of Subsection 4.2, the significance determination is based on whether direct NO_X emissions, when added to the annual allocation (2002) including purchased RTCs are greater than the Initial 1994 RECLAIM allocation plus NTCs plus the maximum daily operation NO_X significance threshold of 55 pounds per day. Based on this comparison, the direct NO_X emissions from the installation of CTGs are not expected to result in significant impacts.

Table 4.2-20
Overall Peak Daily Operational Non-RECLAIM Daily Mass Emissions (Pre-Mitigation)

Source	CO (lb/day)	VOC (lb/day)	SO_X (lb/day)	PM10 (lb/day)
Combustion Turbines (CTG)[a]	1,778.8	256.3	198.7	790.3
Cooling Tower				71
Total	**1,778.8**	**256.3**	**198.7**	**861.3**
Indirect Emissions (Aqueous Ammonia Delivery Trucks)	0.0	0.0	0.0	0.0
Total Project	**1,778.8**	**256.3**	**198.7**	**861.3**
Average Daily Historical Emissions	(97.8)	(57.6)	(7.7)	(16.3)
Net Emissions Increase	1,681	199	191	845
Significance Threshold	*550*	*55*	*150*	*150*
Significant? (Yes/No)	Yes	Yes	Yes	Yes

[a] Emissions for two CTGs.

Table 4.2-21
Project RECLAIM NO_X Peak Daily Emissions

Criteria	Emissions
CTG NO_X Emissions (lb/day)	1,221
Average Daily Historical Emissions	(526)
Net Emissions Increase	695

2002 RECLAIM NO_X allocation (lb/day)[a]	271
Total (lb/day)	**966**
Significance Threshold	1,542
Significant? (Yes/No)	**No**

[a] The 2002 facility allocation for NO_X includes purchased RTCs and is converted to pounds per day. This value was taken from the Facility Permit to Operate. The value from the column headed NO_X RTC Holding was selected.

4.2.3.2 Localized Ambient Air Quality Impacts

The dispersion modeling results and a determination of whether CO, PM10, NO_X, and SO_X emissions from the project exceed the significance criteria presented in Table 4.2-1 are discussed in the following subsections.

Carbon Monoxide and Particulate Matter

The dispersion modeling results for the CO and PM10 analyses are provided in Table 4.2-22. Figure 4.2-1 presents the locations of the receptor grids used to determine the maximum CO impacts. Figure 4.2-2 presents the locations of the receptor grids used to determine the maximum PM10 impacts. The dispersion modeling results indicate that the expected "worst-case" emissions from the proposed project would not exceed the allowable concentration changes listed in Table 4.2-1 for CO or PM10. Therefore, significant adverse CO or PM10 localized air quality impacts are not expected from the operation of the CTGs, HRSGs, STG, SCR, or cooling tower.

Table 4.2-22
Summary of CO and PM10 Impacts

Pollutant	Averaging Period	Significant Change Threshold ($\mu g/m^3$)	Predicted [a] Maximum Ground Level Impact ($\mu g/m^3$)	Significant? (Yes/No)	Location of Maximum Ground Level Concentration	
					UTM E (m)	UTM N (m)
PM10	24-hr Annual	2.5 1	2.43 0.49	N N	373,220 373,220	3,794,445 3,794,445
CO	1-hr 8-hr	1,100 500	94.1 62.8	N N	371,083 370,583	3,792,143 3,791,843

a = Based on operating scenarios listed in Table 4.2-16

Nitrogen Dioxide and Sulfur Dioxide

The project site is located within the SCAQMD's East San Fernando Valley monitoring area. Recent background air quality data for NO_X and SO_2 for the East San Fernando Valley monitoring station and estimated NO_X and SO_2 air quality impacts from the project site are presented in Table 4.2-23. The incremental impacts were added to appropriate East San Fernando Valley background concentrations and the total concentrations compared to the most stringent of the CAAQS or NAAQS.

The dispersion modeling results indicate that NO_X and SO_X emissions from operation-related activities at the VGS do not exceed the NO_X and SO_2 standards. Therefore, significant NO_X or SO_2 localized air quality impacts are not expected from the operation of the CTGs, HRSGs, STG, SCR, and cooling tower.

Table 4.2-23
Summary of NO_X and SO_2 Impacts

Averaging Period	Maximum[a] Predicted Impacts (μg/m³)	Estimated Background Concentration[b] (μg/m³)	Total Concentration (μg/m³)	State Standard (μg/m³)	National Standard (μg/m³)	Significant? (Yes/No)
SO_2						
1-hour	35.7	26	61.7	650	--	N
3-hour	30.8	26	56.8	--	1300	N
24-hour	10.1	23.6	33.7	109	365	N
Annual	0.1	0.5	0.6	--	80	N
NO_X						
1-hour	113.6	338.4	452.0	470	--	N
Annual	0.74	85.7	86.4	--	100	N

a = Based on operating scenarios listed in Table 4.2-16.
b = Maximum concentration for three-year period, 1999-2001 at East San Fernando Valley monitoring site (069)

4.2.3.3 Health Risks

The results of the ACE2588 analysis indicate a MEI cancer risk of 0.69 in one million (0.69 x 10^{-6}) at a distance of approximately 2.3 km northwest of the project site. The pathway contribution to the total carcinogenic risk is shown in Table 4.2-24.

A maximum chronic hazard index of 0.06 was calculated for the respiratory endpoint at a receptor approximately 2.3 km northwest from the project site. The two pollutants contributing most to the chronic hazard index for the MEI were acrolein (46 percent) and ammonia (45 percent).

The MEI for the acute analysis is located at a receptor approximately 2.3 km north-northwest of the VGS site. A maximum acute hazard index of 0.23 was calculated for the respiratory and eye endpoints, primarily from acrolein (89 percent).

The HRA results show that toxic impacts from the project site are below the TAC significance criteria presented in Table 4.2-1.

Table 4.2-24
70-Year Cancer Risk per Million for the Maximum Exposed Individual

Pollutant	Inhale	Dermal	Soil	Plants	Sum
Acetaldehyde	3.33E-08	0.00E+00	0.00E+00	0.00E+00	3.33E-08
Arsenic	1.60E-08	4.00E-10	1.89E-08	7.88E-09	4.32E-08
Benzene	3.49E-08	0.00E+00	0.00E+00	0.00E+00	3.49E-08
Beryllium	8.17E-11	0.00E+00	0.00E+00	0.00E+00	8.17E-11
Butadiene-1,3	1.95E-09	0.00E+00	0.00E+00	0.00E+00	1.95E-09
Cadmium	8.58E-10	0.00E+00	0.00E+00	0.00E+00	8.58E-10
Chloroform	5.81E-09	0.00E+00	0.00E+00	0.00E+00	5.81E-09
Chromium (hex.)	1.02E-09	1.57E-12	7.41E-12	2.98E-12	1.03E-09
Formaldehyde	4.94E-07	0.00E+00	0.00E+00	0.00E+00	4.94E-07
Lead	4.56E-12	1.78E-13	8.40E-12	3.53E-12	1.67E-11
Nickel	7.97E-09	0.00E+00	0.00E+00	0.00E+00	7.97E-09
Propylene oxide	1.59E-08	0.00E+00	0.00E+00	0.00E+00	1.59E-08
benz[a]anthracene	2.29E-10	2.18E-10	3.43E-10	2.50E-09	3.29E-09
Benzo[a]pyrene	1.43E-09	1.36E-09	2.15E-09	1.56E-08	2.05E-08
Benzo[b]fluoranthrene	1.21E-10	1.15E-10	1.81E-10	1.32E-09	1.73E-09
Benzo[k]fluroanthrene	1.18E-10	1.12E-10	1.76E-10	1.28E-09	1.69E-09
Chrysene	2.56E-11	2.44E-11	3.84E-11	2.79E-10	3.68E-10
Dibenz[a,h]anthracene	2.60E-09	7.74E-10	1.22E-09	8.86E-09	1.35E-08
Indeno[1,2,3-cd]pyre	8.66E-10	2.27E-10	3.57E-10	2.59E-09	4.04E-09
Tetra-p-dioxin	8.94E-11	0.00E+00	0.00E+00	0.00E+00	8.94E-11
1,2,3,4,6,7,8-Hepdio	4.01E-12	0.00E+00	0.00E+00	0.00E+00	4.01E-12
1,2,3,4,6,7,8-Octa	2.55E-12	0.00E+00	0.00E+00	0.00E+00	2.55E-12
1,2,3,4,5,6,7,8-Octf	2.06E-13	0.00E+00	0.00E+00	0.00E+00	2.06E-13
Pentachlor-p-dioxin	8.51E-11	0.00E+00	0.00E+00	0.00E+00	8.51E-11
Hexachlor-p-dioxin	2.15E-11	0.00E+00	0.00E+00	0.00E+00	2.15E-11
Tetrachlor-furan	7.97E-11	0.00E+00	0.00E+00	0.00E+00	7.97E-11
Pentachlor-furan	5.57E-10	0.00E+00	0.00E+00	0.00E+00	5.57E-10
Hexachlor-furan	5.75E-11	0.00E+00	0.00E+00	0.00E+00	5.75E-11
Heptachlor-furan	3.99E-12	0.00E+00	0.00E+00	0.00E+00	3.99E-12
Total Risk	**6.18E-07**	**3.23E-09**	**2.34E-08**	**4.03E-08**	**6.85E-07**
Based on both turbines in normal operating mode 8760 hours/year per turbine, cooling tower emissions, and 12 diesel readiness tests per year per turbine.					

4.2.4 Carbon Monoxide Impacts Analysis

Increases in traffic from a project may lead to impacts of CO emissions on sensitive receptors if the traffic increase worsens congestion on roadways or at intersections. An analysis of these impacts is required if:

- The project is anticipated to reduce the level of service (LOS) of an intersection rated at C or worse by one full level; or
- The project is anticipated to increase the volume-to-capacity ratio of an intersection rated D or worse by 0.02.

As indicated in the transportation/traffic analysis (Section 4.7), the volume-to-capacity at the San Fernando Road and Sheldon Street intersection, which is currently rated D+, may increase by more than 0.02 from construction workers leaving the VGS site at the end of the work day. This is the only intersection that meets either of the above criteria during either construction or operations.

Sensitive receptors are identified in Figure 5.1 of the SCAQMD CEQA Handbook (1993) as:

- Long-term health care facilities
- Rehabilitation centers
- Convalescent centers
- Retirement homes
- Residences
- Schools
- Playgrounds
- Child care centers
- Athletic facilities

The area in the vicinity of the intersection is heavy manufacturing that precludes the presence of sensitive receptors. Therefore, the potential increase in congestion at this intersection during the short-term construction period is not anticipated to lead to significant adverse CO impacts on sensitive receptors.

These emissions are temporary and are expected to cease within six months. Therefore, long-term exposure to construction-related CO that could result in significant adverse human health affects to nearby project site sensitive receptors is not expected.

4.2.5 AQMP Consistency

CEQA requires that any inconsistencies between the proposed project and applicable regional and local plans (CEQA Guidelines § 151265(d)) be addressed in the EIR. The 1997 AQMP and the 1999 amendments to the AQMP demonstrate that the state and national ambient air quality standards can be achieved within the required timeframes. The District has lead responsibility for the development of the AQMP. The Southern California Association of Governments (SCAG) develops strategies for the implementation of the AQMP and facilitates the implementation of the strategies. The proposed project is being undertaken for several reasons, but the relevant reason with regards to the AQMP is to comply with Regulation XX - RECLAIM. Accordingly, projects that comply with SCAQMD rules and regulations are considered consistent with the AQMP and other regional plans.

4.2.6 Potential Health Risks from Diesel Exhaust Particulate Matter

The project will lead to increased emissions of diesel exhaust particulate matter from onsite construction equipment and diesel-fueled truck exhaust and from offsite diesel-fueled truck exhaust during construction. In 1998, the CARB listed particulate matter in the exhaust from diesel-fueled engines (diesel particulate matter) as a toxic air contaminant and concluded that it is probably carcinogenic to humans. An Advisory Committee was formed to advise the CARB staff in its preparation of an assessment of the need to further control toxic air pollutants from diesel-fueled engines. The Risk Management Subcommittee was formed to identify the: (1) operating parameters; (2) emission factors; and (3) modeling methodologies recommended for estimating human health risks from diesel-fueled engines. This information will be used by the Subcommittee to develop the scenarios to evaluate the risks associated with exposure to diesel particulate emissions. The SCAQMD is waiting for this guidance before initiating a quantitative risk analysis for diesel particulate emissions.

Significant impacts associated with exposure to diesel particulate emissions are not expected during either construction or operational activities. As listed in Table 4.2-5, construction-related onsite and offsite diesel exhaust particulate matter emissions are estimated to be approximately 23 and five pounds per day, respectively. However, these emissions are temporary and are expected to cease within six months. Therefore, long-term exposure to construction-related diesel exhaust particulate matter that could result in significant adverse human health affects to nearby project site sensitive receptors is not expected.

Additionally, as shown in discussed in subsection 4.2.2.2 above, peak daily operation-related diesel exhaust particulate matter emissions are not anticipated to increase.

4.2.7 Mitigation Measures

4.2.7.1 Construction Mitigation Measures

As indicated in Table 4.2-5, construction-related activities associated with the proposed project may have significant unmitigated air quality impacts for CO, VOC, NO_X, and PM10.

The emissions from construction-related activities are primarily from three main sources: 1) onsite fugitive dust, 2) onsite construction equipment, and 3) offsite motor vehicles. The mitigation measures listed below are intended to minimize the emissions (e.g., air quality impacts) associated with these sources.

Mitigation measures for each emission source and the estimated control efficiency of each mitigation measure are listed in Table 4.2-25. As shown in the table, no feasible[5] mitigation measures have been identified for the emissions from on-road (offsite) vehicle trips. Additionally, no other feasible mitigation measures have been identified to further reduce emissions from this source or the sources for which mitigation measures have been identified.

Table 4.2-25
Construction-Related Mitigation Measures and Control Efficiency

Mitigation Measure	Mitigation	Source	Pollutant	Control Efficiency (%)
AQ-1	Increase watering of active sites by one additional time per day[a]	Onsite Fugitive Dust PM10	PM10	16[a]
AQ-2	Proper equipment maintenance	Construction Equipment Exhaust	VOC NO_x SO_x PM10 CO	5 5 5 5 0
AQ-3	Prior to use in construction, the project proponent will evaluate the feasibility of retrofitting the large off-road construction equipment that will be operating for significant periods. Retrofit technologies such as selective catalytic reduction, oxidation catalysts, air enhancement technologies, etc. will be evaluated. These technologies will be required if they are commercially available and can feasibly be retrofitted onto construction equipment.	Construction Equipment Exhaust	CO VOC NO_X SO_X PM10	Unknown Unknown Unknown Unknown Unknown

[5] CEQA Guidelines §15364 defines feasible as ". . . capable of being accomplished in a successful manner within a reasonable period if time, taking into account economic, environmental, legal, social, and technological factors."

Table 4.2-25 (Concluded)
Construction-Related Mitigation Measures and Control Efficiency

Mitigation Measure	Mitigation	Source	Pollutant	Control Efficiency (%)
AQ-4	Use low sulfur diesel (as defined in SCAQMD Rule 431.2) where feasible.	Construction Equipment	SO_X PM10	Unknown
	No feasible measures identified[b]	On-Road Motor Vehicles	VOC NO_x PM10 CO	N/A N/A N/A N/A

a - It is assumed that construction activities will comply with SCAQMD Rule 403 – Fugitive Dust, by watering active sites two times per day, reducing fugitive dust by 50 percent. This mitigation measure assumes an incremental increase in the number of times per day active sites are watered (i.e., from two to three times per day).

b - Health and Safety Code §40929 prohibits the air districts and other public agencies from requiring an employee trip reduction program making such mitigation infeasible. No feasible measures have been identified to reduce emissions from this source.

Estimated peak daily mitigated emissions by construction activity are listed in Table 4.2-26. The overall peak daily mitigated construction-related emissions are anticipated to occur during simultaneous foundation construction, and paving and equipment installation. The overall peak daily mitigated construction-related emissions are summarized in Table 4.2-27. The implementation of mitigation measures, while reducing emissions, does not reduce the construction-related CO, VOC, NO_X, or PM10 impacts below significance.

Table 4.2-26
Peak Daily Construction Emissions for Each Construction Phase (Mitigated)

Activity	Location	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM10 (lb/day)	Fugitive PM10 (lb/day)	Total PM10 (lb/day)
Grading	Onsite	14.0	3.5	25.7	2.4	1.3	3.1	4.5
	Offsite	4.5	0.3	0.3	0.0	0.0	0.1	0.2
	Total	18.5	3.8	26.0	2.4	1.3	3.3	4.6
Foundations and Paving	Onsite	151.1	14.4	73.1	5.8	4.2	38.4	42.5
	Offsite	404.3	28.9	83.4	0.0	2.9	108.2	111.1
	Total	555.4	43.2	156.6	5.8	7.1	146.7	153.6
Equipment Installation	Onsite	172.2	59.0	315.6	26.2	17.9	0.0	17.8
	Offsite	915.1	60.3	74.9	0.0	1.7	64.8	66.5
	Total	1,087.3	119.3	390.6	26.2	19.5	64.8	84.3

Table 4.2-27
Overall Peak Daily Emissions During Construction (Mitigated)

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM10 (lb/day)	Fugitive PM10 (lb/day)	Total PM10 (lb/day)
Onsite Construction Equipment Exhaust	306.5	50.4	403.8	33.7	23.0	--	23.0
Mitigation Reduction (%)	0%	5%	5%	5%	5%	--	--
Mitigation Reduction (lb/day)	0.0	-2.5	-20.2	-1.7	-1.1	--	-1.1
Remaining Emissions	**306.5**	**47.9**	**383.6**	**32.0**	**21.8**	--	**21.8**
Onsite Motor Vehicles	16.8	2.9	5.1	0.0	0.2	--	0.2
Mitigation Reduction (%)	0%	0%	0%	0%	0%	--	--
Mitigation Reduction (lb/day)	0.0	0.0	0.0	0.0	0.0	--	0.0
Remaining Emissions	**16.8**	**2.9**	**5.1**	**0.0**	**0.2**	**--**	**0.2**
Onsite Fugitive PM10	--	--	--	--	--	45.7	45.7
Mitigation Reduction (%)	--	--	--	--	--	16%	--
Mitigation Reduction (lb/day)	--	--	--	--	--	-7.3	-7.3
Remaining Emissions	--	--	--	--	--	**38.4**	**38.4**
Asphaltic Paving	--	1.6	--	--	--	--	--
Mitigation Reduction (%)	--	0%	--	--	--	--	--
Mitigation Reduction (lb/day)	--	0.0	--	--	--	--	--
Remaining Emissions	--	**1.6**	--	--	--	--	--
Architectural Coating	--	21.0	--	--	--	--	--
Mitigation Reduction (%)	--	0%	--	--	--	--	--
Mitigation Reduction (lb/day)	--	0.0	--	--	--	--	--
Remaining Emissions	--	**21.0**	--	--	--	--	--
Total Onsite	**321.8**	**72.7**	**386.8**	**32.0**	**21.9**	**38.4**	**60.3**
Offsite Motor Vehicles	1,319.4	89.1	158.4	0.0	4.5	173.0	177.6
Mitigation Reduction (%)	0%	0%	0%	0%	0%	0%	
Mitigation Reduction (lb/day)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Emissions	**1,319.4**	**89.1**	**158.4**	**0.0**	**4.5**	**173.0**	**177.6**
Total Offsite	**1,319.4**	**89.1**	**158.4**	**0.0**	**4.5**	**173.0**	**177.6**
TOTAL	**1,642.7**	**162.5**	**547.1**	**32.0**	**26.6**	**211.5**	**237.8**
CEQA Significance Level	*550*	*75*	*100*	*150*	--	--	*150*
Significant? (Yes/No)	**Yes**	**Yes**	**Yes**	No	--	--	**Yes**
Note: Totals may not match sum of individual values because of rounding							

The overall peak daily mitigated construction-related CO, VOC, NO_X, SO_X and PM10 emissions are anticipated to occur during simultaneous foundation construction, paving and equipment installation at the project site. The emissions associated with each source and an estimate of the reductions associated with the proposed mitigation measure(s) are listed in Table 4.2-27. The implementation of mitigation measures, while reducing emissions, does not reduce the construction-related CO, VOC, NO_X, or PM10 impacts below significance.

4.2.7.2 Operational Mitigation Measures

Operation-related activities associated with the proposed project may have significant unmitigated air quality impacts for CO, SO_x, VOC, and PM10.

Pursuant to Rule 1304(a)(2), LADWP is not required to provide emission offsets when replacing electric utility steam boilers with CTGs unless there is an increase in generating capacity. If there is a net increase in capacity, LADWP would be required to provide offsets only for the increase in capacity. LADWP is decommissioning four electric utility steam boilers with a net capacity of 526 MW as part of the proposed project, and replacing them with CTGs with a net capacity of 532 MW. LADWP will be required to provide offsets for VOC, PM10, CO, and SO_x for only 6 MW of generating capacity to satisfy the requirements of Regulation XIII.

However, VOC is an ozone precursor and is considered to be a regional pollutant. Under CEQA, offsets are a viable mitigation measure for regional pollutants. Offsets provided in this context are provided for CEQA mitigation to reduce the significant impacts to levels of insignificance and are independent of the Rule 1304 exemption described above, which applies to the permitting action.

Unmitigated SO_x emissions exceed the significance criteria. The emissions associated with the one-hour diesel fuel readiness testing contribute almost 50 percent of the total for peak daily SO_x emissions. The use of low sulfur diesel fuel during readiness testing will reduce the significant impact of SO_x emissions to insignificance. Due to the use of natural gas as the primary fuel, SO_x emissions during normal operation of the CTGs would not be significant.

For CO and PM10 emissions associated with the proposed project, no feasible mitigation measures have been identified to reduce significant impacts to insignificance. However, the proposed project utilizes state-of-the-art emission controls for these pollutants.

The feasible mitigation measures for operating emissions are presented in Table 4.2-28.

Table 4.2-28
Operation-Related Mitigation Measures and Control Efficiency

Mitigation Measure	Mitigation	Source	Pollutant	Control Efficiency (%)
AQ-5	Use low sulfur diesel (as defined in SCAQMD Rule 431.2).[a]	Diesel readiness testing	SO_x	97%
AQ-6	Provide VOC Offsets	Combustion contaminant	VOC	N/A
	No feasible measures identified	Fuel combustion in CTGs	PM10 CO	N/A N/A

a - Pursuant to Rule 431.2, low sulfur diesel will be required for use in stationary sources by June 2004. The project is expected to be operational prior to that date. The use of low sulfur diesel is therefore an appropriate mitigation measure for the project.

The overall peak daily mitigated operation-related emissions are summarized in Table 4.2-29. The implementation of mitigation measures, while reducing emissions, does not reduce the operation-related CO or PM10 impacts below significance.

Table 4.2-29
Overall Peak Daily Operational Non-RECLAIM Daily Mass Emissions (Mitigated)

Source	CO (lb/day)	VOC (lb/day)	SO_X (lb/day)	PM10 (lb/day)
Combustion Turbines (CTG)[a]	1,778.8	256.3	198.7	790.3
Cooling Tower				71
Total	**1,778.8**	**256.3**	**198.7**	**861.3**
Indirect Emissions (Aqueous Ammonia Delivery Trucks)	0.0	0.0	0.0	0.0
Total Project	**1,778.8**	**256.3**	**198.7**	**861.3**
Average Daily Historical Emissions	(97.8)	(57.6)	(7.7)	(16.3)
Net Emissions Increase (Pre-Mitigation)	1,681	199	191	845
Emission Reduction Due to Mitigation	0	199	(95.6)	0
Net Emissions with Mitigation	**1,681**	**0**	**95**	**845**
Significance Threshold	*550*	*55*	*150*	*150*
Significant? (Yes/No)	Yes	No	No	Yes

a - Emissions for two CTGs.

4.2.8 Remaining Impacts

4.2.8.1 Construction

Although the above mentioned mitigation measures will reduce emissions, construction-related CO, VOC, NO_X, and PM10 impacts will not be reduced to levels of insignificance.

4.2.8.2 Operation

Low-sulfur diesel fuel will be used during diesel fuel readiness testing to reduce peak daily SO_x emissions to levels of insignificance. VOC is an ozone precursor and is considered to be a regional pollutant. Therefore, offsets can be used to mitigate significant VOC impacts to levels of insignificance.

No feasible mitigation measures have been identified to reduce CO or PM10 emissions from operations to insignificant levels, and offsets cannot be used to mitigate significant CO or PM10 impacts. Therefore, impacts from CO and PM10 emissions will not be reduced to insignificant levels.