3.0 SETTING

3.1 Introduction

In order to determine the significance of the impacts associated with a proposed project, it is necessary to evaluate the project's impacts against the backdrop of the environment as it exists at the time the NOP/IS is published. The CEQA Guidelines define "environment" as "the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance" (CEQA Guidelines §15360; see also Public Resources Code §21060.5). Furthermore, a CEQA document must include a description of the physical environment in the vicinity of the project, as it exists at the time the notice of preparation is published, from both a local and regional perspective (CEQA Guidelines §15125). Therefore, the "environment" or "existing setting" against which a project's impacts are compared consists of the immediate, contemporaneous physical conditions at and around the project site (Remy et al., 1996).

This chapter presents the existing setting for each environmental topic analyzed in this report. This ~~Draft~~Final EIR is focused only on the environmental topics identified in the IS as having the potential for being affected by this project, i.e., air quality, biological resources, cultural resources, energy, geology/soils, hazards and hazardous materials, hydrology/water quality, noise, solid/hazardous waste, and transportation/traffic. The reader is referred to the IS for a discussion of environmental topics not considered in this ~~Draft~~Final EIR and the rationale for inclusion or exclusion of each environmental topic. In Chapter 4, potential adverse impacts from these identified environmental areas are then compared to the existing setting to determine whether the effects of the implementation of the proposed project are significant.

3.2 Air Quality

The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, consisting of the four-county South Coast Air Basin (Basin) (Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino counties), and the Riverside County portions of the Salton Sea Air Basin (SSAB) and Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. It includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Los Angeles County portion of MDAB (known as north county or Antelope Valley) is bounded by the San Gabriel Mountains to the south and west, the Los Angeles/Kern county border to the north, and the Los Angeles/San Bernardino county border to the east. The Riverside County portion of the SSAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of the Riverside County and the SSAB that is bounded by the San Jacinto

Mountains to the west and the eastern boundary of the Coachella Valley to the east (see Figure 1.1-1).

The three sites involved in this project, HGS, SGS, VGS all lie within the Basin (See Figure 3.2-1). The current air quality settings in the vicinity of these sites are discussed in the following sections. Portions of this discussion are taken from Keith (SCAQMD, 1980).

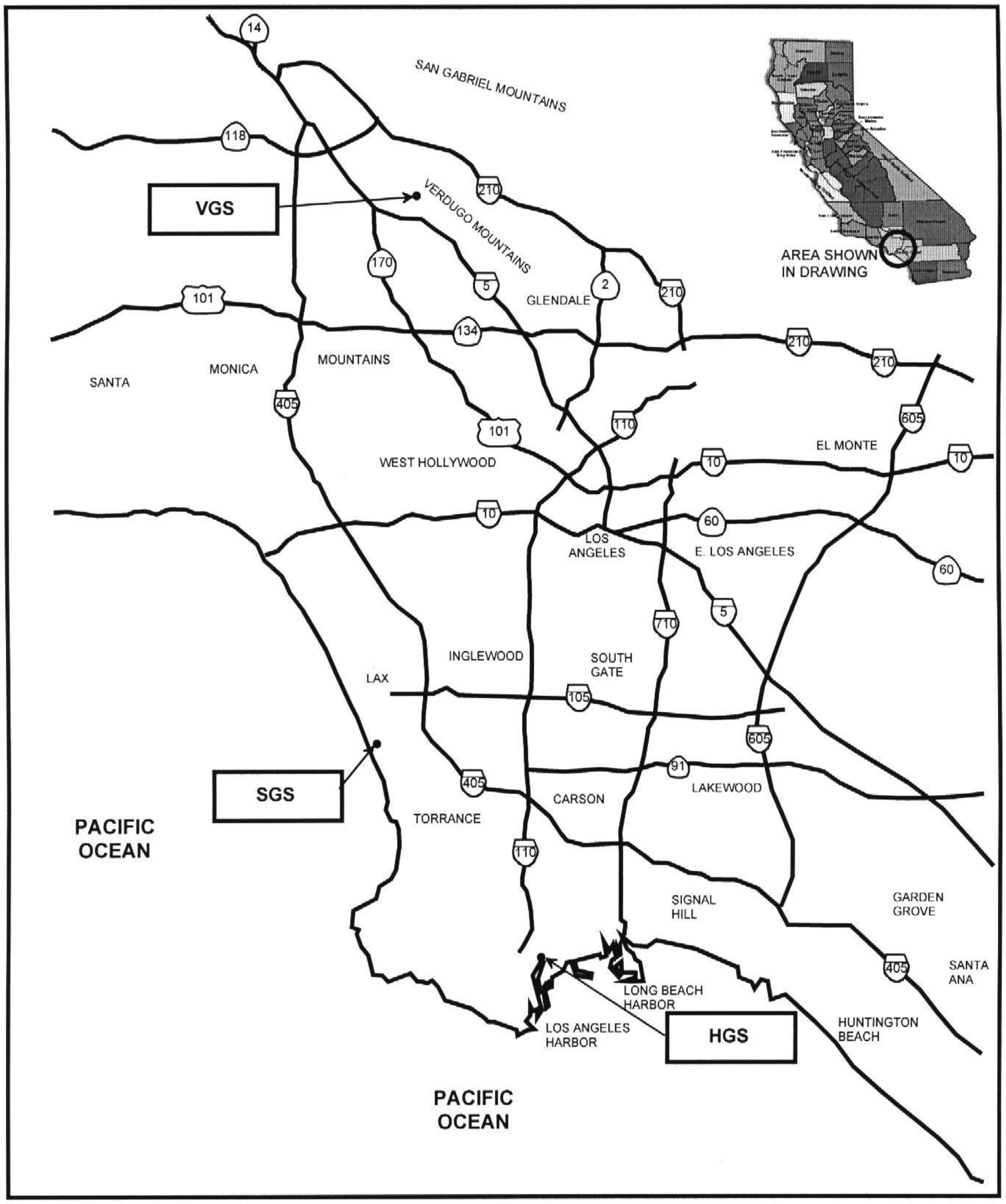
3.2.1 Regional Climate

The regional climate significantly influences the air quality in the Basin; temperature, wind, humidity, precipitation and even the amount of sunshine influences the quality of the air. In addition, the Basin is frequently subjected to an inversion layer that traps air pollutants.

Annual average temperatures throughout the Basin vary from the low to middle 60º F. Due to decreased marine influence, however, the eastern portion of the Basin shows greater variability in average annual minimum and maximum temperatures. January is the coldest month throughout the Basin, with average minimum temperatures of 47° F in downtown Los Angeles and 36 °F in San Bernardino. All portions of the Basin have recorded maximum temperatures above 100 °F. Temperature has an important influence on Basin wind flow, pollutant dispersion, vertical mixing, and photochemistry.

Although the climate of the Basin can be characterized as semi-arid, the air near the land surface is quite moist on most days because of the presence of a marine layer. This shallow layer of sea air is an important modifier of Basin climate. Humidity restricts visibility in the Basin, and the conversion of sulfur dioxide to sulfates is heightened in air with high relative humidity. The marine layer is an excellent environment for that conversion process, especially during the spring and summer months. The annual average relative humidity is 71 percent along the coast, and 59 percent inland. Because the ocean effect is dominant, periods of heavy early morning fog are frequent, and low stratus clouds are a characteristic feature. These effects decrease with distance from the coast.

More than 90 percent of the Basin's rainfall occurs from November through April. Annual average rainfall varies from about nine inches in Riverside to 14 inches in downtown Los Angeles. Monthly and yearly rainfall totals are extremely variable. Summer rainfall usually consists of widely scattered thundershowers near the coast and slightly heavier shower activity in the eastern portion of the region and near the mountains. Rainy days comprise five to 10 percent of all days in the Basin with the frequency being higher near the coast. The influence of rainfall on the contaminant levels in the Basin is minimal. Although some wash-out of pollution would be



SGS SCATTERGOOD GENERATING STATION

HGS HARBOR GENERATING STATION

VGS VALLEY GENERATING STATION

NOT TO SCALE

N

FIGURE 3.2-1

REGIONAL MAP

Los Angeles Department of Water and Power

Drawn by: M. Scop	Date: 11/1/2000	Project number 6190-026-200	REV. 0
Figure Name: regional.dsf	Checked by:		

expected with winter rains, air masses that bring precipitation of consequence are very unstable and provide excellent dispersion that masks wash-out effects. Summer thunderstorm activity affects pollution only to a limited degree. If the inversion is not broken by a major weather system, high contaminant levels can persist even in areas of light showers. However, heavy clouds associated with summer storms minimize ozone production because of reduced sunshine and cooler temperatures.

Due to the generally clear weather, about three-quarters of possible sunshine is received in the Basin (the remaining one-quarter is absorbed by clouds). The ultraviolet portion of this abundant radiation is a key factor in photochemical reactions. On the shortest day of the year there are about 10 hours of possible sunshine, and about 14-½ hours on the longest day of the year. The percentage of cloud cover during daylight hours varies from forty-seven percent at Los Angeles International Airport (LAX) to thirty-five percent at Sanberg, a mountain location. The number of clear days also increases with distance from the coast; 145 days at LAX and 186 days at Burbank (Local Climatological Data, 1999). The Basin typically receives much less sunshine during the first six months of the year than the last six months. This difference is attributed to the greater frequency of deep marine layers and the subsequent increase in stratus clouds during the spring and to the fact that the rainy season begins late in the year, November, and continues through early spring.

The importance of wind to air pollution is considerable. The direction and speed of the wind determines the horizontal dispersion and transport of air pollutants. During the late autumn to early spring rainy season, the Basin is subjected to wind flows associated with traveling storms moving through the region from the northwest. This period also brings five to 10 periods of strong, dry offshore winds, locally termed “Santa Anas” each year. During the dry season that coincides with the months of maximum photochemical smog concentrations, the wind flow is bimodal, typified by a daytime onshore sea breeze and a nighttime offshore drainage wind. Summer wind flows are created by the pressure differences between the relatively cold ocean and the unevenly heated and cooled land surfaces that modify the general northwesterly wind circulation over southern California. Nighttime drainage begins with the radiational cooling of the mountain slopes; heavy, cool air descends the slopes and goes through the mountain passes and canyons as it follows the lowering terrain toward the ocean. Another characteristic wind regime in the Basin is the “Catalina Eddy,” a low level cyclonic (counterclockwise) flow centered over Santa Catalina Island which results in an offshore flow to the southwest. On most spring and summer days, some indication of an eddy is apparent in coastal sections.

The vertical dispersion of air pollutants in the Basin is frequently restricted by the presence of a persistent temperature inversion in the atmospheric layers near the earth’s surface. Normally, the temperature of the atmosphere decreases with altitude. However, when the temperature of the atmosphere increases with altitude, the phenomenon is termed an inversion. An inversion condition can exist at the surface or at any height above the ground. The bottom of the inversion, known as the mixing height, is the height of the base of the inversion.

In the Basin, there are two distinct temperature inversion structures that control vertical mixing of air pollution. During the summer, warm, high-pressure descending (subsiding) air is undercut by a shallow layer of cool marine air. The boundary between these two layers of air is a persistent marine subsidence/inversion. This boundary prevents vertical mixing which effectively acts as an impervious lid to pollutants over the entire Basin. The mixing height is normally situated 1,000 to 1,500 feet above mean sea level.

A second inversion-type forms in conjunction with the drainage of cool air off the surrounding mountains at night followed by the seaward drift of this pool of cool air. The top of this layer forms a sharp boundary with the warmer air aloft and creates nocturnal radiation inversions. These inversions occur mostly in the winter, when nights are longer and onshore flow is weakest. They are typically only a few hundred feet above mean sea level. They very effectively trap pollutants near ground level, such as NO_x and carbon monoxide (CO) from vehicles, as the pool of cool air drifts seaward. Winter is therefore a period of high levels of primary pollutants along the coastline.

In general, inversions in the Basin are lower before sunrise than during the daylight hours. As the day progresses, the mixing height normally increases as the warming of the ground heats the surface air layer. As this heating continues, the temperature of the surface layer approaches the temperature of the base of the inversion layer. When these temperatures become equal, the inversion layer's lower edge begins to erode and if enough warming occurs, the layer breaks up. The surface layers are gradually mixed upward, diluting the previously trapped pollutants. The breakup of inversion layers frequently occurs during mid- to late-afternoon on hot summer days. Winter inversions usually break up by mid-morning.

3.2.2 Meteorology in the Vicinity of the Project

The coastal area in the vicinity of HGS and SGS is dominated by a semi-permanent, subtropical, Pacific high-pressure system. Generally mild, the climate is tempered by cool sea breezes, but may be infrequently interrupted by periods of extremely hot weather, passing winter storms, or Santa Ana winds. The VGS is located somewhat further inland where the temperature is generally higher and the relative humidity lower than along the coast.

The HGS is located along the coast to the south and east of LAX in an area where the topography is relatively flat with the Los Angeles Harbor to the west and south. The most characteristic feature of the climate in the area is the night and morning low cloudiness and sunny afternoons that prevail during the spring and summer months, and occur often during the remainder of the year. Daily temperature range is usually less than 15°F in the spring and summer, and 20°F in the fall and winter. Rainfall averages about 12 inches a year, falling almost entirely from late October to early April. Average normal high temperatures are slightly higher than LAX, and average normal low temperatures are slightly lower. Precipitation and humidity levels are very similar to LAX. The meteorological data (temperature and precipitation) from the Los Angeles International Airport are detailed in Table 3.2-1.

The SGS is located on the coastline with the Pacific Ocean to the west, and a gently sloping hillside to the east. Similar to HGS, this location is coastal. The meteorological data (temperature and precipitation) from the Los Angeles International Airport are representative of the area in the vicinity of SGS (see Table 3.2-1).

Table 3.2-1
Average Monthly Temperatures and Precipitation for
Los Angeles International Airport, CA, 1961-1990

Month	**Los Angeles International Airport**		
	Mean Daily Temperatures		**Mean Monthly Precipitation (inches)**
	Maximum (°F)	**Minimum (°F)**	
January	65	47	2.40
February	66	49	2.51
March	65	50	1.98
April	68	53	0.72
May	69	56	0.14
June	72	60	0.03
July	75	63	0.01
August	76	64	0.15
September	76	63	0.31
October	74	59	0.34
November	71	52	1.76
December	66	48	1.66
Absolute extreme temperatures	110	23	12.01 (total)
Reference: 1999 Local Climatological Data, Annual Summary with Comparative Data, Los Angeles, California, International Airport			

The VGS is located further inland where the temperature is slightly higher and the relative humidity lower than along the coast. The topography is generally flat as well. Summers in the area are warmer than along the immediate coast, with peak temperatures averaging near 80^{o} F. Rainfall averages about 14.5 inches a year, falling almost entirely from late October to early April.

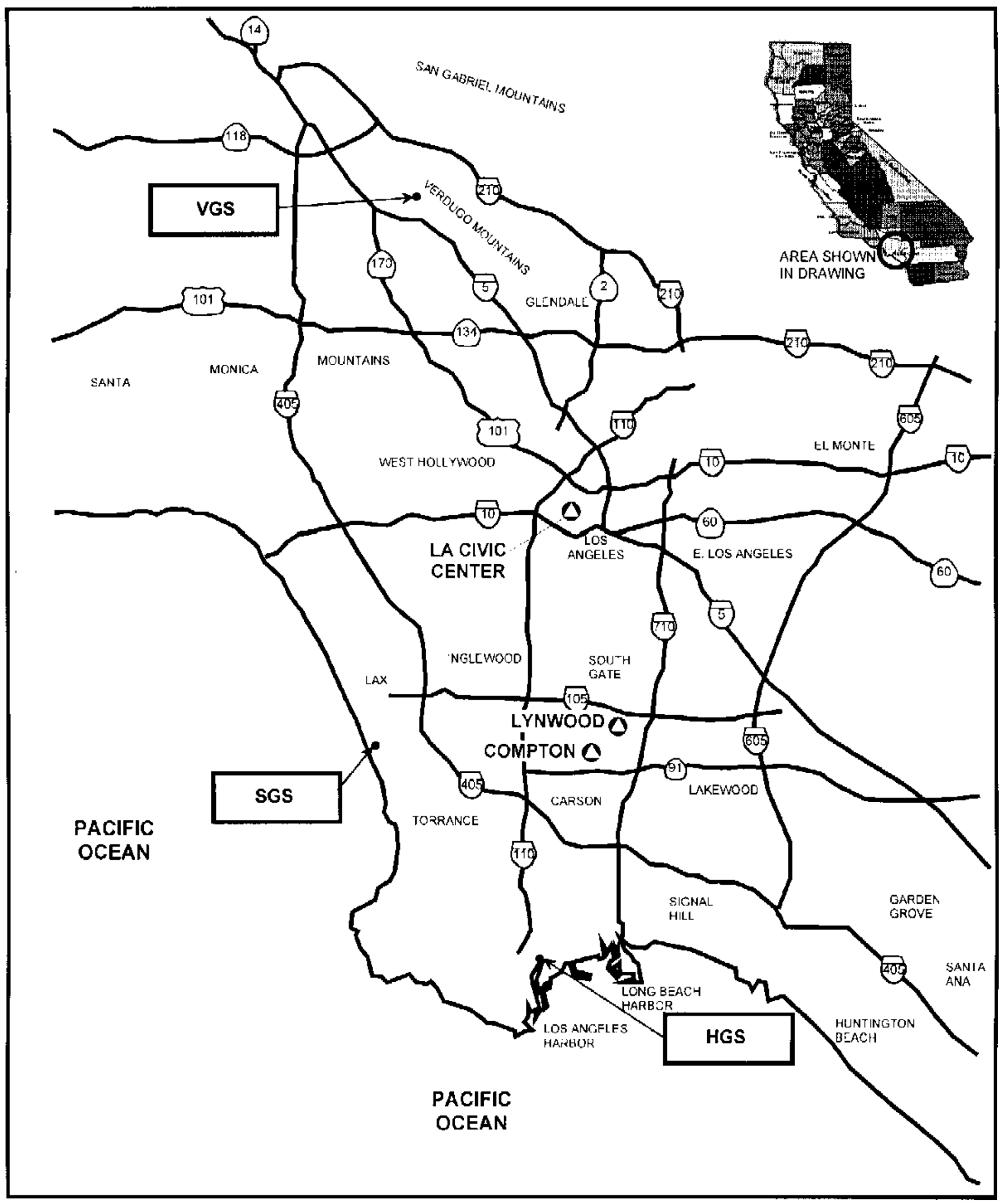
The locations of the three meterological monitoring stations, Long Beach, Los Angeles, and Glendale are shown relative to the project sites in Figure 3.2-2. Typical winter and summer season wind patterns for morning and afternoon for the Basin are shown in Figure 3.2-3. An annual wind rose for Long Beach, representative of HGS is shown in Figure 3.2-4. An annual wind rose for Los Angeles representative of the SGS is shown in Figure 3.2-5. An annual wind rose for Glendale representative of the VGS is shown in Figure 3.2-6.

3.2.3 Existing Air Quality

Air quality is determined primarily by the type and amount of contaminants emitted into the atmosphere, the size and topography of the air basin, and the meteorological conditions. The Basin has low mixing heights and light winds, which are conducive to the accumulation of air pollutants. Pollutants that impact air quality are generally divided into two categories: criteria pollutants (those for which health standards have been set) and toxic air contaminants (those that cause cancer or have adverse human health effects other than cancer).

3.2.3.1 Criteria Pollutants

The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to national and state standards. These standards are set by the U. S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) at levels to protect public heath and welfare with an adequate margin of safety. National Ambient Air Quality Standards (NAAQS) were first authorized by the federal Clean Air Act of 1970. California Ambient Air Quality Standards (CAAQS) were authorized by the state legislature in 1967. Air quality of a region is considered to be in attainment of the standards if the measured ambient air pollutant levels for ozone, carbon monoxide (CO), SO_2 (1 and 24 hour), NO_2, particulate matter less than 10 microns in diameter (PM_{10}), are not exceeded, and all other standards are not equaled or exceeded at any time in any consecutive three-year period. National standards (other than ozone, PM_{10}, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. The Basin is a non-attainment area for ozone, PM_{10}, and CO.



METEOROLOGICAL MONITORING STATION
SGS SCATTERGOOD GENERATING STATION
HGS HARBOR GENERATING STATION
VGS VALLEY GENERATING STATION

N

NOT TO SCALE

FIGURE 3.2-2
METEOROLOGICAL MONITORING STATIONS IN THE PROJECT AREA
Los Angeles Department of Water and Power

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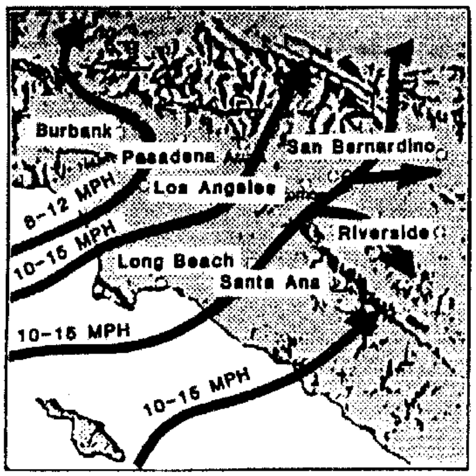
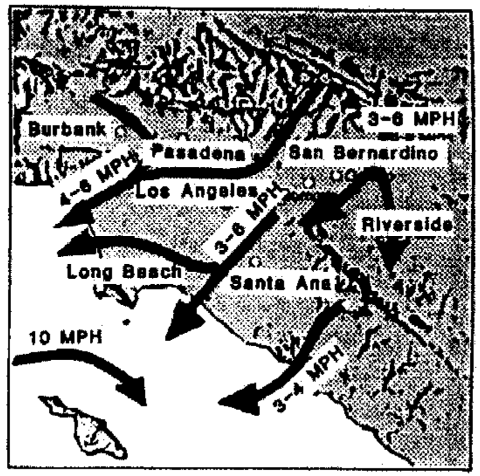
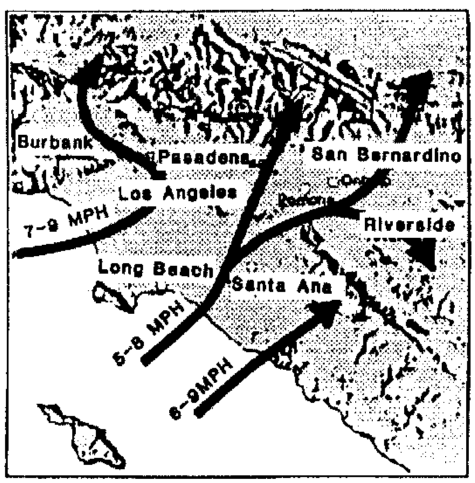
Figure Name: regional.dsf	Checked by:		



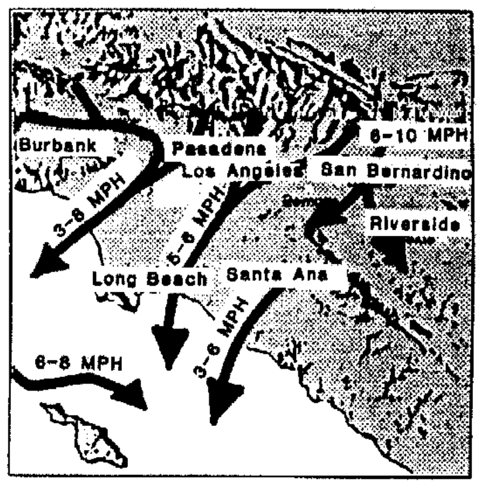
Typical Summer Daytime Ocean Winds
(noon to 7:00 pm)



Typical Summer Night Drainage Winds
(midnight to 5:00 am)



Typical Winter Daytime Ocean Winds
(noon to 7:00 pm)



Typical Winter Night Drainage Winds
(midnight to 5:00 am)

FIGURE 3.2-3

Dominant Wind Patterns in the Basin

Los Angeles Department of Water and Power

Drawn by: M. Scoo	Date: 11/2/2000	Project number 6190-026-200	REV 0
Figure Name: windpattern.dsf	Checked by:		

Reference: AQMD CEQA Air Quality Handbook, November 1993

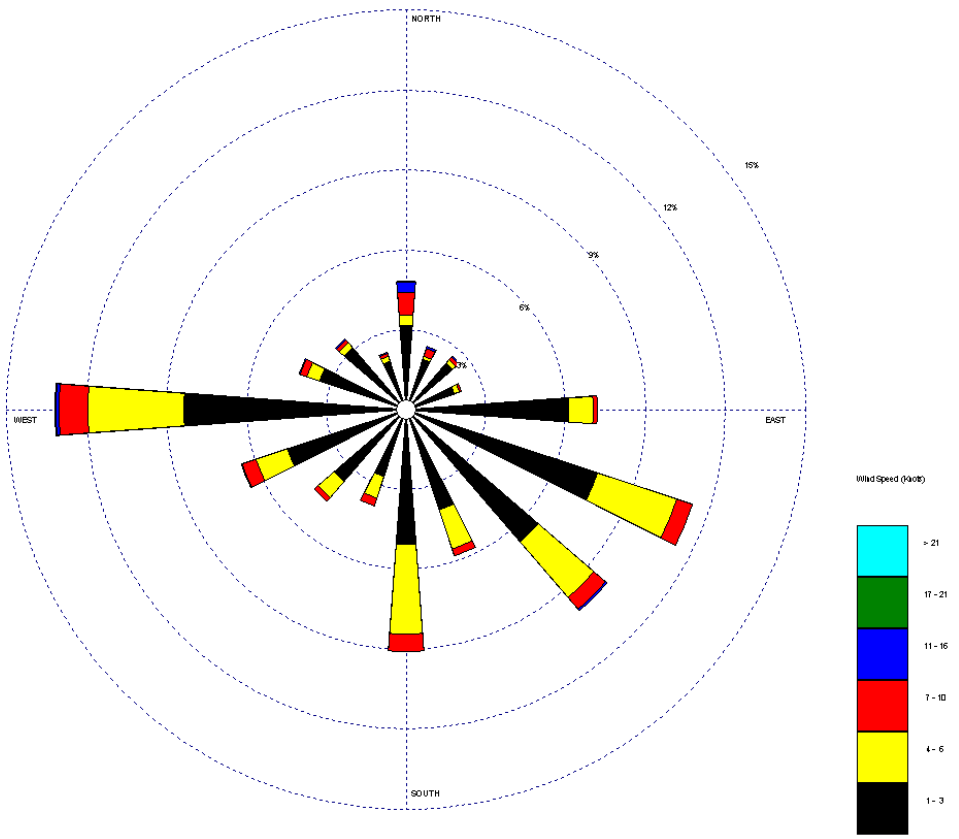


Figure 3.2-4 – Long Beach Station

Long Beach 1981
Note: Wind Direction is the Direction the Wind is Blowing From

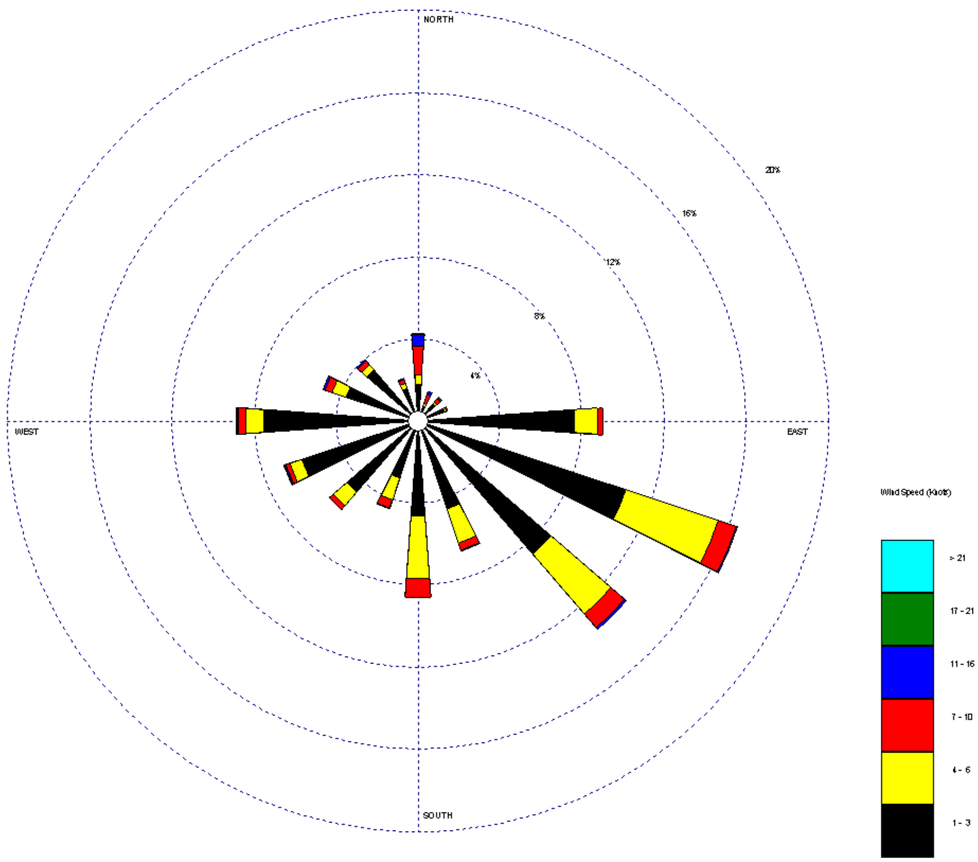


Figure 3.2-5 – Los Angeles Station

Reseda 1991
Note: Wind Direction is the Direction the Wind is Blowing From

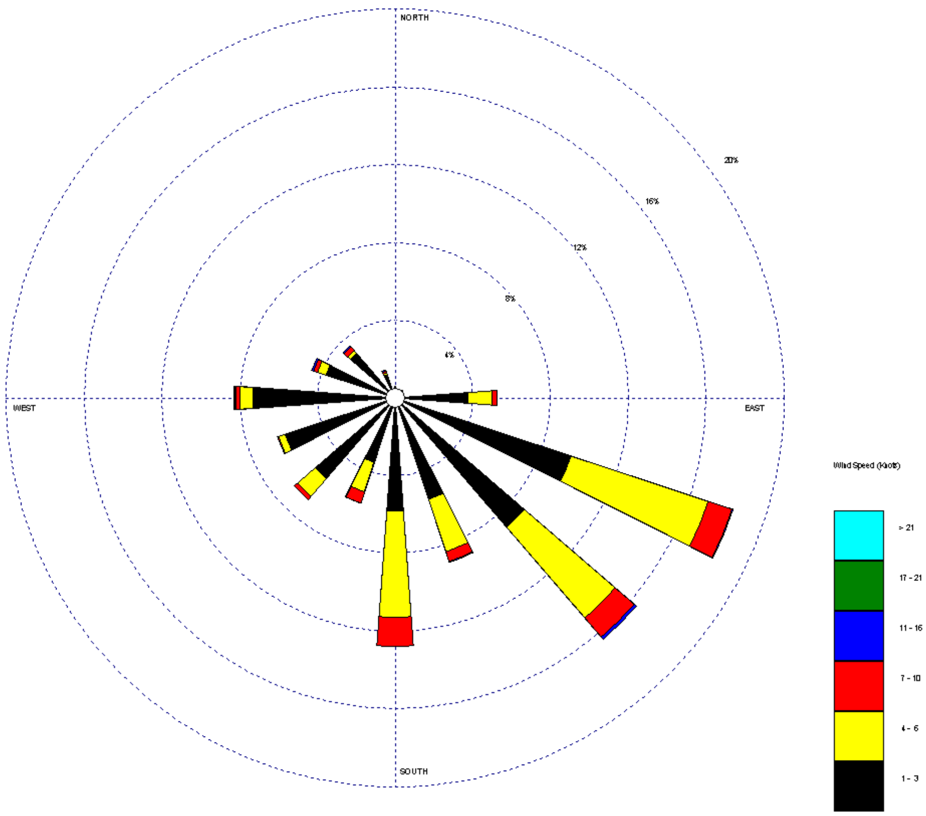


Figure 3.2-6 – Glendale Station

Burbank 1981
Note: Wind Direction is the Direction the Wind is Blowing From

It is the responsibility of the SCAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in the district. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, CO, NO_2, PM_{10}, SO_2, and lead. These standards were established to protect sensitive receptors from adverse health impacts due to exposure to air pollution. The CAAQS are more stringent than the federal standards, and in the case of PM_{10} and SO_2, much more stringent. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride. Hydrogen sulfide and vinyl chloride are currently not monitored in the Basin, however, because these contaminants are not seen as a significant air quality problem. CAAQS and NAAQS for each of these pollutants and their effects on health are summarized in Table 3.2-2. The SCAQMD monitors levels of various criteria pollutants at 33 monitoring stations Figure 3.2-7 identifies the locations of ambient air monitoring stations in the Basin.

Table 3.2-2
Ambient Air Quality Standards

Air Pollutant	**State Standard**	**Federal Primary Standard**	**Most Relevant Effects**
	Concentration/ Averaging Time	**Concentration/ Averaging Time**	
Ozone	0.09 ppm, 1-hr. avg.	0.12 ppm, 1-hr avg., 0.08 ppm, 8-hr avg.	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. 20 ppm, 1-hr avg.	9 ppm, 8-hr avg. 35 ppm, 1-hr avg.	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses

Table 3.2-2 (cont.'d)
Ambient Air Quality Standards

Air Pollutant	State Standard	Federal Primary Standard	Most Relevant Effects
	Concentration/ Averaging Time	Concentration/ Averaging Time	
Nitrogen Dioxide	0.25 ppm, 1-hr avg.	0.053 ppm, annual arithmetic mean	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg. 0.25 ppm, 1-hr. avg.	0.030 ppm, annual arithmetic mean 0.14 ppm, 24-hr avg.	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM_{10})	30 µg/m3, annual geometric mean 50 µg/m3, 24-hr avg.	50 µg/m^3, annual arithmetic mean 150 µg/m3, 24-hr avg.	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Sulfates	25 µg/m^3, 24-hr avg.	None	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m3, 30-day avg.	1.5 µg/m3, calendar quarter	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction

Table 3.2-2 (cont.'d)
Ambient Air Quality Standards

Air Pollutant	State Standard	Federal Primary Standard	Most Relevant Effects
	Concentration/ Averaging Time	Concentration/ Averaging Time	
Visibility-Reducing Particles	In sufficient amount to reduce the visual range to less than 10 miles at relative humidity less than 70%, 8-hour average (10am - 6pm)	None	Visibility impairment on days when relative humidity is less than 70 percent
µg/m3 = microgram per meter cubed ppm = parts per million			

<u>Harbor Generating Station</u>

The HGS is located in the vicinity of the South Coastal Los Angeles County monitoring station. Recent background 1996 through 1999 ambient air quality data for criteria pollutants for this monitoring station are presented in Table 3.2-3. Ambient air quality was compared to the most stringent of either the CAAQS or NAAQS, which was the CAAQS in all cases. These monitoring data indicate the South Coastal area is in compliance with both CAAQS and NAAQS for CO, NO_2, SO_2, sulfate, and lead.

State ozone and PM_{10} air quality standards were exceeded at the South Coastal air monitoring station on several days each year and exceeded the national ozone standard one day. National PM_{10} standards were met in all years. The maximum ozone concentrations observed and the number of days with exceedances have remained relatively the same. PM_{10}, on the other hand, has exhibited a general downward trend from 113 µg/m^3 to 79 µg/m^3. The number of observed exceedances of the state 24-hour standard has varied from six to 13 days per year during this period.

Neither the state nor the national 1-hour and 8-hour CO standards were exceeded during this four-year period. For NO_2, the maximum measured concentrations each year were less than the 0.25 parts per million (ppm) one-hour state standard and the annual national standard. For SO_2 and lead, measured concentrations were well below both the state and federal standards. The maximum sulfate concentrations were below the state 24-hour standard each year.

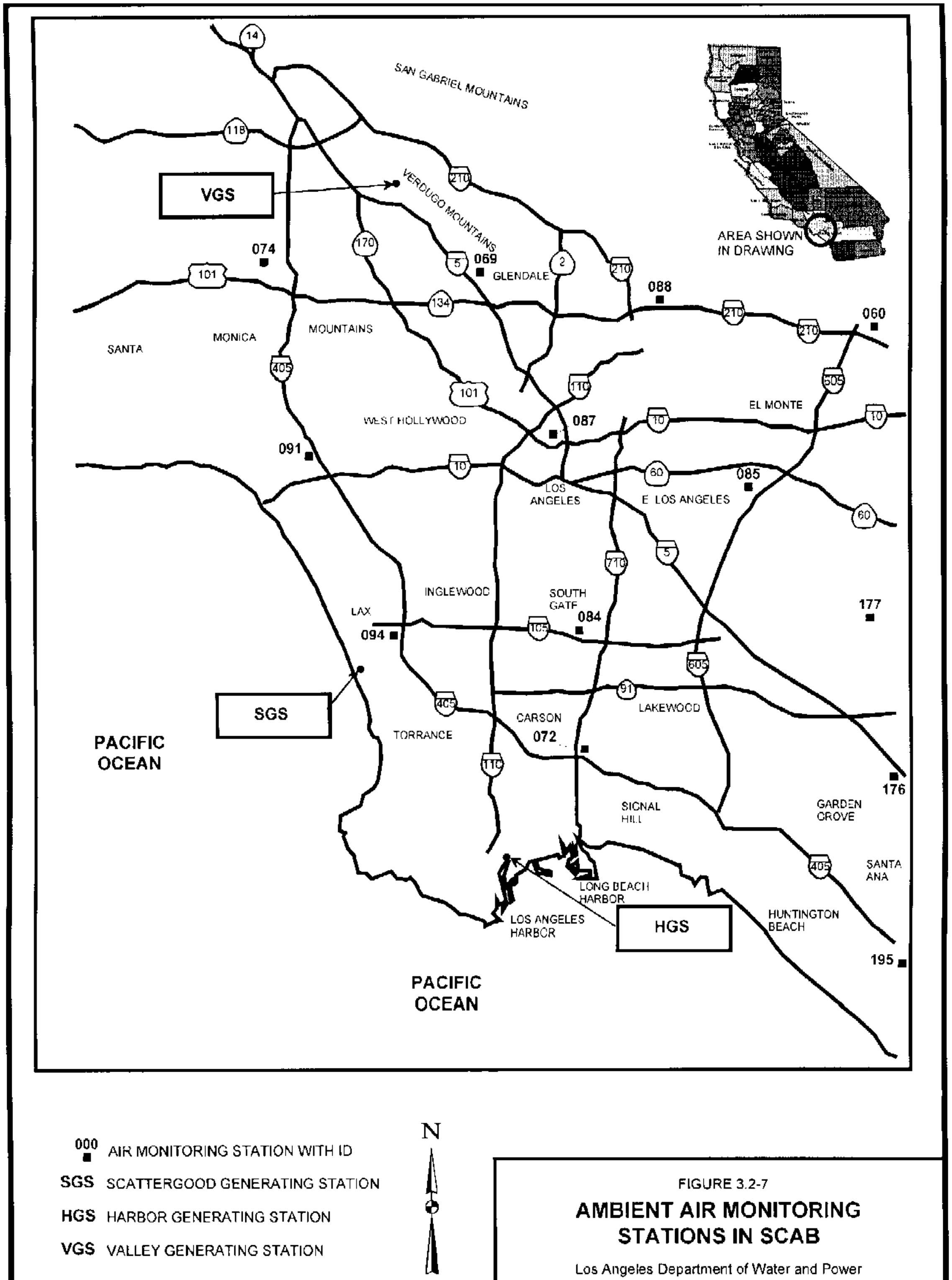


FIGURE 3.2-7

AMBIENT AIR MONITORING STATIONS IN SCAB

Los Angeles Department of Water and Power

Drawn by: M. Scop	Date: 11/1/2000	Project number 6190-026-200	REV 0
Figure Name: regional dsf	Checked by:		

Table 3.2-3
Background Air Quality Data for the South Coastal Los Angeles (ID No. 072) (1996-1999)

Constituent	Maximum Observed Concentration (in ppm, unless otherwise noted) (No. of Standard Exceedances - most restrictive)					
	State Standard	**Federal Standard**	**1996**	**1997**	**1998**	**1999**
Carbon monoxide						
1-hour	20.0 ppm	35.0 ppm	10 (0 days)	9 (0 days)	8 (0 days)	7 (0 days)
8-hour	9.0 ppm	9.5 ppm	6.9 (0 days)	6.7 (0 days)	6.6 (0 days)	5.4 (0 days)
Ozone						
1-hour	0.09 ppm	0.12 ppm	0.11 (5 days)	0.10 (1 day)	0.12 (2 days)	0.13 (3 days)
Nitrogen dioxide						
1-hour	0.25 ppm	---	0.17 (0 days)	0.20 (0 days)	0.16 (0 days)	0.15 (0 days)
Annual	---	0.053 ppm	0.034	0.033	0.034	0.0342
Sulfur dioxide						
1-hour	0.25 ppm	---	0.04 (0 days)	0.04 (0 days)	0.08 (0 days)	0.05 (0 days)
24-hour	0.04 ppm	0.14 ppm	0.013 (0 days)	0.011 (0 days)	0.013 (0 days)	0.011 (0 days)
Annual	---	0.03 ppm	0.003	0.002	0.002	0.0027
PM_{10}						
24-hour	50 μg/m^3	150 μg/m^3	113 μg/m^3 (7 days)	87 μg/m^3 (10 days)	69 μg/m^3 (6 days)	79 μg/m^3 (13 days)
Annual Mean:						
Geometric	30 μg/m^3	---	30.8 μg/m^3	38.2 μg/m^3	29.2 μg/m^3	36.4 μg/m^3
Arithmetic	---	50 μg/m^3	35.3 μg/m^3	40.5 μg/m^3	32.3 μg/m^3	38.9 μg/m^3
Lead						
30-day	1.5 μg/m^3	---	0.08 μg/m^3 (0 mos.)	0.05 μg/m^3 (0 mos.)	0.07 μg/m^3 (0 mos.)	0.06 μg/m^3 (0 mos.)
Calendar Quarter	---	1.5 μg/m^3	0.08 μg/m^3 (0 qtrs.)	0.03 μg/m^3 (0 qtrs.)	0.04 μg/m^3 (0 qtrs.)	0.05 μg/m^3 (0 qtrs.)
Sulfates						
24-hours	25 μg/m^3	---	19.9 μg/m^3 (0 days)	11.4 μg/m^3 (0 days)	14.5 μg/m^3 (0 days)	13.7 μg/m^3 (0 days)

* = Incomplete record of data; may not be representative. PM_{10} and sulfate only monitored every 6 days.
Reference: CARB Air Quality Data Annual Summaries 1995-1998; SCAQMD Air Quality Data Annual Summaries 1996-1999.

Scattergood Generating Station

The SGS is located in the vicinity of the Southwest Coastal Los Angeles County monitoring station. Recent background 1996 through 1999 ambient air quality data for criteria pollutants are presented in Table 3.2-4. Ambient air quality was compared to the most stringent of either the CAAQS or NAAQS, which was the CAAQS in all cases. These monitored data indicate that this area is in compliance with both CAAQS and NAAQS for NO_2, SO_2, sulfate, and lead.

The state ozone air quality standard was exceeded at the South Central Los Angeles County air monitoring station on eight days in 1996, six days in 1997, and one day in 1999. The national ozone standard was exceeded on one day in 1996, three days in 1997, and one day in 1999. The state PM_{10} standard was exceeded between four and seven days per year during this period.

The state 1-hour CO standard was met during this four-year period. However, both the state and federal 8-hour standards were exceeded for CO on at least one day per year in 1996 and 1997. Both state and national standards for CO were met in 1999. For NO_2, the maximum measured concentration each year were less than the 0.25 ppm one-hour state standard and the annual national standard. For SO_2 and lead, measured concentrations were well below both the state and national standards. The maximum sulfate concentrations were below the state 24-hour standard each year.

Table 3.2-4
Background Air Quality Data for the Southwest Coastal Los Angeles County Monitoring Station (ID No. 094)
(1996-1999)

Constituent	Maximum Observed Concentration (in ppm, unless otherwise noted) (No. of Standard Exceedances - most restrictive)					
	State Standard	Federal Standard	1996	1997	1998	1999
Carbon monoxide						
1-hour	20.0 ppm	35.0 ppm	13 (0 days)	12 (0 days)	11 (0 days)	10 (0 days)
8-hour	9.0 ppm	9.5 ppm	11.6 (6 days)	10.3 (1 day)	9.4 (1 day)	8.4 (0 days)
Ozone						
1-hour	0.09 ppm	0.12 ppm	0.13 (8 days)	0.11 (6 days)	0.09 (0 days)	0.15 (1 day)
Nitrogen dioxide						
1-hour	0.25 ppm	---	0.15 (0 days)	0.17 (0 days)	0.15 (0 days)	0.13 (0 days)
Annual	---	0.053 ppm	0.0285	0.028	0.0295	0.0295
Sulfur dioxide						
1-hour	0.25 ppm	---	0.06 (0 days)	0.10 (0 days)	0.03 (0 days)	0.09 (0 days)
24-hour	0.04 ppm	0.14 ppm	0.014 (0 days)	0.015 (0 days)	0.014 (0 days)	0.020 (0 days)
Annual	---	0.03 ppm	0.0025	0.0014	0.0039	0.0040

Table 3.2-4
Background Air Quality Data for the Southwest Coastal Los Angeles County Monitoring Station (ID No. 094)
(1996-1999)

Constituent	Maximum Observed Concentration (in ppm, unless otherwise noted) (No. of Standard Exceedances - most restrictive)					
	State Standard	**Federal Standard**	**1996**	**1997**	**1998**	**1999**
PM10 24-hour	50 μg/m^3	150 μg/m^3	107 μg/m^3 (5 days)	79 μg/m^3 * (4 days)*	66 μg/m^3 (7 days)	69 μg/m^3 (6 days)
Annual Mean: Geometric	30 μg/m^3	---	32.6 μg/m^3	35.5 μg/m^3*	32.7 μg/m^3	35.6 μg/m^3
Arithmetic	---	50 μg/m^3	29.2 μg/m^3	33.8 μg/m^3*	30.3 μg/m^3	33.4 μg/m^3
Lead 30-day	1.5 μg/m^3	---	0.04 μg/m^3 (0 mos.)	0.06 μg/m^3* (0 mos.)*	0.06 μg/m^3 (0 mos.)	0.05 μg/m^3 (0 mos.)
Calendar Quarter	---	1.5 μg/m^3	0.03 μg/m^3 (0 qtrs.)	0.05 μg/m^3* (0 qtrs.)*	0.04 μg/m^3 (0 qtrs.)	0.04 μg/m^3 (0 qtrs.)
Sulfates 24-hours	25 μg/m^3	---	18.4 μg/m^3* (0 days)*	14.4 μg/m^3* (0 days)*	13.5 μg/m^3 (0 days)	18.8 μg/m^3 (0 days)

* = Incomplete record of data; may not be representative. PM_{10} and sulfate only monitored every 6 days.
Reference: CARB Air Quality Data Annual Summaries 1995-1998; SCAQMD Air Quality Data Annual Summaries 1996-1999.

Valley Generating Station

The VGS is located in the vicinity of the East San Fernando Valley monitoring station. Recent background 1996 through 1999 ambient air quality data for criteria pollutants are presented in Table 3.2-5. Ambient air quality was compared to the most stringent of either the CAAQS or NAAQS, which was the CAAQS in all cases. These monitored data indicate that this area is in compliance with both CAAQS and NAAQS for CO, NO_2, and SO_2.

State ozone and PM_{10} air quality standards were exceeded at the East San Fernando Valley air monitoring station on many days each year. The number of days that the state ozone standard was exceeded varied from a low of 13 days in 1999 to a high of 34 days in 1998 over this period. Peak PM_{10} concentration has decreased from 110 µg/m^3 to 82 µg/m^3 at this site. The number of observed exceedances of the state 24-hour PM_{10} standard have varied from a low of nine days in 1998 to a high of 21 days in 1999.

The state 8-hour CO standard was exceeded during this four-year period only once, in 1996. For NO_2, the maximum measured concentrations each year were less than the 0.25-ppm one-hour state standard and the national annual standard. The SO_2 concentrations were below state and national standards during this period. No data was available at this site for lead or sulfates during this period.

Table 3.2-5
Background Air Quality Data for the East San Fernando Valley Station
(ID No. 069) - (1996-1999)

Constituent	Maximum Observed Concentration (in ppm, unless otherwise noted) (No. of Standard Exceedances - most restrictive)					
	State Standard	Federal Standard	1996	1997	1998	1999
Carbon monoxide						
1-hour	20.0 ppm	35.0 ppm	12 (0 days)*	9 (0 days)	8 (0 days)	9 (0 days)
8-hour	9.0 ppm	9.5 ppm	9.3 (1 days)*	7.4 (0 days)	7.5 (0 days)	9.0 (0 days)
Ozone						
1-hour	0.09 ppm	0.12 ppm	0.14 (31 days)	0.13 (15 days)	0.18 (34 days)	0.12 (13 days)
Nitrogen dioxide						
1-hour	0.25 ppm	---	0.20 (0 days)	0.20 (0 days)	0.14 (0 days)	0.18 (0 days)
Annual	---	0.053 ppm	0.0461	0.0424	0.0416	0.0456
Sulfur dioxide						
1-hour	0.25 ppm	---	0.01 (0 days)	0.04 (0 days)*	0.01 (0 days)	0.01 (0 days)
24-hour	0.04 ppm	0.14 ppm	0.009 (0 days)	0.008(0 days)*	0.009 (0 days)	0.003 (0 days)
Annual	---	0.03 ppm	0.0004	0.0003*	0.0002	0.0001
PM_{10}						
24-hour	50 $\mu g/m^3$	150 $\mu g/m^3$	110 $\mu g/m^3$ (15 days)	92 $\mu g/m^3$ * (17 days)*	75 $\mu g/m^3$ (9 days)	82 $\mu g/m^3$ (21 days)
Annual Mean:						
Geometric	30 $\mu g/m^3$	---	37.5 $\mu g/m^3$	41.9 $\mu g/m^3$*	32.8 $\mu g/m^3$	40.6 $\mu g/m^3$
Arithmetic	---	50 $\mu g/m^3$	41.5 $\mu g/m^3$	44.8 $\mu g/m^3$*	36.0 $\mu g/m^3$	43.7 $\mu g/m^3$
Lead						
30-day	1.5 $\mu g/m^3$	---	No Data	No Data	No Data	No Data
Calendar Quarter	---	1.5 $\mu g/m^3$				
Sulfates						
24-hours	25 $\mu g/m^3$	---	No Data	No Data	No Data	No Data

* = Incomplete record of data; may not be representative. PM_{10} and sulfate only monitored every 6 days.
Reference: CARB Air Quality Data Annual Summaries 1995-1998; SCAQMD Air Quality Data Annual Summaries 1996-1999.

3.2.3.2 Toxic Air Contaminants

<u>Cancer Risk</u>

One of the primary health risks of concern due to exposure to toxic air contaminants (TACs) is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no “safe” level of exposure to carcinogens, that is, any exposure to a carcinogen poses some risk of causing cancer. Health statistics show that one in four people will contract cancer over their lifetime, or 250,000 in a million, from all causes, including diet, genetic factors and lifestyle choices. About two percent of cancer deaths in the United States may be attributable to environmental pollution (Doll and Peto, 1981).

<u>Noncancer Health Risks</u>

Unlike carcinogens, for most noncarcinogens it is believed that there is a threshold level of exposure to the compound below which it will not pose a health risk. The California Environmental Protection Agency (CalEPA) and California Office of Environmental Health Hazard Assessment (OEHHA) have developed reference exposure levels (RELs) for noncarcinogenic TACs that are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The noncancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

<u>Multiple Air Toxics Exposure Study II (MATES II) Study</u>

The MATES II study, which is the most comprehensive study of urban toxic air pollution ever undertaken, shows that motor vehicles and other mobile sources of air pollution are the predominant source of cancer-causing air pollutants in the Basin. The SCAQMD’s Governing Board directed staff to undertake the MATES II study as part of the agency’s environmental justice initiatives (e.g., EJ Initiative #7) adopted in late 1997. A panel of scientists from universities, an environmental group, businesses and other government agencies helped design and guide the study. The study was aimed at determining the cancer risk from toxic air pollution throughout the area by monitoring toxics continually for one year at 10 monitoring sites. Another goal was to determine if there were any sites where TAC concentrations emitted by local industrial facilities were causing a disproportionate cancer burden on surrounding communities. To address this second goal, the SCAQMD monitored toxic pollutants at 14 sites for one month each with three mobile monitors. Monitoring platforms were placed in or near residential areas adjacent to clusters of facilities. Although no TAC hotspots were identified, models show that elevated levels can occur very close to facilities emitting TACs.

In the MATES II study, SCAQMD monitored more than 30 toxic air pollutants at 24 sites over a one-year period in 1999. The SCAQMD collected more than 4,500 air samples and together with the California Air Resources Board performed more than 45,000 separate laboratory analyses of these samples. A similar study known as MATES I was conducted in 1986 and 1987. In each study, SCAQMD calculated cancer risk assuming 70 years of continuous exposure to monitored levels of pollutants.

The MATES II study found that the average carcinogenic risk throughout the Basin is about 1,400 in one million (1,400 x 10^{-6}). Mobile sources (e.g., cars, trucks, trains, ships, aircraft, etc.) represent the greatest contributors. As shown in Figure 3.2-8, about 70 percent of all risk is attributed to diesel particulate emissions; about 20 percent to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde); about 10 percent of all risk is attributed to stationary sources (which include industries and other certain businesses such as dry cleaners and chrome plating operations.)

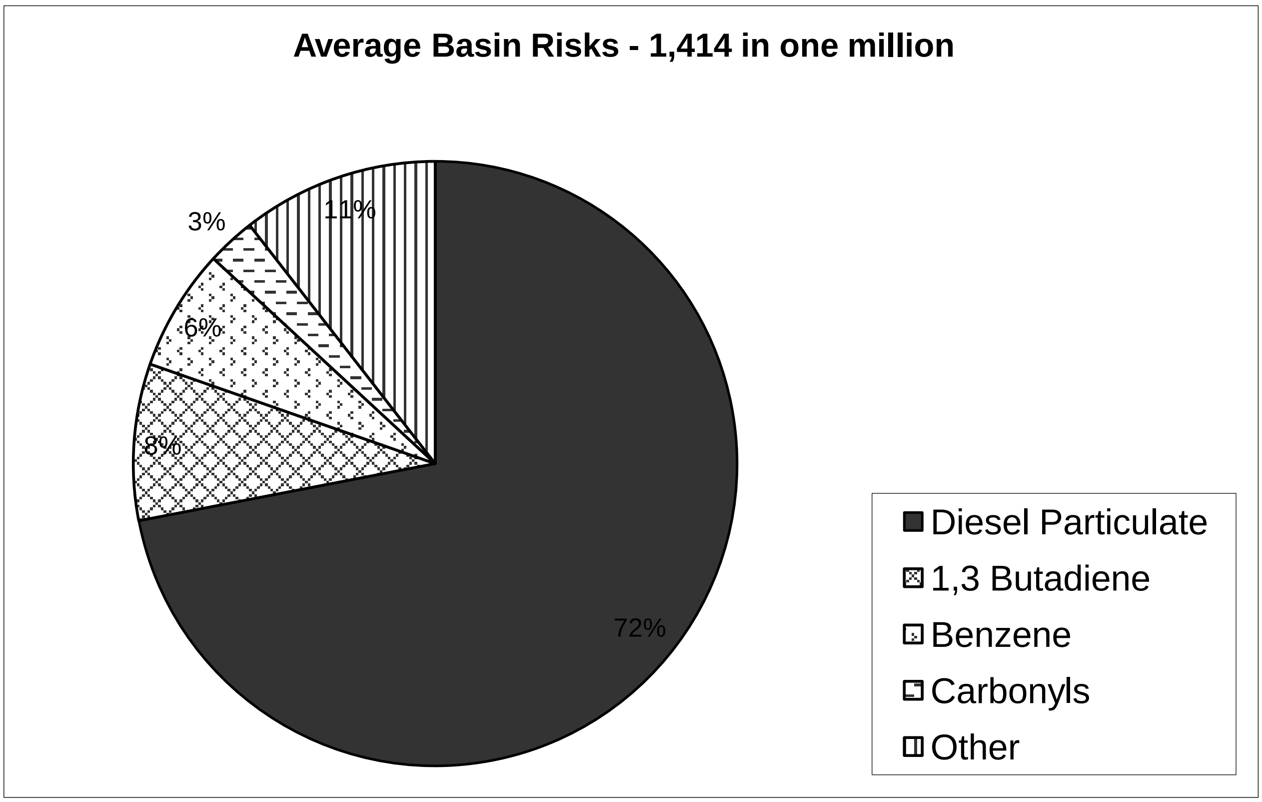


Figure 3.2.8 - Major Pollutants Contributing To Cancer Risk In The South Coast Air Basin

3.2.4 Regional Emissions Inventory

SCAQMD has compiled emissions inventories for both criteria pollutants and TACs. The inventories are presented in the following subsections.

3.2.4.1 Criteria Pollutants Inventory

SCAQMD's current emissions inventory for the Basin is summarized in Table 3.2-6. The emissions inventory for the anthropogenic inventory is made up of stationary sources (both point and area sources are in this category) and mobile sources encompassing on-road and off-road mobile sources. On-road mobile sources include light-duty passenger vehicles; light-, medium-, and heavy-duty trucks; motorcycles, and urban buses. Off-road mobile sources include off-road vehicles, trains, ships, aircraft, and mobile equipment. The SCAQMD emissions inventory only includes emissions in the district of the criteria air pollutants NO_x, CO, SO_x, PM_{10}, and VOC (a precursor of criteria air pollutants). Since ozone is formed by photochemical reactions involving the precursors VOC and NO_x, it is not inventoried.

Table 3.2-6
Anthropogenic Sources of Criteria Pollutant Emissions for Baseline Year 1993
(ton/day, annual average)

Source Category	NO_x	SO_x	CO	VOC	PM_{10}
Stationary and area sources	155.49	23.12	98.90	461.73	387.32
Mobile sources (on- and off-road)	1,134.32	75.42	8,562.40	857.27	45.36
Total	1,289.81	98.54	8,661.30	1,319.00	432.68
Source: Appendix III, 1997 AQMP					

As shown in Table 3.2-6, mobile sources are the major contributors to emissions in the Basin, i.e., CO (99 percent), NO_x (88 percent), SO_x (77 percent), and VOC (65 percent). A significant percentage of fine PM_{10} in the atmosphere is attributable to entrained road dust (10 percent).

3.2.4.2 Toxic Pollutants Inventory

The data available for toxic emissions inventories are not nearly as complete as the data for criteria pollutants. Starting in 1989, industrial facilities have been required to compile toxic emissions inventories under the AB 2588 program. Companies subject to the program are required to report their toxic emissions to the SCAQMD.

The SCAQMD's first toxic air pollutant emissions inventory was compiled for 30 TACs for the year 1982 for stationary sources only. This inventory was updated during the preparation of the 1987 MATES study. This is the most up-to-date inventory prepared by the SCAQMD (Sycip, 1997). The MATES study consists of an evaluation and a characterization of ambient air toxics data in the district. The MATES study also estimates the cancer risk of several TACs. For the MATES study, 20 of the original 30 pollutants were updated for the year 1984. Additionally, mobile source emissions for 12 of the 20 toxic pollutants were compiled. The stationary source data included 1,244 point sources and the mobile source inventory included only on-road motor vehicles. A summary of the 1984 toxics emissions inventory is presented in Table 3.2-7, which provides the estimated toxic emissions for selected compounds, by source category.

Table 3.2-7
1998 Annual Average Day Toxic Emissions for the South Coast Air Basin (lbs/day)

Pollutant	On-Road	Off-Road	Point	AB2588	Area	Total
Acetaldehyde[a]	5485.8	5770.3	33.9	57.1	189.1	11536.2
Acetone	4945.8	4824.7	3543.5	531.4	23447.4	37292.8
Benzene	21945.5	6533.4	217.7	266.8	2495.4	31458.8
Butadiene [1,3]	4033.8	1566.1	6.7	2.0	151.3	5759.9
Carbon tetrachloride	0.0	0.0	8.8	1.8	0.0	10.6
Chloroform	0.0	0.0	0.0	35.5	0.0	35.5
Dichloroethane [1,1]	0.0	0.0	0.0	0.1	0.0	0.1
Dioxane [1,4]	0.0	0.0	0.0	105.0	0.0	105.0
Ethylene dibromide	0.0	0.0	0.0	0.2	0.0	0.2
Ethylene dichloride	0.0	0.0	4.9	17.6	0.0	22.5
Ethylene oxide	0.0	0.0	58.1	12.3	454.1	524.4
Formaldehyde[a]	16664.9	16499.3	521.6	674.7	1107.5	35468.0
Methyl Ethyl Ketone[a]	905.1	906.9	3240.2	385.9	14535.4	19973.5
Methylene chloride	0.0	0.0	1378.6	1673.6	9421.7	12473.9
MTBE	58428.9	2679.2	40.5	434.4	5473.7	67056.7
p-Dichlorobenzene	0.0	0.0	0.0	4.5	3735.6	3740.1
Perchloroethylene	0.0	0.0	4622.0	2249.1	22813.1	29684.2
Propylene oxide	0.0	0.0	0.0	22.3	0.0	22.3
Styrene	1114.8	287.1	447.0	3836.7	21.4	5707.0
Toluene	63187.6	11085.9	5689.6	3682.4	52246.7	135892.2
Trichloroethylene	0.0	0.0	1.1	58.0	2550.3	2609.3
Vinyl chloride	0.0	0.0	0.0	4.3	0.0	4.3
Arsenic	0.1	0.3	2.7	0.7	21.4	25.2
Cadmium	1.6	1.5	0.5	0.7	27.5	31.8
Chromium	2.4	2.3	3.9	2.2	302.2	313.0

Table 3.2-7
1998 Annual Average Day Toxic Emissions for the South Coast Air Basin (lbs/day)

Pollutant	On-Road	Off-Road	Point	AB2588	Area	Total
Diesel particulate	23906.3	22386.3	0.0	5.4	815.3	47113.4
Elemental carbon[b]	27572.1	6690.3	702.8	0.0	16770.5	51735.7
Hexavalent chromium	0.4	0.4	0.3	1.0	0.1	2.2
Lead	0.7	0.9	1.9	24.5	1016.3	1044.3
Nickel	2.5	2.2	2.9	21.6	85.6	114.9
Organic carbon	16426.2	15381.8	0.0	0.0	108612.1	140420.2
Selenium	0.1	0.1	3.0	5.7	2.6	11.6
Silicon	68.6	67.6	167.2	0.0	248614.0	248917.4

Source: Final MATES II Study, SCAQMD (March 2000).
[a] Primarily emitted.
[b] Including elemental carbon from all sources; including diesel particulate.

3.2.5 Regulatory Setting

The SCAQMD has regulatory jurisdiction over the air quality issues related to the proposed project. The project must comply with all relevant SCAQMD Rules and Regulations in order to be issued permits to construct and operate. In addition, the project must comply with the relevant federal air quality requirements. Table 2.4-1 in Chapter 2 summarizes the SCAQMD and federal air quality Rules and Regulations relevant to the proposed project.

3.3 Biological Resources

Scattergood Generating Station

The SGS is located near the coast in what was formerly a historically coastal dune area. However, over time, this area has been highly disturbed by development and human activity. Few areas within the site are undeveloped and support vegetation. Of the small existing vegetated areas, much of it is covered by a variety of plant known as iceplant. Adjacent areas were surveyed for vegetation, which included common dune species such as beach rocket and Prim rose.

The California Natural Diversity Database (CNDDB June 15, 2000) listed two plants that had been sighted near the SGS site or occurred generally within the region. These include the beach spectaclepod (*Dithyrea maritima*), which is a State Threatened and Federal Species of Concern and the Coastal dunes milk-vetch (*Astragalus tener* var *titi*), which is state and federally endangered.

The CNDDB reported that the beach spectaclepod was found on established sand dunes in El Segundo in 1932, but it has probably now been extirpated. The habitat in the areas adjacent to the site seems likely to have been suitable at one time for its presence although because of development and associated disturbance its presence now is much less likely. No individuals of the plant were observed during a brief visit to the area on October 28, 2000.

The dune habitat of the site is probably not suitable for the coastal dunes milk vetch since it requires moist pockets of alkaline soils, which were not observed during the site visit. The CNDDB indicated that this population is believed to be extirpated.

The CNDDB also listed a variety of insects that have been observed in the vicinity of the SGS. A population of the Federally Endangered El Segundo blue butterfly (*Euphilotes battoides allyni*) is resident on the Chevron Refinery property located adjacent to the south of the site. However, it is unlikely that the El Segundo blue butterfly occurs at the SGS site, as no dune buckwheat (*Eriogonum parvifolium*), its required food source, was observed in the area.

The Lange's El Segundo dune weevil (*Onychobaris langei*), a Federal Species of Concern, could also occur at the SGS site. However, this determination is based primarily on the fact that its food source, the evening primrose, is present in El Segundo dunes area. In any event, this beetle is currently threatened by the invasion of exotics such as iceplant. Iceplant was notably present on the property and the area of possible habitat was quite small for a significant colony of the dune weevil to be present. Another Federal Species of Concern, Dorothy's El Segundo dune weevil (*Trigonoscuta dorothea dorothea*) is also found on coastal sand dunes. This beetle is commonly found beneath native plants. As the project area is covered by asphalt and iceplant, the beetle is not expected to be present.

Belkin's dune tabanid fly (*Brennania belkini*) inhabits coastal dunes and could possibly be present on the SGS site. The presence of Henne's eucosman moth (*Eucosma hennei*), a Federal Species of Concern, is less likely, since the larval food plant is *Phacelia ramosissima* var. *austrolitoralis*. Phacelia was not observed in the area surrounding the project site.

<u>Harbor and Valley Generating Stations</u>

According to the CNDDB, no special status plants, animals, or natural habitats are found on or in close proximity to the HGS or VGS sites.

3.4 Cultural Resources

The project sites lie within the historic territory of the Native American group known as the Gabrielino or Tongva, one of the wealthiest, most populous, and most powerful ethnic nationalities in aboriginal southern California (Conejo Archaeological Consultants, 2000, Bean and Smith 1978). Their historic territory included the Los Angeles Basin (which includes the watersheds of Los Angeles, San Gabriel, and Santa Ana Rivers), the coast from Aliso Creek in the south to Topanga Creek in the north, and the four southern Channel Islands. Prior to the arrival of the Tongva/Gabrielino’s Shoshonean speaking ancestors into southern California, the archaeological records indicate that sedentary populations occupied the coastal regions of California more than 9,000 years ago (Conejo Archaeological Consultants, 2000, Erlandson and Colten, 1991).

The HGS was originally constructed in the 1930s, the SGS Units #1 and #2 were constructed in 1958 and 1959, respectively, with SGS Unit #3 being constructed in 1974, and the VGS and associated redwood cooling towers were constructed in 1954 (Conejo Archaeological Consultants, 2000). All three generating stations (e.g., project sites) have been subject to previous ground disturbance associated with the construction and operation of the existing equipment.

3.5 Energy Resources

Based on the evaluation of project-related impacts to energy sources conducted as part of the NOP/IS, it was determined that the only potentially significant impact to energy sources would be associated with the use of gasoline and diesel fuel during the proposed project construction-related activities. Therefore, the project's operational use of natural gas and electricity are not discussed in this document. Refer to the NOP/IS (September 29, 2000), attached to the ~~Draft~~Final EIR as Appendix A, for information concerning the operational-related natural gas and electricity usage associated with the proposed project.

California is the third largest consumer of gasoline in the world. In 1997, Californians used more than 14 billion gallons of gasoline a year and another two billion gallons of diesel fuel. California is a major producer of gasoline products. A total of 15 refineries currently operate in the state and produce the vast majority of gasoline used in California. They are located in three regions: the eastern San Francisco Bay Area, the Bakersfield area and southern Los Angeles County. In general, the Bay Area refineries supply gasoline for northern California, while the Bakersfield and Los Angeles County refineries supply southern California. The oil industry typically has moved gasoline between the two halves of the state, as well as exported gasoline from California to other states and the world market. Much of the fuel produced at California refineries is transported via pipeline to bulk terminals in outlying areas. The fuel is then transferred to tank trucks, which bring the gasoline to service stations (California Energy Commission [CEC], 1999).

According to the CEC, forecasts for California show on-road gasoline demand increasing from 13.1 billion gallons in 1997 to 14.4 billion gallons by 2015. Diesel use is forecast to increase from 2.5 billion gallons in 1997 to 3.3 billion gallons by 2015. On a per capita basis, annual gasoline demand is projected to decline from 408 gallons in 1997 to 370 gallons in 2015 (CEC, 1999a). Table 3-5.1 provides the CEC's gasoline and diesel demand forecasts for the Los Angeles region.

Table 3.5-1
Projected Gasoline And Diesel Fuel Demand For Transportation
In The Los Angeles Region[a]
(Million Gallons Per Year)[b]

		Year		
Fuel Type	**2000**	**2003**	**2007**	**2015**

Table 3.5-1
Projected Gasoline And Diesel Fuel Demand For Transportation
In The Los Angeles Region[a]
(Million Gallons Per Year)[b]

	Year			
Fuel Type	**2000**	**2003**	**2007**	**2015**
Gasoline[c]	6,469	6,529	6,638	6,839
Diesel[d]	1,086	1,141	1,242	1,379

Source: *On-Road & Rail Transportation Energy Demand Forecasts for California* (CEC, April 1999)

[a] The Los Angeles Region includes the Counties of Imperial, Los Angels, Orange, Riverside, San Bernardino, and Ventura.

[b] Estimates taken from Case B forecasts, which include transit and light-duty vehicle demand; assumes the ZEV requirements are met and that natural gas autos gain significantly increased acceptance in California.

[c] Gasoline demand projections include freight, transit, and light-duty vehicle use.

[d] Diesel projections include freight and transit use, and roughly 10 percent of demand is for rail diesel.

3.6 Geology and Soils

The installation of new combustion turbine generators and ancillary equipment including aqueous ammonia tanks at the Harbor, Valley and Scattergood Generating Stations will require only moderate amounts of excavation or grading as part of the new construction. The following discussion addresses the significant geological hazards associated with the sites and the proposed projects.

3.6.1 Geologic Setting

3.6.1.1 Harbor and Scattergood Generating Stations

Both the HGS and SGS are located on the coastal plain of the Los Angeles Basin. The Los Angels Basin is a northwest trending lowland plain that is roughly 50 miles long by approximately 20 miles wide. Structurally, the Los Angeles Basin has been divided into four major subdivisions; the southwestern block, the northwestern block, the central block, and the northeastern block. The HGS and SGS are located on the southwestern block. The surface of this block is a low plain floored with sediments that extends south from the Santa Monica Mountains and includes the offshore submerged San Pedro Shelf. The line of hills and mesas that lie along the Newport Inglewood fault zone defines the inland margin of this block. The lowland surface of the Los Angeles basin slopes gently southward and westward to the Pacific Ocean. Both the SGS and HGS are located on the coast.

The HGS is located on the perimeter of the Los Angeles Harbor. The HGS is underlain by recent alluvial Holocene and upper and middle Pleistocene silts and clays underlain in turn by the lower Pleistocene San Pedro formation. Shallow soils consist of fill material.

Typical of coastal environments, SGS is underlain by Holocene deposits, locally called the El Segundo sandhills. The underlying soils comprise poorly graded beach sands and silty sands. The new aqueous ammonia tanks are proposed to be located in the upper area of the SGS, an area where the groundwater is at least 70 feet below the ground surface. On the lower level of SGS, the groundwater is reported to be over 20 feet deep and within 22 inches of the ground surface. The shallow groundwater beneath the site is of poor quality and is not regarded as a potential potable water source.

3.6.1.2 Valley Generating Station

The VGS is located in the northeast portion of the San Fernando Valley adjacent to the Verdugo Mountains. The San Fernando Valley is located within the Transverse Ranges geological province. The valley is a broad, east west trending; alluvial filled syncline that is drained by the Los Angeles River and its tributaries. Thickness of the underlying alluvium ranges to over 650 feet in the east central portion of the valley (Yerkes and Wentworth, 1971).

The VGS is located overlying undifferentiated Holocene alluvial deposits of gravels, sand, and clay. (Dibblee, 1991) Groundwater in the San Fernando Valley generally flows along a gradient that subparallels the ground surface topography which slopes towards the Los Angeles River. Groundwater beneath the VGS is approximately 180 feet below the ground surface.

3.6.2 Structural Setting

3.6.2.1 Harbor and Scattergood Generating Stations

The SGS and HGS are located in areas of well-known historic seismic activity, and are subject to the effects of moderate to large seismic events. Historic seismic records (California Department of Conservation – Division of Mines and Geology ([CDMG, 2000]) indicate that between 1932 and 2000, approximately 38 earthquakes of Richter magnitude 5.0 or greater have occurred within 50 miles of the sites. Approximately thirty-five active faults are also known to exist with a fifty-mile radius of HGS and SGS (Jensen, 1994). Of primary concern to the SGS and HGS are two active faults located within seven miles: the Palos Verdes Fault to the south of both sites, and the Newport-Inglewood Fault to the north and east of the sites. Another structure that is also of concern is the postulated Compton-Los Alamitos Blind Thrust Fault. This fault, if it exists, would be 0.6 mile north of the HGS and approximately four miles south of SGS.

The Newport-Inglewood Fault Zone dominates the geologic structure of the area encompassing the SGS and HGS, and represents the most significant potential sources of strong ground shaking for these sites. The northwest-tending Newport-Inglewood Fault Zone is over 40 miles long and is marked at the surface by low eroded scarps along en echelon faults and by a northwest-trending chain of elongated low hills and mesas that extend from Newport Bay to Beverly Hills (CDMG, 1998). The orientation of the structural elements of the zone is generally attributed to right-lateral, strike-slip faulting at depth.

3.6.2.2 Valley Generating Station

The VGS is located in an area of well-known seismic activity. Historic seismic records (CDMG, 2000) indicate that between 1932 and 2000, approximately thirty-seven earthquakes of Richter magnitude 5.0 or greater have occurred within 50 miles of the site. Approximately 35 active faults are also known to exist with a 50-mile radius of VGS (Jensen, 1994). Of primary concern to the VGS are five faults located within 10 miles of VGS; the Verdugo Fault, the Oak Ridge Fault, the Sierra Madre-San Fernando Fault, the Northridge Hills Fault, and the postulated Santa Monica Blind Thrust Fault. As a result of their proximity, these geologic structures are considered to be the most likely sources for significant seismic effects at VGS.

3.6.3 Seismicity

Southern California is a seismically active area for which there are good-to-excellent historic records available for the last 150 to 200 years. Instrumental seismic records are available for the past 50 years. Earthquake magnitudes are expressed using the Richter scale, a log scale generally ranging from 0 to slightly less than 9.0.

There is a strong correlation between the distribution of seismic events and the location of major faults. This correlation is particularly true for events greater than magnitude 6.0. The proximity of major faults to the project location areas increases the probability that an earthquake of magnitude six or greater may affect the project site. A magnitude seven or higher earthquake would be capable of adversely affecting most existing structures in the project vicinity.

<u>Harbor Generating and Scattergood Stations</u>

For the area encompassing the HGS and SGS, the greatest concentration of seismic events has resulted from activity on the Newport-Inglewood fault zone and is primarily related to the 1933 Long Beach earthquake and its aftershocks.

The occurrence of numerous earthquakes along the Newport-Inglewood fault zone in historic time graphically demonstrates the Holocene ($\leq$ 11,000 years old) activity of the structure. Most notable of these is the magnitude 6.3 Long Beach earthquake which occurred in 1933. Within the past 30 years, an annual average of between two and three local earthquakes in the magnitude range of 3.0 to 4.5 have been recorded at various locations along the zone. The fault is capable of generating a 6.9 maximum moment magnitude earthquake. Slip rate on the fault is estimated to be 1.00 mm/year.

Another potentially significant fault in the immediate area of HGS and SGS is the Palos Verdes fault zone. The Palos Verdes Fault is a right-lateral oblique-slip fault extending approximately 72 miles from Santa Monica Bay south to Lausen Knoll in the southern San Pedro Channel. This fault is capable of a 7.1 maximum moment magnitude earthquake. The slip rate is estimated to be 3.0 mm/year.

Valley Generating Station

For the VGS, the greatest concentration of local seismic events has resulted from activity on the Oak Ridge Fault (primarily related to the 1994 Northridge earthquake) and activity on the Sierra Madre-San Fernando Fault (related to the 1971 San Fernando earthquake).

3.6.3.1 Important Historic Earthquakes/Earthquake Probability

By 1998 the CDMG had completed a seismic hazard evaluation study of the areas encompassing the project sites (CDMG, 1998). The CDMG evaluation forms the basis for the following discussion on seismic hazards. Available historic local and regional seismic records were compiled, and used to develop defensible and site specific seismic hazard analyses. The hazard analysis, in particular, was designed to predict earthquake-induced ground motions capable of causing ground failure (liquefaction, landslides) for the area including the project sites.

In the CDMG hazard evaluation, the ground shaking levels for the project sites were estimated for each of the sources (local or regional faults capable of generating an earthquake) included in the seismic source model using attenuation relations that relate earthquake shaking with magnitude, distance from the earthquake, and type of fault rupture (strike-slip, reverse, normal, or subduction).

In the hazards evaluation the CDMG included the hazards associated with ground motion exceeding peak horizontal ground acceleration at 10 percent probability of exceedance in 50 years (CDMG, 1998). Table 3.6-1 summarizes the CDMG calculated estimates for probable ground motion and the maximum magnitude of a causative earthquake at the project sites.

Table3.6-1
Ground Motion and Maximum Magnitude Estimates for the Project Sites

Site	Ground Motion (ground acceleration) (10% probability of exceedance in 50 years)	Maximum Earthquake Magnitude (distance in kilometers)	Source
Harbor Generating Station	0.52 g (in alluvium)	7.1 (2 km)	CDMG 1998, Seismic Hazard Evaluation, Long Beach Quadrangle, Los Angeles County, CA
Scattergood Generating Station	0.45 g (in alluvium)	7.1 (7 km)	CDMG 1998, Seismic Hazard Evaluation, Venice Quadrangle,

Table3.6-1
Ground Motion and Maximum Magnitude Estimates for the Project Sites

Site	Ground Motion (ground acceleration) (10% probability of exceedance in 50 years)	Maximum Earthquake Magnitude (distance in kilometers)	Source
			Los Angeles County, CA
Valley Generating Station	0.6 g (in alluvium)	6.9 (2 km)	CDMG 1998, Seismic Hazard Evaluation, San Fernando Quadrangle, Los Angeles County, CA

3.6.3.2 Ground Rupture - Earthquake Zoning

The Alquist-Priolo Special Studies Zones Act specifies that an area, termed an "Earthquake Fault Zone" is to be delineated surrounding faults that are deemed "sufficiently active" or "well defined" after a review of seismic records and geological studies. This legislation was passed to prohibit the location of most structures for human occupancy across the traces of active faults and to mitigate thereby the hazard of earthquake-induced ground rupture. Cities and counties affected by zones must regulate certain existing and development projects within the zones by permitting and building code enforcement (CDMG, 2000).

<u>Harbor and Scattergood Generating Stations</u>

Both the HGS and SGS are located near the Newport-Inglewood Fault, the trace of which has been designated as a special studies zone. However, neither site overlies the designated fault trace as designated by mapping and site investigations conducted as part of the Alquist-Priolo Act.

<u>Valley Generating Station</u>

Although located in an acknowledged seismically active area, the VGS is not located on a fault trace as designated by mapping and site investigations conducted as part of the Alquist-Priolo Act.

3.6.3.3 Subsidence

Of the three generating stations sites only the HGS site has been affected by significant historic ground subsidence. Subsidence is the vertical displacement of the ground surface. Human-induced subsidence of land in the southwest portion of the Los Angeles Basin was first observed in the Wilmington oil field south of the project area in 1937. The removal of oil and gas in this and neighboring oil fields allowed the rock and mineral grains in the oil reservoirs to pack together more closely, reducing bed thickness and causing subsidence of the ground surface.

Human-induced withdrawal of oil from the 1920s to the 1950s in the Long Beach area caused subsidence up to 70 feet, and historically, the area near the HGS had a subsidence of approximately two feet (Association of Engineering Geologists, 1969). In the late 1950s, mitigation measures including water-flooding repressurization reduced subsidence to insignificant levels, and has served to re-establish ground surface stability.

3.6.4 Soils (Surficial Geology)

The HGS is located on the perimeter of the Los Angeles Harbor. The HGS is underlain by recent alluvial Holocene and upper and middle Pleistocene silts, and clays underlain in turn by the lower Pleistocene San Pedro formation. The near-surface soils consist of fill material.

Typical of coastal environments, SGS is underlain by Holocene deposits, locally called the El Segundo sandhills. The underlying soils comprise poorly graded beach sands and silty sands. On the upper area of the SGS site, the proposed area where the new aqueous ammonia tanks will be installed, the groundwater is at least 70 feet below the ground surface. On the lower level of SGS, the groundwater is reported to be at least 20 feet below ground surface.

The VGS is located on undifferentiated Holocene alluvial deposits of gravels, sand, and clay.

3.6.4.1 Expansive Soils

Expansive soils have the ability to shrink and swell with wetting and drying. The shrink-swell capacity of expansive soils can result in differential movement beneath foundations. Investigation of the HGS, SGS, and VGS sites indicates that the majority of the near surface soils are granular in nature. Accordingly, the expansion potential of site soils is anticipated to be low.

3.6.4.2 Soil Liquefaction

Soil liquefaction is a phenomenon in which saturated, cohesionless soils (sand) temporarily lose their strength and liquefy when subjected to dynamic forces such as intense and prolonged ground shaking. Liquefaction typically occurs when the water table is less than 40 feet below ground surface and the soils are predominantly granular and unconsolidated. The potential for liquefaction increases as the groundwater approaches the surface. Recent analysis of seismic hazards in California by the CDMG indicates that of the three sites, only the HGS site is an area where historic occurrence of liquefaction indicates a potential for permanent ground displacements (CDMG, 1999). Also, since granular material and a relatively shallow groundwater underlie the lower area of the SGS site (30 feet or less) the possibility of ground displacements due to soil liquefaction cannot be ruled out completely.

3.6.4.3 Landslides

Landslides involve the downslope movement of masses of soil and rock material under gravity. Landslides can be caused by ground shaking, such as earthquakes, or heavy precipitation events. Generally, landslides occur on the sideslopes of mountains comprised of sedimentary materials.

Sedimentary rocks are particularly susceptible to landslides because they often contain relatively less competent beds of clays and other fine-grained rocks interbedded with more competent beds of sand and gravel.

Recent analysis of seismic hazards in California by the CDMG indicates that of the three generating stations, only the man-made slopes on the SGS are considered to be in an earthquake-induced landslide zone (CDMG, 1999). Other than this area at the SGS site, the remaining area of the SGS site and the other two project sites have no known slope stability problems.

3.6.4.4 Soil Contamination

Limited excavations are planned related to construction activities at the three project sites. If contaminated soils are encountered during construction activities, the soils will be assessed and handled in accordance with all appropriate federal, state and local regulations. For further information on this subject, please refer to Section 3.8.

3.7 Hazards and Hazardous Materials

In general, hazard impacts are not a discipline with specific environmental characteristics that can be easily described or quantified. Instead, hazardous incidents consist of random, unexpected accidental occurrences that may create adverse effects on human health or the environment.

This section describes features of the existing environment as they relate to the risk of a major accident occurring in connection with the proposed project. In particular, operational-related activities, at the HGS, SGS, and VGS project sites. Factors which are taken into consideration to determine the magnitude of a risk of an upset event associated with the proposed project are:

- the probability of an event occurring;
- the types of materials potentially involved in an upset event; and
- the location of sensitive receptors, e.g., residences, schools, and businesses.

Based on a review of the existing LADWP operations and processes, the greatest potential for an upset condition to occur that would affect the public would result from the release of aqueous ammonia that will be used in the SCR systems installed at the HGS, SGS, and VGS sites to reduce NO_x emissions from electrical generating equipment. Aqueous ammonia is currently stored in large quantities at HGS with the volume to increase as a result of the proposed project. Furthermore, aqueous ammonia will be stored in large quantities at SGS and VGS as a result of the proposed project. Currently, LADWP adheres and will continue to adhere to the following safety design and process standards in the operation of the equipment at the three project sites:

- The California Health and Safety Code Fire Protection specifications.
- The design standards established by American Society of Mechanical Engineers, the American Institute of Chemical Engineers, the American National Standards Institute, and the American Society of Testing and Materials.
- The applicable California Occupational Safety and Health Act (Cal-OSHA) requirements.

For HGS, where ammonia is currently used, LADWP utilizes the emergency response capabilities of the City of Los Angeles Fire Department for responding to the release of aqueous ammonia. Additionally, onsite personnel are trained in emergency response procedures and know what actions to initiate in case of a release. For new ammonia operations at SGS and VGS, LADWP personnel at these project sites will be trained in operations and emergency response procedures before the first shipment of aqueous ammonia is made to these sites.

LADWP has prepared a Risk Management Program (RMP) for the aqueous ammonia that is currently used at the HGS. This RMP will be updated to account for the modified ammonia storage and transfer systems at the HGS site. New risk management programs (e.g., RMP and California Accidental Release Prevention Program [CalARP]) will be required for the new ammonia storage and transfer systems associated with the SGS and VGS sites. The City of Los Angeles Fire Department has jurisdiction over the RMP/CalARP programs for the three project sites.

LADWP has prepared an Emergency Response Manual for all its personnel at all electrical generating stations, including the three project sites. This manual describes the emergency response procedures that would be followed in the event of any of several release scenarios and the responsibilities for key response personnel. The scenarios include the release of the following:

- Aqueous ammonia stored at bulk tanks currently located at the HGS;
- Natural gas used throughout the generating stations involving both ignited and unignited vapors; and
- Release of hydrocarbon fuels stored at generating stations.

LADWP will update its Emergency Response Manual to account for the use of aqueous ammonia at the SGS and VGS.

Chapter 4 analyzes various release scenarios associated with the transport, handling, and storage of aqueous ammonia at all three project sites. The ammonia concentration was estimated at various distances from the releases for each scenario. Table 3.7-1 below shows the effects of exposure to ammonia at various concentrations for different exposure times. The USEPA risk management endpoint is 200 ppm.

In the USEPA Accidental Release Information (ARIP) database, there were 17 liquid releases of ammonia in California from 1988 to 1998. More than half of those were anhydrous ammonia releases primarily involving refrigeration units. Nationally, from 1986 to 1998, there were 872 reported releases of ammonia gas, liquid and vapor. Of those, 137 involved liquid ammonia and most of those were anhydrous not aqueous ammonia.

Table 3.7-1
Emergency Response Planning Guidelines
(Ammonia Impact)

Ammonia Concentrations	Responses to Exposure
25 ppm	No significant changes in pulse, blood pressure, and pulmonary function.*
50 ppm	Noted acclimation to odor: no significant physiological changes.*
100 ppm	With excursions to 200 ppm; caused no significant changes in vital functions; however, eye tearing and some discomfort were noted.*
200 ppm	The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.**
1,000 ppm	The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects.***
American Industrial Hygiene Association (AIHA) Emergency Response Planning Guidelines (ERPG) * 18 subjects, 8-hour days, for 6 weeks ** AIHA ERPG – 2 *** AIHA ERPG – 3	

3.8 Hydrology and Water Quality

Water issues in the Los Angeles area are complex and affect supply, demand, and quality of water for domestic, commercial, industrial and agricultural use. Due to the low average rainfall in the region, over half of the water supply in the area is imported, making water supply and water quality important issues. Elements of both the regional and local hydrologic environment are presented in this section.

3.8.1 Water Supply

Since the turn of the century, extensive water development has been carried out in the Los Angeles Basin. The Los Angeles Aqueduct, which imports water from the Owens Valley, was completed in 1913 and extended to the Mono Lake Basin in 1940. Due to restrictions on diversions from the Mono Basin and Owens Valley, the amount of water that can be diverted to Los Angeles has been reduced. This water is usually treated for turbidity.

The Colorado River Aqueduct, which now provides approximately 25 percent of the region's water supply, was completed in 1941. Contracts allow the diversion of 1.21 million acre-feet per year to the Los Angeles area. Colorado River water is typically harder than local supplies and other imported waters due to dissolved constituents from soils and rocks in the Colorado River watershed.

In an average year, 75 percent of the water comes from the eastern Sierras via the Los Angeles Aqueduct. Wells in the San Fernando Valley and other local groundwater basins supply approximately 15 percent of the water supply. The major portion of the groundwater supply comes from the San Fernando Valley Groundwater Basin, which is replenished primarily by rainwater that percolates through the soil. Spreading grounds are used to allow additional rainwater from the Los Angeles River and local creeks and surplus Los Angeles Aqueduct water to percolate into the groundwater basin. The Hansen spreading grounds are located adjacent and northwest of the VGS.

Annually, the LADWP provides approximately 628,000 acre-feet of water to the Los Angeles area annually. About two-thirds of the water demand is for residential uses. About one quarter of the demand is for commercial and governmental uses, with a very small amount used by industry.

3.8.1.1 Harbor Generating Station

The HGS site currently consumes approximately 429,550 gallons of raw water per day. This water is supplied by the LADWP. The HGS site also uses sea water for cooling purposes. However, the sea water cooling system will not be modified by the proposed project.

3.8.1.2 Scattergood Generating Station

The SGS site currently consumes approximately 617,000 gallons of raw water per day. This water is supplied by the LADWP. The SGS site also uses sea water for cooling purposes. However, the sea water cooling system will not be modified by the proposed project.

3.8.1.3 Valley Generating Station

The VGS site currently consumes approximately 637,800 gallons of raw water per day. This water is supplied by the LADWP.

3.8.2 Water Quality

Extensive urbanization in the southern California area has resulted in significant alteration and deterioration of the natural hydrologic environment. Presently, surface runoff flows into a network of storm drains that empty into several large rivers and a complex of manmade channels. Due to extensive paving and surfacing of the land throughout the area, groundwater recharge by infiltration has steadily decreased while pumping has increased.

3.8.2.1 Surface Water Quality

<u>Federal Requirements</u>

Surface water quality is protected by a number of laws, regulations and plans, including the Federal Water Pollution Control Act, otherwise know as the Clean Water Act (CWA). The primary objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's surface waters. Pollutants regulated under the CWA include "priority" pollutants, including various toxic pollutants; "conventional" pollutants, such as biochemical oxygen demand, total suspended solids, oil and grease, and pH; and "nonconventional" pollutants, including any pollutant not identified as either conventional or priority.

The CWA regulates both direct and indirect discharges. The National Pollutant Discharge Elimination System (NPDES) Program (CWA §502) controls direct discharges into waters of the United States. NPDES permits contain industry-specific, technology-based limits and may also include additional water quality-based limits, and establish pollutant-monitoring requirements. A NPDES permit may also include discharge limits based on federal or state water quality criteria or standards.

In 1987, the CWA was amended to include a program to address stormwater discharges. In response, the USEPA promulgated the NPDES stormwater permit application regulations.

Pursuant to §402(p) of the CWA and 40 CFR Parts 122, 123, and 124, the California State Water Quality Control Board (State Board) adopted a general NPDES permit to regulate stormwater discharges associated with industrial activity in California. Stormwater discharges from power plants operating in California are subject to requirements under this general permit.

It should be noted that §316(b) of the CWA requires that the location, design, construction, and capacity of ocean cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts. The HGS and SGS sites are subject to, and comply with, this requirement.

The national pretreatment program (CWA §307(b)) controls the indirect discharge of pollutants to Publicly Owned Treatment Works (POTW) by industrial users. The goal of the pretreatment program is to protect municipal wastewater treatment plants from damage that could occur if hazardous, toxic, or other wastes are discharged into a sewer system and to protect the quality of sludge generated by these plants. On November 19, 1982, the USEPA promulgated Effluent Guidelines and Standards for the "Steam Electric Power Generating Point Source Category" (40 CFR part 423). These regulations prescribe effluent limitation guidelines for once-through cooling water and various in-plant waste streams. Discharges to a POTW are regulated primarily by the POTW itself. Additionally, 40 CFR 423.12(a), provides that effluent limitations either more or less stringent than the USEPA standards may be prescribed if factors relating to the equipment or facilities involved, the process applied, or other such factors are found to be fundamentally different from the factors considered in the establishment of the standards.

<u>State Requirements</u>

On July 23, 1997, the State Board adopted a revised Water Quality Control Plan for Ocean Water of California (Ocean Plan). The Ocean Plan contains water quality objectives for coastal waters of California.

On May 18, 1972 (amended on September 18, 1975), the State Board adopted a Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan). The Thermal Plan contains temperature objectives for the Pacific Ocean.

On June 19, 1975, the State Board adopted the Water Quality Control Policy on the Use and Disposal of Inland Waters used for Power Plant Cooling. The purpose of the policy is to provide consistent statewide water quality principles and guidance for adoption of discharge requirements, and implementation actions for power plants that depend on inland waters for cooling.

On June 13, 1994, the Los Angeles Regional Water Control Board (LARWQCB) adopted an updated Water Quality Control Plan for the Los Angeles Region (Basin Plan). The Basin Plan incorporates by reference the State Board's water quality control plans for ocean waters, control of temperature, significant State Board policies that are applicable to the Los Angeles Region, and the antidegradation policy.

The Basin Plan contains water quality objectives for, and lists the following beneficial uses of waterbodies in the vicinity of the HGS and SGS:

<u>Nearshore Zone</u> (Bounded by the shoreline and a line 1,000 feet from the shoreline or the 30-foot depth contour, whichever is farther from shore)

- Existing: Industrial service supply, navigation, water contact and non-water contact recreation, ocean commercial and sport fishing, preservation of areas of special biological significance, preservation of rare and endangered species, marine habitat, shellfish harvesting, and fish spawning.

<u>Offshore Zone:</u>

- Existing: Industrial service supply, navigation, water-contact and non-water-contact recreation, ocean commercial and sport fishing, preservation of rare and endangered species, marine habitat, and shellfish harvesting.
- Dockweiler Beaches (Hydrologic Unit 405.12)
- Existing: Industrial service supply, navigation, water contact recreation, non-contact water recreation, commercial and sport fishing, marine habitat, and wild habitat.
- Potential: Spawning, reproduction, and/or early development

<u>Harbor Generating Station</u>

The HGS site is located adjacent to the Los Angeles Harbor (Harbor), which is the receiving water for the majority of the site's stormwater and wastewater discharges. Under the State of California Industrial Activities Stormwater General Permit, the HGS is authorized to discharge stormwater. Additionally, the HGS facility must also:

- Eliminate non-stormwater discharges to the stormwater system
- Prepare and implement a Stormwater Pollution Prevention Plan
- Develop and implement a Stormwater Monitoring Plan

The HGS has complied with the above requirements.

Approximately 95 percent of the site is covered with paved asphalt and/or concrete. The remaining portion of the site consists of maintained concrete/gravel and dirt/gravel mixture.

Most of the stormwater runoff (approximately 75 percent) from the HGS site is directed to the circulating cooling water system and discharged to the West Basin of the Harbor. Stormwater from the transformer pad drains is discharged to the storm drain by manually opening a valve following a visual inspection. Stormwater from the north roof drains of the power house discharges to the storm drain on Fries Avenue. The southern most roof drains of the power house direct stormwater to the circulating water outlet tunnels and then to the West Basin of the Harbor.

Stormwater from the tank farm area is directed to Fries Avenue. The diked area drains to a sump that drains to an oil/water separator that discharges to the municipal sewer. Stormwater that enters the fuel gas compressor sumps is directed to the oil/water separator.

The HGS site has a Spill Prevention Control and Countermeasure (SPCC) Plan in place, as required by federal regulations. The SPCC Plan, along with the Integrated Emergency Response Plan, outlines emergency procedures, operating procedures, and engineering controls (e.g. secondary containment) necessary to prevent spills, overflows, or other incidents that may discharge hazardous materials to the Harbor.

The HGS discharges wastewater to Waters of the U.S. under Waste Discharge Requirements contained in Order No. 90-098. This Order serves as NPDES Permit No. CA0000361. The NPDES requirements specifically address effluent discharges to the Harbor, receiving water quality, and monitoring/reporting. Constituents of concern for discharges to the Harbor include heavy metals, synthetic organic pesticides, polyaromatic hydrocarbons (PAHs), and polychlorninated biphenyls (PCBs). Effluent limitations for the HGS are show in Table 3.8-1. Effluent monitoring reports are submitted monthly to the Los Angeles Regional Water Quality Control Board (LARWQCB). The receiving water monitoring program consists of periodic biological surveys of the area surrounding the discharge, as well as physical and chemical characteristics of the water that may be impacted by the discharge. LADWP monitors and samples water quality of the Harbor at several locations. The sampling includes:

- temperature profiles
- otter trawls for fish and macroinvertebrates
- benthic infauna
- sediment grain size analysis

Up to 111.1 million gallons per day of wastewater consisting of once-through cooling water, treated chemical metal cleaning wastes, and low volume wastes (e.g., demineralizer regeneration and cycle make-up/reverse osmosis drains, Units #1 and #2 air cooler drains, small volumes of rainfall runoff, and miscellaneous floor drains) is discharged into the West Basin of the Los Angeles Harbor. The cooling water intake is located at the northwest corner of Slip No. 5, Los Angeles Harbor, and draws ocean water at a depth of 35 feet Mean Lower Low Water (MLLW). Figure 3-8.1 shows the location of the intake and outfall for the once-through cooling water.

Chemical metal cleaning wastes are collected and treated in portable storage (Baker) tanks. The treated chemical metal cleaning wastes are sent to a settling sump where they commingle with low volume wastes before being discharged to the Los Angeles Harbor through the outfall for the once-through cooling water.

Table 3.8-1
Harbor Generating Station's Discharge Limitations

Constituent	Units	Discharge Limitations[1] 30-day Average	Discharge Limitations[1] Daily Maximum
Arsenic	µg/l lbs/day[2]	23.5 21.8	122 113
Cadmium	µg/l lbs/day2	4.1 3.8	16.4 15.2
Chromium[6] (hexavalent)	µg/l lbs/day2	8.2 7.6	32.8 30.4
Copper	µg/l lbs/day[2]	6.1 5.7	43 40
Lead	µg/l lbs/day[2]	8.2 7.6	32.8 30.4
Mercury	µg/l lbs/day[2]	0.162 0.150	0.654 0.606
Nickel	µg/l lbs/day[2]	20.5 19.0	82 76
Selenium	µg/l lbs/day[2]	61.5 57.0	246 228
Silver	µg/l lbs/day[2]	2.37 2.20	10.98 10.17
Zinc	µg/l lbs/day[2]	57.23 53.03	303 281
Chronic toxicity[4]	TU_c	---	4.1
Radioactivity	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30269, California Code of Regulations		

1 – Concentration limits are based on Ocean Plan objectives using a dilution ratio of 3.1 parts of seawater to 1 part effluent.

2 – Based on a flow rate of 111.1 million gallons per day (mgd).

3 – The discharger has the option to meet the hexavalent chromium limitations with a total chromium analysis. However, if the total chromium level exceeds the hexavalent chromium limitation, it will be considered a violation unless an analysis has been made for hexavalent chromium in a replicate sample and the result show within the hexavalent chromium limits.

4 – Expressed as Chronic Toxicity Units (TU_c). $TU_c = 100/NOEC$

where: NOEC (No Observed Effect Concentration) is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism as determined by the result of a critical life stage toxicity test listed in Appendix II of the Ocean Plan adopted and effective on March 22, 1990, pages 22-23. NOEC shall be determined based on toxicity tests having chronic endpoints.

Source: Order No. 95-027

In accordance with the Thermal Plan, LADWP conducted a thermal effects study. The RWQCB-approved study demonstrated that wastes discharged from the HGS were in compliance with the Thermal Plan and protected the beneficial uses of the receiving waters.

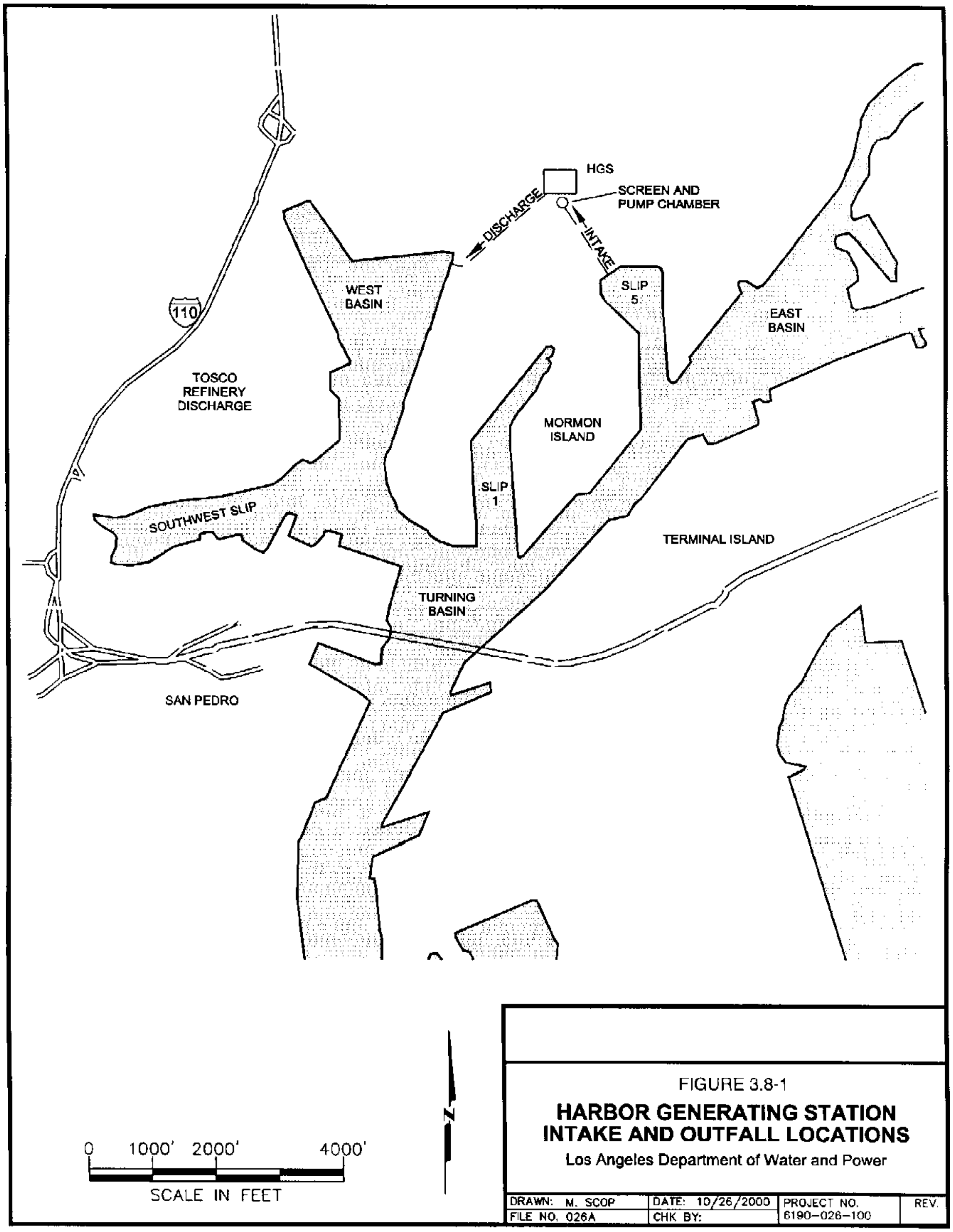


FIGURE 3.8-1
HARBOR GENERATING STATION INTAKE AND OUTFALL LOCATIONS
Los Angeles Department of Water and Power

DRAWN: M. SCOP	DATE: 10/26/2000	PROJECT NO.	REV.
FILE NO. 026A	CHK BY:	6190-026-100	

In accordance with federal and state guidelines for §316(b) of the CWA, studies were conducted to determine whether the location, design, construction, and capacity of the cooling water intake structures reflected the best technology available for minimizing impacts. The study addressed the ecological and engineering factors specified in the guidelines and demonstrated that the ecological impacts of the intake system are environmentally acceptable.

Municipal water, which is provided by the City of Los Angeles and used at the HGS site, is routed to six primary systems:

- Heat exchanger system
- Demineralizer
- Boiler system
- Equipment wash system
- Fuel gas compressor system
- Domestic use

Industrial Waste Permit No. W375878 for the HGS site limits the maximum daily wastewater discharge to the municipal sewer to 6,000 gallons per day. The permit allows the discharge of oil/water separator water from machinery bed plates, drainage sumps, boiler blowdown, and salt water from boiler sumps, equipment and floor washing. The chemical and physical characteristics of discharged waste are a mixture of clear municipal water, steam condensate, sea water, dirt, grit, and detergent. Currently, there are no monitoring requirements associated with the permit.

Figure 3.8-2 presents a schematic of water flow at the HGS.

3.8.2.2 Scattergood Generating Station

The SGS site is located adjacent to the Santa Monica Bay (Bay) on the Pacific Ocean. The Bay is recognized by the USEPA and the State as a natural resource of national significance and is preserved and protected under the National Estuary Program.

The Santa Monica Bay Restoration Project (1994) identified the pollutants of concern for the El Segundo subwatershed as heavy metals (cadmium, chromium, copper, lead, nickel, silver, zinc), debris, pathogens, oil and grease, chlordane, and PAHs.

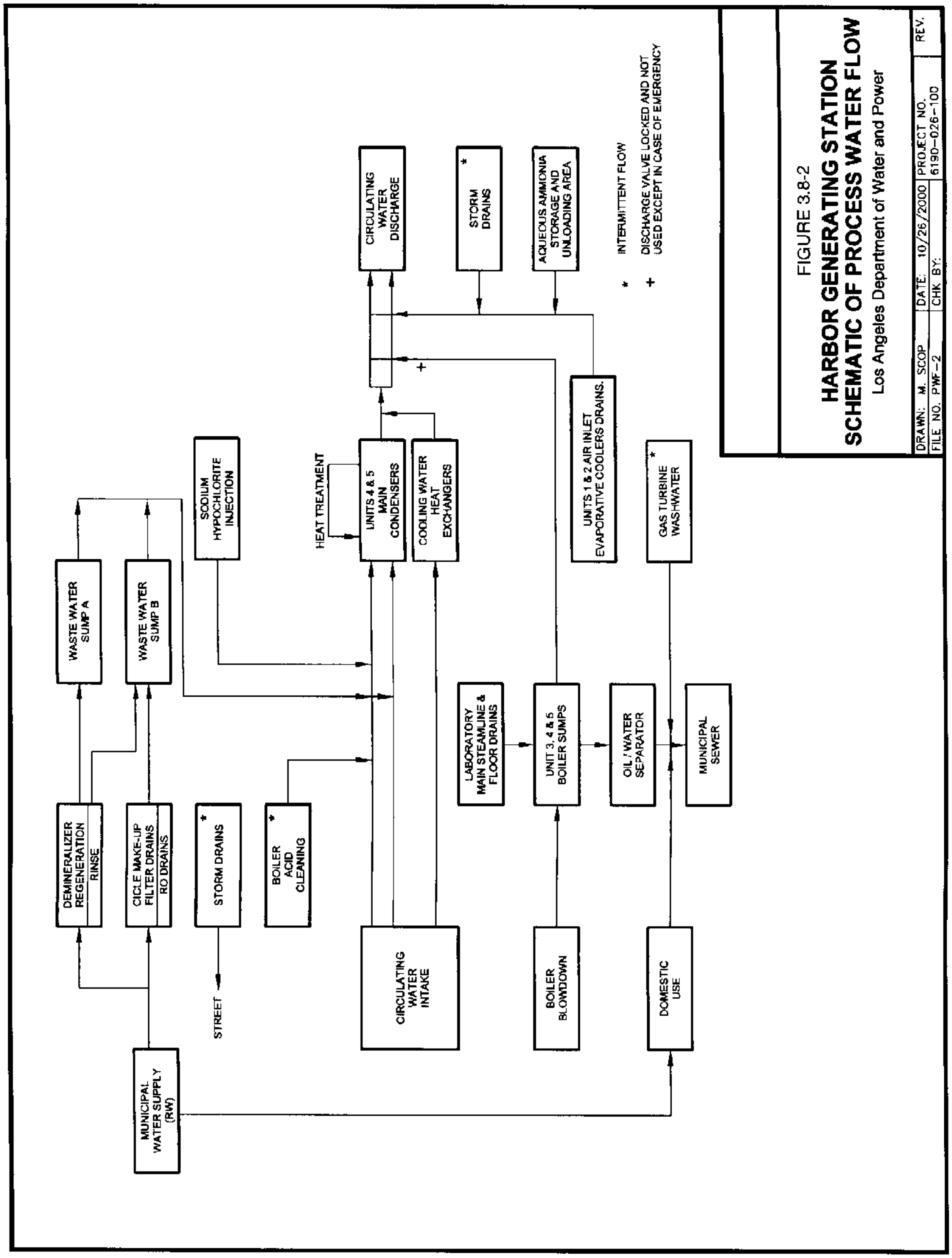


FIGURE 3.8-2
HARBOR GENERATING STATION
SCHEMATIC OF PROCESS WATER FLOW
Los Angeles Department of Water and Power
DRAWN: M. SCOP
FILE NO. PWF-2
DATE: 10/26/2000
CHK BY:
PROJECT NO. 6190-026-100
REV.
* INTERMITTENT FLOW
+ DISCHARGE VALVE LOCKED AND NOT USED EXCEPT IN CASE OF EMERGENCY
CIRCULATING WATER DISCHARGE
STORM DRAINS
AQUEOUS AMMONIA STORAGE AND UNLOADING AREA
SODIUM HYPOCHLORITE INJECTION
HEAT TREATMENT
UNITS 4 & 5 MAIN CONDENSERS
COOLING WATER HEAT EXCHANGERS
UNITS 1 & 2 AIR INLET EVAPORATIVE COOLERS DRAINS.
GAS TURBINE WASHWATER
WASTE WATER SUMP A
WASTE WATER SUMP B
LABORATORY MAIN STEAMLINE & FLOOR DRAINS
UNIT 3, 4 & 5 BOILER SUMPS
OIL / WATER SEPARATOR
MUNICIPAL SEWER
DEMINERALIZER REGENERATION
RINSE
CICLE MAKE-UP FILTER DRAINS
RO DRAINS
STORM DRAINS
BOILER ACID CLEANING
STREET
CIRCULATING WATER INTAKE
BOILER BLOWDOWN
DOMESTIC USE
MUNICIPAL WATER SUPPLY (RW)

The 1998 California 303(d) List, approved by the USEPA on May 12, 1999, identified the following as pollutants of concern for the Bay (Offshore and Nearshore): dichloro-diphenyl trichloroethane (DDT), polychlorinated biphenyls (PCBs), PAHs, chlordane, heavy metals (cadmium, copper, lead, mercury, nickel, silver, zinc), and debris.

Approximately 95 percent of the SGS site is covered with paved asphalt and/or concrete. The remaining portion of the site consists of maintained concrete/gravel and dirt/gravel mixture. The ground surface generally slopes from east to west in the site vicinity. Surface water from the site flows into catch basins located throughout the paved portions of the facility. This water drains either to the storm drain system via the circulating water system or to the ocean via the rain water sump.

The SGS has a SPCC Plan in place, as required by federal regulations. The Integrated Emergency Response Plan, which includes the SPCC Plan, outlines emergency procedures, operating procedures, and engineering controls (e.g., secondary containment) necessary to prevent spills, overflows, or other incidents that may discharge hazardous materials to the Bay.

The SGS discharges wastewater to Waters of the United States under Waste Discharge Requirements contained in Order No. 00-083, which was issued in June 2000, and expires in May 2005. The Order serves as NPDES Permit No. CA0000370. The NPDES requirements specifically address effluent and stormwater discharges to the Bay, receiving water quality, and monitoring/reporting. Effluent limitations for the SGS site are shown in Table 3.8-2. Effluent monitoring reports for the SGS site are submitted monthly to the LARWQCB. The LADWP monitors and samples water quality of the Bay at numerous locations upcoast, directly offshore, and downcoast of the HGS. The sampling includes:

- temperature profiles
- dissolved oxygen
- pH
- impingement sampling for fish and commercially important macro-invertebrates
- collection of California mussels from the discharge conduit
- benthic infauna
- sediment grain size analysis

Table 3.8 2
Scattergood Generating Station's Discharge Limitations

Constituent	Units	Discharge Limitations[1]

		30-day Average	Daily Maximum
Outfall			
Total residual chlorine[2]	mg/l	---	0.436
Free available chlorine	mg/l kg/day	0.2 258	---
Arsenic	µg/l	57	313
Cadmium	µg/l	11	43
Chromium[6] (hexavalent)	µg/l	21	86
Copper	µg/l	13	109
Lead	µg/l	21	86
Mercury	µg/l	0.4	1.71
Nickel	µg/l	54	214
Selenium	µg/l	161	642
Silver	µg/l	6	28
Zinc	µg/l	136	778
Chronic Toxicity[4]	TU_c	---	10.7
Radioactivity	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30269, California Code of Regulations		
In-plant Waste Streams[5]			
Suspended solids	mg/l	30	100
Oil and grease	mg/l	15	20
Copper, total	mg/l	1.0	1.0
Iron, total	mg/l	1.0	1.0
Low Volume Wastes			
Suspended solids	mg/l	30	100
Oil and grease	mg/l	15	20
Cooling Tower Blowdown			
Chromium, total	mg/l	0.2	0.2
Zinc, total	mg/l	1.0	1.0
Priority pollutants	µg/l	NDA[6]	NDA[6]

Table 3.8 2
Scattergood Generating Station's Discharge Limitations

Constituent	Units	Discharge Limitations[1]	
		30-day Average	Daily Maximum

1 – Concentration limits are based on Ocean Plan objectives using a dilution ratio of 9.7 parts of seawater to 1 part effluent, except for chlorine.

2 – Based on EPA-approved variance from best available technology for TRC pursuant to Section 301(g) of the Clean Water Act based on daily sampling at Discharge Serial No. 001 during periods of chlorination. Total residual chlorine may not be discharged from any single generating unit for more than 2 hours per day. For chlorine discharges of up to 40 minutes, the daily maximum limit is 0.436 mg/l. For chlorine discharges exceeding 40 minutes, the applicable total residual chlorine limitations shall be calculated using the same methodology as was used to support the state Ocean Plan exception.

3 – The discharger has the option to meet the hexavalent chromium limitations with a total chromium analysis. However, if the total chromium level exceeds the hexavalent chromium limitation, it will be considered a violation unless an analysis has been made for hexavalent chromium in a replicate sample and the result show within the hexavalent chromium limits.

4 – Expressed as Chronic Toxicity Units (TU_c). TU_c = 100/NOEC

where: NOEC (No Observed Effect Concentration) is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism as determined by the result of a critical life stage toxicity test listed in Appendix II of the Ocean Plan adopted and effective on March 22, 1990, pages 22-23. NOEC shall be determined based on toxicity tests having chronic endpoints.

5 – For the purpose of these limitations, chemical metal cleaning wastes shall mean any wastewater resulting from chemical cleaning of any metal process equipment including, but not limited to boiler acid rinses.

6 – No detectable amount of the 126 priority pollutants contained in chemicals added for cooling tower maintenance.

Source: Order No. 00-083

At the SGS, up to 496 million gallons per day of wastewater consisting of once-through cooling water, pretreated metal cleaning wastes, low volume in-plant wastes, cooling water blowdown, and stormwater runoff is discharged to the Bay (Pacific Ocean), near Dockweiler State Beach in El Segundo. The wastewater is discharged through an outfall (Discharge Serial No. 001) located approximately 1,200 feet offshore, at a depth of 15 feet MLLW. Cooling water is drawn from the Bay through a single 12-foot internal diameter conduit, which extends approximately 1,600 feet offshore. The conduit is equipped with a velocity cap to deter marine life from entering the system.

Chemical metal cleaning wastewater, consisting of boiler acid rinses, is periodically generated, collected, and treated with alkaline chemicals in portable storage tanks. The treated effluent is sent to settling basins where it mixes with low volume waste streams (floor drain water which has passed through an oil/water separator; nonchemical metal cleaning wastes which, include boiler and preheater wash waters; reverse osmosis brine, boiler and evaporator blowdown; condensate polisher regeneration wastes; and laboratory drains). Residues in the basins and the portable tanks are periodically hauled away to permitted disposal facilities.

In accordance with the Thermal Plan, LADWP conducted a thermal effects study. The RWQCB-approved study demonstrated that wastes discharged from the SGS were in compliance with the Thermal Plan and the beneficial uses of the receiving waters.

In May 1998, the USEPA approved a SGS request for a variance from Best Available Technology Economically Achievable for total residual chlorine pursuant to Section 301(g) of the CWA. In July 1988, the State Board adopted Resolution 88-80 that granted a permanent exception from the Ocean Plan for total residual chlorine.

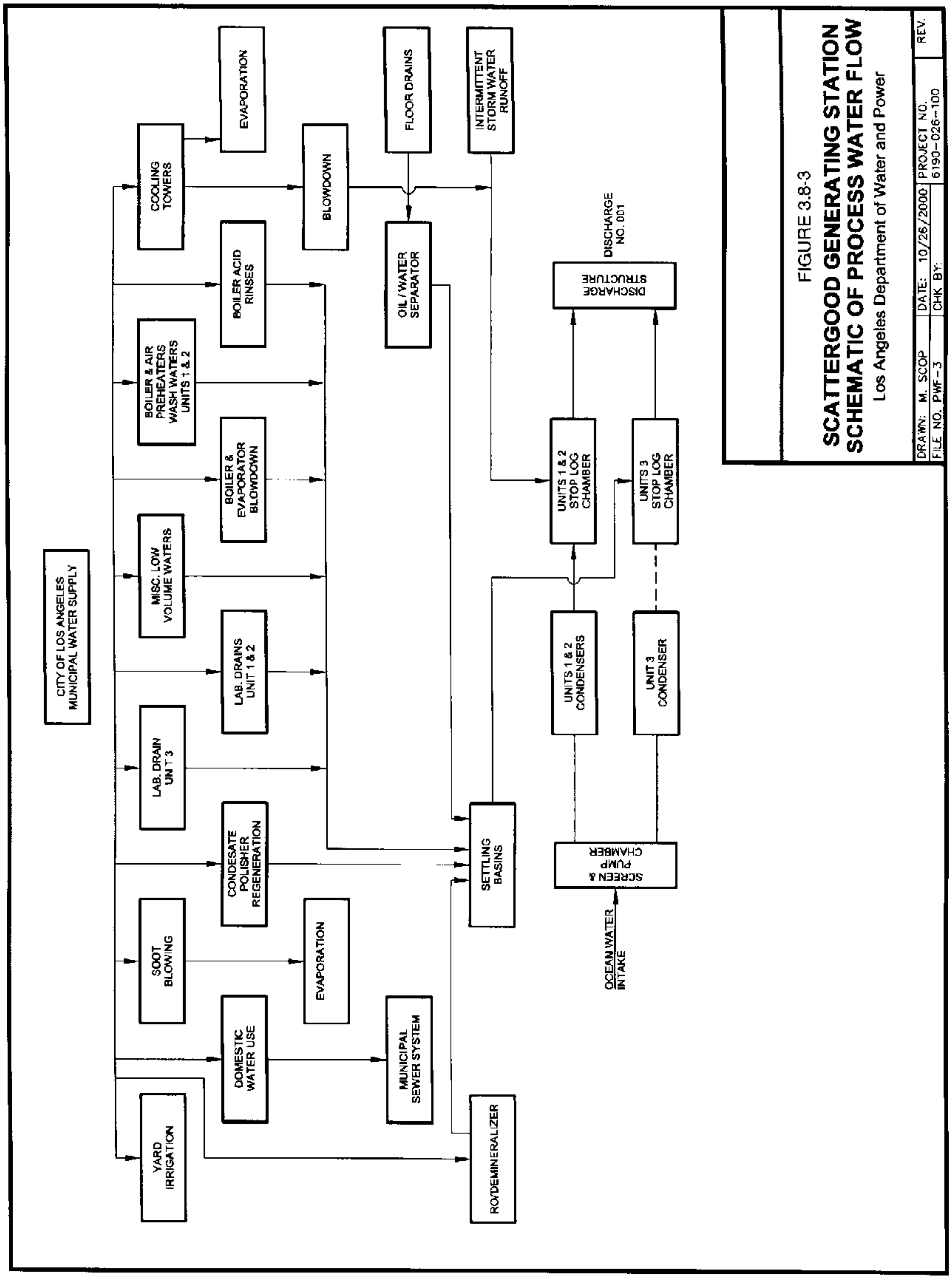
In accordance with federal and state guidelines for §316(b) of the CWA, studies were conducted to determine whether the location, design, construction, and capacity of the cooling water intake structures reflected the best available technology for minimizing impacts. The RWQCB-approved study addressed the ecological and engineering factors specified in the guidelines, demonstrated that the ecological impacts of the intake system are environmentally acceptable, and provided evidence that no modifications to design, location, or capacity of the intake structure are required.

Figure 3.8-3 presents a schematic of water flow at the SGS.

3.8.2.3 Valley Generating Station

The VGS site is located in the San Fernando Valley, which is located in the Los Angeles River watershed. The Tujunga Wash Flood Control Channel, which is a major tributary of the Los Angeles River, forms the northwest boundary of the site. The ground surface generally slopes from north to south in the vicinity of the site.

Due to major flood events at the beginning of the century, by the 1950s most of the river was lined with concrete. The majority of the Los Angeles River Watershed is considered impaired due to a variety of point and nonpoint sources. The pollutants of concern include pH, ammonia, a number of metals, coliform, trash, scum, algae, oil, various pesticides, and volatile organics.


CITY OF LOS ANGELES MUNICIPAL WATER SUPPLY
COOLING TOWERS
EVAPORATION
BLOWDOWN
FLOOR DRAINS
INTERMITTENT STORM WATER RUNOFF
BOILER ACID RINSES
OIL / WATER SEPARATOR
DISCHARGE STRUCTURE
DISCHARGE NO. 001
BOILER & AIR PREHEATERS WASH WATERS UNITS 1 & 2
BOILER & EVAPORATOR BLOWDOWN
MISC. LOW VOLUME WATERS
UNITS 1 & 2 STOP LOG CHAMBER
UNITS 3 STOP LOG CHAMBER
LAB. DRAINS UNIT 1 & 2
UNITS 1 & 2 CONDENSERS
UNIT 3 CONDENSER
LAB. DRAIN UNIT 3
CONDESATE POLISHER REGENERATION
SETTLING BASINS
SCREEN & PUMP CHAMBER
OCEAN WATER INTAKE
SOOT BLOWING
EVAPORATION
DOMESTIC WATER USE
MUNICIPAL SEWER SYSTEM
YARD IRRIGATION
RO/DEMINERALIZER
FIGURE 3.8-3
SCATTERGOOD GENERATING STATION
SCHEMATIC OF PROCESS WATER FLOW
Los Angeles Department of Water and Power
DRAWN: M. SCOP
DATE: 10/26/2000
PROJECT NO. 6190-026-100
REV.
FILE NO. PWF-3
CHK BY:

Under the State of California Industrial Activities Stormwater General Permit, the VGS site is authorized to discharge stormwater. The VGS facility must also:

- Eliminate non-stormwater discharges to the stormwater system
- Prepare and implement a Stormwater Pollution Prevention Plan
- Develop and implement a Stormwater Monitoring Plan

The VGS has complied with the above requirements.

Various types of ground cover material occur across the 120-acre site. Approximately 45 percent of the VGS site is covered with paved asphalt and/or concrete or buildings. The other surfaces of the site consist of approximately 15 percent vegetation and/or dirt, 15 percent maintained rocks/gravel, and 25 percent dirt/gravel mixture.

The four primary discharge points for stormwater flow at the VGS are:

- Gravel pit
- Cooling tower overflow basin
- Station cooling water system
- Municipal storm drain system

The stormwater from the areas identified in the following bullet points is collected onsite.

- Aboveground tank farm
- Cooling tower area
- Power generation area
- Gravel pit area
- Truck unloading area/storage house

The gravel pit receives approximately 40 percent of the stormwater flow, including stormwater from the tank farm and power generation area. Most of the stormwater drainage from the area around the cooling towers passes through a skim pond and is retained onsite in an earthen overflow basin, where the water either evaporates or percolates into the ground. Generally, the remaining stormwater runoff from the site collects in drainage ditches along the southeast and southwest property boundaries and is accumulated in two offsite stormwater catch basins prior to discharge to the municipal storm drain system. The municipal storm drain system directs either to the Sheldon Street Catchbasin or to the San Fernando Road Catchbasin. According to the Los Angeles City Engineering Bureau (Valley Division), these catchbasins discharge to the Burbank Western Flood Control Channel, which connects to the Los Angeles River

The designated beneficial uses of the Burbank Western Channel surface waters in the Los Angeles River Planning Area (Basin 4B) are potential non-contact water recreation, periodic warm freshwater habitat, and periodic wildlife habitat (LARWQCB, 1995).

The VGS has a SPCC Plan in place, as required by federal regulations. The SPCC Plan, along with the Integrated Emergency Response Plan, outlines emergency procedures, operating procedures, and engineering controls (e.g. secondary containment) necessary to prevent spills, overflows, or other incidents that may discharge hazardous materials to the Los Angeles River.

The process water and industrial wastewater system is diagramed in Figure 3.8-4. Municipal water, which is obtained from the City of Los Angeles and used at the VGS site, is directed to the following four primary systems:

- Sanitary water system
- Bearing cooling water system
- Station cooling water system
- Boiler system

Water in the sanitary water system ultimately is discharged to the municipal sanitary sewer system. Water from the bearing cooling water system either evaporates or is recycled in the station cooling water system. The station cooling water system recirculates the water to the cooling tower operations. However, approximately nine gallons of water per minute per turbine is replaced and the blowdown is discharged. Water directed to the boiler system undergoes physical and chemical treatment prior to use in the boilers. Chemicals such as phosphates, chlorine, acids, and caustics are used in the treatment process. Boiler blowdown water, as well as water from the power generation unit floor drains, oil/water separator, sump overflow, and demineralizer storage tank overflow, is diverted to wastewater basins A and B. The water from the basins is discharged to Wastewater Holding Tank C prior to being introduced into the cooling water system for recirculation.

The VGS is authorized to discharge industrial wastewater to the City of Los Angeles sewer system under Industrial Wastewater Permit No. W-173173, which expires February 28, 2003. Discharge limitations and sampling frequencies for the VGS site are identified in Table 3.8-3.

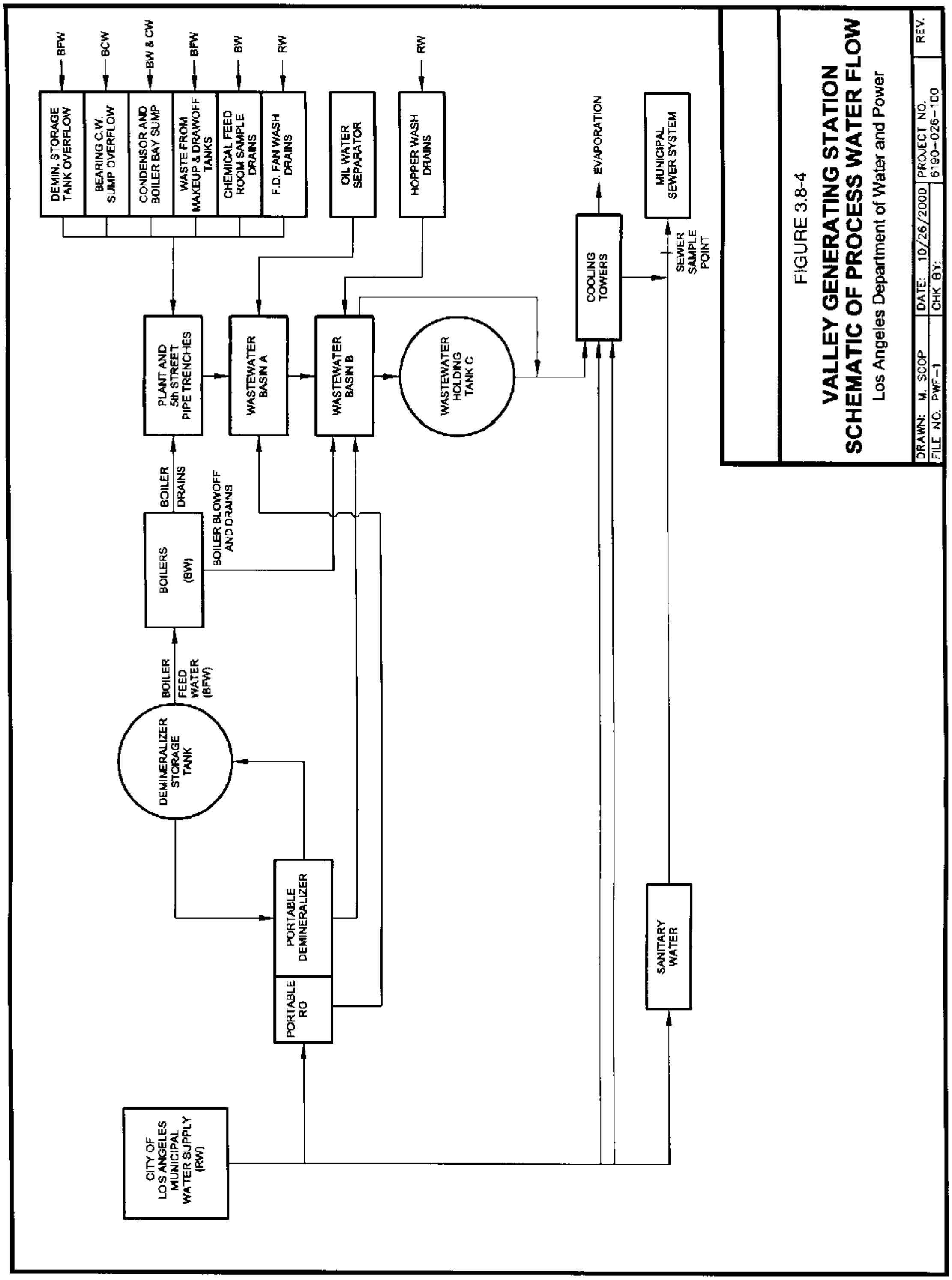


FIGURE 3.8-4
VALLEY GENERATING STATION
SCHEMATIC OF PROCESS WATER FLOW
Los Angeles Department of Water and Power

Table 3.8-3
Valley Generating Station's Discharge Limitations

Sample Point 01: Discharge Limitations		
Constituent	**Local Instantaneous Maximum, mg/l**	**Federal**
		Instantaneous Maximum, mg/l
Arsenic	3.00	---
Cadmium	15.00	---
Chromium, total	10.00	0.20
Copper	15.00	---
Lead	5.00	---
Nickel	12.00	---
Silver	5.00	---
Zinc	25.00	1.00
Cyanide, total	10.00	---
Cyanide, free[1]	2.00	---
Remaining 124 priority pollutants	---	No detectable amount
Polychlorinated biphenyl compounds	---	No discharge allowed
Sulfides (dissolved)	0.10	---
Oil and grease (dispersed)	600.00	---
Oil and grease (floatable)	None visible	---
pH (standard units)	5.50 – 11.00	---
1 – Cyanide (free) shall mean cyanide amenable to chlorination as defined by 40 CFR 136.		

Sample Point 02: Discharge Limitations	
Constituent	**Federal**
	Daily Maximum, mg/l
Copper	1.00

Sample Point 01: Monitoring Requirements		
Constituent	**Measurement Frequency**	**Sample Type**
Flow	---	Report
Arsenic	Once / 6 mo.	Grab or composite
Cadmium	Once / 6 mo.	Grab or composite

Sample Point 01: Monitoring Requirements		
Constituent	**Measurement Frequency**	**Sample Type**
Chromium, total	Once / 1 mo.	Grab
Copper	Once / 6 mo.	Grab or composite
Lead	Once / 6 mo.	Grab or composite
Nickel	Once / 6 mo.	Grab or composite
Silver	Once / 6 mo.	Grab or composite
Zinc	Once / 1 mo.	Grab
Cyanide, total	Once / 6 mo.	Grab
Cyanide, free	Once / 6 mo.	Grab
Sulfides, dissolved	Once / 6 mo.	Grab
Chlorides	Once / 6 mo.	Grab or composite
Oil and grease	Once / 6 mo.	Grab
pH[1]	Once / 6 mo.	Grab
Sample Point 01: Monitoring Requirements		
Copper	once/ Batch[5]	Composite
1 – The pH of the wastewater discharge to the sewer system shall be monitored and recorded continuously using a pH meter and recorder. A logbook for calibration of the pH meter shall be maintained. The pH charts shall be initiated daily by an operator at the facility.		

3.8.2.4 Groundwater Quality

Los Angeles Basin

HGS and SGS sites are located in the Los Angeles Basin, which is bordered by the Newport-Inglewood Fault on the east, by the Santa Monica Bay on the west, by the Ballona Gap on the north, and by the Palos Verdes hills on the south. Many of the shallow water-bearing units in the Los Angeles Basin area are hydraulically connected to offshore sediments. Withdrawal of fresh water in the coastal areas from these zones has resulted in significant saltwater intrusion into the groundwater basins. The West Coast Basin Barrier Project is an ongoing project operated by the Los Angeles County Department of Public Works (LACDPW). This project involves a series of injection wells and spreading basins installed and maintained by the LACDPW to prevent further seawater intrusion. However, large plumes of saline water have been trapped behind the barrier, degrading some ground water with high concentrations of chloride. The ground water in the lower aquifers is generally of good quality.

Groundwater resources are managed by the Water Replenishment District of Southern California (WRD), formerly known as the Central and West Basin Water Replenishment District. The State Department of Water Resources acts as the court-appointed Watermaster in connection with water rights adjudications. In addition to limiting total extractions from the Basin, groundwater resources management programs administered by the WRD include:

- Purchase of imported and reclaimed water for replenishment.
- Creation of fresh water barriers along the coast by injection of purchased imported water into injection wells. (This allows water levels in the more inland portions of the Basin to be drawn below sea level without the threat of seawater intrusion.)
- Monitoring of groundwater quality and determination of the relative quantities of local, imported, and reclaimed water to be used for replenishment, so as to maintain the chemical quality of the groundwater.

Several measures have been taken to stabilize groundwater levels in the project vicinity and thereby combat the further intrusion of seawater (e.g., groundwater extractions are limited to adjudicated amounts under court control).

<u>San Fernando Valley Groundwater Basin</u>

VGS site is located in the San Fernando Valley Groundwater Basin (SFVGB). The groundwater quality in this area has been impacted by volatile organic compounds from industry, nitrates from subsurface sewage disposal, and past agricultural activities. The SFVGB does not have continuous effective confining layers above ground water and as a result pollutants have seeped through the upper sediments into the groundwater. The RWCCB is investigating area-wide sources of groundwater contamination for four Superfund sites located in the area and interim cleanup measures include groundwater pumping and treatment.

3.9 Noise Resources

3.9.1 Noise Measurement Criteria and Local Ordinances

3.9.1.1 Noise Measurement Criteria

Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, is intense enough to damage hearing, or is otherwise annoying (unwanted sound). Since environmental noise, by its nature, varies with time, it is beneficial to define certain measurement terms that are used to characterize this fluctuating quantity as well as some other basic acoustical terminology.

Sound levels are measured on a logarithmic scale in decibels (dB). The universal measure for environmental sound is the “A” weighted sound level, dBA, which is the sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. “A” scale weighing is a set of mathematical factors applied by the measuring instrument to shape the frequency content of the sound in a manner similar to the way the human ear responds to sounds.

The residual environmental noise level is the quasi-static noise level that exists in the absence of all identifiable, sporadic noise events such as automobile pass-byes, aircraft fly-overs, intermittent dog barking, etc. In most environments, this level is composed of the cumulative sum of far-off, indistinguishable road transportation sources. The residual level itself varies slowly with time as these sources increase or diminish. It has been found that the measurable sound level quantity, L90 (in dBA) well represents the residual sound level. L90 is the level that is exceeded 90 percent of the sample time.

The true energy average level over a specific time period is defined as the equivalent level (Leq). Leq is the level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual varying noise level. Hence, Leq provides a measure of the true average sound level in an area and includes all sporadic or transient events. Leq is usually measured in hourly intervals over long periods in order to develop 24-hour noise levels.

One 24-hour measure of interest for this project is the Community Noise Equivalent Level (CNEL). This noise descriptor is the equivalent noise level over a 24-hour period mathematically weighted during the evening and night when residents are more sensitive to intrusive noise. The daytime period is from 7:00 to 19:00; evening from 19:00 to 22:00; and nighttime from 22:00 to 7:00. A weighting factor of five dB is added to the measured evening levels and 10 dB to the nighttime levels. The weighted levels over a 24-hour period are then averaged to produce the single number CNEL rating.

In addition to the absolute noise level that might occur when a new noise source is introduced into an area, it is also important to consider the level of the existing noise environment. If the existing noise environment is quite low and a new noise source greatly increases the noise exposure (even though a criterion level might not be exceeded), some impact may occur. General rules of thumb for real-life noise environments are that a change of over five dB is readily noticeable and would be considered a significant increase. Changes from three to five dB may be noticed by some individuals and would be considered a substantial increase, possibly resulting in sporadic complaints; and changes of less than three dB are normally not noticeable and are considered "insignificant."

3.9.1.2 Local Ordinances

The project consists of modifications at the HGS, SGS, and VGS facilities. The three generating stations (e.g., project sites) are located within the City of Los Angeles in the communities of Playa del Rey, Wilmington, and Sun Valley, respectively.

Federal, state, and local agencies regulate environmental and occupational, as well as, other aspects of noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. Local General Plans identify general principles intended to guide and influence development plans, and Noise Ordinances set forth specific standards and procedures for addressing particular noise sources and activities. The HGS, SGS, and VGS facilities are governed by local or county ordinances.

Noise impacts from the operation and construction of the modifications of the HGS, SGS, and VGS are determined by the local city noise regulations summarized in Table 3.9-1. The City of Los Angeles Noise Element of the General Plan bases its noise limitations on Guidelines for Noise Compatible Land Use Matrix (Table 3.9-2). Based on the matrix, noise levels to 65 dBA are considered "conditionally acceptable" for residential uses. The Noise Element of the General Plan considers CNEL noise levels of 70 to 75 dBA "conditionally acceptable" for industrial uses.

The City of Los Angeles Municipal Code, Chapter IV, Article 1, Section 41.40 (Amended Ordinance Number 161,574), prohibits construction or repair of or excavation for buildings or structures which involves the use of power machinery between the hours of 10:00 PM and 7:00 AM. Construction projects which constitute an emergency or where undue hardship or unreasonable delay would result from the interruption of construction can be exempted with written permission of the Board of Police Commissioners. These requirements would be in effect for this project. The City of Los Angeles Municipal Code, Chapter XI, Article 2, Section 112.05, requires that noise levels generated by construction equipment within a residential zone not exceed 75 dBA at a distance of 50 feet from the source between the hours of 10:00 PM and 7:00 AM. Noise must be monitored to avoid an increase beyond 75 dBA in any residential zone of the City or within 500 feet thereof, and will be monitored to avoid any increase beyond 75 dBA at distance of 50 feet from the source of the noise.

The SGS facility is located approximately 1,400 feet west of a residential community located in the City of El Segundo. The El Segundo Municipal Code, Title 9, Chapter 9.06, Section 9.06.040 states that noise levels caused by a source should not exceed five dBA above the ambient noise levels at residential property lines.

Table 3.9-1
Local Noise Ordinances

City	Facility	Construction Limit (dBA)	Operations Limit (exterior dBA except where noted)
Los Angeles	HGS	(7 AM -10PM)	70 to 75 dBA CNEL – Considered "acceptable" to "conditionally acceptable" for industrial use
	SGS	75 dBA	65 to 70 dBA CNEL – Considered "conditionally acceptable for commercial use
	VGS	Construction activities prohibited without a special permit at other times of day	65 dBA CNEL or less –Considered "conditionally acceptable" for residential use

Table 3.9-1
Local Noise Ordinances

City	Facility	Construction Limit (dBA)	Operations Limit (exterior dBA except where noted)
El Segundo	SGS	No noise levels greater than 5 dBA above ambient noise levels	60 dBA at residential property lines or no noise levels greater than 5 dBA above ambient noise levels at residential property lines

3.9.2 Existing Noise Environment

3.9.2.1 Harbor Generating Station

The HGS is located in the City of Los Angeles adjacent to the Port of Los Angeles within an M3 zone which is designated for light and heavy industrial uses. The HGS occupies an irregularly shaped parcel of land bordered by Harry Bridges Boulevard to the north; Avalon Boulevard to the east; a container storage area to the south; and Lagoon Avenue to the west. The nearest residential area is located approximately one-quarter mile to the north.

The ambient noise environment in the area of the HGS is influenced by a wide variety of sources. Noise in the area is generated by industrial activities such as container stacking, scrap metal handling and processing, bulk material loading and unloading, and vehicular traffic on major transportation arterials. In October 1989, sound level measurements were conducted at HGS on existing steam turbine Units #3 and #5 and at five locations along the HGS property line,. The measurements were made at a reference distance of three feet from the source units. These measurements were conducted in support of the ~~Draft~~Final Environmental Impact Report for the repowering of the HGS site (LADWP, 1990). At the time of the measurements, CT Units #3 and #5 were operating at near capacity. Results indicate that the sound level generated by steam turbine Unit #3 was 91.5 dBA and Unit 5 was 90.7 dBA.

Ambient sound level measurements were conducted in 1989 at five locations along the northern, southern, eastern, and western property boundaries of HGS site. Ambient sound level measurements conducted at these five locations ranged from 59.1 to 64.6 dBA Leq. Based on these sound levels, the CNEL would be expected to range from approximately 65 to 71 dBA. These noise levels are considered to be "normally acceptable" for the industrial land use of the area according to the Guidelines for Noise Compatible Land Use of the City of Los Angeles.

3.9.2.2 Scattergood Generating Station

The SGS is surrounded by industrial, recreational, and residential land uses. Industrial uses in the project vicinity include the Chevron El Segundo oil refinery and a power generating station owned and operated by Dynergy Power Corporation to the south, and the Hyperion Wastewater Treatment Plant to the north-northwest. The ambient noise environment in the project vicinity is composed of the contributions from equipment and operations within these commercial and industrial areas, from the traffic on the nearby transportation roads (Vista Del Mar and Grand Avenue), and from other individual activities in the area. Residential areas are located approximately 1,400 feet east and northeast of the SGS on a bluff approximately 70 to 90 feet in elevation above the grade of the project site. A state recreational area (Dockweiler State Beach) is located along the Pacific Ocean approximately 300 feet west of the project site.

3.9.2.3 Valley Generating Station

The VGS site is located in the City of Los Angeles. The VGS occupies a parcel of land bounded by Glenoaks Boulevard to the northeast; Sheldon Road to the southeast; San Fernando Road to the southwest; and a flood control channel to the northwest, beyond which is Branford Road. The area surrounding the facility is primarily commercial/industrial; however, an emergency medical clinic, a hospital and two motels are present adjacent to the site on San Fernando Road. A sand and gravel plant is located on the northwest portion of the site. There are no residences located in the immediate vicinity of the VGS. The nearest residential properties are located approximately one-half mile to the north.

3.10 Solid/Hazardous Waste

The Resource Conservation and Recovery Act (42 U.S.C §6901 et seq.) (RCRA) sets forth standards for the management of hazardous solid wastes. RCRA allows the USEPA to delegate its administration to the various states if and when a state program is shown to be at least equivalent to the federal requirements. California received RCRA authorization on August 1, 1992. California Code of Regulations (CCR) Title 22, §66260 et seq. contains the RCRA-equivalent regulations governing hazardous waste management in California. In addition, the California Health and Safety Code, §25100 et seq., identifies California-specific requirements for the identification and management of non-RCRA hazardous wastes. CCR Title 14, Section 17020 et seq., sets forth the minimum standards for the management of solid wastes, as well as enforcement and administration provisions for solid waste storage and disposal.

3.10.1 Nonhazardous Waste

Nonhazardous wastes will be generated during project construction and operational activities. The demolition/construction debris and operations waste would be disposed at either a Class II (industrial) or Class III (municipal) landfill. The Los Angeles County Sanitation District maintains three landfills in Los Angeles County (Nellor, 2000) which serve LADWP facilities, including three project sites. These landfills, Puente Hills, Scholl Canyon, and Calabasas, however, do not accept liquids or hazardous wastes. Projected closure dates for these three landfills range from 2003 at Puente Hills Landfill to 2023 at Scholl Canyon. Permitted daily capacity ranges from 3,500 tons per day at Calabassas to 13,200 tons per day at Puente Hills (Nellor, 2000).

3.10.2 Hazardous Waste

There are currently three Class I (hazardous waste) landfills located in California. Chemical Waste Management Corporation in Kettleman City is a permitted treatment, storage, and disposal facility with a capacity of 13 million cubic yards. Safety Kleen operates a Class I facility in Button Willow with a permitted capacity of 13 million cubic yards, of which 2.5 million cubic yards has been filled. Landfill disposal is also available for the Safety Kleen facility located in Westmoreland. In addition, hazardous waste can be transported to permitted facilities outside California.

3.10.2.1 Harbor Generating Station

The HGS site generated approximately 600 tons of hazardous waste in 1999, most of which was oily water (158 tons), oil-impacted soil and debris (404 tons), and recovered oil/water from pipelines (40 tons). Other hazardous wastes included sand blast grit and parts washer solution.

3.10.2.2 Scattergood Generating Station

In 1999, the SGS site generated approximately 467 tons of hazardous waste, consisting primarily of oily water (362 tons) and friable asbestos (64 tons). Other hazardous wastes generated included waste aerosols, lamp ballasts, waste paint related material, fly ash, filter cake, and oil-impacted debris.

3.10.2.3 Valley Generating Station

The VGS site generated approximately 47 tons of hazardous waste in 1999, most of which was tetrachloroethylene-impacted liquids (40 tons). The other wastes included oil/water separator sludge, parts washer solution, petroleum naphtha, and dry cooling tower sludge.

3.10.3 Waste Minimization

The LADWP has an aggressive waste minimization program. In 1999, the LADWP disposed of 11,487 tons of nonhazardous waste and recycled 22,746 tons of material. The recycled material included metal, yard waste, paper, cardboard, and plastic.

Ongoing hazardous waste minimization efforts include using natural gas with low sulfur content as the primary fuel for power generating equipment, segregating and clearly/correctly labeling containers, providing drip pans to collect oil from leaking equipment, and monitoring boiler chemistry.

3.11 Transportation/Circulation

The transportation system utilized in the SCAQMD's jurisdiction is a multi-faceted and multi-modal system for moving people and goods. It includes an extensive network of freeways, highways and roads; public transit; and air and sea routes. This section describes the project sites in relation to the regional and local transportation setting. The existing circulation system is discussed, and existing traffic volumes and levels of service are summarized.

3.11.1 Surrounding Highway and Rail Network

Regional transportation facilities in the vicinity of the proposed project sites provide excellent accessibility to the entire southern California region. The HGS site is located east of the Harbor Freeway (Route 110), west of the Terminal Island Freeway (Route 103), and south of the San Diego Freeway (Interstate 405). The SGS site is located south of Imperial Highway (Route 105) and east of Pacific Coast Highway (Route 1). The VGS site is located northwest of the Golden State Freeway (Route 5) and Hollywood Freeway (Route 170) interchange.

In addition to the vehicular system, the project sites are serviced by a network of railroad facilities. This system provides an alternative mode of transportation for the distribution of goods and materials. The railroad network includes an extensive system of private railroads and several publicly-owned freight lines. The Southern California Regional Rail Authority operates commuter rail systems in the Los Angeles area. Additionally, Amtrak provides inter-city service, principally between San Diego and San Luis Obispo.

The Los Angeles area is served by two main line freight railroads--the Burlington Northern Santa Fe and the Union Pacific Railroad. These freight railroads connect southern California with other U.S. regions, Mexico and Canada via their connections with other railroads.

3.11.2 Local Roadways and Circulation Routes

A traffic analysis was performed for the three project sites by Austin-Foust Associates. The analysis is included in Appendix E.

The anticipated construction and operational traffic at SGS and VGS is forecasted to be below the Congestion Management Program (CMP) guidelines. The CMP is a state-mandated program to improve mobility and reduce traffic congestion to acceptable levels. Construction-generated traffic at either facility will be less than 50 trips per hour. Operation-generated traffic at either site will be less than five trips per day. Access to these sites is available via direct access routes to regional roadway and freeway facilities. Based on the minimal anticipated impacts, the existing traffic conditions in the vicinity of SGS and VGS are not included in this section.

The anticipated construction traffic at HGS will be above CMP guidelines and therefore, local roadways and intersections were analyzed in detail for HGS. The following is a description of local roadways and circulation routes.

Harbor Freeway (Interstate 110) – This is a six-to-eight lane freeway traveling from San Pedro to downtown Los Angeles. It passes west of the site and provides interchanges at “C” Street, Anaheim Street and Pacific Coast Highway.

San Diego Freeway (Interstate 405) – This is an eight-to-ten lane freeway traveling south-north from Irvine to San Fernando. It passes north of the site and provides an interchange on Alameda Street.

Alameda Street – This is a four-lane roadway extending west and north from the project site. There are a three signalized cross streets, including Pacific Coast Highway, Henry Ford Avenue, and Anaheim Street. Other cross street traffic is controlled by STOP signs and Alameda Street traffic does not stop at these locations.

Harry Bridges Boulevard – Alameda Street changes into Harry Bridges Boulevard as it turns into an east-west direction. Major intersections include Avalon Boulevard, Fries Avenue, Neptune Avenue and Figueroa Street.

Figueroa Street – This is a four lane north-south roadway extending from the project vicinity north to central Los Angeles and ends at a "T" intersection with Harry Bridges Boulevard. Located just north of Harry Bridges Boulevard are the Interstate 110 northbound on/off ramps.

Pacific Coast Highway – This is a six lane east-west arterial roadway located north of the project site and is a State Highway designated as SR-1.

Anaheim Street – This is a four lane east-west roadway.

Wilmington Boulevard – This is a four-to-six lane north-south roadway.

Avalon Boulevard – This is a four lane divided roadway extending north-south from Water Street south of the project site to south-central Los Angeles.

Fries Avenue – This is a four lane north-south roadway that provides access to incoming and outgoing traffic for the Port of Los Angeles and forms the eastern boundary for the HGS site.

Island Avenue – This is a two-lane north-south collector roadway providing access to residential neighborhoods north of Harry Bridges Boulevard and is the gated entrance to the HGS site south of Harry Bridges Boulevard.

Lagoon Avenue - This is a two-lane north-south collector roadway providing access to residential neighborhoods north of Harry Bridges Boulevard and forms the western boundary of the HGS site.

Water Street – This is a two-lane east-west collector roadway south of the project site in the Port of Los Angeles area and is used as an alternate route between Avalon Boulevard and Fries Avenue.

It is assumed that construction traffic generated by the proposed project at the HGS project site will access the site via Island Avenue and will be directed along Harry Bridges Boulevard toward the Harbor Freeway and Alameda Street toward Interstate 405.

3.11.3 Existing Traffic Conditions

A traffic analysis was performed by Austin-Foust Associates for the proposed modifications related to HGS. The results of the traffic analysis are included in Appendix E.

The HGS site is located at 161 North Island Avenue, City of Los Angeles (Wilmington) adjacent to the Port of Los Angeles. The HGS occupies an irregularly shaped parcel of land bordered by Harry Bridges Boulevard to the north; Avalon Boulevard to the east; a container storage area to the south; and Lagoon Avenue to the west.

Based on the anticipated circulation patterns for traffic associated with construction-related activities at the HGS site, the following seven intersections have been included in a traffic analysis.

1. Figueroa & I-110 Freeway NB on/off ramps
2. Figueora & Harry Bridges Blvd
3. Alameda & I-405 NB on/off ramp
4. Alameda & 223rd/Wardlow access
5. Alameda & Sepulveda
6. I-405 SB on/off & 223rd/Wardlow I-710 on/off ramp & Pier B St
7. 223rd & Alameda/Wardlow access

3.11.3.1 Traffic Estimates

Existing AM and PM peak hour turning movement volumes at these intersections were counted by Traffic Data Services, Inc. on October 19, 20, and 23, 2000, for intersections 1 and 2 above and on June 20, 2000, for intersection 3 through 7 above. The locations of these intersections are illustrated in Figures 3.11-1 and 3.11-2. Intersection capacity utilization (ICU) values are presented in Table 3.11-1 and are a means of representing peak hour volume/capacity ratios. The ICU is the proportion of an hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. If an intersection is operating at 80 percent of capacity, then 20 percent of the signal cycle is not used. The signal could show red on all indications 20 percent of the time and the signal would just accommodate approaching traffic. All intersections are presently operating at an acceptable level of service during the AM and PM peak hour under existing conditions.

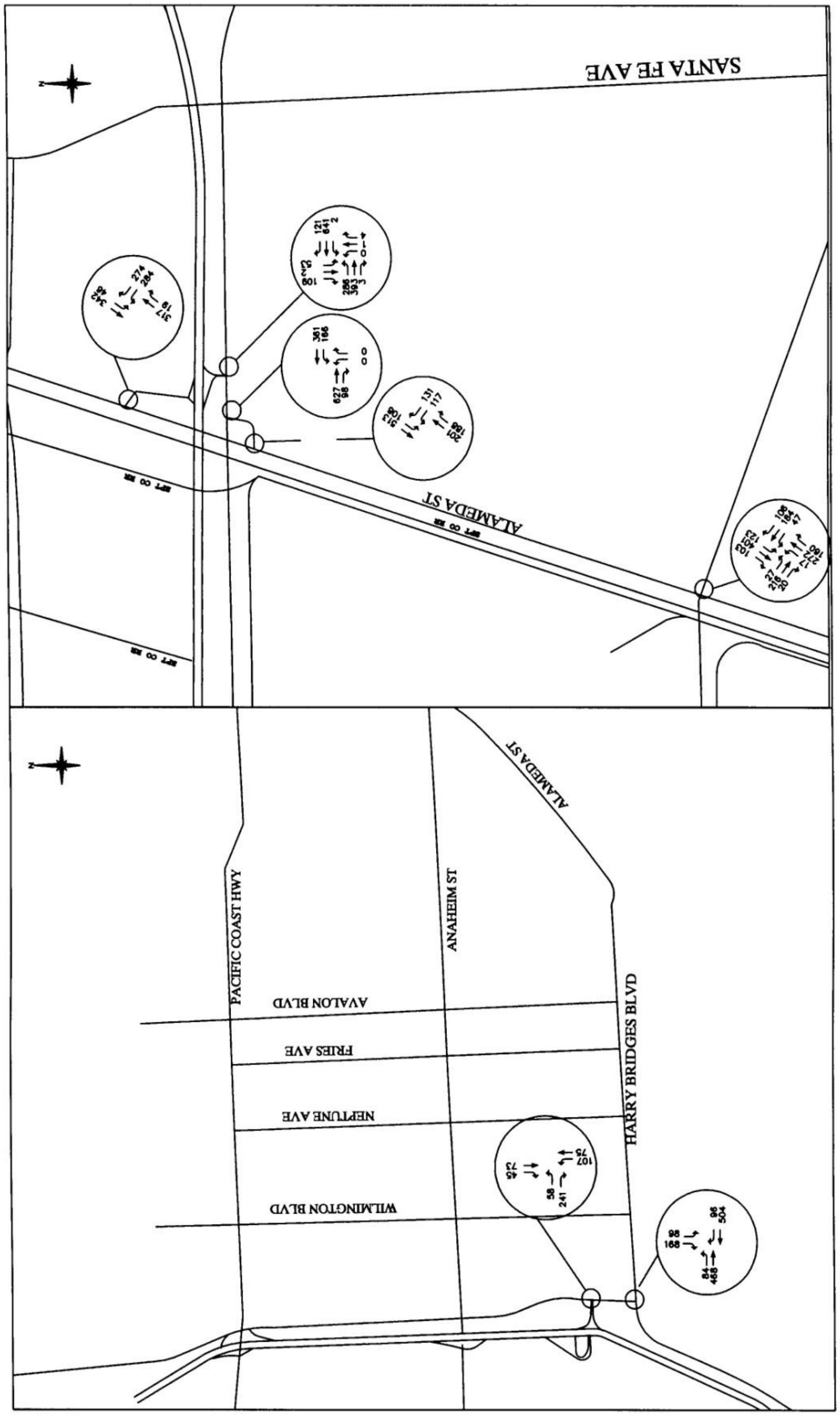


Figure 3.11-1
EXISTING AM
PEAK HOUR TURN VOLUMES (HGS)

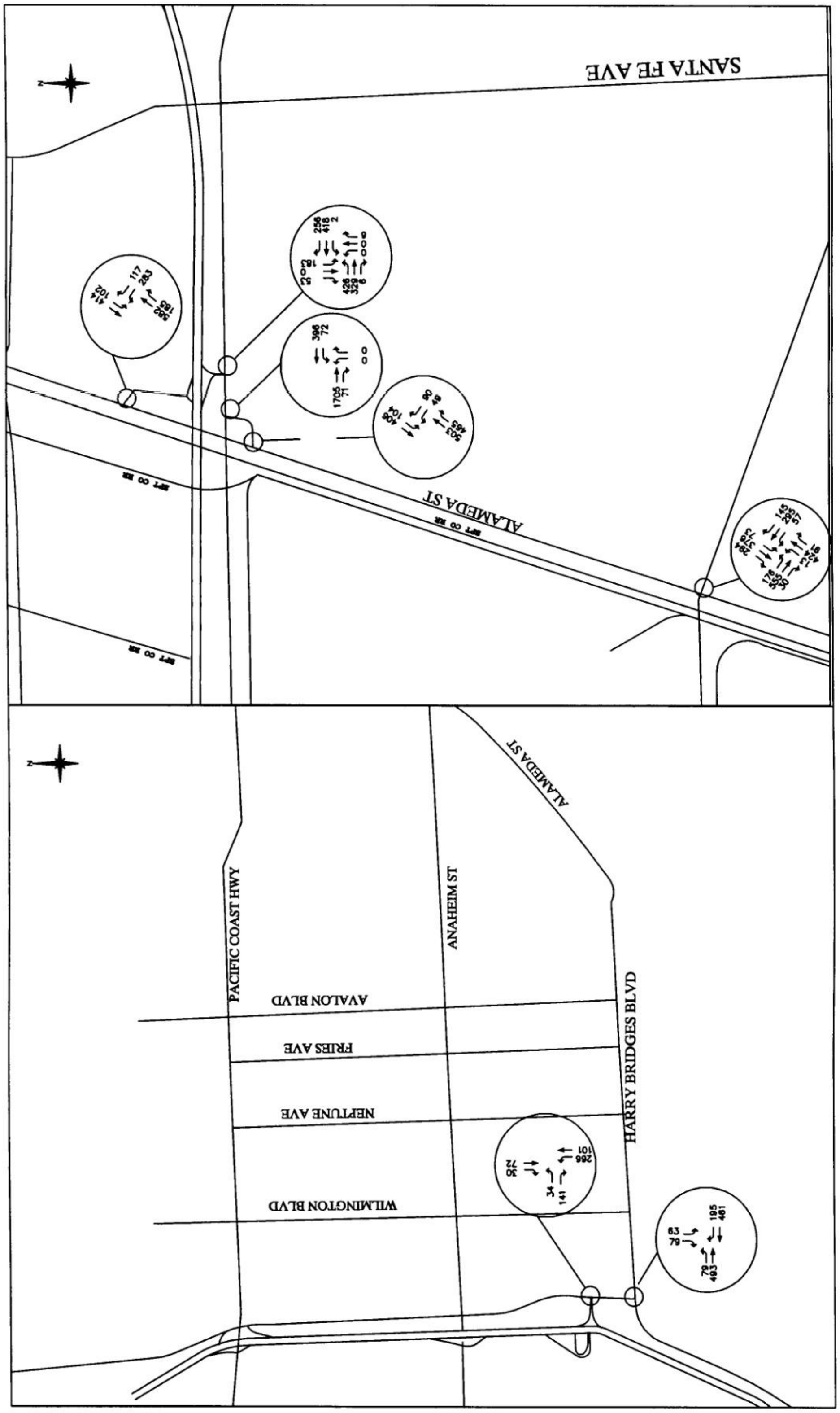


Figure 3.11-2
EXISTING PM PEAK HOUR TURN VOLUMES (HGS)

Table 3. 11-1
Existing Level of Service Summary

Intersection	Existing AM Peak Hour Volume/Capacity Ratio	Existing PM Peak Hour Volume/Capacity Ratio
1. Figueroa & I-110 Freeway	.36	.40
2. Figueroa & Harry S. Bridges	.42	.41
3. Alameda & I-405 Northbound	.41	.52
4. Alameda & 223rd/Wardlow Access	.37	.52
5. Alameda & Sepulveda	.51	.83
6. I-405 Southbound On/Off Ramp & 223rd/Wardlow	.42	.50
7. 223rd & Alameda/Wardlow Access	.45	.81
Level of Services Ranges: .00 - .60 A; .61 - .70 B; .71 - .80 C	.81 - .90 D; .91 – 1.0 E; Above 1.0 F	

3.11.3.2 Average Daily Traffic (ADT)

Existing ADT volumes were collected for selected roadway links near the HGS and then compared to the ADT volumes previously estimated in a 1991 study completed for the LADWP HGS Repowering Project. The 1991 study indicated that the proposed HGS Repowering Project would not have significant traffic impacts. The comparison of the existing (Year 2000) and 1991 24-hour traffic volumes on Harry Bridges Boulevard east of Figueroa Street and east of Avalon Boulevard is summarized in Table 3.11-2.

An examination of this table indicates that the growth in traffic volumes in this area have been relatively level since 1991. In fact, the direct comparison of the selected roadway links indicates a 15 to 20 percent reduction in the ADT on roadways adjacent to HGS. When the proposed project site traffic is added to current (Year 2000) existing conditions, the total daily traffic remains less than what previously existed in 1991. It should be noted that the Year 2000 volume counts were measured for one day only, whereas the 1991 volume counts may have been measured over a longer period of time and thereby more accurately representing the conditions along the roadway segments at that time. A worst-case assumption using a one percent increase per year to the 1991 volumes would yield a traffic volume of 24,416 vehicles at the Figueroa Street segment and 21,037 vehicles at the Avalon Boulevard segment. This would result in a v/c ratio of .69 (LOS B) at the Figueroa Street segment and a v/c ratio of .58 (LOS A) at the Avalon Boulevard segment for Year 2000.

Both comparisons demonstrate that traffic volumes in this area have been relatively level since 1991. Additionally, the comparisons demonstrate that adequate roadway capacity is available in the project site area.

Table 3.11-2
Comparison of Existing (Year 2000) and 1991 Traffic Volumes

Location	Capacity	1991 Vol.	1991 V/C	2000 Vol.	2000 V/C	Project Vol.	Exist+Prj Vol.	Exist+Prj V/C
East of Figueroa St.	36,000	22,400	.62 (B)	18,800	.52 (A)	140	18,940	.53 (A)
East of Avalon Blvd	36,000	19,300	.54 (A)	13,600	.38 (A)	60	13,330	.38 (A)

3.12 Other Issue Areas Eliminated During the Initial Study

The NOP/IS for the proposed project released to the public on October 3, 2000 includes an environmental checklist of approximately 17 environmental topics. The IS concluded that the project would have not significant direct or indirect adverse effects on the following environmental topics:

- Aesthetics
- Agricultural Resources
- Cultural Resources
- Land Use/Planning
- Mineral Resources
- Population/Housing
- Public Services
- Recreation

However, a comment was received requesting additional information on Cultural Resources; therefore, Cultural Resources have been considered in this ~~Draft~~Final EIR.

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