Resource, Reliability and Environmental Concerns of Aging Power Plant Operations and Retirements

California Energy Commission

APPENDIX A
PLANT DATA SHEETS

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Alamitos

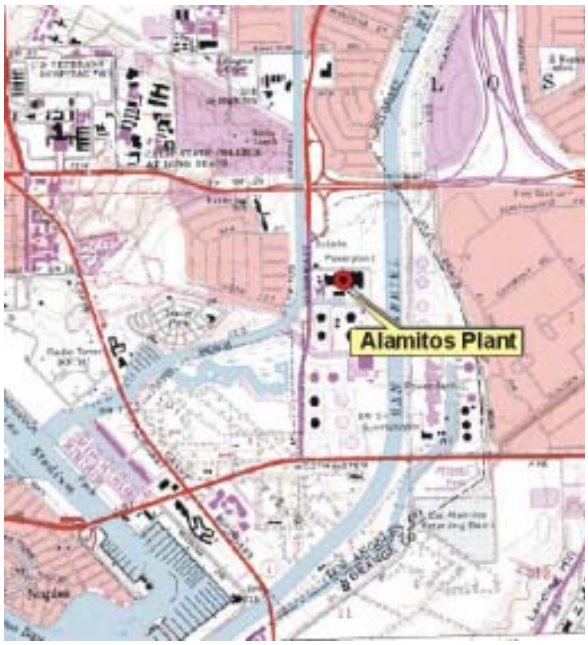
CEC ID: G0011 EIA ID: 315

Address: 690 North Studebaker Road
Long Beach, CA 90803

County: Los Angeles

Air Basin: Los Angeles

Directions: Location is on the border of LA and Orange counties, very close to intersection of 405 and 605 freeways. From 405 in southern Long Beach take the Studebaker Road exit and proceed south on Studebaker Road for approximately 1.1 miles to the plant entrance.



Facility Overview

Plant nominal capacity: Steam turbines: 1,950 MW (Units 1-6)
Combustion turbine: 133 MW (Unit 7), not part of this study.

Plant Owner/Operator

Owner name: AES Southland, LLC (AES Corp.)

Owner address: 690 N. Studebaker Road
Long Beach, CA 90803

Operator name: AES Southland, LLC

Operator address: same

Site

Size: The total plant site is 234 acres. AES Southland, LLX owns 127 acres. Southern California Edison (SCE) owns the remainder (107 acres).

Description:	The site has seven power generating units, two related retention basins, and a channel-fed cooling system. Within the fenced plant boundary there is also a fuel oil storage system (approximately 2 million barrels) owned by the Edison Pipeline & Terminal Company, major electrical switchyards (220-kV, 66-kV, and 12-kV) owned by SCE, and other miscellaneous SCE facilities.
Surrounding area:	Surrounding facilities include a variety of residential, commercial, retail, office, hotel, and light industrial development. The closest residences are located 300 feet to the west across Studebaker Road and Los Cerritos Channel, and 500 feet north across State Route 22. East of the generating station, across the San Gabriel River, is the Los Angeles Department of Water and Power's Haynes Generating Station. Beyond the Haynes Generating Station lie residential areas within the City of Seal Beach. North of the facility is State Highway 22 (Seventh Street), beyond which lies a large area of residential and commercial uses. The south side of the generating station is bordered by Westminster Avenue. Across Westminster Avenue to the south is an area of open space and oil fields. In addition, a variety of uses west of the generating station (across Studebaker Road and the Los Cerritos Channel) include an oil field, open space area, commercial development, and residential areas. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	Long Beach General Plan, the Southeast Development Improvement Plan (SEADIP), and the Long Beach Local Coastal Program (LCP). **General Plan**: Land Use District (LUD) No. 7, Mixed Use District **Local Coastal Program**: within Coastal Zone and designated as PD-1 (Planned Development District, Subarea 19); **Southeast Area Communities** (SEADIP) area designated as an IG zone (General Industrial)

Cooling

Cooling system	Three once-through cooling water systems: one serving Units 1 and 2, one serving Units 3 and 4, and one serving Units 5 and 6. Unit 7 is air cooled.
Cooling sources:	Alamitos Bay (Units 1-6). Short intake canals (2) from the Cerritos Channel, which in turn takes water from Alamitos Bay Marina, part of the Long Beach Marina, which in turn is within the Long Beach Outer Harbor. Inland from the intakes the Channel becomes Los Coyotes Flood Control Channel, which substantially affects the intake operations during rainy periods.

Cooling discharge:	Wastes are discharged to the San Gabriel River Flood Control Channel (Units 1-6) through three channel bank outfalls that lie approximately 2,000 feet north of Westminster Avenue, along the western bank of the river. This River also receives the discharge of the LADWP Haynes Power Plant.
Cooling system details:	Each cooling water system incorporates screen systems designed to remove trash, algae, marine life, and other materials from the cooling water. The intake structure for Units 1 and 2 draws 144,000 GPM (4 pumps). The cooling water intake structure for Units 3 and 4 draws 272,000 GPM (4 pumps). Cooling water for Units 5 and 6 is provided by a separate canal extending from the Los Cerritos Channel. This canal branches off to two separate but identical intake structures, one serving Unit 5 and one serving Unit 6. These intake structures draw a total of 467,600 GPM (4 pumps). Heated water is discharged via sluiceways to the San Gabriel River at three points approximately two miles upstream of the river mouth. The discharges to the river are through channel bank outfalls located in the west river bank.
Cooling system	The NPDES permit (Order No. 00-082; NPDES Permit No. CA0001139) allows a maximum discharge of 1,282.8 MGD consisting of once-through cooling water from six steam electric power generating units, sanitary wastes, and wastes from three retention basins. Discharge No. 001 (Units 1 & 2) total maximum flow of 210.5 MGD consists of 208 MGD once-through cooling water, and the remainder is other waste. Discharge No. 002 (Units 3 & 4) total maximum flow of 389 MGD is once-through cooling water. Discharge No. 003 (Units 5 & 6) total maximum flow of 683.1 MGD consists of 674 MGD once-through cooling water, and the remainder is other wastes. Total maximum flow of once-through cooling water based on the information presented above is 1,271 MGD. 1,275 MGD maximum permitted per Los Angeles RWQCB, 2002.
Screening system:	All 6 units are equipped with traveling type screens. All use screens of approximately 1-inch mesh. Trash bars pre-screen for very large debris.
Biofouling Control:	Continuous chlorination by aqueous solution of Sodium Hypochlorite, admitted before condensers. Thermal heat treatment every 5 to 8 weeks for control of black mussels and algae.

Electrical Interconnect

Description:	220-kV and 66-kV switchyards
Transmission details:	All units connect electrically to the on-site switchyard of SCE, all at 220-kV. The switchyard feeds six (6) 220-kV transmission lines that connect to various other Southern California Edison (SCE) substations.
Site arrangement:	Alamitos is a major switching center for the SCE utility. There are two sections of double bus breaker arrangements at 220-kV. There is also a large 220/66-kV substation and 66/12-kV substation. The transmission lines into the 220-kV switchyard terminate at the following major substations: Lighthipe, Center, Barre #1 and Barre #2. The peaking unit 7 is connected to the 66-kV switchyard.

Fuel Supply

Fuel type:	Natural gas. All units were originally designed for oil and/or gas fuel, and were modified many years ago to use natural gas fuel only.
Fuel system description:	A Southern California Gas Company gas transmission line is located at the northeast corner of the property. There are various pressure reducing stations to bring gas to the pressure required for the power plant.

Units 1 & 2

Air Pollution Control:

Limited to natural gas fuel, using low NOx burners (per ARB Database), SCR, and ammonia injection.

Emissions Limits Unit No. 1 and No. 2:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	---	9 ppmv @ 3% O2
CO	500 ppmv 2000 ppmv	300 ppmv @ 3% O2 (Unit 1) 500 ppmv @ 3% O2 (Unit 2)
PM	0.1 grains/dscf	0.1 grains/dscf @ 3% O2
SOx	Boiler No. 1 = 2751 tons/yr Boiler No. 2 = 105 tons/yr	Boiler No. 1 = 2751 tons/yr Boiler No. 2 = 105 tons/yr
NH3	10 ppmv	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Cal ISO dispatched. Units 1 & 2 were NOT designated Reliability Must Run (RMR) in 2001, but are designated RMR in 2002. According to the AES web site (July 2002), "The station has the capability to supply 2083 MWs of energy into the Southern California electrical grid, which is controlled by the California Independent System Operator (CAISO). This capacity is provided from six individual steam generating units and a combustion turbine peaking unit. Williams Energy Marketing and Trading supplies gas to the facility and has dispatch rights to all the plant output under a long term 'Tolling Agreement'. The plants can also be dispatched by the CAISO, through Williams, under the terms of a Must Run Agreement which is in place to provide grid reliability services during times the plant wouldn't normally be running for economic reasons." There is also an agreement between California DWR and Alleghany Energy Supply Company, LLC, concerning the Alamitos generation.

Units 3 & 4

Air Pollution Control:

Limited to natural gas fuel, using flue gas recirculation, SCR, and ammonia injection.

Emissions Limits Unit No. 3 and No. 4:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	---	9 ppmv @ 3% O2
CO	300 ppmv	500 ppmv @ 3% O2
PM	0.1 grains/dscf	0.1 grains/dscf @ 3% O2
SOx	Boiler No. 3 = 290 tons/yr Boiler No. 4 = 814 tons/yr	Boiler No. 3 = 290 tons/yr Boiler No. 4 = 814 tons/yr
NH3	10 ppmv	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:

Cal ISO dispatched, subject to a "must run" agreement since divestiture. In 2001, approximately 90% energy sold into market. 3,456 & 3,715 hours dispatched as a Reliability Must Run (RMR) unit (Cal ISO), although only one (1) start per unit was designated as due to RMR.

Refer to Units 1 & 2 for Power Sales Arrangement discussion.

Units 5 & 6

Air Pollution Control:

Limited to natural gas fuel, using flue gas recirculation, low NOx burners (Unit 5 only per ARB Database), SCR and ammonia injection.

Emissions Limits Unit No. 5 and No. 6:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	10.75 lbs/1000 gal fuel oil	9 ppmv @ 3% O2
CO	250 ppmv (fuel oil) 300 ppmv (natural gas)	250 ppmv @ 3% O2
PM	0.1 grains/dscf	0.1 grains/dscf @ 3% O2
SOx	Boiler No. 5 = 4193 tons/yr Boiler No. 6 = 1476 tons/yr 500 ppmv (fuel oil)	Boiler No. 5 = 4193 tons/yr
NH3	20 ppmv	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:

Cal ISO dispatched. Not subject to a "must run" agreement.

Refer to Units 1 & 2 for Power Sales Arrangement discussion.

Basic Unit Information

Unit	**1**	**2**	**3**	**4**	**5**	**6**
Dependable MW	175	175	320	320	480	480
Minimum Load MW	10	10	25	25	75	75
Online Date	Sep-1956	Feb-1957	Dec-1961	Jun-1962	Mar-1964	Sep-1966
RMR in 2004	-	-	Yes	-	-	-
SCR Installed	Yes	Yes	Yes	Yes	Yes	Yes

2003 Performance

Unit	**1**	**2**	**3**	**4**	**5**	**6**
Capacity Factor	0.081	0.085	0.389	0.222	0.205	0.186
Heat Rate, Btu/kWh						
minimum load	26,143	26,324	18,409	16,827	14,901	15,219
average	13,735	13,443	10,877	10,800	10,830	11,250
maximum load	11,566	11,154	9,849	9,756	9,762	9,590
NOx Rate, lb/MMBtu	0.0267	0.0129	0.0133	0.0152	0.0068	0.0129
NOx Rate, lb/MWh	0.366	0.174	0.145	0.164	0.074	0.145

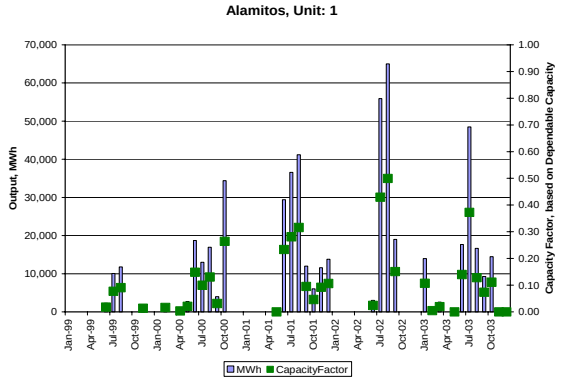
Past Five Years

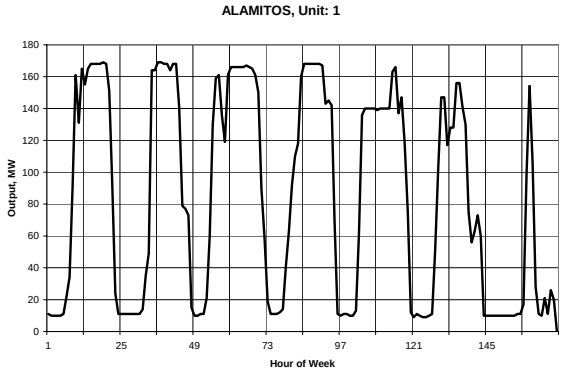
Unit	1	2	3	4	5	6
Output, MWh						
1999	25,780	81,440	675,886	501,672	1,015,275	659,169
2000	92,145	258,765	941,062	1,187,113	2,142,964	1,720,153
2001	150,610	314,010	1,300,483	1,326,102	2,821,879	2,682,933
2002	142,973	167,808	1,043,989	710,764	1,433,863	619,790
2003	123,589	129,675	1,089,514	622,817	861,684	784,026
Fuel Use, MMBtu						
1999	343,590	1,018,501	7,164,957	5,376,940	10,062,745	6,791,140
2000	1,270,948	3,439,026	10,195,813	12,977,760	21,245,466	17,415,529
2001	2,043,036	4,286,590	13,954,421	15,100,881	27,333,804	26,711,123
2002	1,809,292	2,164,441	11,092,860	7,777,044	14,778,222	6,626,704
2003	1,697,498	1,743,236	11,851,019	6,726,485	9,331,992	8,820,179
NOx Emission, pounds						
1999	25,780	81,440	675,886	501,672	1,015,275	659,169
2000	92,145	258,765	941,062	1,187,113	2,142,964	1,720,153
2001	150,610	314,010	1,300,483	1,326,102	2,821,879	2,682,933
2002	142,973	167,808	1,043,989	710,764	1,433,863	619,790
2003	123,589	129,675	1,089,514	622,817	861,684	784,026

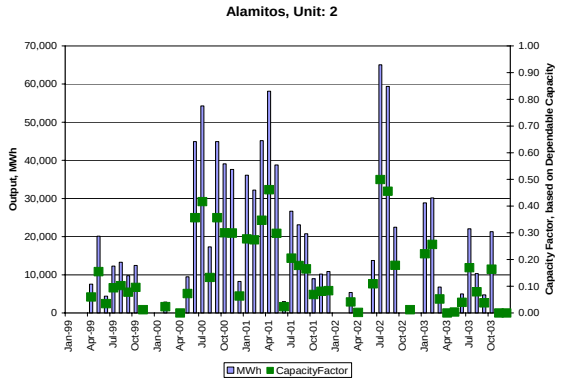
Charts

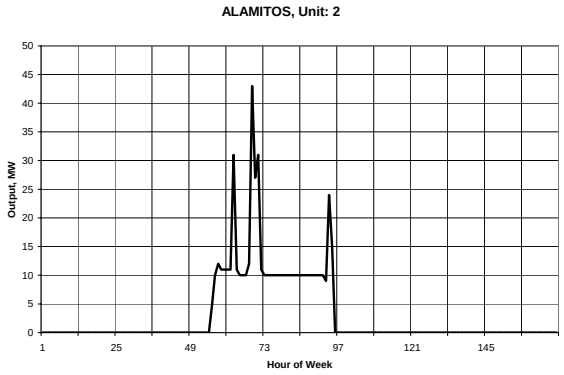
Monthly Output & Capacity Factor

Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)

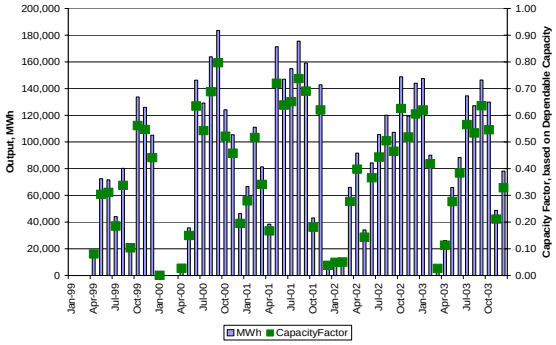




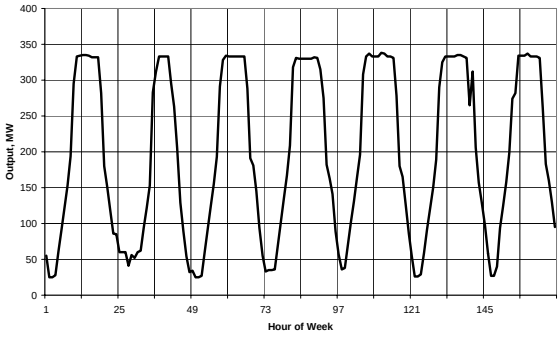




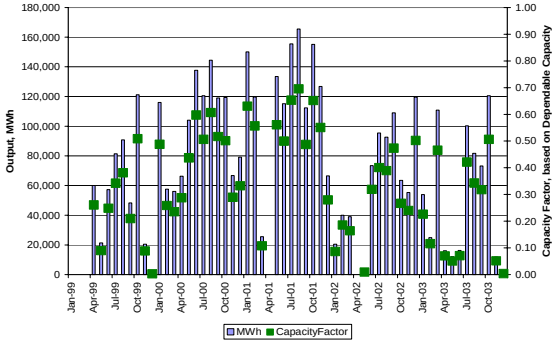
Alamitos, Unit: 3



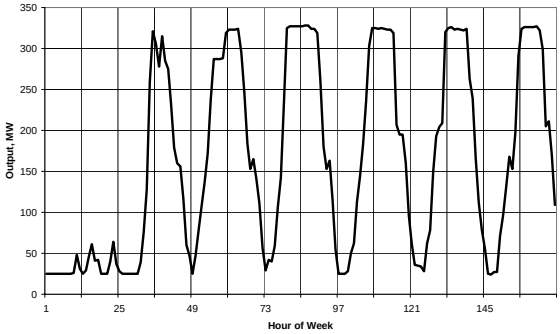
ALAMITOS, Unit: 3



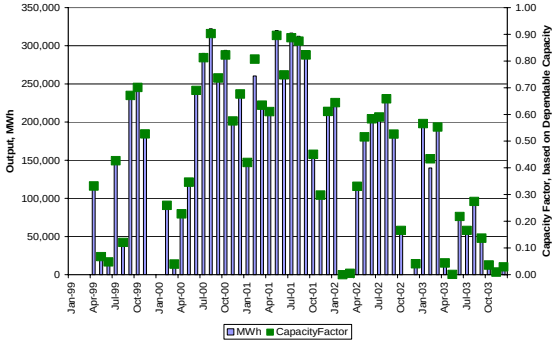
Alamitos, Unit: 4



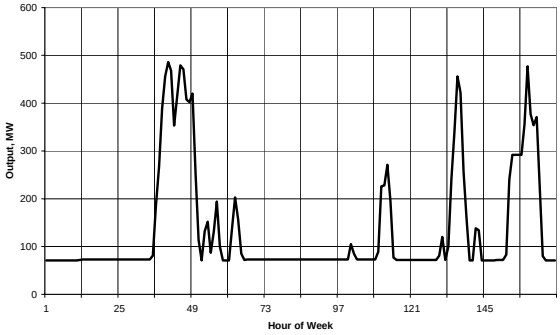
ALAMITOS, Unit: 4



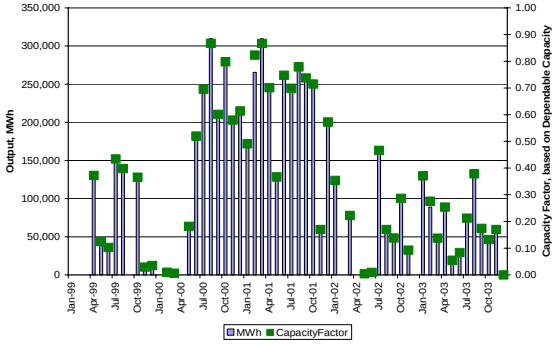
Alamitos, Unit: 5



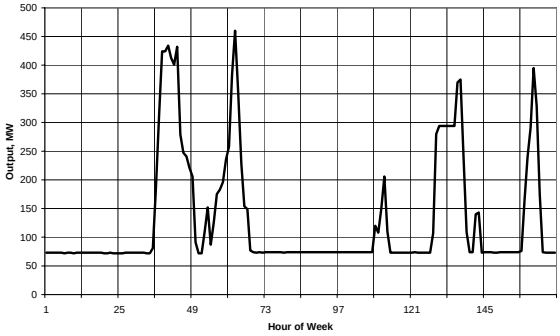
ALAMITOS, Unit: 5



Alamitos, Unit: 6



ALAMITOS, Unit: 6



Permits/Agreements

Air:	▪ Facility Permit to Operate, January 01, 2000: Issued by South Coast Air Quality Management District (Facility I.D.# 115394) ▪ Facility Permit to Operate, January 01, 2001 ▪ Facility Permit to Operate, March 09, 2001 ▪ Initial Title V Permit Issued: August 19, 1999. Title V Permit Expiration Date: August 18, 2004
Water:	**NPDES Permit No. CA0001139; CI-6113** ▪ Issuing Agency: Los Angeles RWQCB ▪ Effective Date: May 30, 2000, Revised June 29, 2000. ▪ Expiration Date: May 10, 2005. ▪ Order No. 00-082 (Waste Discharge Requirements) serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	95 - 96	**96 - 97**	**97 - 98**	**98 - 99**	**99 - 2000**
NO_x	---	---	44.30	902.00	1,063.86
PM_{10}	---	---	1.50	12.51	15.64
VOC	---	---	1.18	34.43	50.16
CO	---	---	9.05	253.22	330.06
SO_x	---	---	0.32	9.47	11.80

Source: Annual Reports from South Coast Air Quality Management District for Facility ID #115394.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	653.3	717.9	717.9	717.9	717.9
PM_{10}	53.4	47.2	47.2	47.2	47.2
VOC	35.8	31.1	33.3	31.1	33.3
CO	319.6	283.9	283.9	283.9	283.9
SO_x	20.8	15.7	15.7	15.7	15.7

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Attainment Status:

Pollutant	South Coast Attainment Status for 2002	
	Federal	**State**
Ozone – One hour	Extreme Nonattainment	Extreme Nonattainment
CO	Serious Nonattainment	Nonattainment [1]
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Serious Nonattainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note (1): Only L.A. County is in nonattainment for CO. All other areas of the South Coast APCD are in attainment

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: Nearby resources include San Gabriel River Channel and Cerritos River Channel.

Listed Marine Species: No marine species listed in the California Natural Diversity Database within one-mile of the generating station site.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Nearby resources include San Gabriel River Channel and Cerritos River Channel.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Los Alamitos Regions				
Centromadia parryi ssp australis	Southern tarplant			Annual herb-May-November
Passerculus sandwichensis beldingi	Belding's savannah sparrow	SE	Year round resident in salt marsh habitat	Year-long in its preferred habitat
Phrynosoma coronatum blainvillei	San Diego horned lizard		Coastal sage scrub in friable sandy and rocky soils from L.A. south to Baja California.	Warm periods
Sidalcea neomexicana	Salt spring checkerbloom			Perennial herb-March-June
Centromadia parryi ssp australis	Southern tarplant			Annual herb-May-November
Southern coastal salt marsh	Southern coastal salt marsh			
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	No visual treatment is utilized on the power plant. No visual screening on east side of facility other than levy wall. Tall landscaping (20-foot) with slated fencing and an earthen berm located on south side of plant along Westminster Avenue. West side of facility screened by a number of different methods, including fencing with slats or climbing vegetation, earthen berms, and dense landscaping. Large trees and earthen berms screen the north side of the facility.
Perimeter fencing/walls, height of the fencing/wall (ft)	8- to 10-foot cyclone fencing with barbed wire surrounds the facility. Heavy-duty gate at entrance to facility.
Landscaping	Ornamental flower beds and trees surround entrance to facility and administration building. The landscaping on the west and south sides of the facility included dense plantings of bottle brush, eucalyptus, pine, and Australian tea-trees. Ice plant and climbing vines occupied many areas of the understory. Scattered populations of mature evergreens were planted along the facilities eastern border.
Visual plumes – number and size	One 500-foot plume (estimated) was visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 1 through 6), which creates no visible water vapor plumes from cooling operations. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The power boiler (Units 1 through 6) exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

The existing Unit 7 peaking turbines may have a yellow to brown NO_x exhaust plume. The outlet exhaust temperature for this unit is too high to allow formation of water vapor.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	559,634	66,907 (12.0%)
2000 Minority	593,923	304,216 (51.2%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Long Beach		
Total Population	461,522	54.8% minority
Households	163,088	2.77 persons/household
Total Housing Units	171,632	5.0% vacancy rate
Labor Force	226,670	6.1% unemployment
Los Angeles County		
Total Population	9,519,338	51.3% minority
Households	3,133,774	2.98 persons/household
Total Housing Units	3,270,909	4.2% vacancy rate
Labor Force	4,857,500	6.5% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department Labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Broadway

CEC ID: G0061 EIA ID: 420

Address: 130 Wallis Street
Pasadena, CA 91105

County: Los Angeles

Directions:

could not find Wallis Street on map, address out of date?

Facility Overview

Plant nominal capacity:

Generating units:

Cooling system:

Plant Owner/Operator

Owner name: City of Pasadena

Owner address:

Owner contact:

Operator name: City of Pasadena

Operator address:

Operator contact:

Site

Size: The total Broadway plant site is 6.11 acres.

Description: The site has one 65MW steam unit and a cooling tower system. Major electrical switchyards (17-kV, 4-kV) and other miscellaneous facilities are owned by Pasadena Water and Power.

Surrounding area:	Surrounding land uses include Interstate-110, general commercial uses, restaurants, residential apartment buildings, and Blair High School.	
General Plan and Zoning Designations:	Central District Specific Plan	IG SP2 (General Industrial)

Cooling

Cooling system type:	
Cooling sources:	
Cooling discharge:	Zero liquid discharge
Cooling system details:	
Cooling system flow:	
Screening system:	
Biofouling Control:	

Electrical Interconnect

Description:	
Transmission details:	
Site arrangement:	

Fuel Supply

Fuel type:	
Fuel system description:	

Basic Unit Information

Unit	**B3**
Dependable MW	66
Minimum Load MW	20
Online Date	Jun-1965
RMR in 2004	No
SCR Installed	Yes

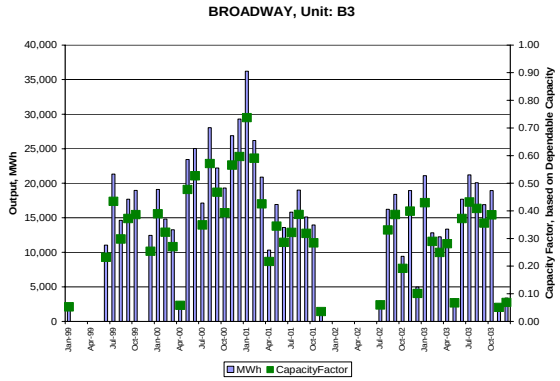
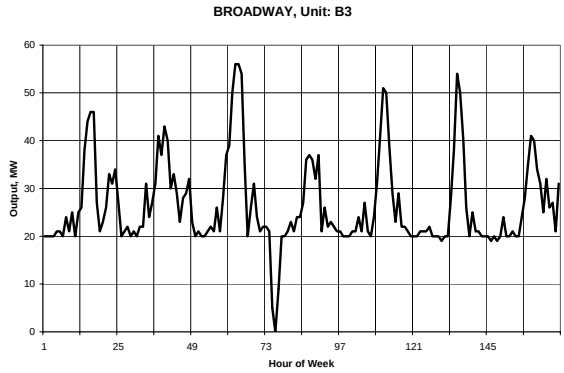
2003 Performance

Unit	**B3**
Capacity Factor	0.283
Heat Rate, Btu/kWh	
minimum load	12,330
average	11,744
maximum load	10,269
NOx Rate, lb/MMBtu	0.0271
NOx Rate, lb/MWh	0.318

Past Five Years

Unit	**B3**
Output, MWh	
1999	98,690
2000	241,329
2001	189,715
2002	70,886
2003	163,389
Fuel Use, MMBtu	
1999	1,173,957
2000	2,660,367
2001	2,157,003
2002	849,276
2003	1,918,919
NOx Emission, pounds	
1999	26,693
2000	62,176
2001	46,393
2002	19,604
2003	52,008

Charts

Monthly Output & Capacity Factor	Hourly Output During CAISO Peak Week in 2003 (7/19/2003 - 7/25/2003)
	

Permits/Agreements

Air:	▪
Water:	**Storm Water General Permit** ▪ Issuing Agency:

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	**1997**	**1998**	**1999**	**2000**	**2001**
NO_x						
PM_{10}						
VOC						
CO						
SO_x						

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x					
PM_{10}					
VOC					
CO					
SO_x					

.

Complaint Logs:

Notices of Violation (NOV):

Issued Date	**Description**	Status

Notices to Comply (N/C):

Class I Setting:

Attainment Status:

Pollutant	___ AQMD Attainment Status for 2002	
	Federal	State
Ozone – One hour		
CO		
NO_2		
SO_2		
PM_{10}		
Lead		

Source:

Emission Offset Availability:

Total Emission Reduction Credits Available (tons/year) as of

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements: zero liquid discharge

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: None identified in the surrounding area.

Listed Non-Marine Species:

Scientific Name	Common Name	Status	Habitat	Survey Timing Guidelines and Flowering Periods
Helianthus nuttallii ssp. parishii	Los Angeles sunflower	State Presumed Extinct	Marshes and swamps (coastal salt and freshwater).	
Ribes divaricatum var. parishii	Parish's gooseberry	State candidate	Salix swales in riparian woodland	
Linanthus orcuttii	Orcutt's linanthus	State candidate	Chaparral, lower montane coniferous forest.	

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual Resources	
Visual screening	
Perimeter fencing/walls, height of the fencing/wall (ft)	
Landscaping	
Visual plumes – number and size	

Any Existing Plume Abatement Measures:

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income		
2000 Minority		

Source:

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of		
Total Population		
Households		
Total Housing Units		
Labor Force		
Los Angeles County		
Total Population		
Households		
Total Housing Units		
Labor Force		

Source:

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Coolwater

CEC ID: G0767 EIA ID: 329

Address: 37000 Santa Fe Street
Dagget, CA 92327

County: San Bernardino

Directions:

Facility Overview

Plant nominal capacity:	628 MW
Generating units:	Unit1: steam turbine, 65 MW Unit 2: steam turbine, 81 MW Unit 3: combined cycle, 241 MW Unit 4: combined cycle, 241 MW
Cooling system:	

Plant Owner/Operator

Owner name:	Reliant Energy Coolwater LLC	***Operator name:***	Reliant Energy Coolwater LLC
Owner address:		***Operator address:***	
Owner contact:		***Operator contact:***	

Site

Size:	The total plant site is _280____ acres. Reliant Energy owns_280___ acres. Southern California Edison (SCE) owns the remaining __0__acres.
Description:	The site has _4___ power generating units, related retention basins/evap. ponds? , and a cooling tower system. Within the fenced plant boundary there is also a fuel oil storage system (approximately _60,000_barrels) owned by the Reliant Company, major electrical switchyards (220-kV (units 3&4), 115-kV (Units 1&2)) owned by SCE, and other miscellaneous SCE facilities.
Surrounding area:	Surrounding land uses include a closed coal gasification demonstration facility, solar energy facilities, Mojave Desert open spaces, the Mojave River, Interstate 40, the Atchison, Topeka and Santa Fe rail lines, and scattered rural residences. The small rural community of Daggett, in San Bernardino County, is located approximately 2.5 miles to the west.
General Plan and Zoning Designations:	General Plan - Rural Living (RL) and Rural Conservation (RC) / Zoning – Regional Industrial (IR). Utility uses are permitted in all zoning districts, subject to site approval during a conditional use permit (CUP) process.

Cooling

Cooling system type:	
Cooling sources:	
Cooling discharge:	
Cooling system details:	
Cooling system flow:	
Screening system:	
Biofouling Control:	

Electrical Interconnect

Description:	
Transmission details:	
Site arrangement:	

Fuel Supply

Fuel type:	Natural gas.
Fuel system description:	

Basic Unit Information

Unit	**1**	**2**	**3**	**4**
Dependable MW	65	81	241	241
Minimum Load MW	20	20	N/A	N/A
Online Date	Jun-1961	May-1962	May-1978	Aug-1978
RMR in 2004	No	No	No	No
SCR Installed	No	No	No	No

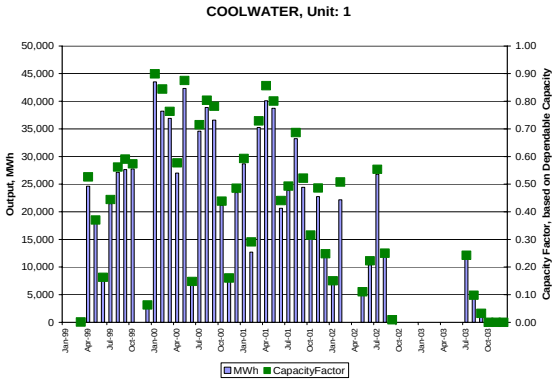
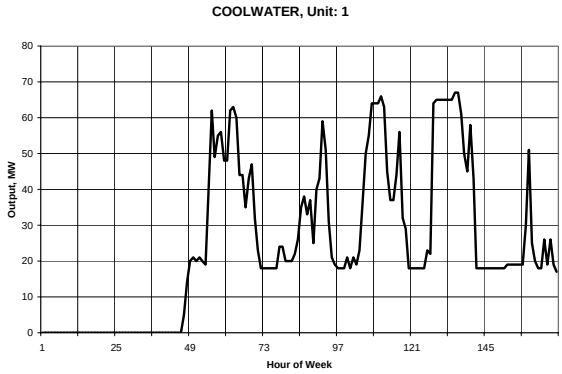
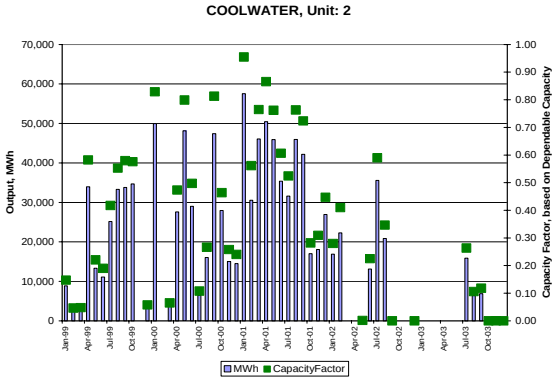
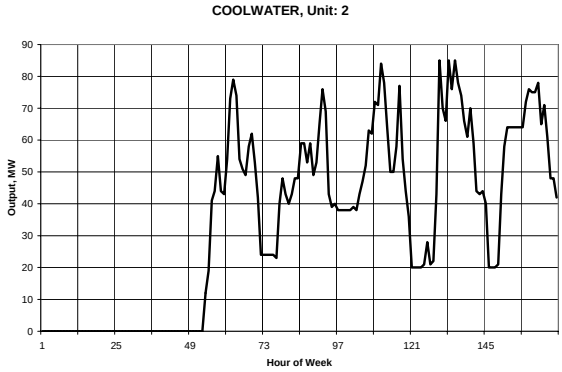
2003 Performance

Unit	**1**	**2**	**3**	**4**
Capacity Factor	0.032	0.041	0.338	0.256
Heat Rate, Btu/kWh				
minimum load	12,005	12,506	N/A	N/A
average	9,018	10,082	10,246	10,231
maximum load	8,969	9,802	N/A	N/A
NOx Rate, lb/MMBtu	0.0724	0.0673	0.1050	0.1059
NOx Rate, lb/MWh	0.653	0.678	1.076	1.084

Past Five Years

Unit	**1**	**2**	**3**	**4**
Output, MWh				
1999	157,283	203,014	1,004,361	933,791
2000	357,069	286,023	696,410	1,384,022
2001	307,534	447,708	1,470,675	942,969
2002	84,534	108,811	924,941	780,789
2003	17,980	29,151	712,983	539,815
Fuel Use, MMBtu				
1999	1,642,649	2,131,716	10,159,043	9,986,719
2000	3,566,984	2,876,916	6,606,160	14,754,393
2001	3,134,731	4,517,243	13,339,043	9,453,411
2002	531,450	1,122,956	7,951,116	7,550,848
2003	162,142	293,885	7,305,048	5,522,610
NOx Emission, pounds				
1999	160,451	202,523	1,234,742	1,320,266
2000	269,046	285,115	857,436	1,617,134
2001	229,293	462,379	1,067,207	952,322
2002	45,130	100,371	934,509	819,320
2003	11,734	19,776	767,344	584,943

Charts

Monthly Output & Capacity Factor	Hourly Output During CAISO Peak Week in 2003 (7/19/2003 - 7/25/2003)
	
	

Permits/Agreements

Air:	▪
Water:	**Storm Water General Permit** ▪ Issuing Agency:

Environmental Information: Air Quality

Plant Emissions:

	Reported Emissions 1996 – 2001 (t/yr)					
Pollutant	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
NO_x						
PM_{10}						
VOC						
CO						
SO_x						

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x					
PM_{10}					
VOC					
CO					
SO_x					

.

Complaint Logs:

Notices of Violation (NOV):

Issued Date	Description	Status

Notices to Comply (N/C):

Class I Setting: .

Attainment Status:

Pollutant	___ AQMD Attainment Status for 2002	
	Federal	State
Ozone – One hour		
CO		
NO_2		
SO_2		
PM_{10}		
Lead		

Source:

Emission Offset Availability:

Total Emission Reduction Credits Available (tons/year) as of

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: None identified in the surrounding area.

Listed Non-Marine Species:

Scientific Name	Common Name	Status	Habitat	Survey Timing Guidelines and Flowering Periods
Mentzelia tridentata	Creamy blazing star	State candidate	Mojave desert scrub	
Gopherus agassizii	Desert tortoise	Federal and State Threatened	Mojave desert scrub	

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual Resources	
Visual screening	
Perimeter fencing/walls, height of the fencing/wall (ft)	
Landscaping	
Visual plumes – number and size	

Any Existing Plume Abatement Measures:

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income		
2000 Minority		

Source:

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of		
Total Population		
Households		
Total Housing Units		
Labor Force		
San Bernardino County		
Total Population		
Households		
Total Housing Units		
Labor Force		

Source:

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Contra Costa

CEC ID: G0147 EIA ID: 228

Address: 3201 Wilbur Avenue
Antioch, CA 94509

County: Contra Costa

Air Basin: Bay Area

Directions: From Highway 4 take Highway 160 north and exit at Wilbur Avenue. Proceed west (left) on Wilbur Avenue for approximately 0.2 mile to the plant entrance.

Facility Overview

Plant nominal capacity: 680 MW (Units 6 & 7)
Units 1-5 have retired.

Plant Owner/Operator

Owner name: Mirant Delta, LLC

Owner address: 1350 Treat Blvd. Suite 500
Walnut Creek CA 94596

Owner contact: Bettie Yee-Joe
Phone: (925) 287-3110
Fax: (925) 281-4436
bettie.yee-joe@mirant.com

Operator name: Mirant Delta, LLC

Operator address: same

Operator contact: same

Site	
Size:	190 acres in total. Pittsburg power plant is located 5 miles downstream.
Description:	The plant currently consists of ten boilers, seven steam turbines, and associated facilities (e.g., an electrical switchyard, buildings for offices and turbine generators, cooling water intake structures and discharge channels, fuel oil tanks, pipelines, and an inactive marine terminal). Only two of the steam turbine units (Units 6 and 7) are currently operational. Of the 10 boilers on site, Boilers 1-8 have been retired and are incapable of operating; the boilers serving Units 6 & 7 are called Boilers 9 & 10. Generating Units 1-5 have been retired. Generator Units 4 & 5 have been converted to synchronous condensers, which are used to respond to changing system conditions and upsets by providing voltage support to the electrical grid. The operation of Units 4 & 5 does not result in air emissions or electricity generation. The plant site also contains non-operational areas used for employee recreation, sand storage, and agriculture. There are nine aboveground fuel oil storage tanks located in a fuel tank farm on the western portion of the property with a combined storage capacity of 2.2 million barrels of oil. Residual fuel is stored in eight of these tanks and displacement fuel oil to purge and preheat pipes when switching from burning natural gas to residual fuel oil in the boilers is stored in the remaining tank. *Refer to the attached Site Visit Report for additional information.*
Surrounding area:	The plant site is bound to the north by the San Joaquin River; by a paperboard manufacturing facility to the west; by the Atchison, Topeka, and Santa Fe railroad tracks and right-of-way to the south; by undeveloped open space, a chemical manufacturing facility, and a boating marina to the east; by a power generating facility to the southwest; and by parkland to the northeast. A residential area is also located to the southwest.
General Plan and Zoning Designations:	The Contra Costa General Plan guides land use planning and policy in the unincorporated portions of the county. **General Plan:** Heavy Industrial (HI) | **Zoning:** Heavy Industrial

Cooling	
Cooling system type:	Once-through cooling using water from the San Francisco Delta.
Cooling sources:	San Joaquin River/San Francisco Delta
Cooling discharge:	San Joaquin River/San Francisco Delta

Cooling system details:	Cooling water is taken from two intakes in the San Joaquin River. Units 1-5 intake is approximately 250 feet from the southern shoreline. The intake for Units 6 & 7 is on the southern shoreline. Four circulating water pumps servicing Units 6 & 7 have variable speed controls, allowing them to be operated from 50 to 95 percent of their capacity. Cooling water is circulated through the condensers and then discharges from two outfalls through a 600-foot long, 100-foot wide cooling channel that discharges to the river. The planned Unit 8 cooling tower makeup, process water makeup, evaporative cooler makeup, combustion turbine online washing, and potable water uses will be supplied by re-use of water already withdrawn from the San Joaquin River for use in Units 6 & 7.
Cooling system	The 1995 NPDES permit (Order No. 95-234; NPDES Permit No. CA0004863) allows a maximum discharge from the existing Units 6 & 7 outfall of 341 MGD. All but one MGD of this is allowed for cooling water discharge. The remaining one MGD is for boiler blowdown, intermittent screen wash, and intermittent wash water from other cleaning operations. Outfall 001 carries an average of 38 MGD of once-through cooling water and minor volumes of process water and stormwater runoff. Outfall 002 carries an average of 340 MGD of once-through cooling water, boiler blowdown, and washwater. Allowable maximum flows for Outfall 001 and 002 are 560 MGD and 440 MGD, respectively (Per Divestiture Application No. 98-01-008, 8/5/1998). Outfall 003 discharges intermittent intake screen wash. Outfall 004 and 006 thru 010 carry seasonal stormwater runoff. Outfall 005 carries fish pump water.
Screening system:	The intake sturcture for Units 6 & 7 consists of six bar racks located approximately 15 feet in front of the 3/8-inch mesh vertical traveling screens.

Biofouling	Chlorination and screen washing are used to control for biofouling. Chlorination is usually performed one to three times per week to control algal growth, but may be used as often as once per day during very hot weather. Per the EPA 316(b) Case Studies, a fish pump removal system was installed at Units 1-5 (retired) of the Contra Costa facility to remove fish from the area in front of the screens, thereby reducing striped bass losses. Intake design criteria have been implemented at Contra Costa Units 6 & 7 to minimize impingement, including an intake approach velocity of 0.8 fps, configuration of the intake structure to include lateral fish escape routes, and location of intake screens parallel to the shoreline. In 1986, the San Francisco Bay RWQCB and Central Valley RWQCB established additional NPDES permitting requirements for the Pittsburg and Contra Costa facilities to protect striped bass. Adjustments include the preferential use of Pittsburg Unit 7, which is equipped with a closed-cycle system, during spring when young striped bass are present, and the installation of variable-speed circulating water pump controls for the once-through cooling system of Pittsburg Units 1-6 and Contra Costa Units 6 & 7 to be used from February 1 through July 31 each year.

Electrical Interconnect

Description:	An old station with switchyard of 230-kV nominal voltage
Transmission details:	Eight transmission connections to PG&E substations: position #1 and #4 to San Mateo, position #2 and #5 to Tesla, position #3 and #6 to Vaca-Dixon, and position #7 and #8 to Newark substations. The new Unit 8 is in the process of requesting additional capacity certification.
Site arrangement:	Two busses of one section each, all configured as breaker and a half.

Fuel Supply	
Fuel type:	Natural Gas and residual fuel oil (emergency only)
Fuel system description:	The boilers for Units 6-7 are capable of burning natural gas or residual fuel oil. BAAQMD Regulation 9, Rule 11, prohibits burning residual fuel oil, except for limited testing purposes and in the event of natural gas curtailment. Natural gas is delivered to the plant via a 20-inch transmission pipeline from PG&E's Antioch Gas Terminal, which also serves the Pittsburg Power Plant as a secondary line. Between 1974 and 1976, a 42-mile-long underground pipeline was constructed between Richmond and Antioch to transport fuel oil from Chevron's Richmond Refinery to the Pittsburg and Contra Costa power plants. Fuel oil delivery to the plant can be made via a pipeline that connects to the Pittsburg Power Plant fuel tank farm (last known deliveries were made in 1990). The marine terminal used to accommodate a 20,0000-barrel barge and included a 12-inch pipeline for pumping fuel oil from the barge to the fuel storage tanks at the site, but this is no longer in use and would require significant dredging of waterways and repairs or restore marine deliveries of oil.

Units 6 & 7	
Unit Design:	Steam Turbine
Boiler Design:	Boilers 9 & 10: Babcock & Wilcox, single chimney of concrete with steel liner, 450 ft tall.
Design Rating:	Boiler heat input of 3400 MMBtu/hr (996 MW thermal each)
Unit History:	PG&E originally constructed the Contra Costa Power Plant (CCPP) complex in 1951. Units 4 & 5 were added in 1953, and Units 6 & 7 were added in 1964. Units 6 & 7 were started up in 1964. In 1994, the original Units 1, 2, and 3 were retired, leaving only Units 4, 5, 6, and 7 in operation. Mirant Corporation purchased the CCPP from PG&E in April of 1999. Units 6 & 7 are the only units that still produce power. Units 4 & 5 are used as synchronous condensers only.
Original Owner:	Pacific Gas & Electric

Air Pollution

Unit 6 - Proposed combustion modifications in 1998. Low NOx burners with 30% flue gas recirculation (FGR) were installed in 2000. Installation of in-duct SCR is planned for 2003.

Unit 7 - Low NOx burners with 30% FGR were installed in 1997. Boiler No. 10 also has in-duct SCR installed.

Emission Limits Boiler No. 9 and No. 10:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	175 ppmvd @ 3% O2, 1-hr avg. (natural gas) 300 ppmvd @ 3% O2, 1-hr avg. (fuel oil) 0.057 lb/MMBtu (2002), 1-hr avg. 0.037 lb/MMBtu (2004), 1-hr avg. 0.018 lb/MMBtu (2005), 1-hr avg.	175 ppmv @ 3% O2
CO	500 ppmv 2000 ppmv	1000 ppmv @ 3% O2
PM	0.15 grains/dscf @ 6% O2	0.15 grains/dscf @ 3% O2
SOx	GLC 0.5 ppm (3 min. avg.), 0.25 ppm (1-hr avg.), 0.05 ppm (24-hr avg.) 300 ppmvd Sulfur content of nongaseous fuel < 0.5 wt.% Boiler No. 9 = 356 tons/yr Boiler No. 10 = 4252 tons/yr	300 ppmv @ 3% O2
NH3	10 ppmvd @ 3% O2 (rolling 1-hr avg.), upon installation of an applicable control device	10 ppmv @ 3% O2
Lead	6.75 kg/day 1.0 $\mu g/m^3$ (24-hr avg.)	---

Unit Performance:

On-line hours (CEC CEMS California.xls)

Unit 9 (Boiler): Year 2000 = 7,102.5 hours and Year 2001 = 7,271 hours

Unit 10 (Boiler): Year 2000 = 7,499 hours and Year 2001 = 5,653.75 hours

Capacity Factor (CEC CEMS California.xls)

Unit 9 (Boiler): Year 2000 = 56.75% and Year 2001 = 76.60%

Unit 10 (Boiler): Year 2000 = 58.55% and Year 2001= 79.64%

CF, % = [(Gross Electrical Output, MWh ÷ On-line hours) ÷ Design MW] * 100

Net Generation (PG&E's Application No. 98-01-008, August 5, 1998)

Unit 6 = 984,399 MWh*

Unit 7 = 1,009,205 MWh*

*Averaged over a five year period (1993-1997)

Net generation ISO Data Capacity Factor (CF):

Unit 6: Year 2001 = 1,786,008 MWh; 1,786,008/(340 MW * 8760) = 60% CF

Unit 7: Year 2001 = 1,513,912 MWh; 1,513,912/(340 MW * 8760) = 51% CF

	Heat Rate, HHV (CEC CEMS California.xls) Unit 9 (Boiler): Year 2000 = 9,744 Btu/kWh and Year 2001 = 9,399 Btu/kWh Unit 10 (Boiler): Year 2000 = 9,819 Btu/kWh and Year 2001 = 9,628 Btu/kWh Heat Rate = Total Fuel Input, MMBtu ÷ Gross Electrical Output, MWh * 1000
Description of Loading Management and/or Power Sales Arrangement:	Units 6 & 7 have been designated Reliability Must Run (RMR) since divestiture, and continuing through 2001. ISO Dispatch.

Basic Unit Information

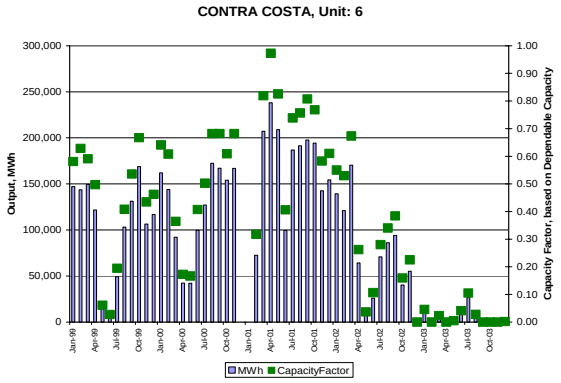
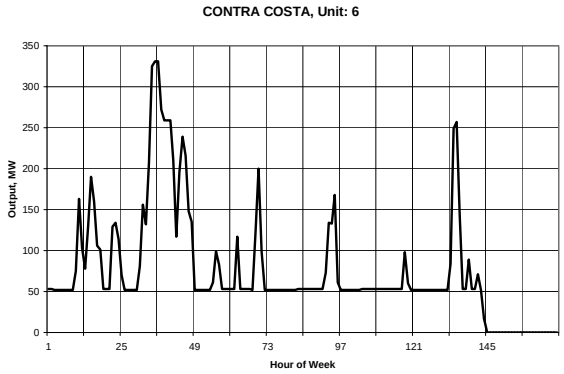
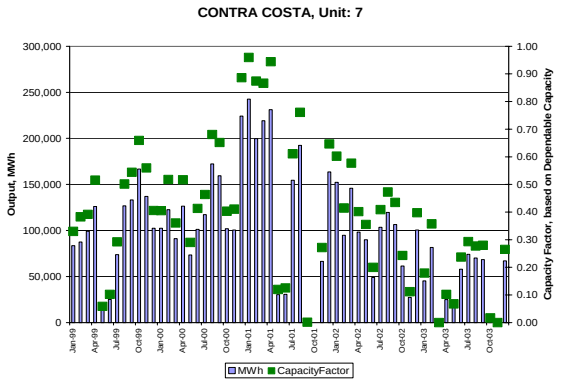
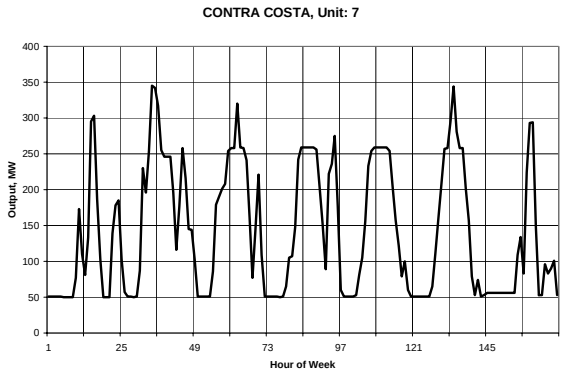
Unit	**6**	**7**
Dependable MW	340	340
Minimum Load MW	50	50
Online Date	Jun-1964	Aug-1964
RMR in 2004	-	Yes
SCR Installed	No	Yes

2003 Performance

Unit	**6**	**7**
Capacity Factor	0.021	0.172
Heat Rate, Btu/kWh		
minimum load	11,951	11,752
average	10,968	10,288
maximum load	9,592	9,428
NOx Rate, lb/MMBtu	0.0549	0.0108
NOx Rate, lb/MWh	0.602	0.111

Past Five Years		
Unit	**6**	**7**
Output, MWh		
1999	1,259,896	1,176,129
2000	1,370,368	1,492,866
2001	1,893,584	1,530,961
2002	876,534	1,148,685
2003	62,809	510,893
Fuel Use, MMBtu		
1999	12,088,149	11,304,481
2000	13,455,448	14,546,358
2001	18,232,128	14,388,999
2002	8,635,029	11,231,338
2003	688,894	5,256,231
NOx Emission, pounds		
1999	955,120	614,181
2000	1,006,808	952,989
2001	1,254,435	1,207,391
2002	395,698	103,704
2003	37,806	56,820

Charts

Monthly Output & Capacity Factor	Hourly Output During CAISO Peak Week in 2003 (7/19/2003 - 7/25/2003)
	
	

Permits/Agreements

Air:	▪ Final Major Facility Review Permit, October 19, 2000: Issued by the Bay Area Air Quality Management District (Facility I.D.# A0018) ▪ Permit Expiration Date: September 14, 2003
Water:	**NPDES Permit No. CA0004864** ▪ Issuing Agency: Central Valley RWQCB ▪ Effective Date: April 27, 2001. ▪ Expiration Date: April 1, 2006. ▪ Order No. 5-01-107 (Waste Discharge Requirements) Serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	**1997**	**1998**	**1999**	**2000**	**2001**
NO_x	2849.72	1010.88	980.61	1348.53	1660.74	983.21
PM_{10}	75	21	21	28	35	42
VOC	51	14	13	18	22	25
CO	597	280	272	374	460	551
SO_x	214.14	4	4	6	7	8

Source: Annual Summary from Bay Area Air Quality Management District for Facility ID # A0018.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	839	1010.3	819.8	1156.6	819.8
PM_{10}	17.5	21.2	28.3	34.8	28.3
VOC	5.2	6.9	8.2	9.9	8.2
CO	234.3	279.6	374.1	460	374.1
SO_x	3.5	4.2	5.6	7	5.6

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4931). Accessed October 2001.

Complaint Logs: No complaints found.

Notices of Violation (NOV): No Notices of Violation found.

Notices to Comply (N/C): No Notices to Comply found.

Class I Setting: Located within 100 km of Point Reyes National Seashore Recreation Area.

Attainment Status:

Pollutant	Bay Area Attainment Status for 2002	
	Federal	**State**
Ozone – One hour	Not Classified/Moderate [1]	Serious Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note (1): San Francisco Bay Area is designated "Not Classified / Moderate" under 23 U.S.C. Section 104(b)(2) and has a 2006 attainment deadline.

Emission Offset Availability: www.baaqmd.gov/permit/banking/banking.htm

Total Emission Reduction Credits Available (tons/year) as of May 7, 2002.

PM	140
POC	3,339
NO_x	1,750
SO_2	1,030
CO	1,088
NPOC	459
PM_{10}	222

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements: From the Contra Costa Power Plant Unit 8 Project Final Staff Assessment (March, 2001): The 1995 NPDES permit (Order No. 95-234; NPDES permit No. CA0004863) limits the maximum temperature of the Units 6 & 7 discharge to 39 °F above the natural receiving water temperature, or less.

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species:

Listed Marine Species:

Scientific Name	Common Name	Status	Habitat	Survey Timing Guidelines
Contra Costa Regions				
Archoplites interruptus	Sacramento perch		Sacramento River and its tributaries. Portions of the Sacramento-San Joaquin River Delta	Yearound
Phalacrocorax auritus	Double-crested cormorant		Aquatic habitats- bays, estuaries, marine, lacustrine, and riverine habitats. Inland waterways and canals and manmade reservoirs.	Yearound

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Study Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Sacramento-San Joaquin River Delta/Estuary and Grizzly Island Complex/Suisun Marsh

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Contra Costa Regions				
Apodemia mormo langei	Lange's metalmark butterfly	FE	Sand dunes with larval food host plant (buckwheat). Currently only known from antioch dunes	August and September when adults lay eggs on host plants
Aster lentus	Suisun marsh aster			Perennial herb-May-November
Cordylanthus mollis ssp mollis	Soft bird's-beak	FE		Annual herb-July-November
Lilaeopsis masonii	Mason's lilaeopsis	SR	Pilings, docks, and shorelines	Perennial herb-April-November
Oenothera deltoides ssp howellii	Antioch dunes evening-primrose	FE		Perennial herb-March-November
Thamnophis gigas	Giant garter snake	FT	Highly aquatic. Perennial and seasonal wetlands. Slow-moving vegetated streams, canals, irrigated farmland, and rice fields. Needs adjacent hibernacula for over-wintering.	In general, can be observed in early spring following winter hibernation - late summer/early fall. Protocol-level surveys required for presence absence studies.
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

ual screening	Heavy, tall vegetation in front of parcel along Wilbur Avenue and 10-foot fencing with fabric screening on east side of facility.
imeter fencing/walls, height of the cing/wall (ft)	6-10 foot cyclone fencing encloses. Only south side of facility has fabric screening.
ndscaping	Dense mixture of mature oleander, pepper and eucalyptus trees located alo extended main entrance. The southern border was planted with a mixture o pine, eucalyptus, pepper and liquid amber trees. Vegetation along the eastern border of the facility was limited to isolated walnut and oak trees. Large eucalyptus trees were planted along the western perimeter.
ual plumes – number and size	No plume visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling, which creates no visible water vapor plumes from cooling operations. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler (Units 9 and 10) exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	88,943	7,134 (8.0%)
2000 Minority	128,786	54,564 (42.3%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Antioch		
Total Population	90,523	34.7% minority
Households	29,338	3.07 persons/household
Total Housing Units	30,116	2.6% vacancy rate
Labor Force	38,210	6.2% unemployment
Contra Costa County		
Total Population	948,816	34.5% minority
Households	344,129	2.72 persons/household
Total Housing Units	354,577	2.9% vacancy rate
Labor Force	515,700	4.7% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department Labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

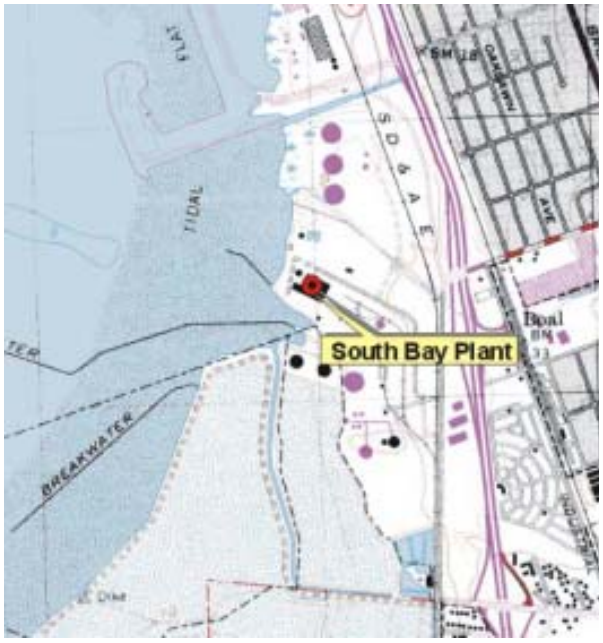
South Bay

CEC ID: G0571 EIA ID: 310

Address: 990 Bay Boulevard
Chula Vista, CA 91911

County: San Diego

Directions: From Interstate 5, take the "L" Street exit and proceed south (turn left) on Bay Boulevard for approximately 0.1 mile to the plant entrance.



Facility Overview

Plant nominal capacity:	703 MW Special Note: At divestiture, the Port of San Diego announced its intention to close and decommission the South Bay plant as soon as it was not required for local grid reliability (designation as RMR units).
Generating units:	Unit 1 – Steam Turbine, 147 MW, gas fueled, ocean water cooled. Unit 2 – Steam Turbine, 150 MW, gas fueled, ocean water cooled. Unit 3 – Steam Turbine, 171 MW, gas fueled, ocean water cooled. Unit 4 – Steam Turbine, 222 MW, gas fueled, ocean water cooled. GT-1 – Gas Turbine, 13 MW, JP-5 fueled, air cooled, not part of this study.
Cooling system:	Seawater once-through cooling

Plant Owner/Operator

Owner name:	Port of San Diego	***Operator name:***	DFD California Operations (Duke Fluor Daniel)
Owner address:	3165 Pacific Highway San Diego, CA 92101	***Operator address:***	c/o plant address
Owner contact:	Thomas A. Page, 619-696-2000	***Operator contact:***	Randy Hickok, VP Duke Energy North America 1290 Embarcadero Rd. Morro Bay, CA 93442 (805) 595-5595 rjhickok@suke-energy.com

Site

Size:	165 acres of land total consisting of a 116-acre power plant site; a 33-acre decommissioned liquid natural gas (LNG) storage facility just south of the power plant; and a 16-acre transmission corridor that runs north of the power plant and adjacent to a railroad right-of-way.
Description:	The South Bay Power Plant consists of four steam turbines, four boilers, one combustion turbine, and associated facilities (e.g., a switchyard, a control building, and fuel oil storage tanks). The plant also includes a residual fuel oil and petroleum storage facility consisting of nine aboveground storage tanks. Seven of the tanks contain residual fuel oil and two contain displacement oil and JP-5 jet fuel for a total storage capacity of 75.2 million gallons. Other on-site facilities include a guard station, an administration building, various engineering buildings and trailers, water tanks, and parking facilities.
Surrounding area:	San Diego and Arizona Eastern Railroad tracks pass along the eastern border of the site. Commercial and industrial land uses are located east of the plant in a multi-building business park (containing over 40 businesses) that stretches along the east side of Bay Boulevard, and a mix of commercial and industrial uses are located north of the plant on Bay Boulevard. Public park and recreation areas, including the J Street Marina, Chula Vista RV Park, and associated facilities, border the bay to the northwest, while San Diego Bay is to the west. Light industrial/commercial land uses are located to the south of the plant within the Bayside Business park. *Refer to the attached Site Visit Report for additional information.*

General Plan and Zoning Designations:	The Chula Vista General Plan and the Chula Vista Bayfront Land Use Plan.	
	Chula Vista General Plan: Project site designated General Industrial.	**Zoning:** City of Chula Vista zoning designates the property as I (Industrial); **Chula Vista Bayfront Land Use Plan:** Portion of plant north of L Streat is covered by Subarea 5, and is designated Industrial.

Cooling

Cooling system type:	Once-through cooling
Cooling sources:	San Diego Bay (Units 1-4)
Cooling discharge:	San Diego Bay (Units 1-4)
Cooling system details:	Cooling water is withdrawn from San Diego Bay through a dredged intake channel. Water enters one of three intake structures located approximately 200 feet from the power plant. Units 1 and 2 are served by a common intake structure. Units 3 and 4 are served by separate intake structures, one for each unit.
Cooling system	The NPDES permit (Order No. 96-05; NPDES Permit No. CA0001368) allows a maximum discharge of once-through cooling water of 601.183 MGD, low volume wastes of 0.537 MGD, and metal cleaning wastes of 0.453 MGD, for a total wastewater discharge of 602.173 MGD. Each unit has two once-through cooling water pumps. The total combined capacity based on nameplate rating of the cooling water pumps is 417,400 gpm. Units 1 & 2 = 78,000 gpm (each); Unit 3 = 124,600 gpm; Unit 4 = 136,800 gpm.
Screening system:	Floating materials are removed by a series of skimming brooms. Water is screened through trash racks and traveling screens to minimize entrainment of fish and debris. Trash racks are cleaned periodically as needed and the debris removed is sent to an appropriate land disposal site. Traveling screens are cleaned intermittently and the debris is washed into a screen debris trough, which crosses over the intake basin and empties into the discharge basin. In the past, a debris net across the intake channel has been used due to periodic heavy influxes of eelgrass and debris. The debris net, which has mesh openings of one inch, was used routinely during the summer months from 1982 to 1986. However, due to improvements made to the traveling screen systems, use of a debris net is now limited to periods of extraordinary high influxes of debris. When in use, the debris net is cleaned daily.

Biofouling Control:	A sodium hypochlorite solution is injected into the cooling water immediately upstream of the cooling water pumps for each unit. Each injection point is controlled separately. Sodium hypochlorite is currently injected at each cooling water pump for ten minutes every two hours. The injection is conducted intermittently throughout the day on each unit that is operating on an as-needed basis to remove marine biological growth in the plant's condenser tubes and associated pipes. Heat treatment of the tunnels and condenser units for removal of encrusting organisms is not conducted at the plant. The encrusting organisms and sediments are manually removed from the intake structure and are discharged into the discharge basin via the screen debris trough.

Electrical Interconnect

Description:	Three transmission lines of 138-kV connect to the SDG&E system.
Transmission details:	Lines 1 & 2 to Los Coches substation, Line 3 to Mission substation.
Site arrangement:	Two busses, breaker and half configuration.

Fuel Supply

Fuel type:	Units 1-4: Designed for natural and/or residual fuel oil. Unit GT-1: JP-5 jet fuel (primary) and natural gas (startup assistance only).
Fuel system description:	JP-5 jet fuel is brought to the site via tanker trucks. Residual fuel oil is brought to the site via an eight-inch pipeline that connects the plant's residual fuel oil storage facility with the 24th Street Terminal Refueling Facility in National City; the pipeline connecting the two facilities is roughly five miles long. Displacement oil may also be delivered to the site from the 24th Street Terminal Refueling Facility or by tanker truck. Natural gas is delivered to the site via SDG&E's natural gas transmission and distribution system.

Unit 1

Unit Design:	Steam Turbine
Boiler Design:	Babcock & Wilcox
Design Rating:	Boiler heat input of 1550 MMBtu/hr (454 MW thermal). Operated at 146 MW electrical.
Unit History:	Unit 1 was started-up in 1960. This plant was sold by San Diego Gas & Electric (SDG&E) to the Port of San Diego on April 23, 1999.
Original Owner:	San Diego Gas & Electric, the regional utility

Air Pollution Control:	Limited to natural gas, with SCR to limit NOx emissions. Emission Limits Utility Boiler No. 1:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	20 ppmvd @ 3% O2 (natural gas), 24-hr avg. 40 ppmvd @ 3% O2 (fuel oil), 24-hr avg.	20 ppmvd @ 3% O2
CO	---	---
PM	---	---
SOx	---	---
NH3	10 ppmv (natural gas), 30 min. avg. 2 ppmv (fuel oil), 30 min. avg.	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Designated Reliability Must Run (RMR) by CAISO since divestiture and extending to 2002

Unit 2

Unit Design:	Steam Turbine
Boiler Design:	Babcock & Wilcox
Design Rating:	Boiler heat of input of 1510 MMBtu/hr (443 MW thermal). Operated at 150 MW electrical.
Unit History:	Unit 2 was started-up in 1962.
Original Owner:	San Diego Gas & Electric, the regional utility
Air Pollution Control:	Limited to natural gas, with SCR to limit NOx emissions. Emission Limits, Utility Boiler No. 2:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	---	---
CO	---	---
PM	---	---
SOx	---	---
NH3	---	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Designated Reliability Must Run (RMR) by CAISO since divestiture and extending to 2002

Unit 3

Unit Design:	Steam Turbine
Boiler Design:	Riley Stoker
Design Rating:	Boiler heat of 2145 MMBtu/hr (629 MW thermal). Operated at 175 MW electrical.

Unit History:	Unit 3 was started-up in 1964.
Original Owner:	San Diego Gas & Electric, the regional utility
Air Pollution Control:	Limited to natural gas, with SCR to limit NOx emissions. Emission Limits, Utility Boiler No. 3:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	---	---
CO	---	---
PM	---	---
SOx	---	---
NH3	---	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Designated Reliability Must Run (RMR) by CAISO since divestiture and extending to 2002

Unit 4

Unit Design:	Steam Turbine
Boiler Design:	Combustion Engineering
Design Rating:	Boiler heat input of 2900 MMBtu/hr (850 MW thermal). Operated at 222 MW electrical.
Unit History:	Unit 4 was started-up in 1971.
Original Owner:	San Diego Gas & Electric, the regional utility
Air Pollution Control:	Limited to natural gas, with SCR for NOx control. Emission Limits Utility Boiler No. 4:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	---	108 ppmvd @ 3% O2 (Unit 1)
CO	---	---
PM	---	---
SOx	---	---
NH3	---	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Designated Reliability Must Run (RMR) by CAISO since divestiture and extending to 2002

Basic Unit Information

Unit	1	2	3	4
Dependable MW	147	150	171	222
Minimum Load MW	30	35	30	50
Online Date	Jul-1960	Jun-1962	Sep-1964	Dec-1971
RMR in 2004	Yes	Yes	Yes	No
SCR Installed	Yes	Yes	Yes	Yes

2003 Performance

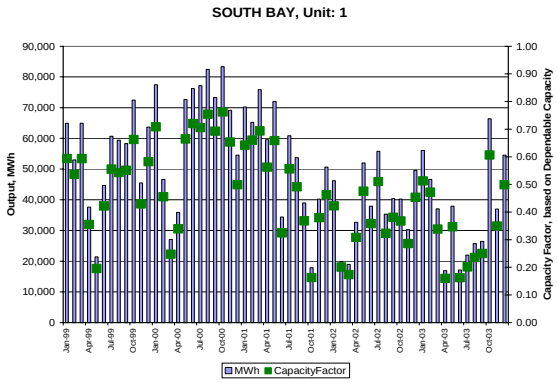
Unit	1	2	3	4
Capacity Factor	0.345	0.373	0.295	0.027
Heat Rate, Btu/kWh				
minimum load	11,283	11,179	11,697	12,532
average	10,027	10,111	10,413	12,367
maximum load	9,539	9,479	9,851	11,594
NOx Rate, lb/MMBtu	0.0130	0.0121	0.0120	0.0084
NOx Rate, lb/MWh	0.131	0.122	0.125	0.104

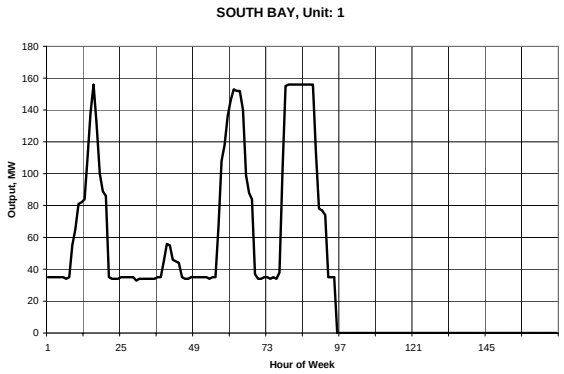
Past Five Years

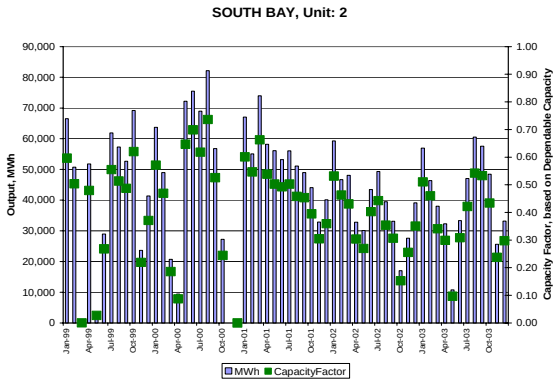
Unit	1	2	3	4
Output, MWh				
1999	646,597	507,253	545,498	175,464
2000	775,993	525,747	652,509	355,399
2001	639,527	636,790	603,987	191,474
2002	459,135	466,098	319,847	84,940
2003	443,835	490,090	442,048	52,374
Fuel Use, MMBtu				
1999	6,470,699	4,923,374	5,445,043	2,065,895
2000	7,756,506	5,186,991	6,552,361	4,248,845
2001	6,439,698	5,812,272	6,106,491	2,365,973
2002	4,654,521	4,400,090	3,312,646	1,023,634
2003	4,450,134	4,955,516	4,603,032	647,713
NOx Emission, pounds				
1999	118,391	510,791	602,928	256,816
2000	123,862	556,746	783,383	515,834
2001	73,524	106,019	95,394	260,987
2002	60,028	52,739	42,271	42,205
2003	58,003	60,030	55,316	5,465

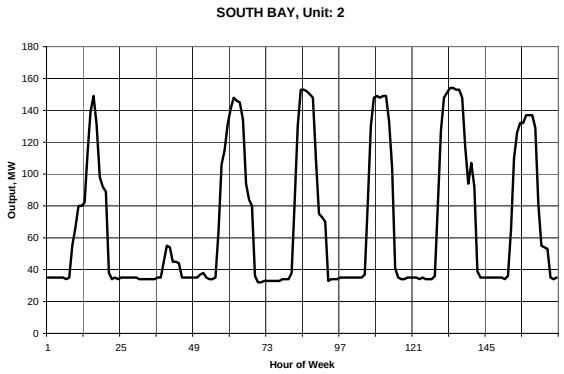
Charts

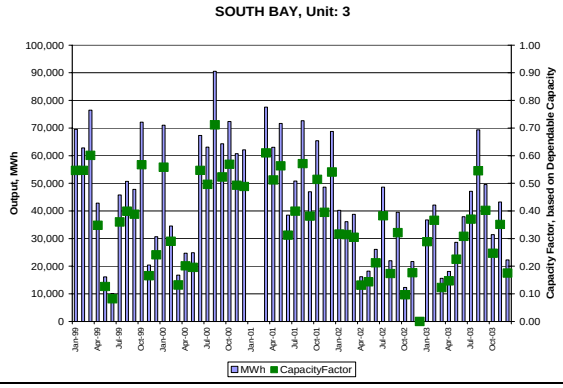
Monthly Output & Capacity Factor	Hourly Output During CAISO Peak Week in 2003 (7/19/2003 - 7/25/2003)

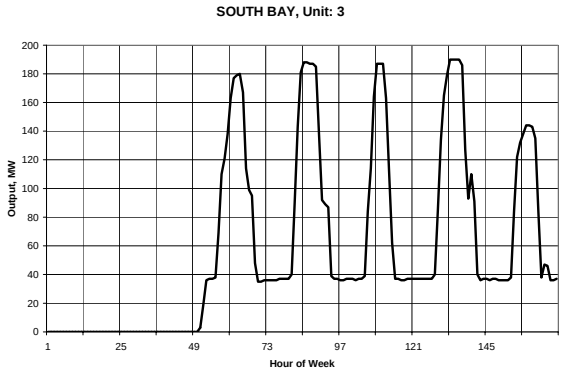


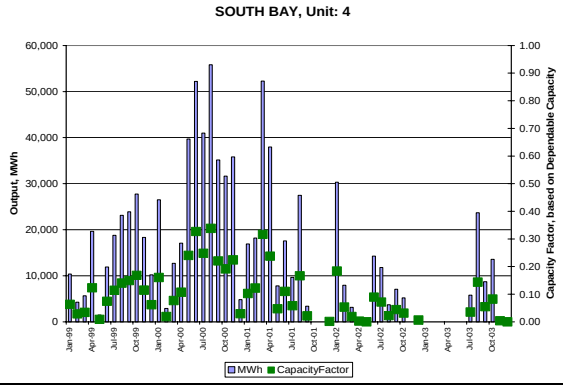


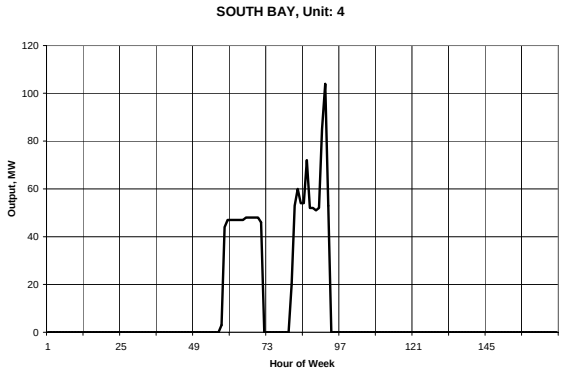












Permits/Agreements	
Air:	▪ Issued by San Diego Air Pollution Control District (Facility I.D.# 334A) ▪ All Permits to Operate are up for renewal on March 1, 2003 ▪ Permit to Operate # 1276 for Gas Turbine/Generator ▪ Permit to Operate # 794 for Utility Boiler, Unit 1
Water:	**NPDES Permit No. CA0001368** ▪ Issuing Agency: San Diego RWQCB ▪ Effective Date: November 14, 1996. ▪ Expiration Date: November 14, 2001. Although the expiration date has passed, this permit will stay in effect until it is updated by the SDRWQCB. ▪ Order No. 96-05 (Waste Discharge Requirements) serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	1394.3	941.8	914.2	747.2	1009.3
PM_{10}	35.7	121.7	133.8	107.4	159.5
VOC	15.2	62.8	67.1	51.6	64.6
CO	419.3	3186.5	3630.2	2700.5	3627.8
SO_x	33.8	14.9	9.4	9.8	34.0

Source: Annual Summaries from San Diego Air Pollution Control District for Facility ID #334A.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	1394.4	941.8	914.2	747.2	914.2
PM_{10}	35.7	121.7	133.8	107.4	133.8
VOC	15.1	62.8	67.1	51.6	67.1
CO	419.3	3186.5	3630.2	2700.5	3630.2
SO_x	33.8	14.9	9.4	9.8	9.4

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4931). Accessed October 2001.

Complaint Logs: No complaints provided.

Notices of Violation (NOV): No Notices of Violation provided.

Notices to Comply (N/C): No Notices to Comply provided.

Class I Setting: Located within 100 km of Agua Tibia Wilderness area.

Attainment Status:

Pollutant	San Diego County Attainment Status for 2002	
	Federal	**State**
Ozone – One hour	Serious Nonattainment	Serious Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm

Emission Offset Availability: No data at this time.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: San Diego City/County Multiple Habitat Conservation Sub-area Plan. Nearby resources include San Diego Bay and Otay River mouth.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
South Bay Region				
Charadrius alexandrinus nivosus	Western snowy plover	FT	Coastal shores, reservoirs, braided river channels, and playas.	In California, can primarily be seen during the breeding period from mid-March - mid-September, some wintering on Southern California beaches.
Rallus longirostris levipes	Light-footed clapper rail	FE, SE	Year-long resident in salt marsh habitat	Year-long in its preferred habitat
Sterna antillarum browni	California least tern	FE, SE	Known to occur on sandy beaches along marine and estuarine environments, salt ponds, and other sparsely vegetated sites near fish bearing water. Occurs in California May - September	In California, can primarily be seen during the breeding period from May - September.
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: San Diego City/County Multiple Habitat Conservation Sub-area Plan. Nearby resources include Sweetwater Marsh National Wildlife Refuge and salt ponds.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
South Bay Region				
Isocoma menziesii var decumbens	Decumbent goldenbush			Shrub-April-November
Lasthenia glabrata ssp coulteri	Coulter's goldfields			Annual herb-February-June
Passerculus sandwichensis beldingi	Belding's savannah sparrow	SE	Year round resident in salt marsh habitat	Year-long in its preferred habitat
***Status Legend: **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	No visual screening observed.
Perimeter fencing/walls, height of the fencing/wall (ft)	8-foot cyclone fencing with barbed wire.
Landscaping	Isolated groups of mature eucalyptus and palm trees located along east side of facility. Dense landscape of palms and other evergreen trees on north side of facility. Ornamental plantings at entrance to facility.
Visual plumes – number and size	Three 400-foot plumes and one 50-foot plume visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 1 through 4), which create no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler exhausts may be able to create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

The turbine exhaust from the simple cycle peaking turbine (Unit 5) is too hot to form visible water vapor plumes.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	373,958	54,073 (14.4%)
2000 Minority	407,717	311,362 (76.4%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Chula Vista		
Total Population	173,556	45.0% minority
Households	57,705	2.99 persons/household
Total Housing Units	59,495	3.0% vacancy rate
Labor Force	76,550	4.0% unemployment
San Diego County		
Total Population	2,813,833	33.5% minority
Households	944,677	2.73 persons/household
Total Housing Units	1,040,149	9.2% vacancy rate
Labor Force	1,461,200	3.8% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

El Centro

CEC ID: G0190 EIA ID: 389

Address: 485 EAST VILLA ROAD
El Centro, CA 92243

County: Imperial

Directions:

Facility Overview

Plant nominal capacity:

Generating units:

Cooling system:

Plant Owner/Operator

Owner name: Imperial Irrigation District

Owner address:

Owner contact:

Operator name:

Operator address:

Operator contact:

Site

Size: The total plant site is 80 acres, owned by the Imperial Irrigation District (IID).

Description:	The site has four power generating units, three water storage ponds, and a cooling tower system. Within the fenced plant boundary there is a fuel oil storage system consisting of four tanks totaling 160,000 barrels, a 92kV switchyard, and other miscellaneous IID facilities.
Surrounding area:	Surrounding land uses include light industrial facilities and agriculture. Other uses in the area are a community park, residential, rail lines, and an IID canal.
General Plan and Zoning Designations:	Public (G) | LU, Limited Use

Cooling

Cooling system	
Cooling sources:	
Cooling discharge:	
Cooling system details:	
Cooling system	
Screening system:	
Biofouling Control:	

Electrical Interconnect

Description:

Transmission

Site arrangement:

Fuel Supply

Fuel type:

Fuel system description:

Basic Unit Information

Unit	**3**	**4**
Dependable MW	44	74
Minimum Load MW	15	20
Online Date	Nov-1957	Aug-1968
RMR in 2004	No	No
SCR Installed	Yes	Yes

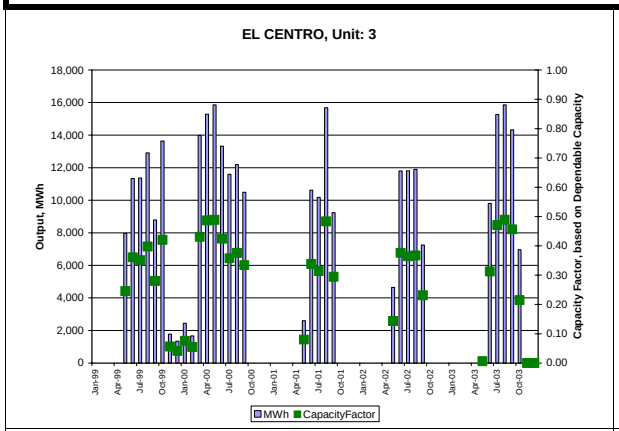
2003 Performance

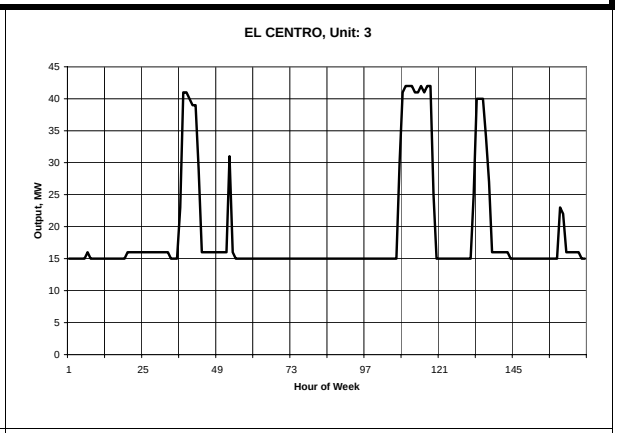
Unit	**3**	**4**
Capacity Factor	0.163	0.312
Heat Rate, Btu/kWh		
minimum load	12,365	11,746
average	11,899	11,478
maximum load	11,070	10,933
NOx Rate, lb/MMBtu	0.1623	0.2326
NOx Rate, lb/MWh	1.931	2.669

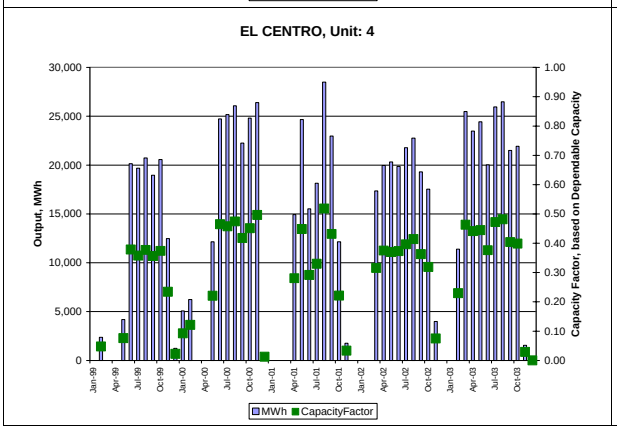
Past Five Years

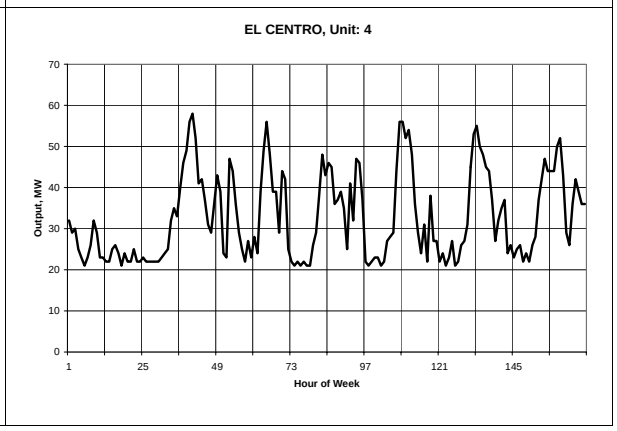
Unit	3	4
Output, MWh		
1999	69,124	120,351
2000	96,840	173,630
2001	48,327	138,644
2002	47,419	162,881
2003	62,435	202,271
Fuel Use, MMBtu		
1999	859,227	1,340,205
2000	1,115,730	2,045,886
2001	609,957	1,704,586
2002	585,883	2,013,308
2003	742,884	2,321,601
NOx Emission, pounds		
1999	138,602	322,032
2000	200,071	491,956
2001	101,367	322,049
2002	96,064	439,459
2003	120,581	539,908

Charts









Permits/Agreements

Air:	▪
Water:	**Storm Water General Permit** ▪ Issuing Agency: Palm Desert Regional Board **National Pollution Discharge Elimination System permit: #CA 0104248** ▪ Issuing Agency: Palm Desert Regional Board

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	1997	1998	1999	2000	2001
NO_x						
PM_{10}						
VOC						
CO						
SO_x						

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x					
PM_{10}					
VOC					
CO					
SO_x					

.

Complaint Logs:

Notices of Violation (NOV):

Issued Date	Description	Status

Notices to Comply (N/C):

Class I Setting: .

Attainment Status:

Pollutant	___ AQMD Attainment Status for 2002	
	Federal	State
Ozone – One hour		
CO		
NO_2		
SO_2		
PM_{10}		
Lead		

Source:

Emission Offset Availability:

Total Emission Reduction Credits Available (tons/year) as of

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Imperial Irrigation District Water Conservation and Transfer Project Habitat Conservation Plan (June 2002).

Listed Non-Marine Species:

Scientific Name	Common Name	Status	Habitat	Survey Timing Guidelines and Flowering Periods
Athene cunicularia	Burrowing Owl	Federal & state species of concern	Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation.	

Source: Energy Commission Compliance Files

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual Resources	
Visual screening	
Perimeter fencing/walls, height of the fencing/wall (ft)	
Landscaping	
Visual plumes – number and size	

Any Existing Plume Abatement Measures:

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income		
2000 Minority		

Source:

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of		
Total Population		
Households		
Total Housing Units		
Labor Force		
Imperial County		
Total Population		
Households		
Total Housing Units		
Labor Force		

Source:

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

El Segundo

CEC ID: G0194 EIA ID: 330

Address: 301 Vista Del Mar
El Segundo, CA 90245

County: Los Angeles

Directions: From Interstate 405, exit at Rosecrans Avenue. Proceed west on Rosecrans (for about 2.7 miles) to Highland Avenue. Turn right (north) on Highland (the street name changes to Vista Del Mar) and proceed about 0.7 miles to the plant entrance.

Facility Overview

Plant nominal capacity:	1,020 MW
Generating units:	Units 1 & 2 – Steam Turbine (Rankine cycle), 175 MW (each), gas fueled, reheat cycle, ocean water cooled; not part of this study. Units 3 & 4 – Steam Turbine (Rankine Cycle), 335 MW (each), gas fueled, reheat cycle, ocean water cooled. Units 5, 6 & 7 are proposed and under consideration by the CEC in 2002. Units 5 & 7 are proposed Combustion Turbine units (GE PG7241FA), Unit 6 a steam turbine unit, the three arranged in a combined cycle configuration. These units are proposed on the Units 1 & 2 site requiring demolition of existing Units 1 & 2, and the demolition of two existing fuel storage tanks for construction laydown. The project would use SCR with ammonia, a dry low-NOx combustor and an oxidation catalyst system to reduce air emissions. The new combined cycle facility is expected to generate 630 MW under nominal condition. This is 280 MW more than the old Units 1 & 2.
Cooling system:	Seawater once-through cooling, two systems; one system for each pair of units. Each unit includes a condenser. One auxiliary cooling water system per each 2 units.

Plant Owner/Operator

Owner name:	El Segundo Power, LLC (NRG Corporation and Destec Energy Company [50% each])	***Operator name:***	NRG El Segundo Operations
Owner address:	301 Vista Del Mar El Segundo, CA 90245	***Operator address:***	301 Vista Del Mar El Segundo, CA 90245
Owner contact:	Mr. Ernie Soccka, General Manager, (619) 615-7666	***Operator contact:***	George M Person, Tech Asst. Phone: (310) 615-6373 Fax: (310) 615-6060 george.person@nrgels.com

Site

Size:	33 acres in total, of which 22 acres is for the generating station and owned by the owner provided above. The remaining area is owned by Southern California Edison (SCE), including the oil tanks and high voltage switchyard (220-kV).
Description:	The site has two large and one small fuel oil tanks that were previously used for storage of oil fuel for generation, but are now used by the Edison Fuel Pipeline and Terminal Company for non-generation purposes. The site includes a related switchyard still under control of the utility company. There are also administration, warehousing, shop, and security buildings. The perimeter is fenced and substantially landscaped. The proposed Units 5, 6 & 7 development would include elimination of the fuel oil tanks.
Surrounding area:	To the south are residential apartments (in the City of Manhattan Beach), north are Chevron off-shore landing facilities and then beach-related recreational uses, west is the Chevron refinery, northwest ½ mile is the Scattergood power plant of the Los Angeles Department of Water and Power (LADWP), which also uses ocean-water cooling. Directly west is beach and ocean. Immediately north of Scattergood power plant is the Hyperion sewage treatment plant of the City of Los Angeles. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	City of El Segundo Coastal Zone Specific, and the City of El Segundo Subdivision and Zoning Code. **City of El Segundo Coastal Zone Specific Plan:** The site is zoned as PP (Power Plant) **City of El Segundo Subdivision and Zoning Code:** Heavy Industrial (M-2)

Cooling	
Cooling system	Units 1 & 2: once-through cooling system. Intake pipe is an open ended vertical conduit retrofitted with velocity cap to reduce fish entrainment, 2,590 ft offshore, discharge 1,989 ft offshore, both from Santa Monica Bay. Intake forebay in the plant, with two circulating water pumps per unit, traveling screen filtration of 1-inch size approximately. Units 3 & 4: Basic system similar to the above. Intake point is 2,595 ft offshore, and discharge is 2,091 ft offshore. Cooling system for the proposed Unit 6 is not determined. It was initially proposed to use the existing seawater cooling system (Units 1 & 2) without modifying the intake or outfall structures and lines, and without modifying the flow rates.
Cooling sources:	Santa Monica Bay
Cooling discharge:	Santa Monica Bay
Cooling system details:	One large intake pipe for each unit (10 ft inside diameter for Units 1 & 2, 14 ft for Units 3 & 4), one large discharge pipe (same sizes) for each. The City of Los Angeles Hyperion sewage treatment plant discharges 5 miles offshore in the same general vicinity. The LADWP Scattergood power plant also has intake and discharge in the same general area.
Cooling system	The NPDES permit (Order No. 00-084; NPDES Permit No. CA0001147) allows a maximum discharge of 606.6 MGD consisting of once-through cooling water, chemical metal cleaning wastes, and low volume wastes. Discharge No. 001 (Units 1 & 2) total maximum flow of 207.01 MGD consists of 207 MGD once-through cooling water, and the remainder is other waste. Discharge No. 002 (Units 3 & 4) total maximum flow of 399.59 MGD consists of 398 MGD once-through cooling water, and the remainder is other waste. Total once-through cooling water is 605 MGD. Eight total pumps; two per each unit. Units 1 & 2: 60,000 gpm each. Units 3 & 4: 150,000 gpm each. The proposed Unit 6 flow volume is not determined at this time, but is proposed at 148,000 gpm.
Screening system:	All units have 2 each traveling (rotary) screens, approximately 1-inch mesh. Bar rakes ahead of the screens.

Biofouling Control:	Heat treatment is typically conducted every six weeks and lasts for about six hours per conduit, with the high temperature lasting for one hour during gate adjustment. During the heat treatment, the temperature of the water discharged through the intake conduit must be raised to 125°F (except during gate adjustment) for two hours to kill the fouling organisms. During gate adjustments, the discharge temperature is allowed to reach 135°F for no more than 30 minutes. Gate adjustments control the temperature of the water recirculated in the intake and discharge points during heat treatment. Calcareous shell debris accumulates in the intake structure as a result of heat treatments. Approximately once a year, this shell debris is physically removed and disposed in the ocean. To control biological growths (defouling), the condenser tubes (arranged in two banks per generating unit, each bank is called condenser half) are treated by intermittently injecting chlorine (in the form of sodium hypochlorite), for a maximum of two hours per generating unit per day, into the cooling water stream. Chlorination system using sodium hypochlorite solution, is used as needed but limited to "no available chlorine residual" at the outfall.

Electrical Interconnect

Description:	SCE switchyard on site, 220-kV nominal voltage.
Transmission details:	Two transmission lines, 220-kV nominal voltage, connect the SCE switchyard to area substations. The specific lines are to Chevmain and El Nido substations.
Site arrangement:	Two sections of double bus configuration, one with section breaker and one without.

Fuel Supply

Fuel type:	Natural gas. The plant previously had the ability to burn oil fuel but this has been eliminated.
Fuel system description:	Southern California Gas Company delivery from high-pressure main.

Units 3 & 4

Unit Design:

Unitary design of turbine, boiler, condenser, cooling system. Turbine Generator is 325 MW nominal, General Electric reheat cross-compound (that is, an HP turbine with its turbine-generator set operating at 3,600 rpm, and a separate LP turbine with the turbine-generator set operating at 1,800 rpm, both generators connected electrically as a single unit) single flow axial steam exhaust (36-inch Last Stage Blades), direct connected boiler feed pump on HP steam turbine shaft. Steam conditions of 2400 psig/ 1050 °F/ 1050 °F – typically operated at lower steam temperatures for reliability. Exhaust at 1½ Inches Mercury condenser pressure. The two electrical generators per unit (HP and LP sections) are each hydrogen cooled.

Boiler Design:

Combustion Engineering Co. corner-fired, burners at the top and down-flow "upside down" pressurized furnace, two horizontal Ljungstrom regenerative air preheaters per boiler, radiant steam generating section, convective superheating sections and economizer, forced water circulation in the boilers. Single chimney per unit.

Design Rating:

Heat 3,350 MMBtu/hr (982 MW thermal). 325-MW rating, the unit is operated at lower steam temperatures, 1,000 °F rather than 1,050 °F, to manage failure and maintenance requirements when operated at design temperatures.

Unit History:

Design and Construction by Bechtel Power Company, Units 3 & 4 are "sister" units to Alamitos Units 3 & 4 and Etiwanda Units 3 & 4.

El Segundo Units 3 & 4 were started up in 1964 and 1965, respectively.

Original Owner:

Owner and operator until divestiture in 1997 was SCE. El Segundo Power, LLC, acquired the El Segundo Generating Station in April 1998.

Air Pollution Control:

Limited to natural gas fuel, using flue gas recirculation, low NOx burners. Also uses SCR and ammonia injection per the Air Quality Permit.

Emissions Limits Unit No. 3 and No. 4:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	10.75 lbs/1000 gal fuel oil	---
CO	300 ppmv (natural gas) 250 ppmv (fuel oil) 300 ppmv (refinery gas) 2000 ppmv	---
PM	0.1 grains/dscf	---
SOx	Boiler No. 3 = 182 tons/yr Boiler No. 4 = 370 tons/yr 500 ppmv (fuel oil)	---
NH3	10 ppmv (Boiler No. 3) 20 ppmv (Boiler No. 4)	---

Description of Loading Management and/or Power Sales Arrangement:

CA ISO dispatched, but NOT designated Reliability Must Run (RMR) in 2001 or 2002. Contract exists between California DWR and Dynegy for sale of some output of El Segundo power plant.

Basic Unit Information

Unit	**3**	**4**
Dependable MW	335	335
Minimum Load MW	75	75
Online Date	Aug-1964	Apr-1965
RMR in 2004	No	No
SCR Installed	Yes	Yes

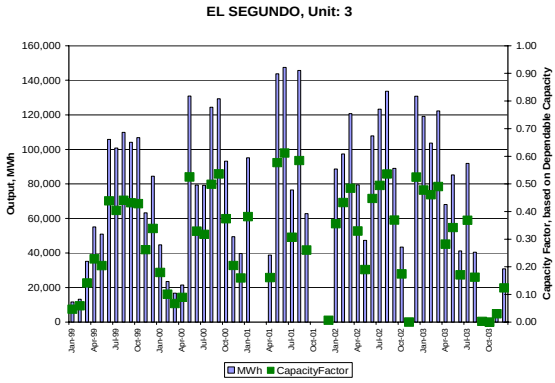
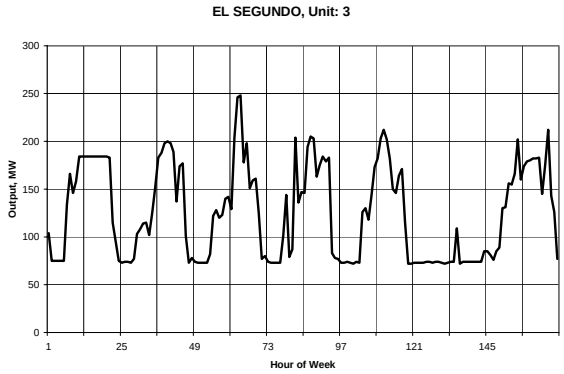
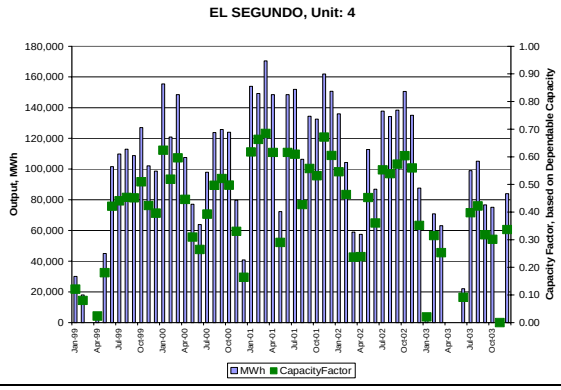
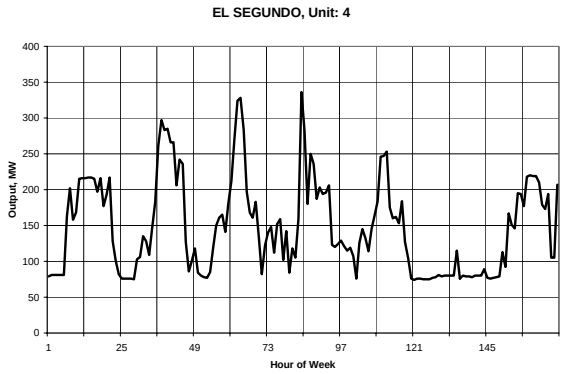
2003 Performance

Unit	**3**	**4**
Capacity Factor	0.242	0.205
Heat Rate, Btu/kWh		
minimum load	12,005	12,506
average	10,149	10,207
maximum load	9,557	9,713
NOx Rate, lb/MMBtu	0.0038	0.0048
NOx Rate, lb/MWh	0.039	0.049

Past Five Years

Unit	**3**	**4**
Output, MWh		
1999	840,960	859,935
2000	831,995	1,265,412
2001	711,903	1,681,052
2002	1,061,387	1,340,186
2003	710,468	601,024
Fuel Use, MMBtu		
1999	8,798,884	9,143,927
2000	8,460,154	12,544,913
2001	7,040,265	16,568,992
2002	10,399,006	13,301,724
2003	7,210,239	6,134,539
NOx Emission, pounds		
1999	489,639	102,342
2000	457,187	145,083
2001	114,673	147,717
2002	58,862	99,620
2003	27,422	29,712

Charts

Monthly Output & Capacity Factor	Hourly Output During CAISO Peak Week in 2003 (7/19/2003 - 7/25/2003)
	
	

Permits/Agreements

Air:	▪ Facility Permit to Operate, Revision 18, January 01, 2002: Issued by South Coast Air Quality Management District (Facility I.D.# 115663) ▪ Initial Title V Permit Issued: August 19, 1999. Title V Permit Expiration Date: August 18, 2004
Water:	**NPDES Permit No. CA0001147.** ▪ Issuing Agency: Los Angeles RWQCB ▪ Effective Date: June 29, 2000. ▪ Expiration Date: May 10, 2005. ▪ Order No. 00-084 (Waste Discharge Requirements) served as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	7/95 - 6/96	96 - 97	97 - 98	98 - 99	99 - 2000
NO_x	361.65	225.47	216.40	---	---
PM_{10}	20.26	15.76	11.69	---	---
VOC	12.7	9.27	9.67	---	---
CO	121.78	94.53	70.15	---	---
SO_x	6.73	5.23	15.73	---	---

Source: Annual Reports from South Coast Air Quality Management District for Facility ID #18763 – El Segundo Generating Station. Due to changed ownership after 1998, the facility ID changed to #115663.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x	361.5	270.7	270.7	270.7	270.7
PM_{10}	20.4	15.8	15.8	15.8	15.8
VOC	13.5	9.3	9.9	9.3	9.9
CO	121.7	94.5	94.5	94.5	94.5
SO_x	6.7	5.2	5.2	5.2	5.2

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs:

Date Received	Description
12/02/97	Odors.

Notices of Violation (NOV):

Issued Date	Description	Status
05/05/00	Visible emissions from Unit #3 boiler exceeding 20% opacity for more than three minutes in one hour. Rule 401 (b)(1)(B)	Closed 01/31/01
07/19/00	Rule 2004 (f)(1) & (i)(1)(A)	Closed 01/31/01
11/16/99	Rule 2004 (f)(1)	---
02/24/96	Exceeded 1996 annual emission allocation for NO_x. Rule 2004 (d)(1)	Closed 05/30/00

Notices to Comply (N/C):

Issued Date	Description	Status
11/16/99	Rule 2004 (f)(1)	---

Class I Setting: Located within 100 km of San Gabriel Wilderness and Cucamonga Wilderness areas.

Attainment Status:

Pollutant	South Coast Attainment Status for 2002	
	Federal	State
Ozone – One hour	Extreme Nonattainment	Extreme Nonattainment
CO	Serious Nonattainment	Nonattainment [1]
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Serious Nonattainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm

Note (1): Only L.A. County is in nonattainment for CO. All other areas of the South Coast APCD are in attainment.

Emission Offset Availability: No data at this time.

Environmental Information: Water Quality

Operational Limits On Water Withdrawals: Under peak operating conditions during summer months, once-through cooling water needs for Units 1 & 2 will not exceed the existing maximum volume of 144,000 gpm or 207 MGD. Intake structure located approximately 2,590 feet offshore incorporates a velocity cap, which meets CWA 316(b) requirements. Reclaimed water use in compliance with the requirements of the California Water Code Section 13550.

Under peak operating conditions during summer months, once-through cooling water needs for Units 3 & 4 will not exceed the existing maximum volume 277,000 gpm or 399 MGD. Intake structure located 2,595 feet offshore incorporates a velocity cap, which meets CWA 316(b) requirements.

Pertinent Waste Discharge Requirements: Discharge requirements established by NPDES Permit in Finding 16 (Order No. 00-84. Temperature of wastes discharged shall not exceed 105°F during normal operation of the facility. During heat treatment, the allowable temperature limit is increased to 110°F. The pH levels of the effluent water shall be within the range of 6.0 to 9.0 pH units at all times. Discharge of wastes in excess of the amounts provided in the tables below is prohibited:

EFFLUENT LIMITATIONS

		Discharge Serial 001		Discharge Serial 002	
Constituent	**Units**	**Monthly Average**	**Daily Maximum**	**Monthly Average**	**Daily Maximum**
Arsenic	µg/L	68	380	98	554
Cadmium	µg/L	13	52	19	76
Chromium (hexavalent)	µg/L	26	104	38	152
Copper	µg/L	15	132	21	192
Lead	µg/L	26	104	38	152
Mercury	µg/L	0.51	2.07	0.75	3.03
Nickel	µg/L	65	260	95	380
Selenium	µg/L	195	780	285	1,140
Silver	µg/L	7	35	10.4	50.3
Zinc	µg/L	164	944	236	1,376
Chronic Toxicity	µg/L	---	13	---	19
Radioactivity	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30269 of the California Code of Regulations				

CHLORINE EFFLUENT LIMITS

		Discharge Limitations	
Constituent	**Units**	**Daily Average**	**Daily Maximum**
Total residual chlorine	mg/L	---	0.4
Free available chlorine	mg/L	0.2	0.5

Current Monitoring Data:

1999 Low Volume Waste Monitoring Data Summary;

Constituent	Units	Average	Maximum
pH		8.9	N/A
Suspended Solids	mg/L	16.6	28.6
Oil and Grease	mg/L	6.1	32.5

Treated Sanitary Wastes Summary of Monthly Monitoring Data Sanitary Plant No. 1

Constituent	Units	Average	Maximum
BODs 20º C	mg/L	3	6
Suspended Solids	mg/L	7.7	16
Settleable Solids	ml/L	0.10	0.10
Oil and Grease	mg/L	1.0	1.0

Adaptive Management Studies/Resultant Changes in Operation: SWPPP and SPCC plans in place.

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: The power plant site is not near a National Marine Sanctuary. The natural marine habitats in the vicinity of ESGS consist primarily of sand substrate. These areas are considered Sensitive Habitat Area. However, the sandy beach and nearshore sand bottom are broken by various manmade structures that provide some hard bottom habitat. Sensitive marine species could inhabit these areas.

Listed Marine Species:

Scientific Name	Common Name	Status*
CLASS OSTEICHTHYES	**BONY FISHES**	
Oncorhynchus mykiss	Southern steelhead	FE, SSC
CLASS REPTILIA	**REPTILES**	
Caretta caretta	Loggerhead sea turtle	FT
Dermochelys coriacea	Leatherback sea turtle	FT
Chelonia midas	Green sea turtle	FE
CLASS AVES	**BIRDS**	
Gavia immer	Common loon	SSC
Pelecanus occidentaliscalifornicus	California brown pelican	FE, SE
Phalacrocorax auritus	Double-crested cormorant	SSC
Charadrius alexandrinusnivosus	Western snowy plover	FT, SSC
Numenius americanus	Long-billed curlew	SSC
Larus californicus	California gull	SSC
Sterna elegans	Elegant tern	FSC, SSC
Sterna antillarum browni	California least tern	SE, FE
Rynchops niger	Black skimmer	SSC
CLASS MAMMALIA	**MAMMALS**	
Enhydra lutris nereis	Southern sea otter	FT
Arctocephalus townsendii	Guadalupe fur seal	FT, ST
Balaenoptera musculus	Blue whale	FE
Balaenoptera physalus	Fin whale	FE
Balaenoptera borealis	Sei whale	FE
Megaptera novaenglinae	Humpback whale	FE
Eubalaena glacialis japonica	Pacific right whale	FE
Physeter catondon	Sperm whale	FE
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **ST** = State Threatened, **FSC** = Federal Species of Concern, **SSC** = State Species of Special Concern		

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Study Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: No Habitat Management or Conservation Plans in place. Only small, isolated patches of natural vegetation and associated wildlife remain as a result of heavy industrial development of the area, including a few small areas of ornamental plantings (i.e., palm trees) immediately to the east of the existing ESGS boundary and isolated patches of ruderal vegetation such as grasses, thistles and other weedy species. Nearby resources include Dockweiler State Park.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*
CLASS DICOTYLEDONAE	**PLANTS**	
Potentilla multijuga	Ballona cinquefoil	FSC
Dithyrea maritima	Beach spectaclepod	FSC/ST
Lasthenia glabrata ssp. Coulteri	Coulter's goldfields	FSC
Hemizonia parryi ssp. australis	Southern tarplant	FSC
Astragalus pycnostachyus var. lanosissimus	Ventura marsh milk vetch	SE
CLASS AVES	**BIRDS**	
Passerculus sandwichensisbeldingi	Belding's savannah sparrow	SE
Athene cunicularia	Burrowing owl	SSC
Polioptila californica	California coastal gnatcatcher	FE/SSC
CLASS INSECTA	**INSECTS**	
Euphiloites battoides allyni	El Segundo blue butterfly	FE
***Status Legend**: **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **ST** = State Threatened, **FSC** = Federal Species of Concern, **SSC** = State Species of Special Concern		

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures:

- Treatment of buildings, structures, and tanks visible to the public with non-reflective colors
- Use of non-reflective fencing
- Minimization of nighttime lighting views from public viewing areas, and minimization of illumination of vicinity and nighttime sky
- Landscape plan in compliance with the requirements of the City of El Segundo to provide continuous screening of the power plant from sensitive viewing areas.

From the attached Site Visit Report:

Visual screening	No visual treatment of the facility. East side screened by (8-15 feet) dense oleander and Australian bottlebrush with facility downslope from road. Cyclone fencing (8ft.) between plant and beach covered with green fabric screening observed on the western perimeter of plant.
Perimeter fencing/walls, height of the fencing/wall (ft)	8-foot cyclone, some sections with barbed wire. Heavy welded steel gate at entrance to facility.
Landscaping	A single row of mature and dense oleander was observed on the eastern boundary of the facility adjacent to Vista Del Mar Road. The slope located between Vista Del Mar Road and the facility consisted of a mixture of non-native grasslands scattered with native plants and large sections of ice plant. Several large eucalyptus and palm tress were located at the facilities entrance. Landscaping was limited along the western and northern portions of the facility.
Visual plumes – number and size	Visible plumes (200-foot) from two of four main stacks. 3 smaller plumes (20-feet) from turbine housing. 2 50-foot plumes from misc. structures.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 1 through 4), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	473,589	51,591 (10.9%)
2000 Minority	506,997	141,466 (27.9%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of El Segundo		
Total Population	16,033	16.4% minority
Households	7,060	2.27 persons/household
Total Housing Units	7,261	1.4% vacancy Rate
Labor Force	10,370	3.0% unemployment
Los Angeles County		
Total Population	9,519,338	51.3% minority
Households	3,133,774	2.98 persons/household
Total Housing Units	3,270,909	4.2% vacancy rate
Labor Force	4,857,500	6.5% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

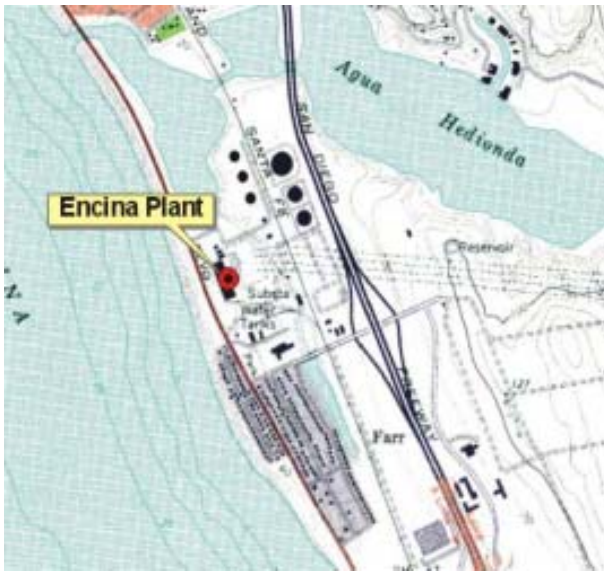
Encina

CEC ID: G0196 EIA ID: 302

Address: 4600 Carlsbad Boulevard
Carlsbad, CA 92008

County: San Diego

Directions: From Interstate 5 take the Cannon Road exit. Proceed west (right) on Cannon Road then head north (right) on Carlsbad Boulevard to the plant entrance.



Facility Overview

Plant nominal capacity:	943 MW
Generating units:	Unit 1 – Steam Turbine, 107 MW, gas fueled, ocean water cooled Unit 2 – Steam Turbine, 104 MW, gas fueled, ocean water cooled Unit 3 – Steam Turbine, 110 MW, gas fueled, ocean water cooled Unit 4 – Steam Turbine, 293 MW, gas fueled, ocean water cooled Unit 5 – Steam Turbine, 315 MW, gas fueled, ocean water cooled GT-1 – Gas Turbine, 14 MW, gas fueled, air cooled. not part of this study
Cooling system:	Seawater once-through cooling; except for GT-1, which is air cooled.

Plant Owner/Operator

Owner name: Cabrillo Power I LLC, NRG West Coast Inc. (NRG Energy and Dynegy Inc.), except Unit 5 owned by PSEG Resources, Inc.

Operator name: NRG Cabrillo Power Operations Inc. (NRG/Northern States Power Co)

Owner address:	750 B Street, Suite 2740 San Diego, CA 92101	***Operator address:***	4600 Carlsbad Blvd. Carlsbad, CA 92008
Owner contact:	Steve Burgstrom President, COO Phone: 713-507-6800	***Operator contact:***	Gregory J. Hughes Regional Plant Manager Phone: (760) 268-4011 Fax: (760) 268-4027

Site

Size:	671 acres total. The portion of the site sold to Dynegy, consisting of approximately 386 acres, included all of San Diego Gas & Electric's (SDG&E) lands used for generation purposes, and substantially all of the three Agua Hedionda lagoons (outer, middle, and inner basins), which encompass approximately 265 acres of water.
Description:	This was SDG&E's largest power plant. The Encina Power Plant consists of five steam turbines, five boilers, one combustion turbine, and associated facilities (e.g., a switchyard, an administration building, and fuel oil storage tanks). The plant also includes a residual fuel oil and petroleum storage facility consisting of 11 aboveground storage tanks. Seven contain back-up residual fuel oil, one contains displacement oil, and three contain diesel fuel for the combustion turbine for a total storage capacity of 71.6 million gallons. Other facilities include a guard station, an administration building, a machine shop, various water tanks, a multi-use structure, a shop/office building, and parking facilities. SDG&E retains the switchyard property, facilities and equipment. Also included in the site are the 6.6-acres site of the Hubbs-Seaworld Research Institute, and a roughly 20-acre section of beach.
Surrounding area:	Surrounding land uses include residential land uses to the north; residential, commercial, and industrial uses to the south; open space to the east; and the Pacific Ocean to the west. Popular recreational and fishing areas are in the immediate vicinity of the plant. Land north of the lagoon is designated in the Carlsbad General Plan (1994) primarily for residential uses, while the land south of the lagoon is designated for tourist-serving commercial use, open space, and public utilities. The land surrounding the inner basin is largely undeveloped; much of the land on the south side of the inner basin is currently used for irrigated farming. SDG&E high-voltage transmission lines run within an east-west transmission corridor along the east side of the lagoon. Interstate 5 passes just east of the power plant, and the Atchison Topeka and Santa Fe railroad line runs north-south through the site. Carlsbad Boulevard and the Pacific Ocean are to the west of the project site. *Refer to the attached Site Visit Report for additional information.*

General Plan and Zoning Designations:	The City of Carlsbad General Plan (1994) and The City of Carlsbad zoning designations for the SDG&E property.	
	General Plan: The project site is designated U (Public Utilities), which covers the dry land, and OS (Open Space), which covers the Agua Hedionda Lagoon.	**Zoning:** The plant is designated P-U (Public Utility), OS (Open Space Zone [Water]), and R-A-10 (Residential Agricultural). The P-U zone covers the majority of the dry land, the OS zone covers the waters of the Agua Hedionda Lagoon, and the R-A-10 zone covers a small portion of dry land between the east and west lagoons.

Cooling

Cooling system	Once-through cooling of steam turbine, air cooled gas turbine.
Cooling sources:	Agua Hedionda Lagoon (Steam Turbine Units 1-5)
Cooling discharge:	Pacific Ocean (Units 1-5)
Cooling system details:	Intake water is obtained through an inlet channel located in the outer lagoon of Agua Hedionda Lagoon.
Cooling system	The 2000 NPDES permit (Order No. 2000-03; NPDES Permit No. CA0001350) allows a maximum discharge of 863.142 MGD of which 857.29 MGD is once-through cooling water and the remainder consists of low volume wastes, metal cleaning wastes, and stormwater runoff.
Screening system:	Water is screened through trash racks and traveling screens to minimize entrainment of fish and debris.
Biofouling Control:	Some encrusting organisms are small enough to pass through the trash racks and screens and enter the intake tunnels. A thermal tunnel recirculation treatment procedure (heat treatment) is used at five- to eight-week intervals to prevent encrusting organisms from developing into significant sizes. This process involved recirculating the condenser discharge water through the condenser and piping to increase the temperature and dislodge the organisms. Intermittent chlorine treatment is used to minimize the formation of slime in the condenser tubes. Only the condensers and salt water heat exchangers are chlorinated.

Electrical Interconnect

Description:	Two switchyards, of 230-kV nominal voltage and 138 kV.
Transmission	Three 230-kV lines; postion 1 to San Onofre, position 2 to Escondido, position 3 to Penasquitos substations. Four 138-kV lines; position 1 and 2 to Escondido, position 3 & 4 to Mission substations.
Site arrangement:	Each operating voltage has two sections of breakers, all are configured as breaker and a half.

Fuel Supply

Fuel type:	Units 1-5: Natural gas, and residual fuel oil if NG is unavailable or uneconomic. Unit GT-1: Natural gas (primary) and diesel fuel oil
Fuel system description:	Units 1 through 5 - Residual fuel oil may be fired up to 160 hours/year for operational and reliability testing and for compliance emissions testing required by the District. An offshore marine terminal, consisting of seven buoys and a pipeline to the tank storage area, was developed to receive bulk residual fuel oil and displacement oil via barge or ship at the site. Diesel fuel for the combustion turbines is brought to the site via trucks. Natural gas is delivered to the site via SDG&E natural gas transmission and distribution system.

Unit 1

Unit Design:	Steam Turbine, General Electric, 1450 psig/1000 °F cycle conditions, non-reheat.
Boiler Design:	Boiler, Babcock & Wilcox, front fired, with air preheaters
Design Rating:	Heat 1,013 MMBtu/hr (297 MW thermal), operated at 105 MW
Unit History:	Unit 1 was started up in 1954. A joint venture of Dynegy, Inc., and NRG Energy acquired Encina power plant and 17 combustion turbines from SDG&E on May 21, 1999. Dynegy will provide fuel management services and market energy from Encina. NRG will manage the operation of the assets out of its new San Diego office.
Original Owner:	San Diego Gas & Electric Company

Air Pollution Control:	Water injection Boiler Emissions Limits:

Pollutant	AQ Permit Limits	ARB Database Limits
Nox	1100 tons/yr for 1999 and 2000 from all electrical generating steam boilers.	---
CO	---	---
PM	---	---
Sox	---	---
NH3	---	---

Description of Loading Management and/or Power Sales Arrangement:	Unit 1 is designated Reliability Must Run (RMR) by CAISO since divestiture and again in to 2002. Power is marketed by Dynegy, Inc. A portion of Encina output is sold via contract with California DWR.

Unit 2

Unit Design:	Steam Turbine, General Electric, 1450 psig/1000 °F cycle conditions.
Boiler Design:	Boiler, Babcock & Wilcox, front fired, with air preheaters
Design Rating:	Heat 1,013 MMBtu/hr (297 MW thermal), operated at 107 MW
Unit History:	Unit 2 was started up in 1956.
Original Owner:	San Diego Gas & Electric Company
Air Pollution Control:	Water injection Boiler Emissions Limits:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	1100 tons/yr for 1999 and 2000 from all electrical generating steam boilers.	---
CO	---	---
PM	---	---
SOx	---	---
NH3	---	---

Description of Loading Management and/or Power Sales Arrangement:	Unit 2 was designated Reliability Must Run (RMR) by CAISO from divestiture to 2001, but is NOT so designated in 2002. Power is marketed by Dynegy, Inc. Some portion of Encina output is sold via contract with California DWR.

Unit 3

Unit Design:	Steam Turbine, General Electric, 1450 psig/1000 °F cycle conditions.
Boiler Design:	Boiler, Babcock & Wilcox, front fired, with air preheaters

Design Rating:	Heat 1,128 MMBtu/hr (331 MW thermal), operated at 110.06 MW
Unit History:	Unit 3 was started-up in 1958.
Original Owner:	San Diego Gas & Electric Company
Air Pollution Control:	Water injection Boiler Emissions Limits:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	1100 tons/yr for 1999 and 2000 from all electrical generating steam boilers.	---
CO	---	---
PM	---	---
SOx	---	---
NH3	---	---

Description of Loading Management and/or Power Sales Arrangement:	Unit 3 was designated Reliability Must Run (RMR) by CAISO from divestiture to 2001, but is NOT so designated in 2002. Power is marketed by Dynegy, Inc. A portion of Encina output is sold via contract with California DWR.

Unit 4

Unit Design:	Steam Turbine, Westinghouse, 1850 psig/ 950 °F steam conditions.
Boiler Design:	Boiler, Babcock & Wilcox, opposed burners, air preheaters included.
Design Rating:	Heat 3,245 MMBtu/hr (951 MW thermal), operated at 316.61 MW
Unit History:	Unit 4 was started-up in June 1973.
Original Owner:	San Diego Gas & Electric Company
Air Pollution Control:	Flue gas recirculation, low NOx burners, and overfire air Boiler Emissions Limits:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	1100 tons/yr for 1999 and 2000 from all electrical generating steam boilers.	36 ppmv @ 3% O2
CO	---	400 ppmv @ 3% O2
PM	---	---
SOx	---	---
NH3	---	---

Description of Loading Management and/or Power Sales Arrangement:	Unit 4 was designated Reliability Must Run (RMR) by CAISO from divestiture to 2001, but is NOT so designated in 2002. Power is marketed by Dynegy, Inc. A portion of Encina output is sold via contract with California DWR.

Unit 5

Unit Design:	Steam Turbine, Westinghouse, 1850 psig/ 1000 °F steam conditions.
Boiler Design:	Boiler, Babcock & Wilcox, opposed burners, air preheaters
Design Rating:	Heat 3,475 MMBtu/hr (1,018 MW thermal), operated at 339.05 MW
Unit History:	Unit 5 was started November 1978 and is the only steam generating utility boiler in the county subject to District Rule 260.42a (Standard for Particulate Matter).
Original Owner:	PSEG Resources, Inc., is the owner. The unit was leased to SDG&E. Initial arrangement with the new site owner was the same.
Air Pollution Control:	SCR, flue gas recirculation, and low NOx burners Boiler Emissions Limits:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	1100 tons/yr for 1999 and 2000 from all electrical generating steam boilers.	25 ppmv @ 3% O2
CO	---	400 ppmv @ 3% O2
PM	---	---
SOx	---	---
NH3	---	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Unit is designated Reliability Must Run (RMR) by CAISO from divestiture to 2002. Power is marketed by Dynegy, Inc. Some portion of Encina output is sold via contract with California DWR.

Basic Unit Information

Unit	**1**	**2**	**3**	**4**	**5**
Dependable MW	107	104	110	293	315
Minimum Load MW	20	20	20	30	30
Online Date	Nov-1954	Jul-1956	Aug-1958	Nov-1973	Nov-1978
RMR in 2004	Yes	Yes	Yes	No	Yes
SCR Installed	Yes	Yes	Yes	Yes	Yes

2003 Performance

Unit	**1**	**2**	**3**	**4**	**5**
Capacity Factor	0.125	0.163	0.218	0.366	0.417
Heat Rate, Btu/kWh					
minimum load	13,094	12,685	13,246	15,259	31,482
average	11,678	11,421	11,432	10,847	11,292
maximum load	10,713	10,503	11,049	10,364	8,800
NOx Rate, lb/MMBtu	0.0122	0.0122	0.0122	0.0122	0.0122
NOx Rate, lb/MWh	0.136	0.136	0.136	0.136	0.136

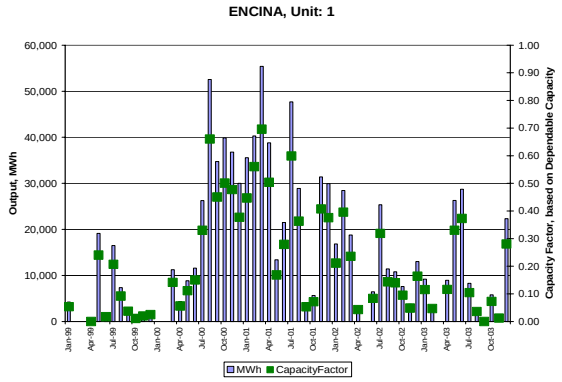
Past Five Years

Unit	1	2	3	4	5
Output, MWh					
1999	55,746	135,430	257,552	1,135,300	1,441,275
2000	256,241	269,297	434,465	1,209,898	1,186,062
2001	352,670	372,258	460,636	1,565,982	1,240,155
2002	145,804	181,603	187,082	906,659	1,028,439
2003	116,765	148,499	209,592	940,196	1,150,690
Fuel Use, MMBtu					
1999	629,401	1,505,208	2,894,989	11,724,687	15,288,427
2000	2,829,970	2,997,042	4,911,930	12,855,558	12,756,229
2001	3,879,352	4,131,782	5,174,712	16,834,358	13,316,375
2002	1,663,534	2,122,222	2,174,673	9,733,617	11,138,522
2003	1,363,617	1,695,973	2,396,104	10,197,923	12,993,685

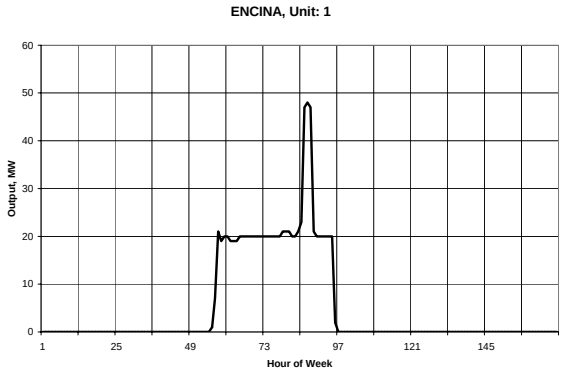
NOx Emission, pounds	Plant Total
1999	2,062,724
2000	1,933,563
2001	2,282,155
2002	549,247
2003	350,140

Charts

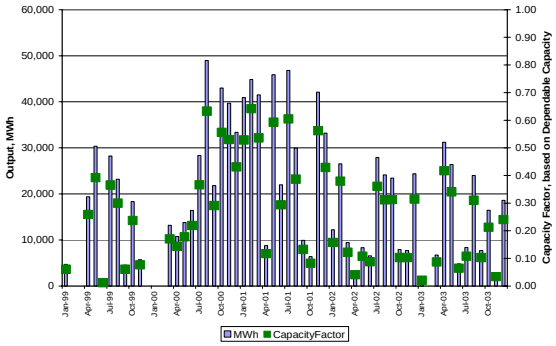
Monthly Output & Capacity Factor



Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)



ENCINA, Unit: 2



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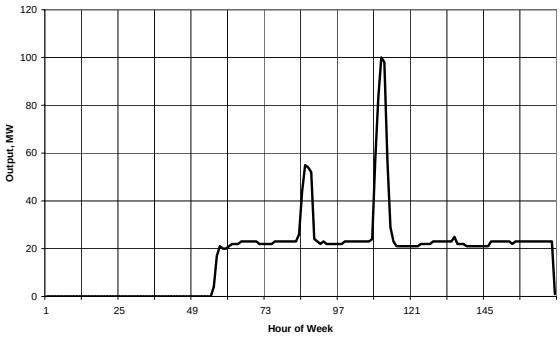

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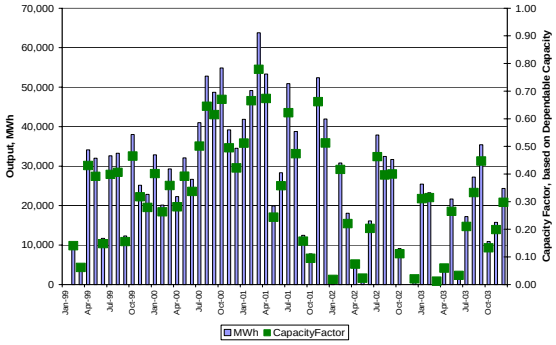

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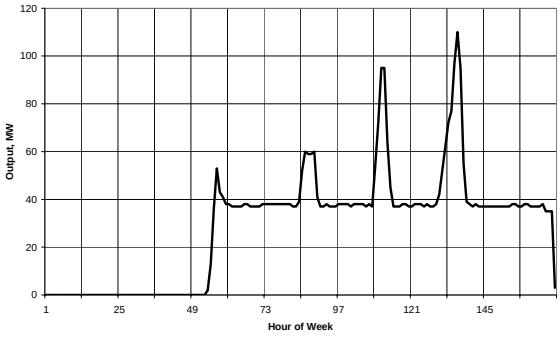

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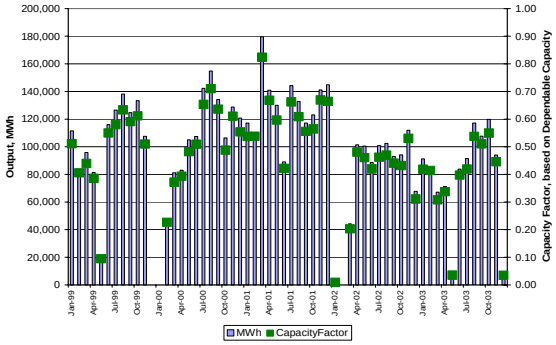
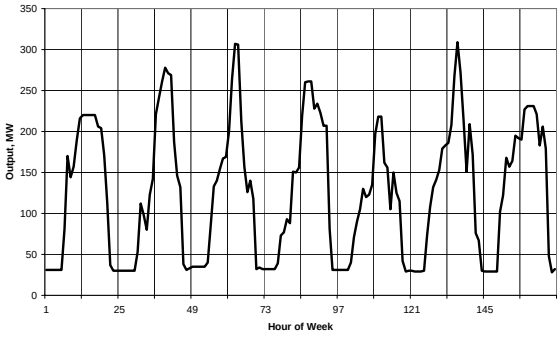
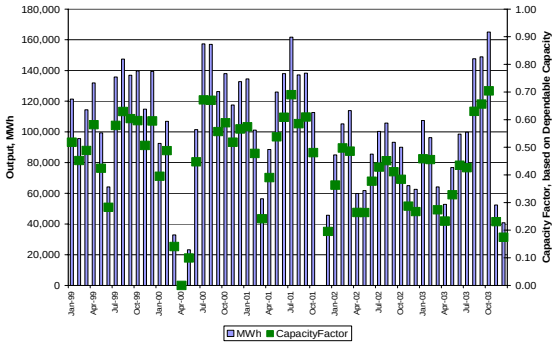


ENCINA, Unit: 4



ENCINA, Unit: 5



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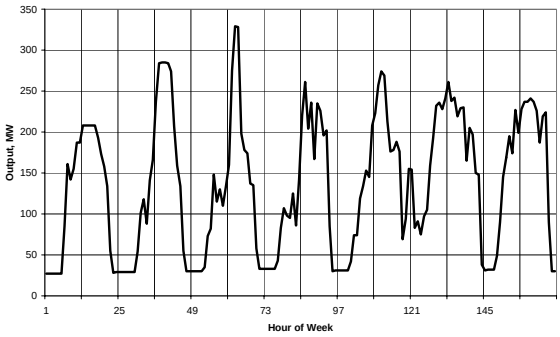


Permits/Agreements

Air:	Issued by San Diego Air Pollution Control District (Facility I.D.# 333A) All Permits to Operate are up for renewal on April 1, 2003 ▪ Permit to Operate # 1267 for Gas Turbine/Generator ▪ Permit to Operate # 791 for Boiler #1 ▪ Permit to Operate # 792 for Boiler #2 ▪ Permit to Operate # 793 for Boiler #3 ▪ Permit to Operate # 1770 for Boiler #4 ▪ Permit to Operate # 5238 for Boiler #5 Additional Auxiliary Equipment: ▪ Permit to Operate # 970274 for Cummins Diesel Engine ▪ Permit to Operate # 920894 for Emergency Engine Generator ▪ Permit to Operate # 960330 for Emergency Standby Engine ▪ Permit to Operate # 972662 for Portable Engine ▪ Permit to Operate # 972663 for Portable Engine ▪ Permit to Operate # 970895 for Dredge ▪ Permit to Operate # 001168 for Abrasive Blast Machine ▪ Permit to Operate # 930938 for Abrasive Blast Machine ▪ Permit to Operate # 941133 for Remote Reservoir Cleaner ▪ Permit to Operate #961265 for Marine Coasting Operation
Water:	**NPDES Permit No. CA0001350.** ▪ Issuing Agency: San Diego RWQCB ▪ Effective Date: February 9, 2000. ▪ Expiration Date: February 9, 2005. ▪ Order No. 2000-03 (Waste Discharge Requirements) serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	1372.0	1109.9	1164.9	1032.9	983.0
PM_{10}	78.3	161.5	188.0	186.1	217.4
VOC	20.5	71.8	87.2	87.6	99.2
CO	475.2	2186.5	2669.7	2687.5	3016.4
SO_x	397.8	47.3	20.7	9.5	73.7

Source: Annual Reports from San Diego Air Pollution Control District for Facility ID #333A.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	1371.9	1109.9	1164.9	1032.9	1164.9
PM_{10}	78.4	161.5	188	186.1	188
VOC	20.5	71.8	87.2	87.5	87.2
CO	475.2	2186.5	2669.7	2687.5	2669.7
SO_x	290.3	47.3	20.7	9.5	20.7

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4931). Accessed October 2001.

Complaint Logs:

Date Received	Description
02/19/02	Black smoke from the Common Unit Chimney. Closed 03/08/02.
07/19/01	Level 2 odor of fuel oil caused by a leak on the top portion of one of the fuel oil storage tanks (Tank #2). Closed 07/25/01.
04/16/01	Black smoke from the power plant's single exhaust stack. Closed 04/27/01.
01/16/01	Plumes of dark, black smoke. 5-10% opacity light brown smoke from the Common Unit Chimney occurred due to a fuel switch from natural gas to fuel oil. Closed 02/13/01.
11/16/00	Black smoke from the big stack. Closed 11/27/00.

Notices of Violation (NOV): No Notices of Violation provided.

Notices to Comply (N/C): No Notices to Comply provided.

Class I Setting: Located within 100 km of San Jacinto Wilderness and Agua Tibia Wilderness areas.

Attainment Status:

Pollutant	San Diego County Attainment Status for 2002	
	Federal	State
Ozone – One hour	Serious Nonattainment	Serious Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm

Emission Offset Availability: No data at this time.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: The adjacent Agua Hedionda Lagoon is designated critical habitat for the tidewater goby. Within the City of Carlsbad Multiple Habitat Conservation Plan.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
Encina Regions				
Eucyclogobius newberryi	Tidewater goby	FE		
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Within the City of Carlsbad Multiple Habitat Conservation Plan. Nearby resources include Carlsbad State Beach.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Encina Regions				
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow		Rocky slopes with relatively open shrub cover in coastal sage scrub.	Breeds mid-March to mid-June
Centromadia pungens ssp laevis	Smooth tarplant			Annual herb-April-September
Coreopsis maritime	Sea dahlia			Perennial herb-May-September
Crotalus ruber rubber	Northern red-diamond rattlesnake		Coastal sage scrub on rocky hillsides.	Warm periods
Dudleya viscida	Sticky dudleya			Perennial herb-May-June
Lotus nuttallianus	Nuttall's lotus			Annual herb-March-June
Nemacaulis denudata var denudata	Coast woolly-heads			Annual herb-April-September
Nemacaulis denudata var gracilis	Slender woolly-heads			Annual herb-March-May
Polioptila californica	California gnatcatcher	FT	Coastal sage scrub	Year round resident within its habitat, breeding period extends from about February 15 - August 30, with peak breeding from mid-March - mid-

				May. Breeding and non-breeding USFWS protocols exist (breeding = March 15-June 30, non-breeding = July 1 - March 14).
Southern coastal salt marsh	Southern coastal salt marsh			
Southern riparian forest	Southern riparian forest			
Vireo bellii pusillus	Least bell's vireo	FE, SE	Riparian habitats.	Breeding period extends from mid-March-late August. April 10-July 31 USFWS recommended survey period (USFWS survey guidelines).
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	The facility is enclosed in a large concrete block structure which covers the machinery of the plant. Additional screening on those portions of the site that are visible to the public is a mix of 8-foot cinder block wall, cyclone fencing with slats, and landscaping.
Perimeter fencing/walls, height of the fencing/wall (ft)	An 8-foot cinder block wall on the south side of the facility and 8-foot cyclone fencing with barbed wire surrounds the remainder of the facility. An 8-foot fence with slats was on the west side of the perimeter facing Carlsbad Blvd.
Landscaping	The south side of the facility was planted with widely spaced mature Australian tea and bottle brush. Vegetation along the western perimeter was sparse due to tall fencing with slats running along the roadside. However, heavy mature eucalyptus and other evergreen species were planted along the northern section of the facility. Large groves of eucalyptus shielded the plant from view from the east.
Visual plumes – number and size	Three small (20-feet) plumes visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 1 through 5), which create no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement. The existing power boiler exhausts (Units 1 through 5) may be able to create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated. The turbine exhaust from the simple cycle peaking turbine (Unit 6) is too hot to form visible water vapor plumes.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	153,603	15,792 (10.3%)
2000 Minority	183,263	64,909 (35.4%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Carlsbad		
Total Population	78,274	13.4% minority
Households	31,521	2.46 persons/household
Total Housing Units	33,798	6.7% vacancy rate
Labor Force	41,780	3.0% unemployment
San Diego County		
Total Population	2,813,833	33.5% minority
Households	944,677	2.73 persons/household
Total Housing Units	1,040,149	9.2% vacancy rate
Labor Force	1,461,200	3.8% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Etiwanda

CEC ID: G0201 EIA ID: 331

Address: 8996 Etiwanda Ave
Rancho Cucamonga, CA 91739

County: San Bernardino

Directions:

Facility Overview

Plant nominal capacity:	640 MW
Generating units:	Units 1 & 2 have retired. Unit 3: 320 MW Unit 4: 320 MW
Cooling system:	

Plant Owner/Operator

Owner name:	Reliant Energy Etiwanda LLC	***Operator name:***	Reliant Energy Etiwanda LLC
Owner address:		***Operator address:***	
Owner contact:		***Operator contact:***	

Site	
Size:	The total plant site is approx. 205 acres. Reliant Energy owns 63.98 acres. Southern California Edison (SCE) owns the remaining 141.02 acres).
Description:	The site has 5 power generating units, 4 related retention basins, and a cooling tower system. Within the fenced plant boundary there is also a fuel oil storage system (decommissioned – approx. 1.18 million barrels) owned by the Pacific Pipeline Systems Company, major electrical switchyards (220-kV, 66-kV) owned by SCE, and other miscellaneous SCE facilities.
Surrounding area:	Surrounding land uses include light industrial facilities, commercial uses, office parks, and a toxics remediation area associated with a former Kaiser Steel facility, the California International Speedway, a waste water treatment plant, and a San Bernardino county detention facility. Although the power plant facility is in San Bernardino County, the incorporated areas of the Cities of Rancho Cucamonga and Fontana are adjacent to the west, and northeast, respectively.
General Plan and Zoning Designations:	

Cooling
Cooling system
Cooling sources:
Cooling discharge:
Cooling system details:

Cooling system
Screening system:
Biofouling Control:

Electrical Interconnect

Description:
Transmission
Site arrangement:

Fuel Supply

Fuel type:
Fuel system description:

Basic Unit Information

Unit	**3**	**4**
Dependable MW	320	320
Minimum Load MW	25	25
Online Date	May-1963	Oct-1963
RMR in 2004	No	No
SCR Installed	Yes	Yes

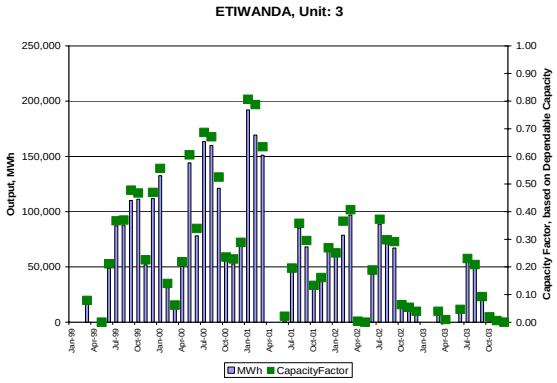
2003 Performance

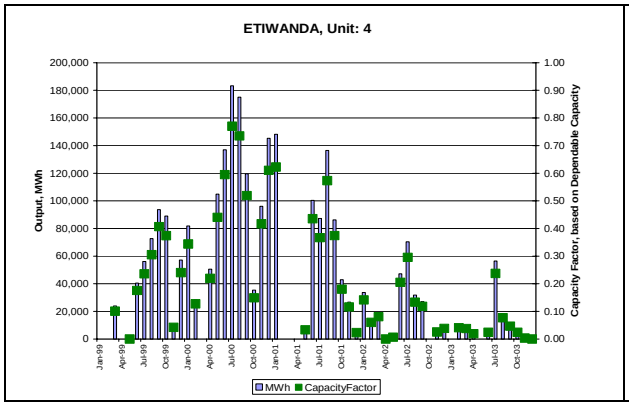
Unit	**3**	**4**
Capacity Factor	0.055	0.043
Heat Rate, Btu/kWh		
minimum load	17,911	18,151
average	12,361	13,039
maximum load	9,784	10,346
NOx Rate, lb/MMBtu	0.0083	0.0062
NOx Rate, lb/MWh	0.102	0.081

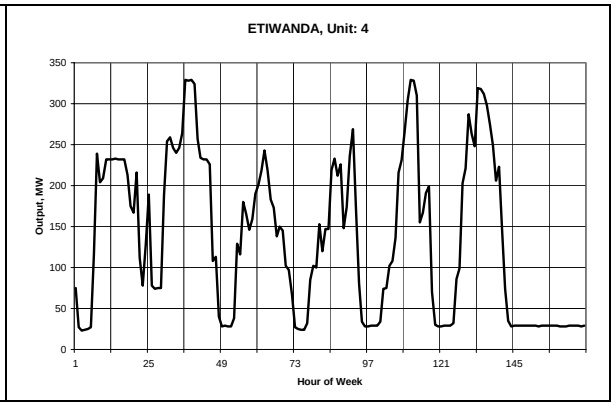
Past Five Years

Unit	**3**	**4**
Output, MWh		
1999	627,951	443,073
2000	1,072,962	1,157,466
2001	850,539	641,617
2002	543,179	258,695
2003	154,192	119,818
Fuel Use, MMBtu		
1999	6,529,962	4,760,418
2000	11,176,378	12,159,576
2001	8,829,723	6,994,431
2002	5,969,581	3,019,710
2003	1,905,988	1,562,317
NOx Emission, pounds		
1999	395,732	320,343
2000	589,765	666,422
2001	389,731	294,464
2002	69,469	50,263
2003	15,767	9,689

Charts

Monthly Output & Capacity Factor	Hourly Output During CAISO Peak Week in 2003 (7/19/2003 - 7/25/2003)
	Not in operation this week.





Permits/Agreements

Air:	▪
Water:	**Storm Water General Permit** ▪ Issuing Agency:

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	1997	1998	1999	2000	2001
NO_x						
PM_{10}						
VOC						
CO						
SO_x						

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x					
PM_{10}					
VOC					
CO					
SO_x					

.

Complaint Logs:

Notices of Violation (NOV):

Issued Date	Description	Status

Notices to Comply (N/C):

Class I Setting: .

Attainment Status:

Pollutant	___ AQMD Attainment Status for 2002	
	Federal	State
Ozone – One hour		
CO		
NO_2		
SO_2		
PM_{10}		
Lead		

Source:

Emission Offset Availability:

Total Emission Reduction Credits Available (tons/year) as of

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: None identified in the surrounding area.

Listed Non-Marine Species:

Scientific Name	Common Name	Status	Habitat	Survey Timing Guidelines and Flowering Periods
Perognathus longimembris brevinasus	Los Angeles pocket mouse	State Species of Concern	Lower elevation grasslands & coastal sage communities in the Los Angeles basin	

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual Resources	
Visual screening	
Perimeter fencing/walls, height of the fencing/wall (ft)	
Landscaping	
Visual plumes – number and size	

Any Existing Plume Abatement Measures:

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income		
2000 Minority		

Source:

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of		
Total Population		
Households		
Total Housing Units		
Labor Force		
San Bernardino County		
Total Population		
Households		
Total Housing Units		
Labor Force		

Source:

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Grayson

CEC ID: G0236 EIA ID: 377

Address: 634 BEKINS WAY
Glendale, CA

County: Los Angeles

Directions:

Facility Overview

Plant nominal capacity:

Generating units:

Cooling system:

Plant Owner/Operator

Owner name: ***City of Glendale***

Owner address:

Owner contact:

Operator name: ***City of Glendale***

Operator address:

Operator contact:

Site

Size: The total plant site is 12 acres, owned by the City of Glendale.

Description:	The site has two combined-cycle gas turbine units, three steam boilers, one simple-cycle gas peaker, and a cooling tower system. Major electrical switchyards (69-kV, and 34.5-kV), and other miscellaneous facilities are owned by the City of Glendale.
Surrounding area:	Surrounding land uses include light industrial facilities, commercial uses, the Southern Pacific Metrolink, the Los Angeles River, and State Route 134.
General Plan and Zoning Designations:	Restricted Industrial | M-1

Cooling

Cooling system type:	
Cooling sources:	
Cooling discharge:	
Cooling system details:	
Cooling system flow:	
Screening system:	
Biofouling Control:	

Electrical Interconnect

Description:	
Transmission details:	
Site arrangement:	

Fuel Supply

Fuel type:	
Fuel system description:	

Basic Unit Information

Unit	**3**	**4**	**5**	**8**
Dependable MW	19	44	42	95
Minimum Load MW	N/A	12	12	N/A
Online Date	Dec-1953	Sep-1959	Nov-1964	Jul-1977
RMR in 2004	No	No	No	No

SCR Installed	No	No	No	Yes

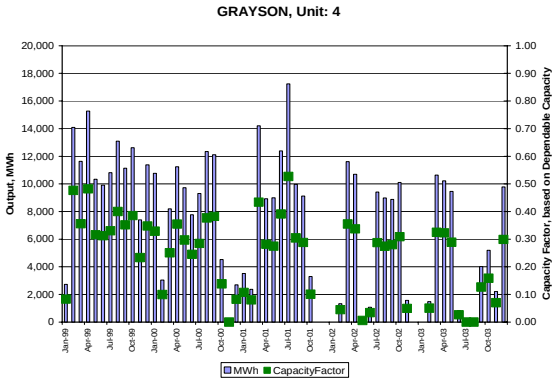
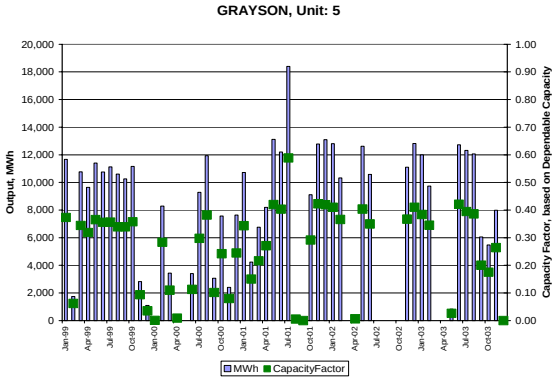
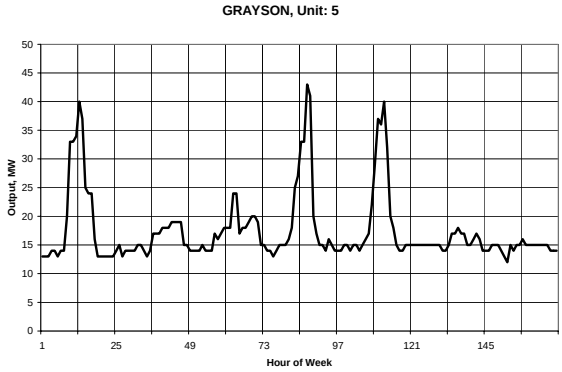
2003 Performance

Unit	**3**	**4**	**5**	**8**
Capacity Factor	N/A	0.140	0.215	N/A
Heat Rate, Btu/kWh				
minimum load	N/A	14,352	15,487	N/A
average	N/A	14,212	14,372	N/A
maximum load	N/A	12,151	12,129	N/A
NOx Rate, lb/MMBtu	N/A	0.0354	0.0318	N/A
NOx Rate, lb/MWh	N/A	0.503	0.457	N/A

Past Five Years

Unit	**3**	**4**	**5**	**8**
Output, MWh				
1999		130,411	103,052	
2000		91,724	57,340	
2001		90,025	108,770	
2002		63,853	70,442	
2003		53,838	79,203	
Fuel Use, MMBtu				
1999		1,652,789	1,262,215	
2000		1,118,073	721,781	
2001		1,090,354	1,342,756	
2002		864,839	950,937	
2003		765,134	1,138,272	
NOx Emission, pounds				
1999		38,880	66,815	
2000		19,521	24,087	
2001		26,319	48,295	
2002		14,693	21,418	
2003		27,057	36,209	

Charts

Monthly Output & Capacity Factor	Hourly Output During CAISO Peak Week in 2003 (7/19/2003 - 7/25/2003)
	Not in operation this week.
	

Permits/Agreements

Air:	▪
Water:	**Storm Water General Permit** ▪ Issuing Agency:

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	**1997**	**1998**	**1999**	**2000**	**2001**
NO_x						
PM_{10}						
VOC						
CO						
SO_x						

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x					
PM_{10}					
VOC					
CO					
SO_x					

.

Complaint Logs:

Notices of Violation (NOV):

Issued Date	Description	Status

Notices to Comply (N/C):

Class I Setting: .

Attainment Status:

Pollutant	___ AQMD Attainment Status for 2002	
	Federal	State
Ozone – One hour		
CO		
NO_2		
SO_2		
PM_{10}		
Lead		

Source:

Emission Offset Availability:

Total Emission Reduction Credits Available (tons/year) as of

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: None identified in the surrounding area.

Listed Non-Marine Species:

Scientific Name	Common Name	Status	Habitat	Survey Timing Guidelines and Flowering Periods
Dudleya multicaulis	Many-stemmed dudleya	State Candidate	Chaparral, coastal scrub, valley and foothill grassland. Endemic to Southern California.	

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual Resources	
Visual screening	
Perimeter fencing/walls, height of the fencing/wall (ft)	
Landscaping	
Visual plumes – number and size	

Any Existing Plume Abatement Measures:

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income		
2000 Minority		

Source:

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of		
Total Population		
Households		
Total Housing Units		
Labor Force		
Los Angeles County		
Total Population		
Households		
Total Housing Units		
Labor Force		

Source:

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Haynes

CEC ID: G0249 EIA ID: 400

Address: 6801 Westminster Avenue
Long Beach, CA 90803

County: Los Angeles

Directions: From Interstate 5, proceed on Interstate 405 South towards San Diego Freeway South/Santa Monica for approximately 47.9 miles. Take the Studebaker Exit and proceed on North Studebaker Road for approximately 2.1 miles. Head east (left) on Westminster Avenue for approximately 0.2 mile to the plant entrance.

Facility Overview

Plant nominal capacity:	1,126 MW Net capacity (Units 1-2, 5-6) Approved project to be started in 2002 will replace Units 3 & 4, the only units on the site without SCR's installed, with a combined cycle plant of 575 net MW. The new capacity of the station is planned to be 1,619 MW net.

Generating units:	Units 1 & 2 – Steam Boiler, operated at 222 MW (each), gas fueled, water cooled Units 3 & 4 – not part of this study Units 5 & 6 – Steam Boiler, operated at 341 MW (each), gas fueled, water cooled In March 2002, EDAW, Inc., prepared the Haynes Generating Station Repowering Project Draft EIR for the Los Angeles Department of Water and Power proposing a 575 MW electrical combined cycle generating system including two dual-fired (natural gas with ultra low-sulfur distillate as emergency backup) combustion turbine units, two heat recovery steam generator units, and one steam turbine generator unit. The proposed project would include removal of existing Units 3 & 4 (444 MW total) from service, and re-rating other existing steam boiler units downward by a total of 82 MW. The total net generating capacity would increase by 49 MW to 1,619 MW. Modification of the plant's existing cooling water systems is required. On July 16, 2002 the Los Angeles Board of Water and Power Commissioners passed resolution 003-010 approving the EIR and authorizing construction. The cost is approximately $355 million Construction to start in mid-2002 with an in-service date not later than Dec. 2004.
Cooling system:	Once-through cooling using ocean water.

Plant Owner/Operator

Owner name:	Los Angeles Department of Water and Power (LADWP)	***Operator name:***	LADWP
Owner address:	111 N. Hope St. Los Angeles, CA 90051-0100	***Operator address:***	6801 Westminster Ave. Long Beach, CA 90803
Owner contact:	William McCarley (213) 481-4211 John Hormozi (213) 367-2157 John.Hormozi@ladwp.com	***Operator contact:***	K.L. Bosworth Plant phone: (310) 431-2578

Site

Size:	The site for Haynes Generating Station was acquired by LADWP in 1957 for the purpose of constructing an electrical generating facility to replace the Seal Beach Steam Generating Plant, which had been operating since the 1920s. The property consists of approximately 122 acres, the majority of which is located in the City of Long Beach, Los Angeles County. Approximately 7.5 acres in the northeast corner of the property are located in the City of Seal Beach, Orange County.

Description:	Haynes Generating Station is a fully developed industrial site. There are currently six steam boiler generating units, all located in the southwest quadrant of the property. The units are generally paired. Units 1 and 2 are the southernmost pair, are approximately 140 feet tall, and each has a single exhaust stack of approximately 250 feet in height. Units 3 and 4 are the centermost pair, are approximately 155 feet tall, and each has two exhaust stacks of approximately 250 feet in height. Units 5 and 6 are the northernmost pair, are approximately 165 feel tall, and each has a single exhaust stack of approximately 250 feet in height. An additional small emergency generating unit (Unit 7) was added in 1970; however, it provides power at a rate of only one to two MW to ensure safe shutdown of the facility in case of an emergency. Associated with the six generators is a circulating water channel located to the east of the units. This channel provides cooling water for the existing generators. To the west of the generator units is an electrical switch gear yard that is fed by the generators and connects to an electrical transmission line that runs along the western edge of the property. In the west-central part of the property are six 37,500-gallon cylindrical aboveground tanks that store aqueous ammonia used in Selective Catalytic Reduction systems associated with Generator Units 1, 2, 5, and 6. The sixth tank is left empty in the event that one of the other tanks must be emptied. The central area of the property contains two wastewater settling ponds, station maintenance and storage facilities, and administrative trailers. The site is essentially unvegetated and has large expanses of impermeable paving. Numerous interior roads are located on the property.
Surrounding area:	Haynes Generating Station is bound by State Highway 22 on the north, and Orange County Flood Control District channel on the east, Westminster Avenue on the south, and the San Gabriel River, including a regional bike trail, on the west. The property is located primarily within the City of Long Beach, but is adjacent to the City of Seal Beach to the north and east. Surrounding areas consist primarily of industrial and residential uses, including the Leisure World retirement community along the entire eastern boundary of the site; industrial facilities (Boeing International) and vacant land to the southeast; the Island Village residential community to the south; vacant land to the southwest; the Alamitos Generating Station along the entire western boundary; residential areas to the northwest; and a community park and residential areas to the north. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	Haynes Generating Station is industrially developed and zoned Planned Development (PD-1). (Haynes Generating Station Repowering Project, Draft EIR, Chapter 8)

Cooling	
Cooling system type:	Once-through cooling
Cooling sources:	Long Beach Marina
Cooling discharge:	San Gabriel River
Cooling system details:	A circulating water channel is located to the east of the generating units. This channel provides cooling water for the existing generators. The channel roughly parallels the San Gabriel River between the Haynes Generating Station and State Highway 1 for approximately one mile. At the highway, water is drawn to the channel through a system of pipes that cross under the San Gabriel River and connect to an intake structure in the Long Beach Marina. At Haynes Generating Station, water is drawn from the channel through separate pump and screen chambers for each generating unit. The cooling water is released through three discharge structures (one per each pair of generator units) located in the bank of the San Gabriel River, to the west of Haynes Generating Station. The Alamitos power plant also discharges to this River.
Cooling system	The NPDES permit (Order No. 00-081; NPDES Permit No. CA0000353) allows a maximum discharge of 1,014 MGD of waste consisting of once-through cooling water from six steam electric power generating units, reverse osmosis membrane reject of the desalination system, metal cleaning wastes, and low volume wastes. Discharge No. 001 (Units 1 & 2) total maximum flow of 210.5 MGD consists of 208 MGD once-through cooling water, and the remainder is other waste. Discharge No. 002 (Units 3 & 4) total maximum flow of 389 MGD is once-through cooling water. Discharge No. 003 (Units 5 & 6) total maximum flow of 683.1 MGD consists of 674 MGD once-through cooling water, and the remainder is other wastes. Total once-through cooling water is 1,271 MGD. 1,011 MGD maximum permitted per Los Angeles RWQCB, 2002.
Screening system:	Separate pump and screen chambers are used for each generating unit.

Biofouling Control:	Heat treatment is used to control marine growth. Once-through cooling water is temporarily recirculated through the cooling water intake system increasing the temperature of the circulating water. This procedure occurs infrequently but could be required every 5 weeks. This procedure lasts approximately 2 hours for the intake conduits. During heat treatment the once-through cooling water intake points alternately become discharge points. Intermittently, each of the condenser halves is treated for control of biological growths by injection of chlorine into the cooling water stream. Calcareous shell debris accumulates in the intake structure as a result of the heat treatment. Approximately once a year, these shell debris may be physically removed from the intake structure for disposal in the Ocean.

Electrical Interconnect

Description:	230-kV switchyard connects to an electrical transmission line that runs along the western edge of the site.
Transmission details:	Four connecting transmission lines; Position 1 to Station G, position 2 to Station A, position 3 to Station A, and position 4 to Station G.
Site arrangement:	Two busses of breaker and a half configuration.

Fuel Supply

Fuel type:	Natural gas. Generators originally ran on fuel oil.
Fuel system description:	Natural gas is supplied by continuous feed from a Southern California Gas Company transmission line. The generators originally ran on fuel oil, and the northern portion of the property is devoted primarily to four large aboveground fuel oil storage tanks. Three of these tanks are now empty, and the fourth is partially filled with fuel oil. There are five additional fuel oil storage tanks in the southeastern quadrant of the property. One tank is partially filled with fuel oil, and the others are nearly empty.

Units 1 & 2

Unit Design:	Rankine Cycle power units with turbine conditions of 2,000psig/1000 °F /1000 °F single reheat, condenser ocean water cooled to 1.5 In Hg nominal. Tandem compound turbine-generator.
Boiler Design:	Steam Boiler, front fired, air preheated, with oxygen content control. Combustion Engineering manufacturer. Single Drum boilers rated 2,050 psig/1,000 °F/1,000 °F single reheat. Steam rating of 1,510,000 lbs/hr.
Design Rating:	Boiler heat input of 2,240 MMBtu/hr (656 MW thermal each). 230 MW gross (each), operated at 222 MW (each).
Unit History:	Units 1 & 2 were placed in operation in 1962.

Original Owner:	LADWP
Air Pollution Control:	SCR and ammonia injection/air injection Emissions Limits Boiler Units No. 1 and No. 2:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	12.37 lbs/1000 gal fuel oil	9 ppmv @ 3% O2
CO	2000 ppmv	---
PM	0.1 grains/dscf	0.1 grains/dscf @ 3% O2
SOx	Boiler No. 1 = 677 tons/yr Boiler No. 2 = 335 tons/yr	500 ppmv @ 3% O2
NH3	10 ppmv (fuel oil) 20 ppmv (natural gas)	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Municipal Utility operation.

Units 5 & 6

Unit Design:	Rankine cycle, supercritical steam type, turbine inlet conditions of 3500 psig/1050 °F/1000 °F single reheat, condenser rated 1.5 In Hg nominal. Cycle currently operated at 1025 °F main steam temperature to reduce damage to high temperature steel components. General Electric cross compound turbine/generator set.
Boiler Design:	Steam Boiler, opposed firing, supercritical Babcock & Wilcox. Steam flow rating of 2,060,000 lbs/hr.
Design Rating:	Boiler heat input of 3,240 MMBtu/hr (950 MW thermal each). 343 MW gross (each), operated at 341 MW (each).
Unit History:	Units 5 & 6 were placed in operation in 1966 and 1967, respectively.
Original Owner:	LADWP
Air Pollution Control:	SCR, ammonia injection/air injection, air preheated, with oxygen content control.

Emissions Limits Boiler Units No. 5 and No. 6:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	12.37 lbs/1000 gal fuel oil	9 ppmv @ 3% O2
CO	2000 ppmv	---
PM	0.1 grains/dscf	0.1 grains/dscf @ 3% O2
SOx	Boiler No. 5 = 1391 tons/yr Boiler No. 6 = 1516 tons/yr 500 ppmv (fuel oil)	---
NH3	20 ppmv (fuel oil) 20 ppmv (natural gas)	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Municipal Utility operation

Basic Unit Information

Unit	**1**	**2**	**5**	**6**
Dependable MW	222	222	341	341
Minimum Load MW	50	50	120	120
Online Date	Sep-1962	Apr-1963	Aug-1966	Mar-1967
RMR in 2004	No	No	No	No
SCR Installed	Yes	Yes	Yes	Yes

2003 Performance

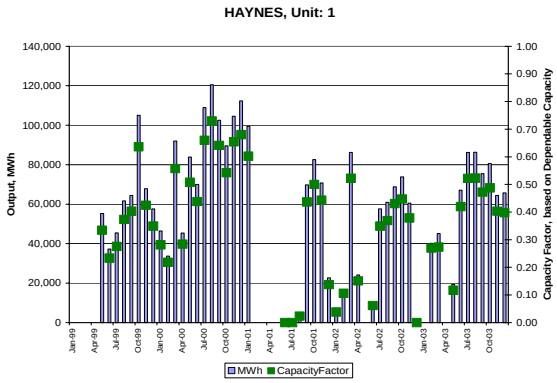
Unit	1	2	5	6
Capacity Factor	0.324	0.234	0.352	0.108
Heat Rate, Btu/kWh				
minimum load	11,546	11,448	10,270	10,414
average	10,319	10,262	9,805	9,928
maximum load	9,753	9,608	9,441	9,293
NOx Rate, lb/MMBtu	0.0054	0.0056	0.0060	0.0060
NOx Rate, lb/MWh	0.056	0.057	0.059	0.060

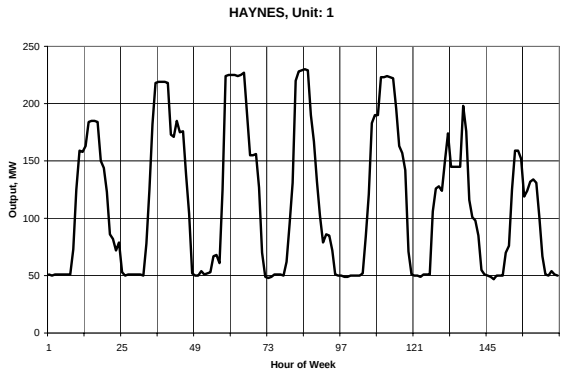
Past Five Years

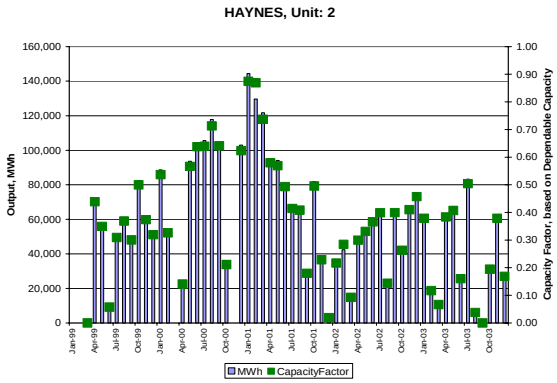
Unit	1	2	3	4
Output, MWh				
1999	494,641	491,921	533,314	522,194
2000	1,009,976	820,641	1,005,859	351,920
2001	349,149	947,471	1,105,256	383,332
2002	464,105	592,599	482,782	581,001
2003	630,496	455,187	1,050,554	323,818
Fuel Use, MMBtu				
1999	5,060,492	4,951,106	5,149,321	5,169,825
2000	10,001,177	7,933,871	9,758,576	3,548,696
2001	3,499,245	9,179,035	10,533,183	3,834,966
2002	4,731,190	6,061,051	4,643,561	5,727,848
2003	6,505,874	4,670,949	10,300,915	3,214,706
NOx Emission, pounds				
1999	82,189	75,444	82,795	661,888
2000	116,880	92,730	74,494	316,926
2001	42,189	107,887	84,953	37,126
2002	57,391	69,419	48,018	36,530
2003	34,998	25,941	61,835	19,271

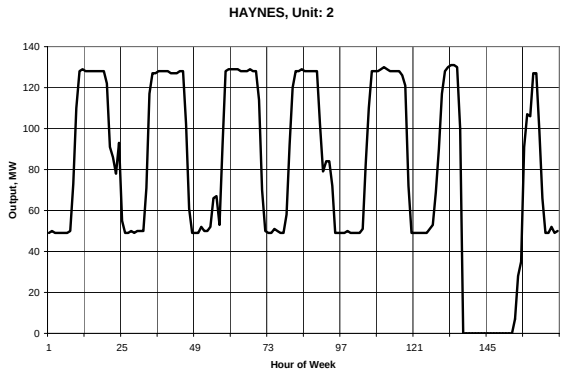
Charts

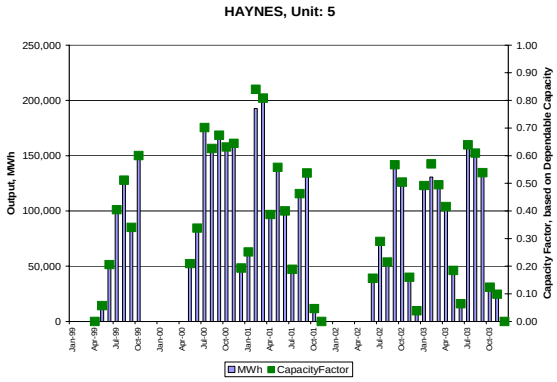
Monthly Output & Capacity Factor	Hourly Output During CAISO Peak Week in 2003 (7/19/2003 - 7/25/2003)

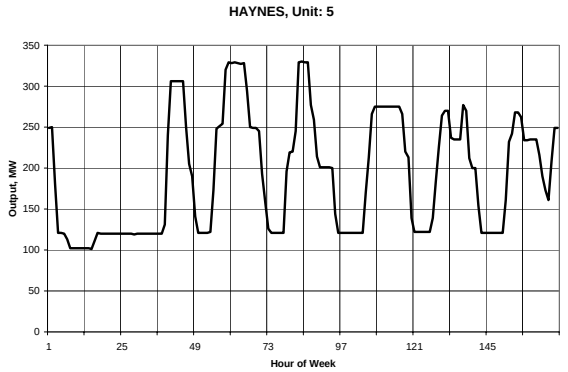


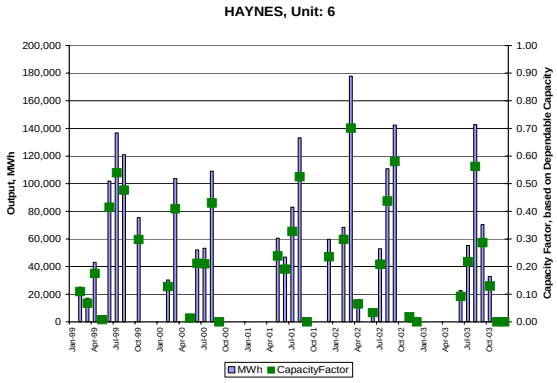


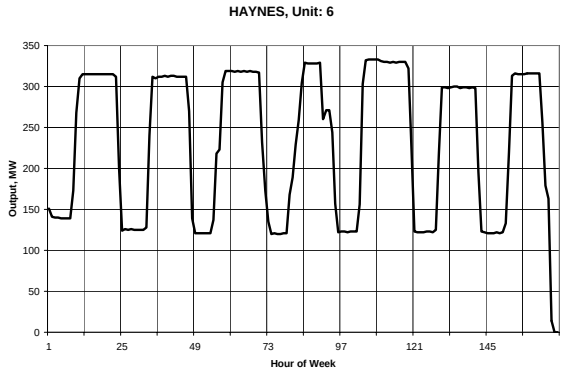












Permits/Agreements

Air:	▪ Facility Permit to Operate, August 19, 1999: Issued by South Coast Air Quality Management District (Facility I.D.# 800074) ▪ Initial Title V Permit Issued: August 19, 1999 ▪ Title V Permit Expiration Date: August 18, 2004
Water:	**NPDES Permit No. CA0000353, CI-2769** ▪ Issuing Agency: Los Angeles RWQCB ▪ Effective Date: April 25, 2000, Revised June 29, 2000. ▪ Expiration Date: May 10, 2005. ▪ Order No. 00-081 (Waste Discharge Requirements) Serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	7/95 - 6/96	**96 - 97**	**97 - 98**	**98 - 99**	**99 - 2000**
NO_x	302.15	169.82	151.23	767.07	756.55
PM_{10}	19.71	10.55	9.22	28.47	42.77
VOC	69.27	36.76	32.26	100.93	150.70
CO	118.69	62.05	54.19	170.38	255.84
SO_x	6.76	3.75	3.30	9.66	14.44

Source: Annual Reports from South Coast Air Quality Management District for Facility ID #800074.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	417.1	388.4	388.4	388.4	388.4
PM_{10}	26.7	10.6	10.6	10.6	10.6
VOC	100.3	36.8	39.2	36.8	39.2
CO	160.6	62	62	62	62
SO_x	8.9	3.8	3.8	3.8	3.8

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs: No complaints found.

Notices of Violation (NOV):

Issued Date	**Description**	Status
08/31/01	Facility NO_x emissions for 1999 compliance year exceeded RTCs in account. Rule 2004 (d)(1)	Incomplete 10/05/01

Notices to Comply (N/C): No Notices to Comply found.

Class I Setting: Located within 100 km of San Gabriel Wilderness and Cucamonga Wilderness areas.

Attainment Status:

Pollutant	South Coast Attainment Status for 2002	
	Federal	**State**
Ozone – One hour	Extreme Nonattainment	Extreme Nonattainment
CO	Serious Nonattainment	Nonattainment [1]
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Serious Nonattainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note (1): Only L.A. County is in nonattainment for CO. All other areas of the South Coast APCD are in attainment.

Emission Offset Availability: No data available.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: Nearby resources include the San Gabriel River Channel.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
Haynes Regions				
Sterna antillarum browni	California least tern	FE, SE	Known to occur on sandy beaches along marine and estuarine environments, salt ponds, and other sparsely vegetated sites near fish bearing water. Occurs in California May - September	In California, can primarily be seen during the breeding period from May - September.
***Status Legend: **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Nearby resources include the San Gabriel River Channel.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Haynes Regions				
Athene cunicularia	Burrowing owl		Open habitats that have suitable burrows (mostly ground squirrel burrows) including pastures, grasslands, and open developed areas.	Peak breeding April 15 - July 15. Potential breeding February1 - August 31. CDFG protocols exist
Centromadia parryi ssp australis	Southern tarplant			Annual herb-May-November
Cicindela senilis frosti	tiger beetle			
Cordylanthus maritimus ssp maritimus	Salt marsh bird's-beak	FE, SE		Annual herb-May-November
Danaus plexippus	Monarch butterfly		Milkweed plants for forage and breeding-wintering in woodlands along coast from Mendocino south to Baja California	No info.
Lasthenia glabrata ssp coulteri	Coulter's goldfields			Annual herb-February-June
Nemacaulis denudata var denudata	Coast woolly-heads			Annual herb-April-September
Passerculus sandwichensis beldingi	Belding's savannah sparrow	SE	Year round resident in salt marsh habitat	Year-long in its preferred habitat
Phrynosoma coronatum blainvillei	San Diego horned lizard		Coastal sage scrub in friable sandy and rocky soils from L.A. south to Baja California.	Warm periods.
Sidalcea neomexicana	Salt spring checkerbloom			Perennial herb-March-June
Southern coastal salt marsh	Southern coastal salt marsh			
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	No visual treatment for the power plant. No screening on east or west side of facility. Landscaping of sparse trees (12-foot) offer minimal screening on north side of plant. Mature landscaping (20-foot) with slated fencing on south side of plant along Westminster Avenue.
Perimeter fencing/walls, height of the fencing/wall (ft)	10-foot cyclone fencing with barbed wire surrounds the facility. Cyclone fence gate at entrance to facility, barbed-wire missing in many areas.
Landscaping	Ornamental flower beds and small trees have been planted around the administration building only. A dense thicket of mature tea-trees (20-feet) have been planted on the south side of the facility along Westminster Avenue. Small populations of native and ornamental trees were observed along the plants northern fence line.
Visual plumes – number and size	No plumes were visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 1 through 6), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e. cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	515,535	60,554 (11.7%)
2000 Minority	555,409	272,942 (49.1%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Long Beach		
Total Population	461,522	54.8% minority
Households	163,088	2.77 persons/household
Total Housing Units	171,632	5.0% vacancy rate
Labor Force	226,670	6.1% unemployment
Los Angeles County		
Total Population	9,519,338	51.3% minority
Households	3,133,774	2.98 persons/household
Total Housing Units	3,270,909	4.2% vacancy rate
Labor Force	4,857,500	6.5% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department Labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

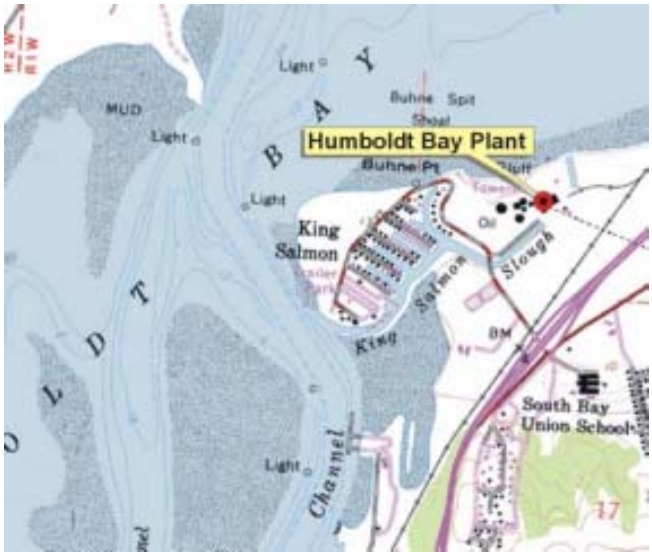
Humboldt Bay

CEC ID: G0268 EIA ID: 246

Address: 1000 King Salmon Avenue
Eureka, CA 95503

County: Humboldt

Directions: From Highway 101, take the King Salmon Avenue exit. Turn left (northwest) on King Salmon Avenue for approximately 0.4 mile to the plant entrance.



Facility Overview

Plant nominal capacity:	135 MW total current capacity 105 MW (Units 1 and 2) rankine steam cycle. 30 MW combustion turbines (MEPPs 2 & 3), not part of this study. Unit 3 nuclear, permanently out of service.
Generating units:	Unit 1 – Steam Generator, Boiler No. 1, Rankine/steam cycle, 52 MW, gas fueled Unit 2 – Steam Generator, Boiler No. 2, Rankine/steam cycle, 53 MW, gas fueled Unit 3 - nuclear fueled Boiling Water Reactor, 65 MW. Operated from August 1963 to July 1976. Shutdown due to economics of a seismic retrofit required after a moderate earthquake. Retired in December 1985. Plant placed in SAFSTOR (with spent nuclear fuel rods stored in water pools on site) until anticipated full decommissioning in 2015. Two Gas Turbines (peaking), diesel fueled generating units designated “MEPP” or Mobile Electric Power Plants, 15 MW each. Originally three MEPP (Units 1-3). Unit 1 is retired (used for spare parts) and Units 2 & 3 remain in service.

Cooling system:	Sea water once through of the active steam units (Units 1 & 2) and remaining requirements of Unit 3. The MEPP do not require cooling water.

Plant Owner/Operator

Owner name:	Pacific Gas & Electric (PG&E)	***Operator name:***	PG&E
Owner address:	PO Box 770000 Mail Code N13J 245 Market St., NIIE San Francisco, CA 94105	***Operator address:***	111 Stony Circle Santa Rosa, CA 95401-9599
Owner contact:	Joseph E. Minkstein, Manager of Technical Services (415) 973.5977 JEM8@pge.com G. Rueger, (415) 973-7000	***Operator contact:***	T.A. Moulia, Plant Manager, (707) 444-0700

Site

Size:	140 acres, of which 32 acres is “controlled”.
Description:	The Humboldt Bay Thermal/Nuclear power plant is located on the shore of the bay, just southwest of Eureka, the County seat and about ¼ mile to the west of State Highway 101 at Buhne Point. The site is located between a fishing harbor and rail line. The site consists of two fossil fuel units, two mobile gas turbines, and a nuclear unit (Unit 3). Indoor construction of the nuclear and steam units. Oil tanks and transmission towers are located on-site.
Surrounding area:	Humboldt Bay to the north is located adjacent to the power plant. Areas surrounding the plant include a combination of open space (adjacent to facility), commercial, agricultural, and residential areas. The peninsula consists of the power plant and fishing harbor. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	**General Plan:** Humboldt Bay Area Plan’s designation of Commercial Recreation (CR) **Zoning:** Commercial Recreation with Flood Hazard Combining Zone and Coastal Zone

Cooling

Cooling system type:	Once-through cooling water system.

Cooling sources:	Humboldt Bay through Fisherman's Channel.
Cooling discharge:	Discharge canal and then returns to Humboldt Bay.
Cooling system details:	The facility uses about 76 MGD of bay water for once-through cooling purposes in the active power generation units. Other discharges to the canal include: discharge from the oil/water separators [40,000 gallons per day (GPD)]; boiler metal cleaning waste (160,000 gallons every 10 to 15 years); boiler metal fireside wash (50,000 gallons every 3 to 5 years); liquid low-level radioactive waste (7,000 GPD); non-contact cooling water (2.3 MGD); Unit 3 caisson groundwater (20 GPD); boiler blowdown, evaporator blowdown, and scale cracking (5,000 GPD); intake screen wash (46,000 GPD); storm water runoff (variable); and discharges from remote storm drains (variable).
Cooling system	The NPDES permit (Order No. R1-2001-45; NPDES Permit No. CA0005622) states that Discharge No. 001 includes 76 MGD of bay water for once-through cooling of Units 1 & 2 (Outfall 001A), and 2.3 MGD of once-through, non-contact cooling water for Units 1 & 2 Bearing Cooling Water (BCW) System (Outfall 001F). Total discharge of once-through cooling water is 78.3 MGD.
Screening system:	Intake screens
Biofouling Control:	Thermal treatments of each cooling water system are conducted once per month to remove mussels from the system.

Electrical Interconnect

Description:	60-kV for the steam units. The MEPP are connected to the nuclear unit transformer and a 115-kV system.
Transmission details:	Single 60-kV line, which is considered distribution system voltage, transmits the power of the two steam units (Units 1 & 2). The MEPP units (Units 2 & 3) are connected to the original nuclear plant switchyard and subsequently to two transmission lines of 115-kV to the PG&E system. The existing transformer and system used for the MEPP has a 65 MW capacity versus current utilization of 30 MW.
Site arrangement:	Units 1 & 2 have a dedicated switchyard. The MEPP's switchyard is distribution switching.

Fuel Supply

Fuel type:	The steam units use natural gas with fuel oil backup. The MEPP units use diesel oil or equivalent distillate oil.
Fuel system description:	On-site oil tanks contain both Bunker C fuel for the steam units and diesel oil fuel for the MEPP units. PG&E gas system, pipeline delivery.

Units 1 & 2

Unit Design:	Rankine cycle, 850 psig/900 °F. Turbine is Westinghouse manufacture, single shaft non-reheat.
Boiler Design:	Unit 1 by Babcock & Wilcox; Unit 2 by Riley Stoker.
Design Rating:	Unit 1 boiler heat input of 680 MMBtu/hr (199 MW thermal). Steam turbines output of 533,750 lbs/hr at 850 psig, 900°F. Operated at 52 MW. Unit 2 boiler heat input of 680 MMBtu/hr (199 MW thermal). Steam turbines output of 566,250 lbs/hr at 850 psig, 900°F. Operated at 53 MW.
Unit History:	Units 1 & 2 initially started 12/01/1956 and 12/01/1958, respectively.
Original Owner:	PG&E
Air Pollution Control:	Emissions Limits Boiler No. 1 and No. 2:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	---	---
CO	---	---
PM	0.20 gr/dscf of exhaust gas calculated to 12% CO2	0.2 grains/dscf @ 12% CO2
SOx	Fuel oil sulfur content not to exceed 1.7%	1000 ppmv @ 12 % CO2
NH3	---	---

Description of Loading Management and/or Power Sales Arrangement:	ISO dispatch. Utility generation.

Basic Unit Information

Unit	**1**	**2**
Dependable MW	52	53
Minimum Load MW	7	7
Online Date	Dec-1956	Dec-1958
RMR in 2004	Yes	Yes
SCR Installed	No	No

2003 Performance

Unit	**1**	**2**
Capacity Factor	0.298	0.207
Heat Rate, Btu/kWh		
minimum load	16,213	16,591
average	13,252	13,636
maximum load	11,865	12,017
NOx Rate, lb/MMBtu	0.2646	0.2299
NOx Rate, lb/MWh	3.507	3.135

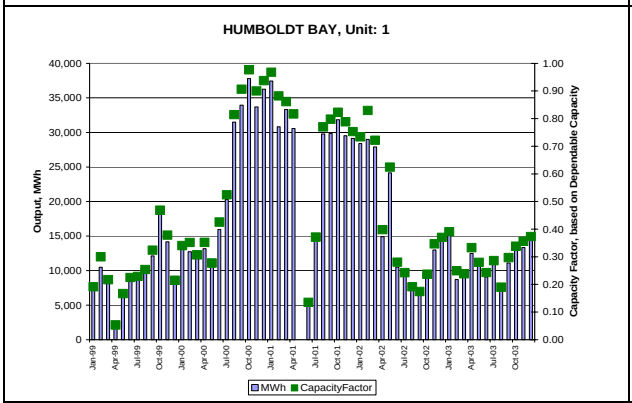
Past Five Years

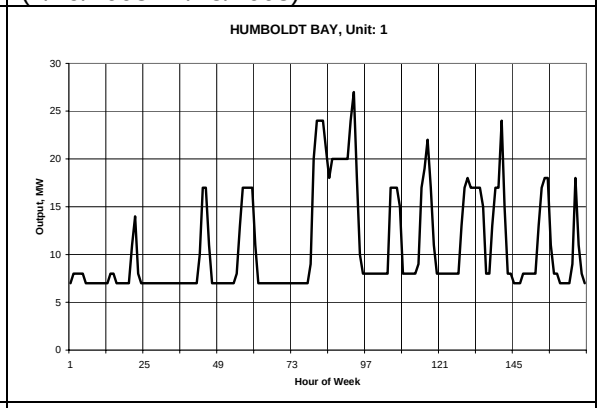
Unit	1	2
Output, MWh		
1999	114,538	118,084
2000	271,088	251,353
2001	301,752	378,430
2002	194,615	190,383
2003	135,796	95,965
Fuel Use, MMBtu		
1999	1,557,585	1,671,588
2000	3,351,865	3,114,291
2001	3,625,109	4,666,569
2002	2,427,832	2,496,025
2003	1,799,522	1,308,611
NOx Emission, pounds		
1999	444,964	391,145
2000	1,503,941	1,327,649
2001	1,744,467	2,583,918
2002	868,937	872,671
2003	476,219	300,836

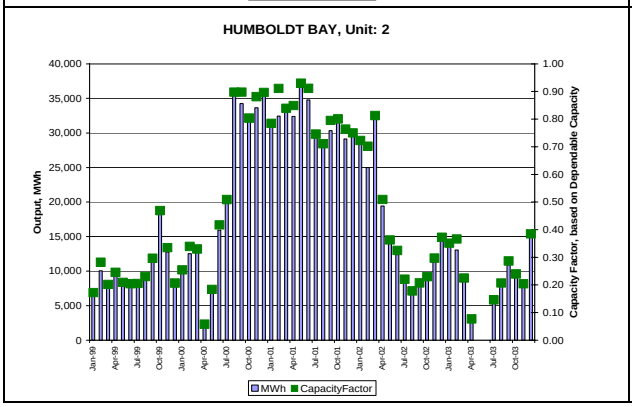
Charts

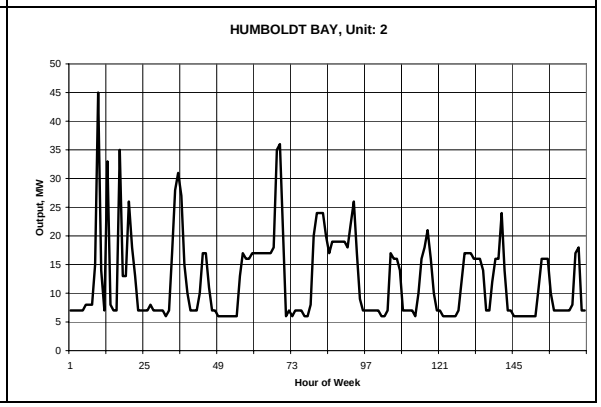
Monthly Output & Capacity Factor

Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)









Permits/Agreements	
Air:	▪ Facility Permit to Operate, March 17, 1998: Issued by North Coast Unified Air Quality Management District (Facility I.D. NCU 059-12, Thermal only) ▪ Revision May 01, 2000 ▪ Revision November 28, 2000 ▪ Various NRC permits
Water:	**NPDES Permit No. CA0005622**. ▪ Issuing Agency: North Coast RWQCB ▪ Effective Date: April 26, 2001. ▪ Expiration Date: April 26, 2006. ▪ Order No. R1-2001-45 (Waste Discharge Requirements) Serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions: Humboldt Bay (Thermal only)

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	**1997**	**1998**	**1999**	**2000**	**2001**
NO_x	298.3	230.7	285.5	454.1	1546.9	2238.2
PM_{10}	12.09	3.74	13.46	16.12	45.97	144.14
VOC	2.14	1.62	12.74	14.60	30.31	32.70
CO	45.79	43.6	58.3	66.5	137.9	162.8
SO_x	107.14	2.27	11.77	2.37	108.1	1461.79

Source: Annual Reports from North Coast Unified Air Quality Management District for Facility ID NCU 059-12.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	298.3	298.3	285.5	285.5	285.5
PM_{10}	11.7	11.7	13.4	13.4	13.4
VOC	1.5	1.5	7.1	7.1	7.1
CO	46	46	58.2	58.2	58.2
SO_x	108.2	108.2	11.8	11.8	11.8

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs:

Date Received	Description
11/04/99	Odor of diesel fuel from diesel generators. These contingency diesel generators run during peak energy demand times. The last inspection of these units revealed compliance with air quality regulations and permit conditions. The odors are most likely from the fuel oil storage tanks and not from the diesel generators.
10/08/99	Strong petroleum smell. Odor was coming from the fuel oil storage tank. PG&E had water in the fuel oil and had increased the temperature in the tank to drive off some of the moisture. The extra heat was creating fumes. They have stopped this method and will bring in a centrifuge with a scrubber to remove the rest of the water. There should be no further odor from this source.
04/16/099	Large column of black smoke from plant. The diesel backup generators were used. Air quality permit conditions limit the opacity of each stack to Ringlemann 2, or 40% opacity. A visible emissions evaluation was performed and it was found each stack emitted an average of Ringlemann 1 or 20% opacity.
01/31/99	Burning heavy oil in one of the tanks causing a tar, oil like smell. PG&E heats up the bunker c fuel oil in these tanks during high-energy demand. Specific odor controls are not currently required on these tanks. Should the odors cause a public nuisance, where a considerable number of persons are affected by the odor, controls may be required. To date only one complaint has been received. Heating of the oil is an intermittent event and odors should be short term.

Notices of Violation (NOV):

Issued Date	Description	Status
07/30/01	Visible emissions exceeding 40% opacity. Regulation 1-410 (a)	$950 settlement
07/30/01	Failure to report breakdown Regulation 1-540 (b)(1)(a)	$950 settlement

Notices to Comply (N/C): No Notices to Comply issued.

Class I Setting: Located within 100 km of Redwood National Park.

Attainment Status:

Pollutant	North Coast Attainment Status for 2002	
	Federal	**State**
Ozone – One hour	Unclassified/Attainment	Attainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm

Emission Offset Availability: No data available.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: Nearby resources include Humboldt Bay.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
Humboldt Bay Regions				
Charadrius alexandrinus nivosus	Western snowy plover	FT	Coastal shores, reservoirs, braided river channels, and playas.	In California, can primarily be seen during the breeding period from mid-March - Mid-September, some wintering on Southern California beaches.
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Nearby resources include Humboldt Bay National Wildlife Refuge (South and North Bay), and Arcata Marsh and Wildlife Sanctuary.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Humboldt Bay Regions				
Abronia umbellata ssp breviflora	Pink sand-verbena			Perennial herb-June-October
Carex arcta	Northern clustered sedge			Perennial herb-June-August
Cordylanthus maritimus ssp palustris	Point Reyes bird's-beak			Annual herb-June -October
Abronia umbellata ssp breviflora	Pink sand-verbena			Annual herb-May-October
Sidalcea oregana ssp eximia	Coast checkerbloom			Perennial herb-July-August
Spergularia canadensis var occidentalis	Western sand-spurrey			Annual herb-June August
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	No visual screening observed other than large berms around tank farm.
Perimeter fencing/walls, height of the fencing/wall (ft)	8-foot cyclone fencing with barbed-wire.
Landscaping	A dense landscape of mature trees including pine, willow, eucalyptus, cypress surrounded the facility. The berm along the bay side is dominated with a thicket of shrubs, small trees, and non-native grasses. The entrance to facility was lined with a row of pine, cypress, and eucalyptus trees.
Visual plumes – number and size	Two 300-foot plumes were visible.

Any Existing Plume Abatement Measures:

The Humboldt Bay (Thermal) power plant uses once-through cooling, which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler (Units 1 and 2) exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

The turbine exhausts from the simple cycle turbines are too hot to form visible water vapor plumes.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	43,033	6,475 (15.0%)
2000 Minority	45,238	8,482 (18.7%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Eureka		
Total Population	26,128	17.6% minority
Households	10,957	2.68 persons/household
Total Housing Units	11,637	5.8% vacancy rate
Labor Force	13,180	6.4% unemployment
Humboldt County		
Total Population	126,518	15.3% minority
Households	51,238	2.39 persons/household
Total Housing Units	55,912	8.4% vacancy rate
Labor Force	59,700	6.4% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department Labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Hunters Point

CEC ID: G0272 EIA ID: 247

Address: 1000 Evans Avenue
San Francisco, CA 94124

County: San Francisco

Directions: From Highway 101, take the Third Street exit. Continue on Third Street then Newhall Street. Turn southeast (right) on Hudson Avenue. Turn northeast (left) on Mendell Street. Turn southeast (right) on Evans Street and proceed for approximately 0.4 mile to the entrance of the plant.

Facility Overview

Plant nominal capacity:	215 MW Units 1 & 4 only. Unit 1 is not part of this study.
Generating units:	Unit 1 - 26 MW each (52 MW total), consisting of engines 1A & 1B, distillate oil fueled. Units 2 & 3 - No longer in generation service, being operated as syncronous condenser for VAR support. Unit 4 - 163 MW, still in normal power generation service. Units 2, 3 and 4 were on a steam header system supplied by Boilers 3 thru 7. Currently only Boiler 7 and Unit 4 remain of the original header system.
Cooling system:	Unit 1 is air cooled, Unit 2 & 3 generators, which operate as synchronous condensers, are ocean water cooled. Unit 4 is ocean water cooled.

Plant Owner/Operator

Owner name:	Pacific Gas & Electric (PG&E)	***Operator name:***	Pacific Gas & Electric
Owner address:	PO Box 770000 Code N13J San Francisco 94177 245 Market St., NIIE San Francisco, CA 94105	***Operator address:***	1000 Evans Avenue San Francisco CA 94124
Owner contact:	Joseph E. Minkstein Phone: (415) 973-5977 Fax: (415) 973-7688 JEM8@pge.com R. Livingston (415) 973-7000	***Operator contact:***	As of February 2002, Lester Olmstead-Rose Phone: (415) 973-1062

Site

Size:	14 acres based on map scaling.
Description:	Per PG&E, Hunters Point Power Plant was first put into service in December 1929. Originally there were four units at the facility. Unit 1, built in 1929, was converted into emergency peaking gas turbines in 1976. Units 2 and 3 were built just after WW II and then shut down in July 2000. Prior to shutting down, each unit produced a total of 160 MW. Unit 4 was built in 1958 and uses natural gas. On July 9, 1998, PG&E entered into an agreement with the City and County of San Francisco to close the Hunters Point Power Plant when the facility was no longer needed. The substation adjacent to the plant was an integral part of the electric system and was necessary to maintain reliable service in the Bay Area. PG&E is currently removing eight of the nine fuel tanks located at the plant--three on the west side of Evans Avenue and five tanks on the east side of Evans Avenue. Work began in June 2002 and will end in November or December of 2002. After closing the facility, PG&E will conduct a full remediation of the plant. Although the plant cannot be completely shut down until the ISO makes its closure determination, PG&E has substantially reduced capacity and production at the plant, without risking electric reliability. In July 2000, with approval from the ISO, Units 2 and 3 were permanently removed from production and converted to synchronous condensers--with zero air emissions--to help maintain the voltage necessary to support the grid. Synchronous condensers are critical components that provide voltage support to the transmission grid. PG&E has continued to reduce the plant's air emissions. Upgrades were installed on the remaining operational fossil fuel unit (Unit 4) between November 2001 and February 2002 to further reduce emissions to levels below stringent Bay Area Air Quality Management District (BAAQMD) standards. As a result of PG&E's upgrade program, nitrogen oxide (NOx) emission concentrations have decreased 65 percent since 1994. These concentrations were 30 percent below the limit set by the BAAQMD in 2000 and 2001.
Surrounding area:	A local housing authority has formed a group known as SAEJ, which is an “environmental justice” organization, which are advocating the demolition of the power plant and its conversion to

	parkway along the bay. Various agreements made during divestiture of other generating plants have made such a plan possible, although final dates for cessation of operation have to be determined by CAISO, and the City of San Francisco has only a "right of first refusal" on the property once it becomes available. Details of the Agreement, which results in the expected demolition of Hunters Point Power Plant, are available in the EIR of 8/5/98 concerning divestiture. "In January 1998, PG&E filed a new application to sell four of its five remaining fossil-fueled power plants…On July 17, 1998, PG&E amended the application to withdraw the Hunters Point plant from the sale, pursuant to a July 9, 1998, agreement between PG&E and the City and County of San Francisco. Under the terms of the agreement, PG&E agreed to withdraw the Hunters Point Power Plant (HPPP) from the auction process by which it proposes to sell the other power plants, and agreed permanently to shut down the HPPP as soon as the facility is no longer needed to sustain electric reliability in SF and the surrounding area, and the FERC has authorized PG&E to terminate the Reliability Must Run Contract for the facility. The agreement provides that the City and PG&E will advocate the expeditious development of generation and/or transmission facilities to replace the HPPP. **PG&E agreed to record a restrictive covenant of the HPPP site ensuring that it will not be used for power generation in the future**, and to give the City a right of first refusal to purchase the site it is sold by PG&E". *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	General Plan and Zoning Designations: **General Plan:** Heavy Industrial | **Zoning:** M-2 (Heavy Industrial)

Cooling

Cooling system	Ocean water direct once-through cooling of condensers.
Cooling sources:	San Francisco Bay
Cooling discharge:	Lower San Francisco Bay
Cooling system details:	Cooling water is withdrawn from the San Francisco Bay from a shoreline surface water intake structure.

Cooling system	The NPDES permit (Order No. 94-057; NPDES Permit No. CA0005649; 5/18/94) Total cooling water discharge flow of 412.3 MGD. Total flow of 413.055 MGD. Outfall 001 once-through cooling water existing discharge of 266 MGD, and other wastes (intake screen was, lubricating water, demusseling) of 0.7486 MGD. Outfall 002 once-through cooling water existing discharge (Unit 4) of 146.3 MGD and 0.0029 MGD of lubricating water. Outfall 003-013 existing stormwater runoff of 0.0035 MGD. Intake pumps for Units 2 & 3 each have a design capacity of 89,000 (2-40,000 gpm main unit plus 1-9,000 gpm house unit pump). Intake pumps for Unit 4 have a design capacity of 101,600 gpm (2 pumps).
Screening system:	Cooling water passes through a bar rack and screen on the intake structure.
Biofouling Control:	Chlorination, thermal demusseling treatment, and manual scraping.

Electrical Interconnect

Description:	The current power plant substation will continue in service as an important distribution switching center for the San Francisco peninsula.
Transmission	One underground 115-kV cable to Potrero, other overhead 230-kV transmission line to Martin Substation.
Site arrangement:	Information not readily available.

Fuel Supply

Fuel type:	Distillate Oil for Gas Turbine Unit 1 and Natural Gas for Unit 4, Boiler 7.
Fuel system description:	All large fuel oil tanks are being dismantled in 2002. Gas is delivered by PG&E.

Unit 4

Unit Design:	This turbine is on a header system of muliple boilers. More than one boiler can provide steam as needed.

Boiler Design:	Boilers 3 thru 6 are Babcock & Wilcox, radiant, dual fuel. Boiler 7 is Combustion Engineering Model Type R, dual fuel
Design Rating:	Boilers 3 thru 6 are rated for Heat at 670 MMBtu/hr (196 MW thermal each). Boiler 7 is rated 1720 MMBtu/Hr.
Unit History:	Unit 4 began operation in 1958. This unit will be out of compliance for NOx in 2004 (SF Peninsula Long-Term Transmission Planning Study Phase 2 Study Plan)
Original Owner:	Pacific Gas & Electric Company
Air Pollution Control:	Not specified. Emission Limits Boiler No. 3 through 7:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	0.057 lb/MMBtu (2002) 0.037 lb/MMBtu (2004) 0.018 lb/MMBtu (2005), 1-hr avg. 175 ppmvd @ 3% O2, 1-hr avg. (natural gas) 500 ppmvd @ 3% O2, 1-hr avg. (fuel oil) (Units 3-6) 700 ppmvd @ 3% O2, 1-hr avg. (fuel oil) (Unit 7)	175 ppmv @ 3% O2
CO	400 ppmvd @ 3% O2 steady state compliance source tests 1000 ppmvd @ 3% O2 (1-hr avg.) for all other periods of operation	1000 ppmv @ 3% O2
PM	0.15 grains/dscf @ 6% O2	0.15 grains/dscf @ 3% O2 (Units 3-6)
SOx	GLC 0.5 ppm (3 min. avg.), 0.25 ppm (1-hr avg.), 0.05 ppm (24-hr avg.) 300 ppmvd Sulfur content of fuel < 0.5 wt% Federal - GLC of 140 ppb, 24-hr avg., once per year and 30 ppb, annual avg. State - GLC of 40 ppb, 24-hr avg., and 250 ppb, 1-hr avg. Boiler No. 3 = 76 tons/yr Boiler No. 4 = 5 tons/yr Boiler No. 5 = 74 tons/yr Boiler No. 6 = 1 ton/yr Boiler No. 7 = 192 tons/yr	300 ppmv @ 3% O2 (Units 3-6)
NH3	10 ppmvd @ 3% O2 (rolling 1-hr avg.), except during startup/shutdown	---
Lead	6.75 kg/day 1.0 $\mu g/m^3$ (24-hr avg.)	---

Description of Loading Management and/or Power Sales Arrangement:	Designated Reliability Must Run (RMR) in 2001 and 2002. Utility generation.

Basic Unit Information

Unit	**4**
Dependable MW	163
Minimum Load MW	40
Online Date	Nov-1958
RMR in 2004	Yes
SCR Installed	No

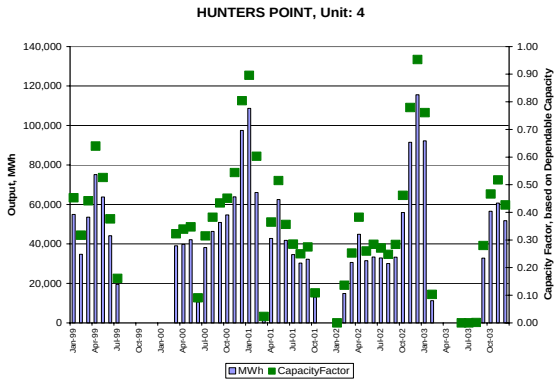
2003 Performance

Unit	**4**
Capacity Factor	0.214
Heat Rate, Btu/kWh	
minimum load	11,226
average	10,301
maximum load	9,586
NOx Rate, lb/MMBtu	0.0394
NOx Rate, lb/MWh	0.406

Past Five Years

Unit	
Output, MWh	
1999	345,812
2000	483,103
2001	434,903
2002	514,614
2003	305,513
Fuel Use, MMBtu	
1999	3,428,279
2000	4,882,311
2001	4,459,464
2002	5,320,219
2003	3,147,197
NOx Emission, pounds	
1999	258,257
2000	371,160
2001	339,933
2002	198,980
2003	124,136

Charts

Monthly Output & Capacity Factor	Hourly Output During CAISO Peak Week in 2003 (7/19/2003 - 7/25/2003)
	Not in operation during the week.

Permits/Agreements

Air:	▪ Final Major Facility Review Permit, September 14, 1998: Issued by the Bay Area Air Quality Management District (Facility I.D.# A0024) ▪ Permit Expiration Date: September 14, 2003
Water:	**NPDES Permit No. CA0005649** ▪ Issuing Agency: San Francisco Bay RWQCB ▪ Effective Date: May 18, 1994. ▪ Expiration Date: May 18, 1999 (This permit has been administratively extended to May 18, 2004). ▪ Order No. 94-057 (Waste Discharge Requirements) serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	**1997**	**1998**	**1999**	**2000**	**2001**
NO_x	1230.77	746.06	669.52	978.68	749.86	555.23
PM_{10}	23	19	30	32	27	49
VOC	21	11	11	14	12	16
CO	206	185	153	234	178	227
SO_x	61	54	205.85	160.93	151.38	48

Source: Annual Summary from Bay Area Air Quality Management District for Facility ID # A0024.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	733.3	741.2	599.9	321	599.9
PM_{10}	17.1	18.2	23.3	14	23.3
VOC	10.7	12.7	15.7	12.9	15.7
CO	219.9	227.4	258	164	258
SO_x	8.7	9.1	28	12	28

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4931). Accessed October 2001.

Complaint Logs:

Date Received	Description
04/06/01	Black smoke. Confirmed.
04/29/98	White smoke. Unconfirmed.
04/21/98	Red smoke. Unconfirmed.
01/20/98	Excessive smoke. Unconfirmed.
06/27/96	Black smoke cloud. Confirmed.

Notices of Violation (NOV):

Issued Date	Description	Status
07/21/98	Boiler combustion opacity > 20% for 5 Min. Regulation 6-302	Cancel
07/21/98	Boiler combustion opacity > 20% for 5 Min. Regulation 6-302	Cancel
05/27/97	ID #5000: Opacity > 30% 3 Min/Hr. Regulation 6-302	Settled Out of Court, MS

Notices to Comply (N/C): No Notices to Comply provided.

Class I Setting: Located within 100 km of Point Reyes National Seashore Recreation Area.

Attainment Status:

Pollutant	Bay Area Attainment Status for 2002	
	Federal	**State**
Ozone – One hour	Not Classified/Moderate [1]	Serious Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note (1): San Francisco Bay Area is designated "Not Classified / Moderate" under 23 U.S.C. Section 104(b)(2) and has a 2006 attainment deadline.

Emission Offset Availability: www.baaqmd.gov/permit/banking/banking.htm

Total Emission Reduction Credits Available (tons/year) as of May 7, 2002.

PM	140
POC	3,339
NO_x	1,750
SO_2	1,030
CO	1,088
NPOC	459
PM_{10}	222

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: Nearby resources includes San Francisco Bay.

Listed Marine Species: No marine species listed in the California Natural Diversity Database within one mile of the power plant site.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Nearby resources include Candlestick Point State Recreation Area and Heron's Head Park Wetlands Restoration Project.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Hunters Point Regions				
Astragalus tener var tener	Alkali milk-vetch			Annual herb-March-May
Helianthella castanea	Diablo helianthella			Perennial herb-April-June
Layia carnosa	Beach layia	FE, SE		Annual herb-March-July
Linanthus rosaceus	Rose linanthus			Annual herb-April-June
Sanicula maritima	Adobe sanicle	SR		Perennial herb-February-May
Triphysaria floribunda	San Francisco owl's-clover			Annual herb-April-June
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	The majority of critical structures are enclosed in structures designed to minimize visual intrusion. The entire perimeter of the facility consists of 8' cyclone fencing with barbed wire and concertina placed along the top of the fence. The western and southern fences have brown slats and landscaping. No landscaping or slats were observed on the northern and eastern fences.
Perimeter fencing/walls, height of the fencing/wall (ft)	An 8-foot cyclone fence with both concertina and barbed wire encloses the entire facility.
Landscaping	Landscaping was limited to a single row of oleander planted along the southwest perimeter of the plant. Eucalyptus trees were planted along the roadway on the northwest side of the plant.
Visual plumes – number and size	No plume visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 3 through 7), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler (Units 3 through 7) exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

The turbine exhausts from the simple cycle turbines (Units 1A and 1B) are too hot to form visible water vapor plumes.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	700,581	86,361 (12.3%)
2000 Minority	749,824	438,352 (58.5%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City and County of San Francisco		
Total Population	776,733	50.3% minority
Households	329,700	2.30 persons/household
Total Housing Units	346,527	4.9% vacancy rate
Labor Force	432,400	6.6% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Huntington Beach

CEC ID: G0274 EIA ID: 335

Address: 21730 Newland Street
Huntington Beach, CA 92646

County: Orange

Directions: Located in northern Orange County in the City of Huntington Beach. From the LA Airport area, proceed on Interstate 405 South towards San Diego approximately 50 miles. Take the CA-39/Beach Boulevard exit towards Huntington Beach. Proceed south (right) on Beach Boulevard for approximately 4.1 miles to Adams Avenue. Proceed east (left) on Adams Avenue for approximately 0.5 mile to Newland Street. Proceed south (right) on Newland Street for approximately 1.7 miles to the plant entrance.

Facility Overview

Plant nominal capacity:	788 MW (online) with the addition of Unit 3. This study includes only units 1 & 2.

Generating units:	Units 1 & 2 – Steam Turbines, 215 MW (each), gas fueled, ocean water cooled Unit 3 – Steam Turbine, 225 MW, gas fueled, ocean water cooled. This unit returned to service 7/31/2002. Unit 4 – This unit is inactive and has been placed into long term return-to-service status, meaning its capacity is not counted as dependable operating capacity. Necessary permits for operation have been relinquished. It has been permitted for return to service as part of the AES Huntington Beach Retool Project. However, work on this unit has been suspended and a completion date is not currently available. Unit 5 (5A1/2, 5B1/2, 5C1/2, 5D1/2) – Combustion Turbine, 133 MW total (16.6 MW each), gas fueled, air cooled.
Cooling system:	Seawater once through cooling (Units 1-2 and Units 3-4 as part of Retool Project)

Plant Owner/Operator

Owner name:	AES Huntington Beach, LLC	***Operator name:***	AES Huntington Beach, LLC
Owner address:	21730 Newland Street Huntington Beach CA 92646	***Operator address:***	same
Owner contact:	Han Tan 714-374-1408 Fax 714-374-1495 htan@aesc.com	***Operator contact:***	same

Site

Size:	The site is 106 acres in total, with 23 acres owned for power generation by the owner listed above. The Southern California Edison (SCE) Company owns the remaining 83 acres.
Description:	The Huntington Beach Generating Station power block has three currently active units (Units 1, 2, and 5), related retention basins, and an ocean-fed cooling system. Additional facilities include an administration building, a maintenance shop, a warehouse and a distillate fuel tank. The SCE Company owns the following plant assets: a fuel-oil storage and transportation system, including the fuel-oil tanks, cutter stock tanks, fuel heaters and associated pumps and piping; a switchyard system comprised of a 220-kV switchyard, a 66-kV switchyard, circuit breakers, towers, lines, structures and buildings and electrical protection; SCEnet communication equipment; and other assets unrelated to power generation, including a wildlife rehabilitation center and vacant land, including some wetlands.

Surrounding area:	Low-density residential areas are located approximately 1,000 feet to the east and southeast of the generating station. Downtown Huntington Beach is approximately 1.5 miles northwest of the generating station. Newland Street and Edison Avenue border the west and north edges of the site, respectively, and Magnolia Street defines the property's eastern boundary. The southeast area of Huntington Beach contains many single-family residential units, including a large concentration of mobile homes. The area surrounding the generating station includes residential developments on the west, northwest, east, and southeast. West of the site is a vacant parcel, which abuts a mobile home park and the Pacific Coast Highway. In addition, Huntington Beach State Park, a popular beach park, lies southwest of the facility on the other side of the Pacific Coast Highway. Open space and wetland areas are situated southeast and northwest of the generating station, and commercial uses predominate north of the plant. The Orange County Sanitation District waste treatment plant is approximately 0.5 miles south of the plant. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	Huntington Beach General Plan and the Huntington Beach Local Coastal Plan. **General Plan:** Designated "Public" with a small portion of the site designated as "Industrial" **Local Coastal Program:** General Industrial (IG), Oil Production (O), Flood Plain (FP2), and Coastal Zone (CZ).

Cooling

Cooling system type:	Once-through cooling water system
Cooling sources:	Pacific Ocean
Cooling discharge:	Pacific Ocean
Cooling system details:	Single cooling water system consisting of four active circulation pumps. Seawater enters Units 1 & 2 from an offshore intake via a 14-foot inside diameter concrete conduit. The cooling water intake structure with velocity cap is located approximately 1,650 feet offshore. Water is discharged to the Pacific Ocean through Discharge Serial No. 001. This discharge consists of a 14-foot inside diameter concrete discharge conduit that extends approximately 1,500 feet offshore. Units 1 & 2 have a closed cooling system to cool auxiliary equipment in each plant. The closed system uses demineralized water that is cooled by part of the main cooling water stream and is then diverted to a heat exchanger and subsequently returned to the main cooling water flow.

Cooling system	The NPDES permit (Order No. 00-5; NPDES Permit No. CA0001163) allows a maximum discharge of 516 MGD when Units 1, 2, and 5 are operating at full capacity simultaneously. Under normal operating conditions, when only Units 1 and 2 are running, the average discharge flow is approximately 256 MGD. Four active circulation pumps, each rated at approximately 44,000 gpm.
Screening system:	Traveling screen system for each generating unit, with screen size of approximately 1 inch. Bar rakes for stopping large debris.
Biofouling Control:	Sodium hypochlorite is used to chlorinate the ocean water upstream from the condenser tubes. Chlorination is done twice each day for approximately 30 minutes per circulating water pump. Heat treatment is implemented through a system of recirculation and temporary reverses of flow through the once-through cooling water system. This is normally performed for approximately two hours per line about every five weeks. During heat treatment, the once-through cooling water system discharge point becomes the intake point and the intake point becomes the discharge point.

Electrical Interconnect

Description:	SCE switchyard system with 230-kV and 66-kV switchyards.
Transmission	Four 230-kV transmission lines connect to Ellis Substation. One 66-kV t-line also connects to Ellis Substation. CA ISO Procedure T-152 dated 5/16/2002 and labeled “Huntington Beach Units 1 through 4 Split Bus Operation” has been prepared to accommodate the expected Units 3 & 4 repower addition. This procedure was written to provide for the fact that circuit breakers at the plant and supporting substations could become stressed beyond their capacity. This is a strong indication that there is no additional capacity beyond the planned expansion.
Site arrangement:	Two sections of double bus configuration (north and south) for four units and four transmission lines. The peaker unit is connected to the 66-kV switchyard, which is also connected to the Ellis Substation.

Fuel Supply

Fuel type:	Natural gas. Originally designed for oil fuel as well as gas, the oil capability has been relinquished.
Fuel system description:	Supplied by Southern California Gas Company.

Units 1 & 2

Unit Design:	Rankine cycle plant of unitary type (single boiler and turbine per unit), single reheat. Steam Turbines are General Electric Tandem Compound vertical exhaust. Steam conditions are 2150 psig/1000 °F/ 1000 °F reheat, with 1.5 InHg rated exhaust.
Boiler Design:	Babcock & Wilcox Model RB-276. Front firing, balanced draft, vertical axis Ljungstrom air preheaters. One chimney per unit.
Design Rating:	Boiler heat input of 2021 MMBtu/hr (592 MW thermal each). Generator operated at 215 MW electrical (each).
Unit History:	Design and construction by Bechtel Power Group. Units 1 & 2 were started-up in 1958.
Original Owner:	Southern California Edison Company. AES acquired the site in 1998 and has operated only Units 1, 2, and 5 for the last several years.
Air Pollution Control:	Mitsubishi manufactured SCR installed in about 1998 and 1999 with ammonia injection. Low NOx Burners previously installed in the 1960s.

Emissions Limits Boiler No. 1 and No. 2:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	10.75 lbs/1000 gal fuel oil	9 ppmv @ 3% O2
CO	500 ppmv 2000 ppmv	500 ppmv @ 3% O2 (Unit 1) 2000 ppmv @ 3% O2 (Unit 2)
PM	0.1 grains/dscf	0.1 grains/dscf @ 3% O2
SOx	Boiler No. 1 = 1314 tons/yr Boiler No. 2 = 1126 tons/yr 8 lbs/1000 gal fuel oil 500 ppmv (fuel oil) 0.83 lbs/MMcf natural gas	500 ppmv @ 3% O2 (Unit 2)
NH3	10 ppmv	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	The units were RMR designated in 2001 and expected to be RMR in 2002. In 2001, Unit 1 was started 3.5 times due to Dispatch Notice, Unit 2 one time. 75% and 82% of generated KWh in 2001 were sold to market rather than RMR sale.

Basic Unit Information

Unit	**1**	**2**
Dependable MW	215	215
Minimum Load MW	20	20
Online Date	Jun-1958	Dec-1958
RMR in 2004	Yes	Yes
SCR Installed	Yes	Yes

2003 Performance

Unit	**1**	**2**
Capacity Factor	0.373	0.378

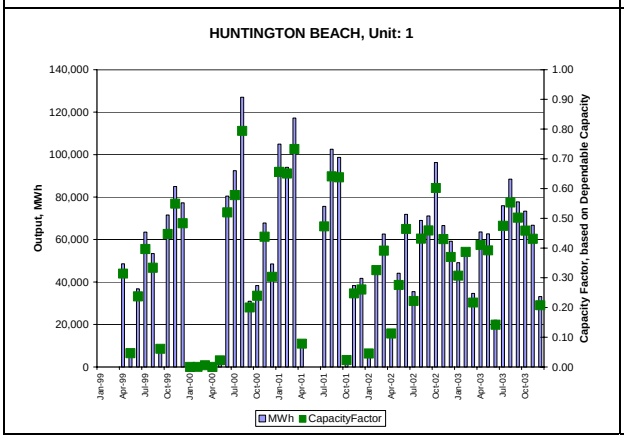
Heat Rate, Btu/kWh		
minimum load	17,081	16,444
average	10,740	10,737
maximum load	9,801	9,714
NOx Rate, lb/MMBtu	0.0051	0.0101
NOx Rate, lb/MWh	0.055	0.109

Past Five Years

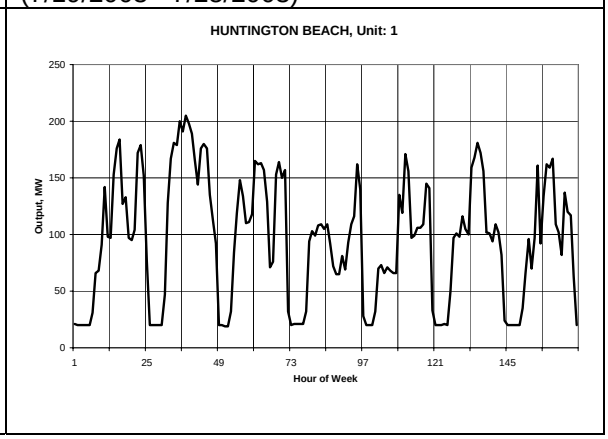
Unit	**1**	**2**
Output, MWh		
1999	452,841	337,426
2000	490,077	801,874
2001	688,888	698,501
2002	647,852	699,436
2003	703,212	712,307
Fuel Use, MMBtu		
1999	4,578,454	3,514,568
2000	5,334,974	8,795,037
2001	7,369,188	7,339,751
2002	7,406,013	7,633,944
2003	7,552,327	7,648,239
NOx Emission, pounds		
1999	368,526	232,332
2000	552,417	674,124
2001	429,104	362,881
2002	81,299	87,196
2003	38,381	77,619

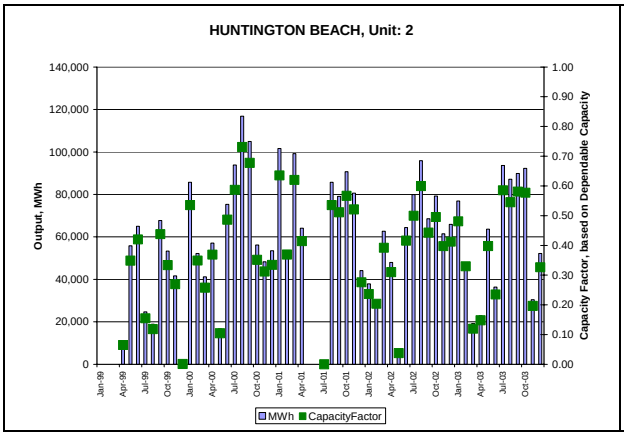
Charts

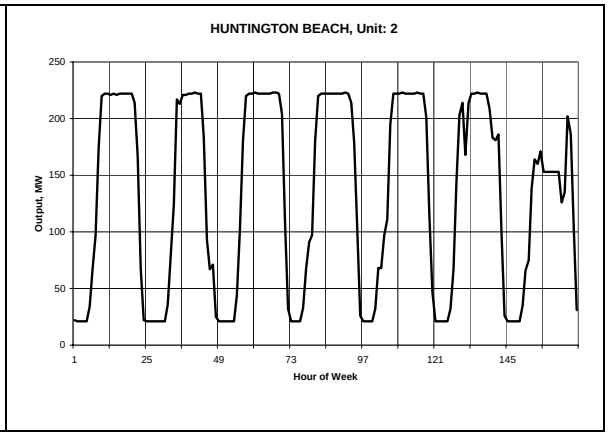
Monthly Output & Capacity Factor



Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)







Permits/Agreements

Air:

- Facility Permit to Operate, July 01, 2000: Issued by South Coast Air Quality Management District (Facility I.D.# 115389)
- Update to Facility Permit to Operate, March 07, 2001
- Update to Facility Permit to Operate, May 30, 2001
- Update to Facility Permit to Operate, July 01, 2001
- Initial Title V Permit Issued: August 19, 1999. Title V Permit Expiration Date: August 18, 2004

Water:

NPDES Permit No. CA0001163

- Issuing Agency: Santa Ana RWQCB
- Effective Date: June 30, 2000.
- Expiration Date: June 1, 2005.
- Order No. 00-5 (Waste Discharge Requirements) serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	7/95 - 6/96	96 - 97	97 - 98	98 - 99	99 - 2000
NO_x	---	---	84.00	427.90	439.44
PM_{10}	---	---	1.25	3.47	5.92
VOC	---	---	1.10	9.85	15.23
CO	---	---	7.65	41.28	90.69
SO_x	---	---	0.26	1.07	3.05

Source: Annual Reports from South Coast Air Quality Management District for Facility ID #115389.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x	332.2	290.7	290.7	290.7	290.7
PM_{10}	11.1	9.2	9.2	9.2	9.2
VOC	8.3	7.5	8.5	7.5	8.5
CO	67.8	56.5	56.5	56.5	56.5
SO_x	3.4	2.8	2.8	2.8	2.8

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs:

Date Received	Description
06/30/99	Amber smoke being emitted into the air. The visible emissions from the natural gas fired peaking turbine were not in excess of 20% opacity at the time of inspection.

Notices of Violation (NOV): No Notices of Violation provided.

Notices to Comply (N/C): No Notices to Comply provided.

Class I Setting: Located within 100 km of San Gabriel Wilderness, Cucamonga Wilderness and Agua Tibia Wilderness areas.

Attainment Status:

Pollutant	South Coast Attainment Status for 2002	
	Federal	State
Ozone – One hour	Extreme Nonattainment	Extreme Nonattainment
CO	Serious Nonattainment	Attainment [1]
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Serious Nonattainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note (1): Only L.A. County is in nonattainment for CO. All other areas of the South Coast APCD are in attainment (i.e. Orange County).

Emission Offset Availability: No data available.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: None identified in the surrounding area.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
Huntington Beach Regions				
Charadrius alexandrinus nivosus	Western snowy	FT	Known to occur on sandy beaches	In California, can primarily be seen during the breeding period

	plover		along marine and estuarine environments, salt ponds, and other sparsely vegetated sites near fish bearing water. Occurs in California May - September	from May - September.
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Nearby resources include Bolsa Chica Ecological Reserve, Huntington State Beach, and Bolsa Chica State Beach.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Huntington Beach Regions				
Cicindela gabbii	Tiger beetle			
Southern coastal salt marsh	Southern coastal salt marsh			
Passerculus sandwichensis beldingi	Belding's savannah sparrow	SE	Year round resident in salt marsh habitat	Year-long in its preferred habitat
Southern coastal salt marsh	Southern coastal salt marsh			
Southern dune scrub	Southern dune scrub			
Southern foredunes	Southern foredunes			
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	No visual treatment of the facility. No visual screening on north side of facility other than berm. Tall, dense landscaping (20-foot) and earthen berms partially screened the facility along Newland Street, the dune restoration area, and along Pacific Coast Highway.
Perimeter fencing/walls, height of the fencing/wall (ft)	8 to 10-foot cyclone fencing with barbed wire surrounds the facility. Cyclone fence gate at entrance to facility.
Landscaping	Ornamental flower beds and trees surround entrance to facility. The south and east side was planted with a double row of mature tea-trees.
Visual plumes – number and size	One 500-foot plume was visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling for operating Units 1 and 2, which creates no visible water vapor plumes. If restarted, Units 3 and 4 will also use once-through cooling. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler exhaust can create fairly large water vapor plumes during periods of cold/wet weather.

The existing Unit 5 peaking turbines have what is described as a yellow to brown NO_x exhaust plume. The outlet exhaust temperature for this unit is too high to allow formation of water vapor plumes. These turbines will either be shutdown or retrofit with NO_x control technology to eliminate the visible plume by January 1, 2004.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	330,829	20,648 (6.2%)
2000 Minority	354,900	115,938 (32.7%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Huntington Beach		
Total Population	189,594	20.8% minority
Households	73,657	2.56 persons/household
Total Housing Units	75,662	2.6% vacancy rate
Labor Force	129,840	2.8% unemployment
Orange County		
Total Population	2,846,289	35.2% minority
Households	935,287	3.0 persons/household
Total Housing Units	969,484	3.5% vacancy rate
Labor Force	1,562,500	3.7% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Long Beach

Address: 2665 West Seaside Boulevard
Terminal Island Long Beach, CA 90802

County: Los Angeles

Directions: Located in the harbor area of Long Beach. From LA Airport, proceed on Interstate 405 South towards San Diego for approximately 35.5 miles. Take the Interstate Interstate 110 South exit towards San Pedro. Proceed for approximately 7.2 miles to the CA-47/Harbor Blvd exit towards Long Beach/Terminal Is/Vincent Thomas Bridge. Merge on CA-47 north and proceed for approximately 3.0 miles over the bridge. Continue on West Ocean Boulevard and bear right towards Gate 5 Shipyard/Pier T Bths111-127. Continue on West Seaside Boulevard for approximately 0.3 mile to the plant entrance.

Facility Overview

Plant nominal capacity: 577 MW (nominal)

Generating units:	Units 1-7 – Combustion Turbines, 61 MW (each) per AQ permit, gas fueled, exhausting to Heat Recovery Boilers (HRBs). The boilers are connected to a common steam header. *Unit 8R –Steam Turbine, 86 MW *Unit 9 –Steam Turbine, 64 MW *Operates as a combined cycle plant; Units 8R & 9 take steam from the common steam header supplied by the HRBs from Units 1-7.
Cooling system:	Units 1-7 are air-cooled gas turbines. Units 8R & 9 steam units exhaust to condensers which are cooled by seawater once through cooling.

Plant Owner/Operator

***Owner name*:**	Long Beach Generation, LLC	***Operator name*:**	NRG El Segundo Operations
Owner address:	Long Beach Generation, LLC 2665 Seaside Blvd. Long Beach, CA 90802	***Operator address:***	301 Vista Del Mar El Segundo, CA 90245
Owner contact:	Audun Aaberg, Regional Plants Manager, plant address, audun.aaberg@nrgels.com	***Operator contact:***	George M. Person Technical Assistant Phone 310-615-6373 Fax 310-615-6060 george.person@nrgels.com

Site

Size:	The Long Beach Generating Station is a 43-acre site located within Los Angeles County at 2665 West Seaside Boulevard on Terminal Island in the City of Long Beach. Of this acreage, 19 acres are owned by the owner of the power facilities listed above, the remainder being owned by the Southern California Edison (SCE) utility and affiliates.
Description:	The power block includes a combined cycle plant having a total of nine power generating units including seven combustion turbines and two steam turbines, related retention basins, and an ocean fed cooling system. Additional facilities include an administration building, maintenance shop, and a distillate fuel tank. SCE owns the fuel storage and transportation system, including fuel-oil tanks, cutter stock tanks, fuel-oil heaters and associated pumps and piping; a switchyard system comprised of a 220-kV switchyard, a 66-kV switchyard, circuit breakers, towers, lines, structures and buildings and electrical protection; SCEnet communication equipment; and other assets unrelated to power generation, including a warehousing facility.

Surrounding area:	The Port of Long Beach area is characterized by primarily industrial land uses that includes railroad lines, cranes, open storage lots, warehouses, and other shipping terminal facilities. The facility is adjacent to the Cerritos Channel and Long Beach Inner Harbor, immediately northwest of the Terminal Island (Gerald Desmond) Bridge. The Cerritos Channel borders the eastern end of the site. The Union Pacific Land Resources Corporation property abutting the generating station's northern and western edges is currently undeveloped. A Union Pacific Railroad right-of-way runs parallel to the generating station's southern boundary; and a small oil production field, the Tidelands Oil Production Field, lies southwest of the site. Immediate neighbors include the U.S. Navy repair yard, now unused. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	City of Long Beach General Plan, the Long Beach Local Coastal Program, and the Port of Long Beach's Port Master Plan. **General Plan**: Land Use District (LUD) No. 12, Harbor/Airport IP-Port Industrial (per Long Beach Municipal Code) **Local Coastal Program** (**Port Master Plan)**: District 3, North West Harbor Planning District

Cooling

Cooling system	Once-through cooling water system
Cooling sources:	Long Beach Inner Harbor
Cooling discharge:	Back Channel, Long Beach Harbor
Cooling system details:	Ocean water is supplied to the station via an intake structure located in the northeast corner of the station at the west bank of Back Channel Long Beach Harbor. Approximately 180,000 gpm of seawater enters Units 8R and 9 when the station is operating. The warmed water is discharged to the Long Beach Harbor Channel through a channel bank outfall structure at Berth 114.
Cooling system	The NPDES permit (Order No. 94-130; NPDES Permit No. CA0001171) allows a maximum discharge of 265 MGD of once-through cooling water (261 MGD) from two steam generating units and low volume wastes (4 MGD). Approximately 180,000 gpm of ocean water is supplied via four pumps. Each unit has two circulating water pumps. The pumps for Units 8R and 9 are rated at 41,000 gpm and 49,000 gpm, respectively.

Screening system:	Traveling screens of approximately 1-inch diameter are used, along with trash bars for limiting ingestion of larger debris.
Biofouling Control:	Heat treatment is typically conducted every five weeks and lasts for about two hours per conduit. Calcareous shell debris accumulates in the intake structure as the result of heat treatments. Approximately once a year, these shell debris may be physically removed and disposed of into the Back Channel, adjacent to and below the intake structure. Condenser tubes are treated by intermittently injecting chlorine (in the form of sodium hypochlorite), for a maximum of two hours per generating unit per day, into the cooling water stream.

Electrical Interconnect

Description:	SCE switchyard system with 220-kV and 66-kV switchyards.
Transmission	The 220-kV switchyard is connected to Harborgen Sub and Lighthipe Sub by two transmission lines. The 66-kV system connects to Hinson Sub with one transmission line.
Site arrangement:	The 220-kV system has two sections of double bus arrangement. The 66-kV bus is one double bus.

Fuel Supply

Fuel type:	Natural gas. The plant was originally installed with the capacity to burn civilian type jet fuel.
Fuel system description:	Supplied by pipeline from the Southern California Gas Company.

Units 1 through 7

Unit Design: Gas Turbine, ABB Model 11D, combined cycle. Industrial style gas turbines, single silo type combustion chamber, single shaft horizontal exhaust.

Boiler Design: Vogt company heat recovery boilers designed to match the steam requirements of the steam turbines; 800 psig and 850 °F main steam temperature. Four old stacks (chimneys) were used; two per unit for Units 1 thru 6, and one for Unit 7.

Design Rating: Gas Turbine heat input of 750 MMBtu/hr (220 MW thermal each). Generator operated at 61 MW electrical (each) per AQ permit. Operated at 83 MW electrical (each) per ARB database.

Unit History: The gas turbines were installed in the 1970s as part of the "combined cycle conversion" of Plant 2. They were manufactured in Minnesota at a new ABB shop, using Swiss/German design and supporting parts. Units 1 through 4 were started-up in 1976. Units 5 through 7 were started up in 1977.

Original Owner: Southern California Edison Company

Air Pollution Control: Steam or water injection.

Emissions Limits Turbine No. 1 through No. 7:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	---	---
CO	2000 ppmv	2000 ppmv @ 15% O2
PM	0.1 grains/dscf 0.01 grains/dscf 11 lbs/hr	0.01 grains/dscf @ 15% O2
SOx	500 ppmv fuel oil	---
NH3	---	---

Unit Performance: Availability: Percentage of Hours in Service =3.9%*

*Averaged over a five-year period (1992-1996). Percentage of hours shown typically represents the average capacity for multiple units within a plant. These percentages do not necessarily indicate operation at full capacity.

(Mitigated Negative Declaration and Initial Study California Public Utilities Commission. Southern California Edison Company's Application No. 96-11-046. Proposal for Divestiture, August 25, 1997, Page 2.4.)

Description of Loading Management and/or Power Sales Arrangement: The Long Beach plant is part of the contract with Dynegy and California Department of Water Resources (DWR).

Unit 8R	
Unit Design:	86 MW Steam Turbine, single shaft single casing non-reheat, integral control valves, down-exhaust, General Electric manufacture. This turbine was recovered from scrap during World War II and little is known of its history prior to WW2.
Boiler Design:	Combined cycle plant, see Unit No. 1 through 7 above
Design Rating:	86 MW, 800 psig, 850 °F, 1.5 Inches Mercury exhaust.
Initial Operation:	Unit 8 was provided with major maintenance and restarted in 1976 as part of the "combined cycle conversion".
Unit History:	The original Plant 2 consisted of 16 boilers and 3 generating steam turbine units called 7, 8, and 9. These were constructed in the 1920s, and operated until being designated cold standby only in the 1960s. Unit 8 was dismantled and sent to Russia during World War II emergency, and replaced with a unit abandoned elsewhere. The new unit was called 8"R" for "Replacement". The plant was redesigned as a combined cycle unit, one of the early ones, using the steam turbines 8R and 9 – Unit 7 being dismantled due to severe deterioration. Plant design and construction was by the Edison utility company.
Original Owner:	Southern Calfornia Edison Company.
Air Pollution Control:	Inapplicable
Unit Performance:	Availability: Percentage of Hours in Service =3.9%* *Averaged over a five-year period (1992-1996). Percentage of hours shown typically represents the average capacity for multiple units within a plant. These percentages do not necessarily indicate operation at full capacity. (Mitigated Negative Declaration and Initial Study California Public Utilities Commission. Southern California Edison Company's Application No. 96-11-046. Proposal for Divestiture, August 25, 1997, Page 2.4.)
Description of Loading Management and/or Power Sales Arrangement:	The Long Beach plant is part of the contract with Dynegy and California Department of Water Resources (DWR).

Unit 9	
Unit Design:	64 MW Steam Turbine, single shaft single casing non-reheat, integral control valves, down-exhaust, General Electric manufacture.
Boiler Design:	Combined cycle plant, see units 1-7 above
Design Rating:	64 MW

Initial Operation:	Unit 9 was started-up in 1977.
Unit History:	This unit was part of the original Plant 2, constructed in the 1920s. The steam turbine was given a major maintenance overhaul during the "combined cycle conversion" of the 1970s.
Original Owner:	Southern California Edison Company
Air Pollution Control:	Inapplicable
Unit Performance:	Availability: Percentage of Hours in Service =3.9%* *Averaged over a five-year period (1992-1996). Percentage of hours shown typically represents the average capacity for multiple units within a plant. These percentages do not necessarily indicate operation at full capacity. (Mitigated Negative Declaration and Initial Study California Public Utilities Commission. Southern California Edison Company's Application No. 96-11-046. Proposal for Divestiture, August 25, 1997, Page 2.4.)
Description of Loading Management and/or Power Sales Arrangement:	No data available.

Basic Unit Information

Unit 8 is the combination of four combustion turbines, units 1-4, and one steam turbine, unit 8; unit 9 is the combination of three combustion turbines, units 5-7, and one steam turbine, unit 9.

Unit	**8**	**9**
Dependable MW	303	227
Minimum Load MW		
Online Date	Dec-1976	Apr-1977
RMR in 2004	No	No
SCR Installed	No	No

2003 Performance

Unit	**8**	**9**
Capacity Factor	0.031	0.020
Heat Rate, Btu/kWh		
minimum load	N/A	N/A
average	12,952	10,979
maximum load	N/A	N/A
NOx Rate, lb/MMBtu	N/A	N/A
NOx Rate, lb/MWh	N/A	N/A

Past Five Years

Unit	8	9
Output, MWh		
1999	N/A	N/A
2000	N/A	N/A
2001	615,381	222,714
2002	81,883	31,254
2003	83,301	39,587
Fuel Use, MMBtu		
1999	N/A	N/A
2000	N/A	N/A
2001	6,940,722	1,724,230
2002	3,203,034	362,036
2003	1,078,901	434,616
NOx Emission, pounds		
1999	N/A	N/A
2000	N/A	N/A
2001	N/A	N/A
2002	N/A	N/A
2003	N/A	N/A

Charts (no data)

Permits/Agreements

Air:	▪ Facility Permit to Operate, July 01, 2000: Issued by South Coast Air Quality Management District (Facility I.D.# 115314) ▪ Facility Permit to Operate, July 01, 2001
Water:	**NPDES Permit No. CA0001171** ▪ Issuing Agency: Los Angeles RWQCB ▪ Effective Date: December 5, 1994. ▪ Expiration Date: November 10, 1999. Although the expiration date has passed, this permit will stay in effect until it is updated by the LARWQCB. ▪ Order No. 94-130 (Waste Discharge Requirements) Serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	7/95 - 6/96	96 - 97	97 - 98	98 - 99	99 - 2000
NO_x	---	---	4.00	90.18	243.00
PM_{10}	---	---	0.45	0.76	16.08
VOC	---	---	1.53	28.84+1.09	5.13
CO	---	---	6.48	69.21	316.75
SO_x	---	---	0.03	0.42	8.28

Source: South Coast Air Quality Management District for Facility ID #115314.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x	57.4	159	159	159	159
PM_{10}	7.4	10.7	10.7	10.7	10.7
VOC	27.6	33.6	41.5	33.6	41.5
CO	54.2	80.8	80.8	80.8	80.8
SO_x	ND	0.5	0.5	0.5	0.5

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs: No complaints found.

Notices of Violation (NOV): No Notices of Violation found.

Notices to Comply (N/C):

Issued Date	Description	Status
01/10/01	Submit revised 1st QCER & APEP, which reflect total actual NO_x emissions generated by all gas turbines for compliance year July 1, 1999, thru June 30, 2000. Also, use proper status codes to denote operating conditions. Rule 2004 (e)(1) Rule 2012 Appendix A, Ch. 7, Sub D, Part 2	Due 1/24/01

Class I Setting: Located within 100 km of San Gabriel Wilderness and Cucamonga Wilderness areas.

Attainment Status:

Pollutant	South Coast Attainment Status for 2002	
	Federal	State
Ozone – One hour	Extreme Nonattainment	Extreme Nonattainment
CO	Serious Nonattainment	Nonattainment [1]
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Serious Nonattainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note (1): Only L.A. County is in nonattainment for CO. All other areas of the South Coast APCD are in attainment.

Emission Offset Availability: No data at this time.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: Nearby resources include Long Beach Harbor and San Pedro Bay.

Listed Marine Species: No marine species listed in the California Natural Diversity Database within one mile of the power plant site.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: None identified in the surrounding area.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Long Beach Regions				
Cicindela hirticollis gravida	Sandy beach tiger beetle			
Cordylanthus maritimus ssp maritimus	Salt marsh bird's-beak	FE, SE		Annual herb-May-October
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	The facility is enclosed in a large concrete structure, which resembles a factory. Large earthen berms on north, south and east sides of facility.
Perimeter fencing/walls, height of the fencing/wall (ft)	10-foot cyclone fencing with barbed wire surrounds the facility. Heavy steel gate at entrance to facility.
Landscaping	Manicured lawn with ornamental flower beds and trees. Intermittent Eucalyptus and bottle brush trees planted along perimeter. Facility not visible to public.
Visual plumes – number and size	No plumes were visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 8 and 9 condensers), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing combustion turbine exhausts (Units 1 through 7) can create fairly large water vapor plumes during periods of cold/wet weather. The combustion turbine exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	528,465	86,845 (16.4%)
2000 Minority	561,499	402,239 (71.6%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Long Beach		
Total Population	461,522	54.8% minority
Households	163,088	2.77 persons/household
Total Housing Units	171,632	5.0% vacancy rate
Labor Force	226,670	6.1% unemployment
Los Angeles County		
Total Population	9,519,338	51.3% minority
Households	3,133,774	2.98 persons/household
Total Housing Units	3,270,909	4.2% vacancy rate
Labor Force	4,857,500	6.5% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Mandalay

CEC ID: G0330 EIA ID: 345

Address: 393 North Harbor Boulevard
Oxnard, CA 93030

County: Ventura

Directions: Near the City of Oxnard, just north of the Oxnard Marina. From Highway 101 take the Seaward Avenue exit. Turn south (left) on East Harbor Boulevard and proceed for approximately 2.3 miles. Continue on Harbor Boulevard for approximately 2.5 miles to the plant entrance.

Facility Overview

Plant nominal capacity:	570 MW maximum summer dependable output with a maximum winter dependable output of 577 MW with all units in operation.
Generating units:	Units 1 & 2 – Steam Turbine, 215 MW (each), gas fueled, ocean water cooled Unit 3 – Combustion Turbine (peaker), 140 MW, gas fueled, air cooled
Cooling system:	Seawater once through cooling (Units 1 & 2)

Plant Owner/Operator

Owner name:	Reliant Energy Mandalay, LLC	***Operator name:***	Reliant Energy Mandalay, LLC

Owner address:	393 Harbor Blvd. Oxnard, CA 93035	***Operator address:***	393 Harbor Blvd. Oxnard, CA 93035
Owner contact:	Tom Snowdon, 805-984-5268	***Operator contact:***	Remmele J. Young Phone 713-207-5509 Fax 713-207-9226 ryoung@reliant.com

Site

Size:	The total plant site is 205 acres. The owner listed above owns 128 acres. Southern California Edison (SCE) owns the remainder.
Description:	The power block has three power generation units, related retention basins, and a canal fed cooling system. Water in the canal is drawn from Oxnard Marina, about two miles south of the power plant. Additional facilities include an administration building, a shop/warehouse, and a distillate fuel tank. The Mandalay station's control room also operates the Ellwood Energy Support Facility. SCE retained the following plant assets: a fuel storage and transportation system, including fuel-oil tanks, cutter stock tanks, fuel-oil heaters and associated pumps and piping; an off-shore lease from the State of California which contains an inactive off-shore oil terminal pipeline that serviced the fuel oil storage system; a switchyard system comprised of a 220-kV switchyard, a 66-kV switchyard, circuit breakers, towers, lines, structures and buildings and electrical protection; SCEnet communication equipment; and other assets unrelated to power generation.
Surrounding area:	The generating station is located in an area primarily characterized by agricultural and open space uses. Land use features north of the facility consist of McGrath State Beach, McGrath Lake, and the Jim Hall Go-Kart School. Harbor Boulevard bisects the property from northwest to southeast, separating the generating station from a tank farm leased to Unocal. The Pacific Ocean borders the western edge of the generating station facility. Areas northeast, east, and southeast of the site are currently in agricultural use. Mandalay State Beach occupies the area directly south of the generating station, continuing approximately 0.5 mile south to Fifth Street. Fifth Street runs east-west, separating the state beach from residential uses to the south. The western end of Fifth Street provides public access to Mandalay State Beach. *Refer to the attached Site Visit Report for additional information.*

General Plan and Zoning Designations:	City of Oxnard 2020 General Plan and the City of Oxnard Coastal Land Use Plan. Portions of the Edison owned facilities are located within the County of Ventura and are within the County Local Coastal Plan. These areas are designated as Coastal Open Space and are zoned C-O-S in the Coastal Zoning Ordinance.

General Plan: Industrial Public Utility/Energy Facility	**Local Coastal Program (Coastal Zone Ordinance)**: A large portion of the site, including the generating facility, is designated as EC (Coastal Energy Facility Zone) and the western portion of the site immediately adjacent to the coastal beach area is designated as RC (Recreation Zone).

Cooling

Cooling system	Once-through cooling water system (Unit 1 & 2)
Cooling sources:	Pacific Ocean, Oxnard Marina located two miles south of the plant.
Cooling discharge:	Pacific Ocean at Mandalay Beach in Oxnard
Cooling system details:	Seawater is pumped from the Edison Canal to the station's two condenser units, one for each generating unit. The cooling water intake structure is located east of the plant at the shoreline and draws water from the surface to a depth of 18 feet via a canal originating in the Channel Islands Harbor. The heated water is discharged to the Pacific Ocean through a concrete and rock-revetted structure located at a point directly across the beach, west of the plant.
Cooling system	The NPDES permit (Order No. 01-057; NPDES Permit No. CA0001180) allows a maximum discharge of 255.3 MGD of wastes consisting of once-through cooling water (255 MGD) from two steam electric generating units (four condenser halves), metal cleaning wastes (0.08 MGD), and low volume wastes (0.172 MGD). Four pumps supply 170,000 gpm of ocean water.
Screening system:	Cooling water enters a screen structure at the station end of the Edison Canal and passes through trash bars that remove large debris.

Biofouling Control:	Chlorine-based algaecide is sprayed into the Edison Canal periodically during spring and summer to control undesirable algae growth that could clog intake screens and impede the pumping of cooing water through the generating station. To control marine fouling, heat treatment is typically conducted every five weeks and lasts for about two hours per conduit. Any debris that accumulates in the intake structure is collected in a container, removed and disposed of by the City of Oxnard. The condenser tubes are arranged in banks of two per generating station. Biological growth on the condenser tubes is controlled by intermittently injecting chlorine in the form of sodium hypochlorite into the cooling water system. There are two chlorination cycles per day during November through February, and three chlorination cycles per day during March through October. Each cycle consists of 10 minutes per condenser half, plus 10 minutes for each of three bearing cooling water heat exchangers. Condenser halves and heat exchangers are chlorinated sequentially during each cycle. The maximum total daily chlorination time is 210 minutes per day. During November through February, the total daily chlorination time is 140 minutes per day.

Electrical Interconnect

Description:	SCE switchyard system with 220-kV and 66-kV switchyards.
Transmission	There are two transmission lines of 220-kV, and one of 66-kV. All three connect to the Santa Clara Substation of SCE. The 66-kV switchyard and line is connected to the Unit 3 peaker.
Site arrangement:	There are 2 bus sections, double bus configuration, each with a section breaker

Fuel Supply

Fuel type:	Natural gas, fuel oil (Units 1 & 2 emergency only), distillate (Unit 3 emergency only)
Fuel system description:	Gas supplied by Southern California Gas Company.

Units 1 & 2

Unit Design:	Rankine cycle plant of unitary type (single boiler and turbine per unit), single reheat. Steam Turbines are General Electric Tandem Compound vertical exhaust. Steam conditions are 2150 psig/1000 °F/ 1000 °F reheat, with 1.5 InHg rated exhaust. These units are similar though not identical to Huntington Beach Units 1 & 2. Single plant control room for control of all units.
Boiler Design:	Babcock & Wilcox, single chimney per unit.
Design Rating:	Steam Generator heat input of 1990 MMBtu/hr (583 MW thermal each). Operated at 215 MW electrical (each)
Unit History:	Units 1 and 2 were started up in 1959. The plant was disrupted by a major flood in the 1960s.
Original Owner:	Southern California Edison
Air Pollution Control:	Both units equipped with Low NOx Burners. SCR was installed in recent years. Emissions Limits Steam Generator Unit No. 1 and No. 2:

Pollutant	AQ Permit Limits	ARB Database Limits
ROC	Calculated Throughput = 33,204.6 MMcf/yr (natural gas) (total) 5.31 lbs/hr, 23.24 tons/yr	**---**
NOx	40.41 lbs/hr, 176.98 tons/yr	**---**
CO	151.62 lbs/hr, 664.09 tons/yr	---
PM	9.48 lbs/hr, 41.51 tons/yr	---
SOx	2.27 lbs/hr, 9.96 tons/yr Unit No. 1 = 1369 tons/yr Unit No. 2 = 1283 tons/yr	---
NH3	17.82 lbs/hr, 78.03 tons/yr	10 ppm @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	None of the Mandalay units are designated Reliability Must Run (RMR) by CAISO in 2001 or 2002

Basic Unit Information

Unit	**1**	**2**
Dependable MW	215	215
Minimum Load MW	20	20
Online Date	May-1959	Aug-1959
RMR in 2004	No	No
SCR Installed	Yes	Yes

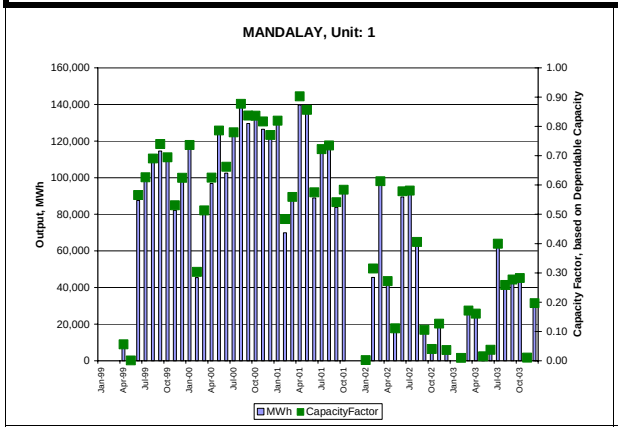
2003 Performance

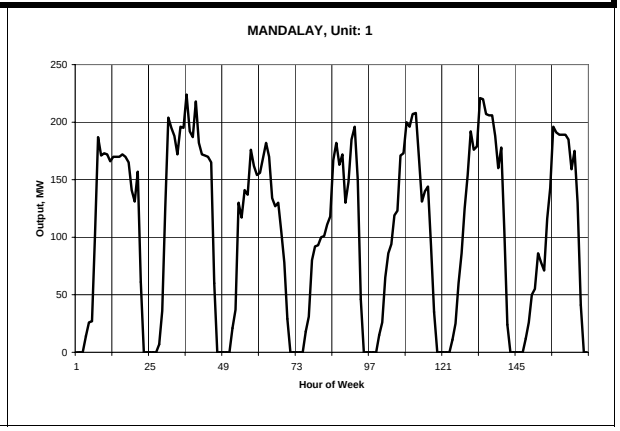
Unit	1	1
Capacity Factor	0.153	0.194
Heat Rate, Btu/kWh		
minimum load	13,433	13,331
average	10,163	9,899
maximum load	9,265	9,172
NOx Rate, lb/MMBtu	0.0044	0.0048
NOx Rate, lb/MWh	0.044	0.047

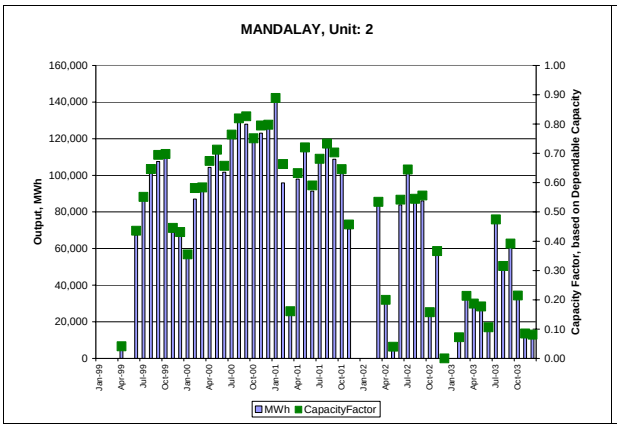
Past Five Years

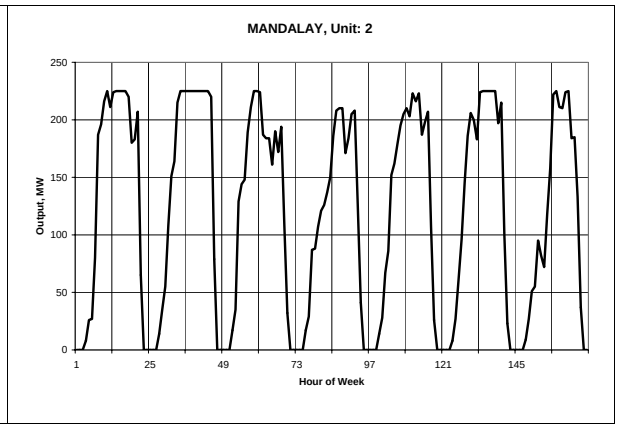
Unit	1	2
Output, MWh		
1999	714,762	622,582
2000	1,348,482	1,309,284
2001	1,066,366	1,077,388
2002	499,331	564,964
2003	288,357	365,833
Fuel Use, MMBtu		
1999	6,751,820	5,721,960
2000	12,856,959	12,159,024
2001	10,045,763	9,859,213
2002	4,710,429	5,144,485
2003	2,930,526	3,621,443
NOx Emission, pounds		
1999	41,993	35,752
2000	70,961	71,899
2001	51,474	64,103
2002	23,304	31,252
2003	12,828	17,341

Charts









Permits/Agreements

Air:	▪ Part 70 Permit (to Operate), April 12, 2000: The Part 70 permit serves as a permit to operate pursuant to Rule 33.1. Issued by Ventura County Air Pollution Control District (Facility I.D.# 13) ▪ Part 70 Permit Issued: October 1, 1998 ▪ Part 70 Permit Expiration Date: September 30, 2003 ▪ Title IV Acid Rain Permit, May 17, 1999 (40CFR72-78) ▪ Title IV Permit Issued: January 1, 1998. Title IV Permit Expiration Date: December 31, 2002
Water:	**NPDES Permit No. CA0001180; CI-2093** ▪ Issuing Agency: Los Angeles RWQCB ▪ Effective Date: March 23, 2001, Revised April 26, 2001. ▪ Expiration Date: March 10, 2006. ▪ Order No. 01-057 (Waste Discharge Requirements) Serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	---	53.7	36.3	71.7	201.0
PM_{10}	---	17.1	7.7	16.1	36.0
VOC	---	9.8	4.9	8.8	18.9
CO	---	265.2	119.8	243.3	510.1
SO_x	---	8.1	1.7	3.5	7.4

Source: Annual Reports from Ventura County Air Pollution Control District for Facility ID #13.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	146.1	53.7	36.3	71.7	36.3
PM_{10}	15.6	17.1	7.7	16.1	7.7
VOC	10	10.5	4.9	8.8	4.9
CO	236.2	265.2	119.8	243.3	119.8
SO_x	10.7	8.1	1.7	3.5	1.7

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs:

Date Received	Description
01/25/02	Odors/Source Spec. Seeing and smelling a "yellow gaseous" emission coming from the stack next to the steam stack.
08/25/00	Odor/Source Spec. Orangish-brown smoke coming from building located next to two stacks.

Notices of Violation (NOV):

Issued Date	Description	Status
06/06/01	Failure of odor abatement requirement – Engine Rule 125	Closed 06/19/01
08/03/00	Exceeding permitted fuel throughput – Turbine Peaking Units Rule 29.C	Closed 12/05/00
12/19/97	Excess NO_x emissions – Power Generation Unit Rule 59.B.1	Settlement 01/21/98

Notices to Comply (N/C):

Issued Date	Description	Status
02/06/02	Received response to Title V deficiency letter on 03/18/02. Rule 29.C	Closed 03/26/02
04/12/01	NTC response received 05/22/01. Reply satisfactory. See Title V for details. Rule 29.C	Closed 10/31/01

Class I Setting: Located within 100 km of San Rafael Wilderness area.

Attainment Status:

Pollutant	Ventura County Attainment Status for 2002	
	Federal	State
Ozone – One hour	Severe Nonattainment	Severe Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm

Emission Offset Availability: No data at this time.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: None identified in the surrounding area.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
Mandalay				
Charadrius alexandrinus nivosus	Western snowy plover	FT	Coastal shores, reservoirs, braided river channels, and playas.	In California, can primarily be seen during the breeding period from mid-March - mid-September, some wintering on Southern California beaches.
Sterna antillarum browni	California least tern	FE, SE	Known to occur on sandy beaches along marine and estuarine environments, salt ponds, and other sparsely vegetated sites near fish bearing water. Occurs in California May - September	In California, can primarily be seen during the breeding period from May - September.
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Generating station is located adjacent to snowy plover critical habitat. Nearby resources include McGrath State Park, McGrath Lake, Santa Clara River Estuary/sandunes, Mandalay Beach, and coastal beaches.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Mandalay				
Astragalus pycnostachyus var lanosissimus	Ventura marsh milk-vetch	FE, SE		Perennial herb-June-October
Cicindela hirticollis gravida	Sandy beach tiger beetle		No info.	
Coastal and valley freshwater marsh	Coastal and valley freshwater marsh			
Cordylanthus maritimus ssp maritimus	Salt marsh bird's-beak	FE, SE		Annual herb-May-October
Southern coastal salt marsh	Southern coastal salt marsh			
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	Vegetated berms (trees and shrubs) used to partially screen the front of the facility. No other visual treatments were observed.
Perimeter fencing/walls, height of the fencing/wall (ft)	8-foot cyclone fence with barbed wire surrounded the facility.
Landscaping	The entrance has thick vegetation including mature bottle brush and Australian tea trees, and manicured lawns. Native vegetation partially obscures the south and north sides of the facility. A partially landscaped sand berm is located on the west side of the facility.
Visual plumes – number and size	One 200-foot plume was visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 1 and 2), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The power boiler exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

The turbine exhaust from the simple cycle peaking turbine (Unit 3) are too hot to form visible water vapor plumes.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	203,859	21,274 (10.4%)
2000 Minority	248,951	158,138 (63.5%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Oxnard		
Total Population	170,358	4.7% minority
Households	43,576	3.85 persons/household
Total Housing Units	45,166	3.5% vacancy rate
Labor Force	86,030	6.4% unemployment
Ventura County		
Total Population	753,197	30.0% minority
Households	243,234	3.04 persons/household
Total Housing Units	251,712	3.4% vacancy rate
Labor Force	424,100	4.4% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Morro Bay

CEC ID: G0371 EIA ID: 259

Address: 1290 Embarcadero
Morro Bay, CA 93442

County: San Luis Obispo

Directions: From Highway 101, take the CA-41 West exit towards Morro Bay. Turn right on Morro Bay Road for approximately 6.8 miles. Proceed on Atascadero Road for approximately 9.1 miles and turn left on CA-1 South. Merge on CA-1 South for approximately 0.2 mile and take the Main Street exit. Bear right on Main Street for approximately 0.3 mile. Turn right on Beach Street for approximately 0.2 mile. Turn right on Embarcadero Road to the plant entrance.

Facility Overview

Plant nominal capacity:	1,002 MW
Generating units:	Units 1 & 2 – Steam Turbine, 163 MW (each), gas fueled, ocean water cooled Units 3 & 4 – Steam Turbine, 338 MW (each), gas fueled, ocean water cooled
Cooling system:	Seawater once-through cooling; intake from Morro Bay and discharge to the Pacific Ocean through a canal outfall entering Estero Bay, north of Morro Rock.

Plant Owner/Operator

Owner name:	Duke Energy Morro Bay LLC	***Operator name:***	Duke Energy North America (DFD) Duke Fluor Daniel California Operations
Owner address:	1290 Embarcadero Rd. Morro Bay CA, 93442	***Operator address:***	same
Owner contact	(805) 595-4200 Randy Hickok VP Duke Energy North America Phone: (805) 595-5595 Fax: (805) 595-5592 rjhickok@duke-energy.com	***Operator contact:***	same

Site

Size:	The Morro Bay Power Plant site is 107 acres. 140 acres in total, including the off-site fuel farm.
Description:	The Morro Bay Power Plant consists of four boilers, turbo-generators, and turbines and associated facilities (e.g. a switchyard, a control building, fuel oil tanks on and off site, a firewater tank and surface impoundments). The on-site fuel farm consists of five aboveground fuel oil tanks and a displacement diesel fuel oil storage tank. The off-site fuel farm consists of two aboveground residual fuel oil storage tanks, two diesel tanks for a fire water pump house, one diesel day tank, and one small diesel tank. Demolition of the off-site tank farm has begun. No fuel oil has been used since 1995.
Surrounding area:	U.S. Highway 1 runs along the eastern boundary of the site. Surrounding land uses include light industry, commercial businesses (including a hotel), marine uses, and residential and recreational facilities. A mobile home park and the Lila Kaiser Park are located on the north side of the site. Estero Bay, Morro Rock, and the Pacific Ocean are located to the west of the site. The off-site fuel tank farm is located about 3.8 miles northeast of Morro Bay, surrounded by mainly agricultural land used for cattle grazing and rangeland. *Refer to the attached Site Visit Report for additional information.*

General Plan and Zoning Designations:	The General Plan (1988) designation for the Morro Bay power plant site is derived from the City's Coastal Land Use Plan (CLUP).

General Plan and CLUP: Coastal Development Industrial (M-2) with Planned Development (PD), and includes Interim/Open Space Uses in Industrial Categories and Environmentally Sensitive Habitat overlays.	**Zoning:** Project site is designated M-2, Coastal-Dependent Industrial district, with Planned Development and Interim/Open Space Uses in Industrial Categories overlays. Adjacent zoning includes M-1 (Light Industrial), R-2 (Duplex Residential), and OA-1 (Open Area 1).

Cooling

Cooling system type:	Seawater once-through cooling system.
Cooling sources:	Morro Bay Harbor, inside the harbor
Cooling discharge:	Pacific Ocean through a canal outfall entering Estero Bay, north of Morro Rock
Cooling system details:	The seawater intake structure is located across the Embarcadero from MBPP in Morro Bay Harbor (east of Morro Rock), houses eight cooling water pumps (two pumps per unit) and related auxiliary equipment. The pumps supply cooling water for all four units. The cooling water is returned to the ocean via three separate underground tunnels. Units 1 and 2 share a common cooling water discharge tunnel; Units 3 and 4 each have separate discharge tunnels. The discharge for the four units flows into a common canal for a short distance prior to entering Estero Bay at the shoreline just north of Morro Rock. The intake location, inside Morro Bay Harbor, is a valued aquatic habitat in the presence of an endangered species, the California Sea Otter. The proposed new plant development combined cycle units are proposed to use the existing seawater channels to provide cooling water for the steam turbine condensers. The eight existing circulating cooling water pumps will be replaced with eight new pumps, each with an operating capacity of approximately 41,250 gpm (59 MGD). New pipelines will be installed on site to connect the combined cycle units to the existing Units 1-4 cooling water supply and discharge conduits. The cooling water return will utilize the exiting Units 1-4 discharge tunnels. After the new units are operational, the existing units will be demolished and the new units will continue to utilize the cooling water supply system. The new combined cycle units are more thermally efficient and will require significantly less cooling water than the existing Units 1 through 4.

Cooling system	The NPDES permit (Order No. 95-28; NPDES Permit No. CA0003743) allows a maximum discharge of 725 MGD of seawater for the primary purpose of cooling. Units 1 & 2 use 184,000 gpm (265 MGD). Units 3 & 4 use 280,000 gpm (403 MGD). Total plant consumption is 464,000 gpm (667 MGD). However, the actual cooling water volume used during the last 15 years is well below the maximum amount, and less than the new power plant will be permitted to use. Each of the proposed combined cycle units is expected to use approximately 165,000 gpm (237 MGD) when the unit is operating at maximum output. The total circulating water requirement of the proposed new plant will be approximately 330,000 gpm (475 MGD).
Screening system:	The seawater intake structure consists of grating to block the intake of large debris and traveling screens that are periodically washed to remove smaller debris.
Biofouling Control:	A chemical feed system consisting of a storage tank with injection pumps will be used intermittently, as required, to supply sodium hypochlorite (12 to 14 percent solution), a biofouling inhibitor, into the cooling water supply lines immediately before the condenser to reduce biofouling of the condensers. Procedures for demusseling include recirculating heated cooling water by restricting the condenser discharge flow and stopping one of the two cooling water pumps. Water supplied by the pump still in operation reverses the flow through half of the condenser causing it to flow back to the intake structure. At the intake structure, the intake stop logs will be lowered to prevent flow of the heated water to the harbor and direct it to the pump still operating. The demusseling procedure lasts several hours, depending on the treatment temperature, but is expected to require about 1 hour at the highest temperature. The procedure will be repeated, as necessary, approximately every 4 to 6 weeks. (MBPP Project FSA Part 3, Section 8.3.1.1, pages 8-21 to 8-22.)

Electrical Interconnect

Description:	Switchyard of 230-kV connecting to 5 substations. 115-kV substation also on-site. Pacific Gas & Electric Company owns the on-site substation.
Transmission details:	Position 1 to Diablo, Position 2 to Mesa, Positions 3 & 4 to Midway, position 5 to Gates, position 6 to Templeton. The AFC for the combined cycle plant specifies that some transmission re-conductoring will be required for this expansion. Thus, there is no additional available capacity.

Site arrangement:	Two busses of one section each, configured as breaker and a half. The generation tie-in lines from the proposed combined cycle units to the existing adjacent PG&E Morro Bay Switchyard will be arranged into two sets of two conductors for a total of four conductors. Each set of conductors consists of one conductor, which will carry the output of one steam turbine generator, and the other conductor will carry the output of two gas turbine generators. The conductors will run from the generation units take-off structure to the available bus positions in the PG&E 230-kV switchyard currently occupied by Units 1-4.

Fuel Supply

Fuel type:	Originally natural gas and oil fuel were used. Oil fuel use discontinued in 1995, and oil delivery facilities are not maintained.
Fuel system description:	Natural gas is delivered from Pacific Gas and Electric Company through pipeline 306, which is 20 inches in diameter, and runs 70 miles (south) from the Kettleman Compressor Station to Morro Bay. An offshore marine terminal has pipelines connected to a pumping station on shore, designed for delivery of oil fuel. The pipelines to the marine terminal are currently inactive (1997), and there are no plans to reactivate them to receive oil in the near future.

Units 1 & 2

Unit Design:	Rankine cycle, 169 MW units. Design Heat Rate of 10,500 Btu/KWHr
Boiler Design:	Combustion Engineering, radiant heat boiler, front fired. One 450 ft chimney shared by Units 1 & 2.
Design Rating:	Boiler heat input of 1700 MMBtu/hr (498 MW thermal each), operated at 163 MW electrical (each).
Unit History:	Units 1 and 2 were started-up in 1956 and 1955, respectively. Divestiture occurred 7/1/98, when Duke purchased the plant.
Original Owner:	PG&E purchased the site in 1951.

Air Pollution Control:	Fuel oil limitations. Emissions Limits Boiler Unit No. 1 and No. 2:

Pollutant	AQ Permit Limits	ARB Database Limits
ROC	---	10 ppmv @ 3% O2 0.075 lbs/hr
NOx	150 ppmvd @ 3% O2, 1-hr avg. (natural gas) 450 ppmvd @ 3% O2, 1-hr avg. (fuel oil) 10% of applicable limit or 2 ppmv, whichever is greater, for continuous in-stack monitoring	150 ppmv @ 3% O2
CO	1000 ppmvd @ 3% O2, 1-hr avg. 2000 ppmvd, annual test	1000 ppmv @ 3% O2
PM	0.3 grains/scf @ 3% O2 (wet) or 0.3 grains/scf @ 12% CO2	0.3 grains/dscf @ 3% O2
SOx	Sulfur content of liquid fuel < 0.5 wt% Boiler No. 1 = 1609 tons/yr (2000-2009), 1405 tons/yr (2010+) Boiler No. 2: 139 tons/yr (2000-2009), 98 tons/yr (2010+)	---
NH3	10 ppmvd @ 3% O2, 1-hr avg.	10 ppm @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Dispatched by ISO.

Units 3 & 4

Unit Design:	Rankine cycle, 359 MW units. Design heat rate of 9,500 Btu/KWHr
Boiler Design:	Babcock & Wilcox, radiant heat boiler. One 450 ft chimney per unit.
Design Rating:	Boiler heat input of 3200 MMBtu/hr (938 MW thermal each), operated at 338 MW electrical (each). Designed to produced 2.2 MMlb/hr steam.
Unit History:	Unit 3 entered commercial operation in 1962, and Unit 4 in 1963. Overfire air ports, flue gas recirculation, and low-NOx burners installed from1992 to 1996.
Original Owner:	PG&E purchased the site in 1951.

Air Pollution Control:	Overfire air ports, flue gas recirculation, and low-NOx burners. Emissions Limits Boiler Unit No. 3 and No. 4:

Pollutant	AQ Permit Limits	ARB Database Limits
ROC	---	10 ppmv @ 3% O2 0.075 lbs/hr
NOx	56 ppmvd @ 3% O2, 1-hr avg. (natural gas) 250 ppmvd@ 3% O2, 1-hr avg. (fuel oil) 225 ppmv @ 3% O2 (natural gas) 300 ppmv @ 3% O2 (fuel oil) 10% of applicable limit or 2 ppmv, whichever is greater, for continuous in-stack monitoring	56 ppmv @ 3% O2
CO	1000 ppmvd @ 3% O2, 1-hr avg. 2000 ppmvd, annual test	1000 ppmv @ 3% O2
PM	0.3 grains/scf @ 3% O2 (wet) or 0.3 grains/scf @ 12% CO2	0.3 grains/dscf @ 3% O2
SOx	Sulfur content of liquid fuel < 0.5 wt% Boiler No. 3: 3793 tons/yr (2000-2009, 3483 tons/yr (2010+) Boiler No. 4: 3289 tons/yr (2000-2009, 2873 tons/yr (2010+)	---
NH3	10 ppmvd @ 3% O2, 1-hr avg.	10 ppm @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	ISO dispatched.

Basic Unit Information

Unit	**1**	**2**	**3**	**4**
Dependable MW	163	163	338	338
Minimum Load MW	30	40	35	35
Online Date	Jul-1956	Oct-1955	Dec-1962	Aug-1963
RMR in 2004	-	-	-	-
SCR Installed	No	No	No	No

2003 Performance

Unit	**1**	**2**	**3**	**4**
Capacity Factor	0.003	0.013	0.049	0.049
Heat Rate, Btu/kWh				
minimum load	12,065	11,393	11,897	12,798
average	13,174	10,836	9,572	9,645
maximum load	9,993	9,783	9,010	9,035
NOx Rate, lb/MMBtu	0.0337	0.0615	0.0320	0.0344
NOx Rate, lb/MWh	0.443	0.666	0.306	0.332

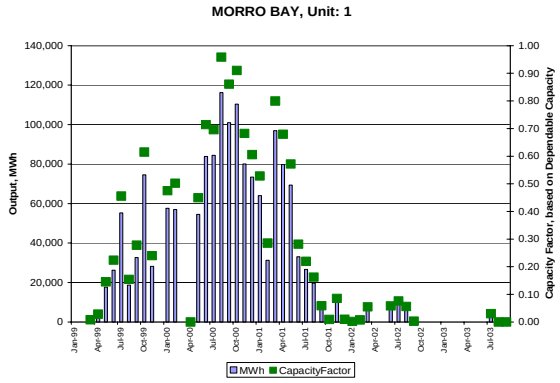
Past Five Years

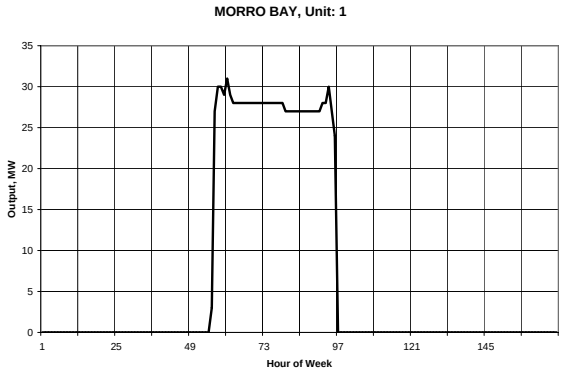
Unit	1	2	3	4
Output, MWh				
1999	257,555	415,678	1,212,021	1,254,369
2000	818,482	794,615	1,910,941	1,895,006
2001	439,884	501,160	1,840,033	1,544,763
2002	30,826	80,218	503,361	1,000,637
2003	3,653	18,123	146,009	145,630
Fuel Use, MMBtu				
1999	2,661,207	4,266,624	11,555,010	12,146,794
2000	8,261,199	8,032,793	17,890,296	17,996,222
2001	4,528,362	5,107,579	17,256,044	14,675,908
2002	343,367	852,028	4,776,900	9,545,461
2003	48,117	196,375	1,397,607	1,404,643
NOx Emission, pounds				
1999	259,607	491,999	355,579	379,447
2000	935,356	1,050,559	694,112	793,229
2001	352,711	357,633	535,271	470,719
2002	20,519	51,191	159,678	336,049
2003	1,619	12,071	44,680	48,363

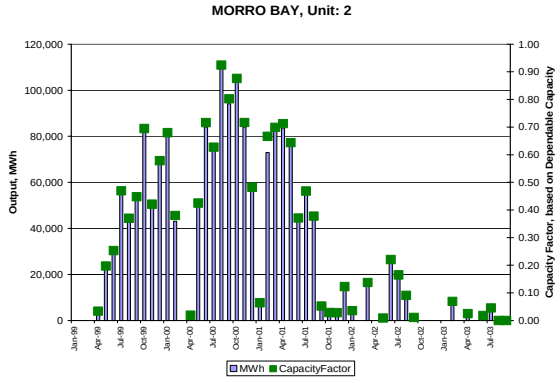
Charts

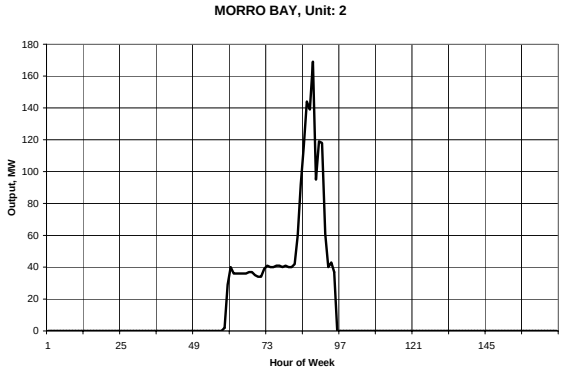
Monthly Output & Capacity Factor

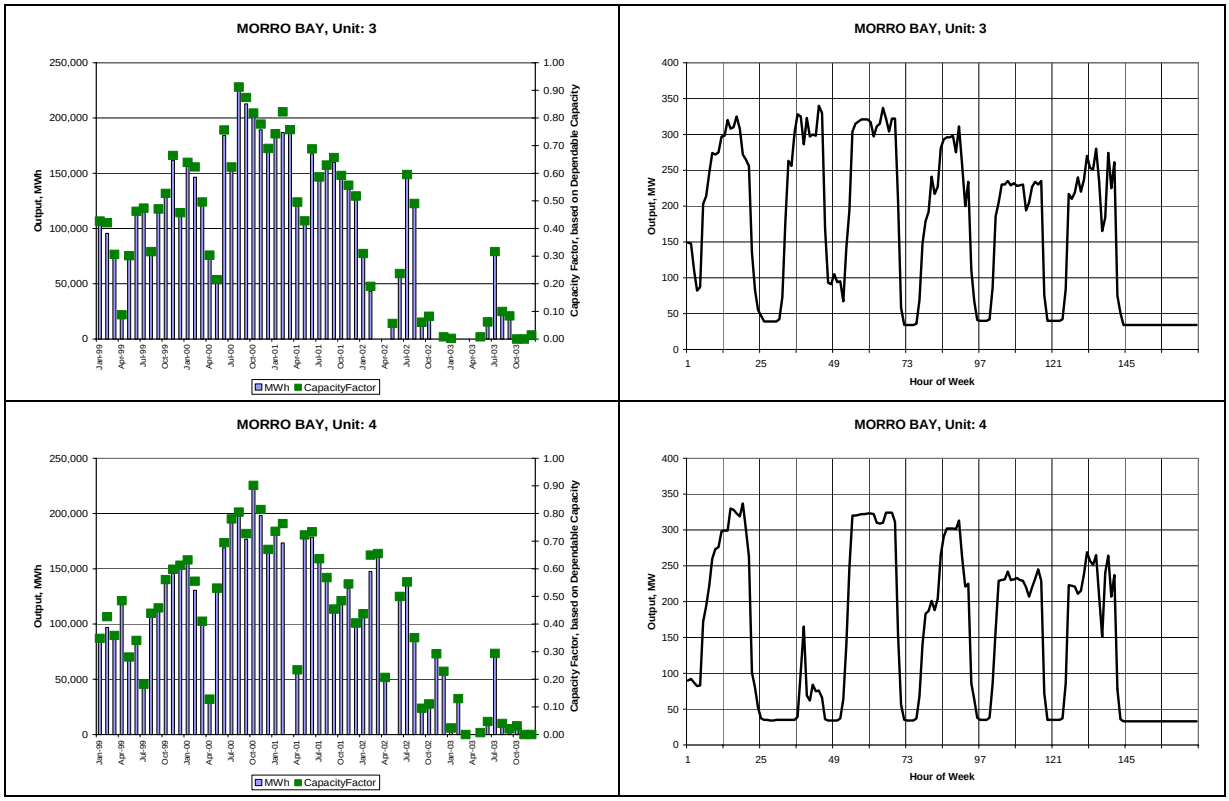
Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)











Permits/Agreements

Air:	▪ Facility Permit to Operate # 113 (formerly D-1390-A-1), February 24, 1999: Issued by San Luis Obispo County Air Pollution Control District ▪ Title V Permit Expiration Date: March 31, 2003 ▪ Phase II Permit Application, December 8, 1991
Water:	**NPDES Permit No. CA0003743** ▪ Issuing Agency: Central Coast RWQCB ▪ Effective Date: March 10, 1995. ▪ Expiration Date: March 10, 2000. Although the expiration date has passed, this permit will stay in effect until it is updated by the CCRWQCB. ▪ Order No. 95-28 (Waste Discharge Requirements) served as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	430.37	328.823	436.757	695.937	1684.657
PM_{10}	21.17	24.028	82.356	114.341	195.091
VOC	5.19	5.576	59.705	82.852	142.328
CO	282.2	320.249	910.161	1263.682	3186.434
SO_x	4.24	4.814	6.511	9.036	15.411

Source: Annual Reports from San Luis Obispo County Air Pollution Control District.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	684.7	328.8	436.8	695.9	436.8
PM_{10}	66.3	24	82.3	114.3	82.3
VOC	11	8.6	59.7	82.9	59.7
CO	210.6	320.3	910.2	1263.7	910.2
SO_x	776.8	4.8	6.5	9	6.5

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs:

Date	Description
2001	8 Complaints of rust-like particulate.
2001	3 Complaints of plume/smoke.
2001	1 Complaint of air quality affected by power plant.
2001	1 Complaint of rust-like particulate and smell.
2000	35 Complaints of rust-like particulate.
2000	8 Complaints of plume/smoke.
2000	1 Complaint of air quality affected by power plant.
2000	1 Complaint of smell.
2000	1 Complaint of rust-like particulate and smell.
1999	2 Complaints of rust-like particulate.
1999	1 Complaint of smell.
1998	1 Complaint of air quality affected by power plant.
1997	1 Complaint of air quality affected by power plant.

Notices of Violation (NOV):

Issued Date	**Description**	Status
9/22/00	Failure to maintain Unit #2 NOx < 150 ppmv. NO_x exceedence (1-hour)	---
6/29/00	Public nuisance – rust-like particulate fallout	---

Notices to Comply (N/C): None found.

Class I Setting: Located within 100 km of Ventana and San Rafael Wilderness areas.

Attainment Status:

Pollutant	San Luis Obispo County Attainment Status for 2002	
	Federal	**State**
Ozone – One hour	Unclassified/Attainment	Moderate Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm

Emission Offset Availability: No data at this time.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: None identifed in the surrounding area.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
Morro Bay Regions				
Charadrius alexandrinus nivosus	Western snowy plover	FT	Coastal shores, reservoirs, braided river channels, and playas.	In California, can primarily be seen during the breeding period from mid-March - mid-September, some wintering on Southern California beaches.
Eucyclogobius newberryi	Tidewater goby	FE	Endemic to brackish coastal lagoons, marshes, and coastal estuaries.	Year round
Helminthoglypta walkeriana	Morro shoulderband (=banded dune) snail	FE	Sandune habitat	Survey immediately after or during rain events per USFWS established protocols. Need USFWS approval to conduct surveys during heavy fog (see USFWS protocols).
Oncorhynchus mykiss irideus	Steelhead - South / Central California coast ESU	FT	Coastal streams	Visual surveys for upstream migrating adults following winter and spring run-off events (generally November-March). Note: observations of rainbow trout in coastal streams will generally be accepted as steelhead observations.
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Nearby resources include Morro Bay State Park and Morro Strand State Beach. Designated critical habitat for the western snowy plover and Morro shoulderband snail occurs within a one-mile radius of the project. The project is also within red-legged frog critical habitat.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Morro Bay Regions				
Astragalus didymocarpus var milesianus	Miles's milk-vetch			Annual herb-March-June
Central dune scrub	Central dune scrub			
Cordylanthus maritimus ssp maritimus	Salt marsh bird's-beak	FE, SE		Annual herb-May-October
Danaus plexippus	Monarch butterfly		Milkweed plants for forage and breeding-wintering in woodlands along coast from Mendocino south to Baja California	No info.
Layia jonesii	Jones's layia			Annual herb-March-May
Monardella frutescens	San Luis Obispo monardella			Perennial herb-May-September
Phrynosoma coronatum frontale	California horned lizard		Coastal scrub, scrub in arid to semi-arid areas with sandy or friable rocky soil.	Warm periods.
Suaeda californica	California seablite	FE		Evergreen shrub-July-October
***Status Legend: **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	Facility housed in block like structure. Earthen berms and landscaping surround the facility.
Perimeter fencing/walls, height of the fencing/wall (ft)	6-10 foot cyclone fencing
Landscaping	The south and east sides of the facility are planted with a mixture of climbing vines and shrubs. Mature trees are scattered across the perimeter and coupled with the berm provide some screening of the power plant. Mature plantings of eucalyptus, tea and pine cover the west side of the facility while the northern perimeter utilizes earthen berms covered with non native grasses and isolated cypress trees.
Visual plumes – number and size	Two large visible plumes.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 1 through 4), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The power boiler exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	27,147	2,167 (8.0%)
2000 Minority	28,178	4,590 (16.3%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Morro Bay		
Total Population	10,350	10.6% minority
Households	4,986	2.04 persons/household
Total Housing Units	6,251	20.2% vacancy rate
Labor Force	5,590	2.1% unemployment
San Luis Obispo County		
Total Population	246,681	15.4% minority
Households	92,739	2.49 persons/household
Total Housing Units	102,275	9.3% vacancy rate
Labor Force	121,500	2.9% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department Labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

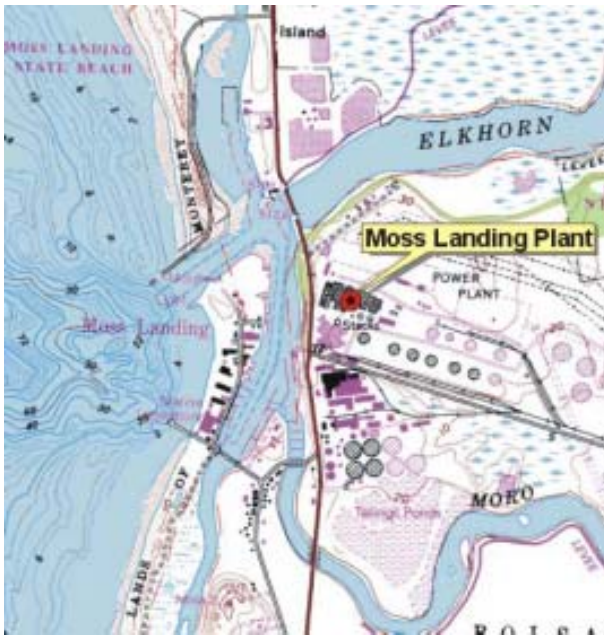
Moss Landing

CEC ID: G0372 EIA ID: 260

Address: Highway 1 & Dolan Road
Moss Landing, CA 95039-0027

County: Monterey

Directions: From Interstate 280, take the CA-17 South exit. Merge on CA-17 South and take the CA-17 exit. Proceed on CA-17 for approximately 8.9 miles and turn left on CA-17 South. Proceed on CA-17 South for approximately 9.4 miles and take the CA-1 South exit. Proceed on CA-1 South for approximately 22.8 miles to the intersection of CA-1, Dolan Road, and the plant entrance.



Facility Overview

Plant nominal capacity:	1,478 MW (Units 6 & 7) 1,060 MW (New Units 1 & 2 - Moss Landing Power Plant Modernization Project) became operational respectively on 7/1/2002 and 7/11/2002. These two new units are not part of this study.

Generating units:	Units 1-5 were retired as of January 1, 1995, and cannot operate without new air quality permits. These units are replaced by New Units 1 & 2 as part of the Moss Landing Power Plant Modernization Project (MLPPMP). Units 6 & 7 – Steam Turbine, 739 MW (each), gas fueled, ocean water cooled Units 1 & 2 (MLPPMP) were approved by the California Energy Commission (CEC) on October 25, 2000. Units 1 & 2 are each 530 MW (1060 MW total), natural gas-fired, combined cycle units. Each combined cycle unit consists of two natural gas fired combustion turbine generators (CTGs 1A/B, 2A/B), two unfired heat recovery steam generators (HRSGs) and a reheat, condensing steam turbine generator (STG). These units will use once through seawater cooling. Eight of the existing 225-foot stacks previously used for Units 1-5 will be dismantled. In addition, all of the fuel oil storage tanks on site will be demolished and Selective Catalytic Reduction (SCR) will be added to the existing Units 6 & 7.
Cooling system:	Seawater once through cooling (Units 6 &7 and new combined cycle Units 1 & 2)

Plant Owner/Operator

Owner name:	Duke Energy Moss Landing, LLC	***Operator name:***	Duke Energy North America Duke Fluor Daniel (DFD) California Operations
Owner address:	Highway 1 and Dolan Road P.O. Box 690 Moss Landing, CA 95039-0690	***Operator address:***	same
Owner contact:	R. Livingston (408) 633-6700	***Operator contact:***	R.T. Nelson (408) 633-6700

Site

Size:	The total plant site is 380 acres. The owner listed above owns 239 acres. Pacific Gas and Electric (PG&E) owns the remainder including its adjacent 500/230/115-kV Moss Landing Substation north of the plant (140 acres).

Description:	The Moss Landing Power Plant consists of 7 electric generation units, 8 225-foot exhaust stacks, 19 fuel oil storage tanks, 2 seawater inlet and outfall structures, various warehouse and office buildings, and other related equipment. The power plant currently operates two single boiler steam turbine units (Units 6 & 7). The MLPPMP includes two combined cycle units (New Units 1 & 2), each consisting of 2 CTGs, 2 HRSGs, and one STG. These units replace the existing electric power generation Units 1-5. These will be installed in the location of the existing fuel tanks 3, 4, and 10. All of the fuel oil storage tanks on site will be demolished and the 8 225-foot exhaust stacks previously used for Units 1-5 will be dismantled. All demolition work is expected to be completed by 2007.
Surrounding area:	The plant is located inland from the Moss Landing Harbor in an area of light industry, commercial, agricultural lands, recreational beaches and tidal wetlands. The site is bounded by Elkhorn Slough National Estuarine Research Reserve on the north, National Refractories and Moro Cojo Slough on the south, Highway 1 and Moss Landing Harbor on the west, and the Southern Pacific Railroad to the east. There are marshy, wetland areas located across the railroad embankment to the southeast of the site. Immediately offshore in the Monterey Bay is the immense 6,000-foot deep Monterey Submarine Canyon, a feature that strongly affects sea water and Elkhorn Slough conditions and movements in the area. Approximately 50 residences are located within one mile of the power plant. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	The North County Land Use Plan: Local Coastal Program for Monterey County, amended May 1987, provides policy guidance for the Moss Landing community. **North County Land Use Plan:** Heavy Industrial – Coastal Dependent uses, in which electrical power generation is **Zoned:** Heavy Industrial (HI)

Cooling

Cooling system type:	Seawater once-through cooling system.
Cooling sources:	Moss Landing Harbor
Cooling discharge:	Units 1-5 to Elkhorn Slough, currently not used. Units 6 & 7 and the new combined cycle Units 1 & 2 to Monterey Bay

Cooling system details:	The Plant has two cooling water intake stations, both located on Mass Landing Harbor. Currently, only the intake station for Units 6 & 7 is in operation. The intake station used by the retired United 1-5 will be modified and used by the new Units 1 & 2 in 2002. The intake structure for Units 6 & 7 is located on the east shore of the southern arm of Moss Landing Harbor, 700 feet south of the Units 1-5 intake structure. Spent cooling water is discharged from two outfalls. Outfall No. 001 for Units 1-5 is located off the southern shore of Elkhorn Slough. This outfall will receive only storm water runoff from parts of the plant, and will not be used to discharge thermal wastes in the future (No thermal discharges from this outfall in Elkhorn Slough are permitted). Outfall 002 for Units 6 & 7 is located approx. 600 feet offshore in Monterey Bay, adjacent to the designated Monterey Bay National Marine Sanctuary, and consists of two 12-foot diameter pipes for each of the two existing units. The new combined cycle units will use the existing Units 6 & 7 outfall system. Flows will increase above the current five (5) feet per second to approximately 8.6 feet per second.
Cooling system	The NPDES permit (Order No. 00-041; NPDES Permit No. CA0006254) allows a maximum discharge from Outfall 002 of 1,226 MGD for the Modernized Power Plant. The current average flow of once-through cooling water for Units 6 & 7 is 750 MGD (10/27/2000). Cooling water flow for the upgraded power plant will range from a low of 180 MGD to a maximum of 1,224 MGD at peak power demand. The typical or average cooling water flow rate for the future conditions is unknown due to the deregulated energy market. Cooling water flow rates will depend on energy demand and the available power at any give point in time. Units 6 & 7 are designed for 864 MGD (600,000 gpm). The MLPPMP (Units 1 & 2) uses 360 MGD (250,000 gpm) of ocean water for cooling for a total of 1224 MGD (maximum).
Screening system:	The new project includes new traveling screens further into the bay in order to minimize entrapment and impingement of biota. Modifications proposed by Duke to the existing Units 1-5 cooling water intake structure include the addition of new angled traveling screens to reduce approach velocities and keep the intake free from debris. Approach velocity is 0.5 feet per second (fps) compared to 0.8 fps at the Units 6 & 7 intake. These screens will be located near the front of the intake, which will eliminate the entrapment of aquatic organisms in the existing 350-foot tunnel which connects from the shoreline to the pumps. The new circulating water system will consist of the shoreline intake with silt diversion skirts, six bar trash racks with 4 inch spacing, a curtain wall with stop logs for isolation, six inclined traveling screens placed at an angle of 55° from the horizontal with a 5/16 inch mesh size, the existing 350 foot long intake tunnel, and six 42,000 gpm circulating water pumps.
Biofouling Control:	Heat treatment of the conduit is currently used to remove mussels. During heat treatment, the daily temperature cannot exceed the average daily temperature of the intake water by more than 40°F.

	Except during periods of heat treatment, the daily average temperature of the discharge shall not exceed the daily average natural temperature of the receiving water by more than: a) 28°F when either one or both Units 6 & 7 are operating but neither Unit 1 nor 2 is operating; b) 26°F when either one or both Units 1 or 2 are operating, and one or both Units 6 & 7 are operating; and c) 20°F when either one or both Units 1 & 2 are operating, but neither Units 6 nor 7 is operating. Per the Soil & Water Resources Errata (June 28, 2000), Duke Energy discovered that they exceed their discharge limitation by 2°F several times in 1999 due to high operational levels, jellyfish clogging the screens and other factors. In addition, Duke detected non-permitted discharges from the Moss Landing facility. These involved high temperature discharges to Moss Landing Harbor resulting from back flushing of heated water to clear the cooling water intake structure of marine organisms. Duke will discontinue all back flushing and will only conduct manual cleaning of the cooling water intake structures for existing Units 6 & 7 and the new combined cycle units. Sodium hypochlorite is used for biofouling reduction.

Electrical Interconnect

Description:	Switchyard of 525-kV and 230-kV connecting to the adjacent 500/230/115-KV PG&E substation.
Transmission	Moss Landing Switchyard (MLSY) has 115-kV, 230-kV, and 500-kV systems. The MLSY supports local load in Monterey, Santa Cruz, Watsonville, and Gilroy (115-kV). The 230-kV switchyard directly connects to the Metcalf substation. The 500-kV system also connects to the Metcalf substation and to the Los Banos substation. Other transmission lines that exit MLSY include: Panoche (230-KV Lines 1/2), GreenValley (115-kV Lines 1/2), Del Monte (115-kV Lines 1/2), Salinas (115-kV Lines 1/2), and Moss Landing 115-kV Taps 1/2. The two new combined cycle units will supply an additional 1060 MW of electricity to the 230-kV transmission system through two short segments of new 230-kV overhead transmission line, and then through the 230/115-kV transformer into the 115-kV system at the PG&E substation located at the site. Per “site inventory for peaking power plants at PG&E facilities, Updated 3-2-01”, Moss Landing is being upgraded for the current expansion, and will have limited additional capacity after the expansion.
Site arrangement:	Both voltages use two busses, and both have breakers configured in breaker and a half scheme.

Fuel Supply

Fuel type:	Natural gas. Units 6 & 7 have had permits that allow fuel oil, however fuel oil is not used, even as a back-up fuel.

Fuel system description:	Natural gas is supplied by the PG&E interstate pipeline system by means of two existing 20-inch and 24-inch diameter pipes. Natural gas is available on site and a short line will be constructed to the two new combined cycle units.

Units 6 & 7

Unit Design:	Rankine cycle, 5,100,000 lbs/hr steam flow 3,500 psig/1000°F/1000°F. Cross-compound turbines, HP and IP elements on single shaft at 3600 rpm, LP on second shaft at 1800 rpm.
Boiler Design:	Boiler Unit No. 6-1 and 7-1, each consisting of: Steam Generators manufactured by Babcock and Wilcox Company, once through cooling, radiant, reheat, pressurized furnace type. Nominal 6500 MMBtu/hr, natural gas-fired with fuel oil standby. Four (4) forced draft fans, each rated at 400,000 CFM at 40.8 inches H2O Two (2) Ljungstrom regenerative air preheaters Sixteen (16) burner cells total, eight (8) front wall, and eight (8) back wall. Each burner cell equipped with three (3) Babcock & Wilcox S-Type low NOx burners, eight (8) dual zone overfire air ports, four (4) front wall, and four (4) back wall. Two (2) flue gas recirculation fans, centrifugal type, each rated at 252,000 CFM at 12.5 inches H2O static pressure. 500 ft chimney for each unit, 66 ft O.D. at base and 20 ft O.D. at the top.
Design Rating:	Boiler heat input of 6500 MMBtu/hr (1905 MW thermal each). Units 6 & 7 each have a net capacity of 739 MW or a total of 1478 MW.
Unit History:	Units 6 & 7 were started-up in 1967 and 1968, respectively.
Original Owner:	The power plant has been generating electricity since 1950. Duke Energy purchased the 239-acre site from PG&E on 7/1/98.

Air Pollution Control:	Air preheated, flue gas recirculation and low NOx burners. As part of the MLPPMP, the owner committed to installing SCR systems on both boilers. SCR with ammonia injection has been installed on Boiler No. 6-1.

Emissions Limits Boiler Unit No. 6-1 and No. 7-1:

Pollutant	AQ Permit Limits	ARB Database Limits
VOC	38.0 lbs/hr and 912.0 lbs/day	---
NOx	85.6 lbs/hr and 2054.4 lbs/day 9.64 tons/day avg. of May 1 through October 31 annually from all boilers 225 ppmvd @ 3% O2 10 ppmvd @ 3% O2, 1-hr avg. (natural gas) 450 lbs/hr, 1-hr avg. (natural gas) at loads at or below 400 gross MW (Unit 7)	90 ppmv @ 3% O2 450 lbs/hr 0.3 lb/MMBtu
CO	862.7 lbs/hr and 20704.8 lbs/day 400 ppmvd @ 3%O2, 1-hr avg. for steady state compliance source tests 1000 ppmvd @ 3% O2, 1-hr avg. for all other periods of operation	400 ppmv @ 3% O2
PM	52.5 lbs/hr and 1260.0 lbs/day 0.15 grains/dscf @ 6% O2 in any exhaust stream	---
SOx	4.9 lbs/hr and 117.6 lbs/day SO2 < 0.2 vol. % in any exhaust stream Sulfur content of fuel oil < 0.5 wt. % Boiler No. 6 = 8921 tons/yr Boiler No. 7 = 976 tons/yr	---
NH3	31.6 lbs/hr and 758.4 lbs/day 10 ppmvd @ 3% O2 (3-60 min. avg.)	---

Basic Unit Information

Unit	**6**	**7**
Dependable MW	739	739
Minimum Load MW	60	60
Online Date	Dec-1967	Aug-1968
RMR in 2004	No	No
SCR Installed	Yes	Yes

2003 Performance

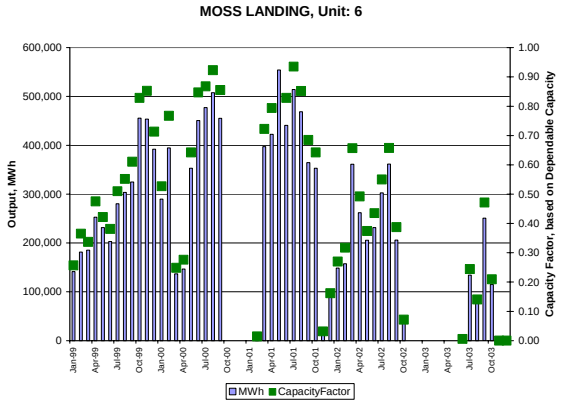
Unit	**6**	**7**
Capacity Factor	0.090	0.116
Heat Rate, Btu/kWh		
minimum load	13,111	14,758
average	9,342	9,325
maximum load	8,719	8,827
NOx Rate, lb/MMBtu	0.0083	0.0067
NOx Rate, lb/MWh	0.078	0.062

Past Five Years

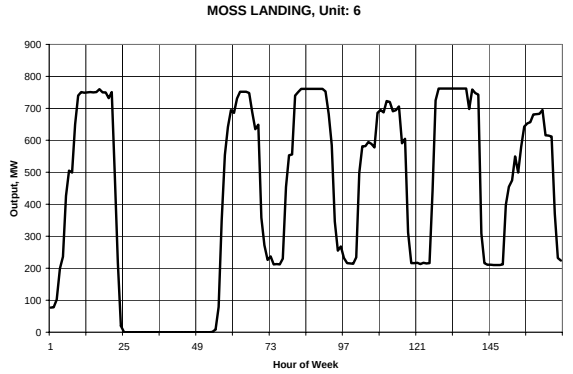
Unit	6	7
Output, MWh		
1999	3,405,050	3,102,175
2000	3,211,545	5,064,846
2001	3,627,486	5,017,197
2002	2,276,079	1,730,249
2003	580,790	752,808
Fuel Use, MMBtu		
1999	31,747,834	28,103,434
2000	29,349,281	45,569,017
2001	32,923,963	45,345,413
2002	20,879,265	16,032,242
2003	5,425,786	7,019,811
NOx Emission, pounds		
1999	2,490,089	2,246,432
2000	2,326,517	3,460,259
2001	336,987	3,534,947
2002	182,344	281,253
2003	476,219	300,836

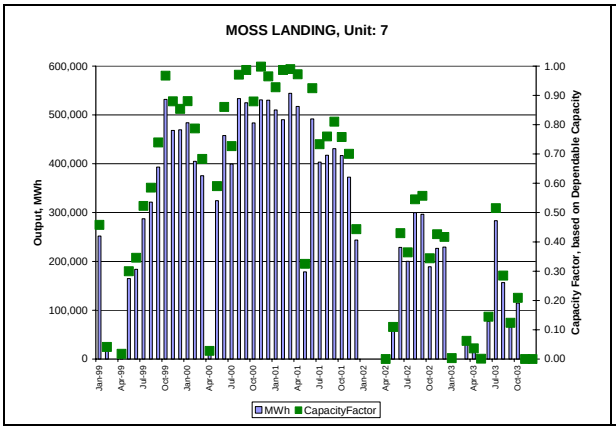
Charts

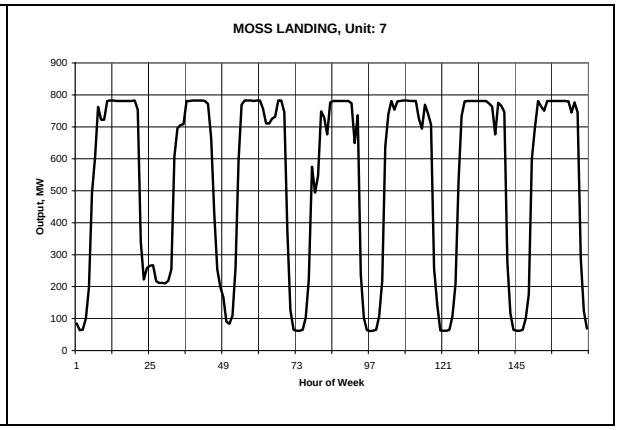
Monthly Output & Capacity Factor



Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)







Permits/Agreements

Air:	▪ All issued by Monterey Bay Unified Air Pollution Control District ▪ Title V Operating Permit, July 31, 2001 ▪ Title V Permit Expiration Date: December 31, 2002 ▪ Permit to Operate, January 02, 2002 for Boiler No. 7-1 and assoc. equip. ▪ Permit to Operate, August 21, 2001 for Boiler No. 6-1 and assoc. equip. ▪ Permit to Operate, October 15, 2001 for Start-Up Package Boiler ▪ Authority to Construct, October 27, 2000 for Gas Turbine Generator Unit 1A ▪ Authority to Construct, October 27, 2000 for Gas Turbine Generator Unit 1B ▪ Authority to Construct, October 27, 2000 for Gas Turbine Generator Unit 2A ▪ Authority to Construct, October 27, 2000 for Gas Turbine Generator Unit 2B
Water:	**NPDES Permit No. CA0006254** ▪ Issuing Agency: Central Coast RWQCB ▪ Effective Date: October 27, 2000. ▪ Expiration Date: October 27, 2005. ▪ Order No. 00-041 (Waste Discharge Requirements) Serves as the NPDES Permit.

Environmental Information: Air Quality

Complaint Logs:

Date Received	Description
10/01/01	Yellow plume from the stacks of the power plant. Checked CEMS monitoring equipment.
07/23/01	Yellow stuff landing on car possibly from the power plant. The substance was found to be pollen, most likely from a shrub or tree.
06/04/01	Smelled natural gas odor at ML harbor docks. Upon inspection, various odors including diesel and fish bait, but not natural gas were found.
02/01/00	Dozens of brown and orange dots all over top and bow of boat from fallout. Copy of complaint forwarded to Duke Energy Claims Dept.
11/26/99	Whitish smoke from the southern stack and blackish/brown smoke from the northern stack. Visual check observed only steam. Stack data for the hours of 11-1pm on 11/26/99 were collected.
11/24/99	Burnt smell from power plant. Complainant was instructed to speak to the District Board.
08/24/99	FTP ongoing. Plan of action discussed.
07/26/99	Continual FTP, which is not being mitigated by Duke Energy. As long as mitigation measures are in place, the District does not cite the plant. By signing the check from Duke Energy, the complainant is agreeing that mitigation for that period is satisfactory.
01/12/99	Yellow-brown spots on cars from the power plant. It was found to be organic fallout. The material was not inorganic and was not at all like the FTP emitted from the power plant stacks.

Notices of Violation (NOV): No Notices of Violation found.

Notices to Comply (N/C): No Notices to Comply found.

Class I Setting: Located within 100 km of Ventana Wilderness area.

Attainment Status:

Pollutant	Monterey Bay Attainment Status for 2002	
	Federal	State
Ozone – One hour	Unclassified/Attainment	Moderate Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm

Emission Offset Availability: No data available.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: Nearby resources include Montery Bay National Marine Sanctuary and Elkhorn Slough National Estuarine Research Reserve.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
Moss Landing Regions				
Charadrius alexandrinus nivosus	Western snowy plover	FT	Coastal shores, reservoirs, braided river channels, and playas.	In California, can primarily be seen during the breeding period from mid-March - Mid-September, some wintering on Southern California beaches.
Charadrius alexandrinus nivosus	Western snowy plover	FT	Coastal shores, reservoirs, braided river channels, and playas.	In California, can primarily be seen during the breeding period from mid-March - Mid-September, some wintering on Southern California beaches.
Eucyclogobius newberryi	Tidewater goby	FE	Endemic to brackish coastal lagoons, marshes, and estuaries of coastal California.	Year round
Rallus longirostris obsoletus	California clapper rail	FE, SE	Year-long resident in salt marsh habitat in coastal wetlands.	Year-long in its preferred habitat
Tryonia imitator	Mimic tryonia (=California brackishwater snail)		Coastal lagoons and estuaries and salt marshes-only in permanently submerged areas	Year round
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Adjacent snowy plover critical habitat. Within red-legged frog critical habitat. Monterey Bay National Marine Sanctuary special protection. Nearby resources include Moss Landing State Beach and Salinas River State Beach.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Moss Landing Regions				
Ambystoma californiense	California tiger salamander	FE	Most time spent in underground refuges, particularly small mammal burrows (Jennings and Hayes 1994). These subterranean sites are usually near the species' breeding sites, but adults are known to migrate over distances of 1000m or more to relatively long-lasting rain pools and other suitable breeding sites (Jennings and Hayes 1994). Breeding takes place following the first significant warm late winter and spring rains.	Visual surveys following the first significant spring warm late winter and spring rains. Burrow and trapping surveys (per USFWS protocol).
Anniella pulchra nigra	Black legless lizard		Coastal dunes - mostly on the Montery Peninsula and in Montery Bay. Potentially occurs in coastal dunes from San Francisco south to Mussel Rock Dunes in Santa Barbara County.	No info.
Assio flammeus	Short-eared owl		Open habitat including pastures, grasslands, and wetlands.	No info.
Athene cunicularia	Burrowing owl		Open habitats that have suitable burrows (mostly ground squirrel burrows) including pastures, grasslands, and open developed areas.	Peak breeding April 15 - July 15. Potential breeding February 1 - August 31. CDFG protocols exist.
Chorizanthe pungens var pungens	Monterey spineflower	FT		Annual herb-April-June
Coastal brackish marsh	Coastal brackish marsh			
Coelus globosus	Globosely dune beetle		Coastal sand dunes, foredunes and sand hummocks	No info.
Danaus plexippus	Monarch butterfly		Milkweed plants for forage and breeding-wintering in woodlands along coast from Mendocino south to Baja California	No info.
Gilia tenuiflora ssp arenaria	Sand gilia	FE, ST		Annual herb-April-June
Riparia riparia	Bank swallow	ST	Fine-textured sandy banks along water courses-usually with a riparian habitat component.	In California during breeding period from April-mid-September.
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	Heavy, tall vegetation in front of parcel along Highway 1. Fence with green fabric on west fence. No other visual screening.
Perimeter fencing/walls, height of the fencing/wall (ft)	6-10 foot cyclone fencing. Fabric placed on western fence line.
Landscaping	Dense plantings of evergreen trees and shrubs were located along the western and northern perimeter of the power plant. These included mature eucalyptus, cypress and tea trees. Minimal landscaping on east perimeter. The southern border of the facility was planted with a row of mature eucalyptus that offered minimal screening of the power plant. Ice plant, herbaceous weeds and native vegetation occupied areas below the tree line.
Visual plumes – number and size	Two large, visible plumes.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 6 & 7 and new Units 1 & 2), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The power boiler exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	19,558	2,780 (14.2%)
2000 Minority	22,540	14,686 (65.1%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Moss Landing		
Total Population	300	40.7% minority
Households	125	2.8 persons/household
Total Housing Units	135	8.0% vacancy rate
Labor Force	N/A	N/A
Monterey County		
Total Population	401,762	44.1% minority
Households	121,236	3.14 persons/household
Total Housing Units	131,708	8.6% vacancy rate
Labor Force	198,400	10.8% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department Labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Olive

CEC ID: G0410 EIA ID: 6013

Address: 164 WEST MAGNOLIA BLVD
Burbank, CA 91502

County: Los Angeles

Directions:

Facility Overview

Plant nominal capacity:

Generating units:

Cooling system:

Plant Owner/Operator

Owner name: City of Pasadena

Owner address:

Owner contact:

Operator name: City of Pasadena

Operator address:

Operator contact:

Site

Size: The total plant site is 10 acres, owned by Burbank Water and Power.

Description:	The site has three power generating units and a cooling tower system. Major electrical switchyards (69-kV and 13.5 kV) and other miscellaneous facilities are owned by Burbank Water and Power.	
Surrounding area:	Surrounding land uses include commercial, car dealerships, car rental facilities, light manufacturing. Nearest residential is about one mile from the site.	
General Plan and Zoning Designations:	General Manufacturing	M-2

Cooling

Cooling system type:	
Cooling sources:	
Cooling discharge:	
Cooling system details:	
Cooling system flow:	
Screening system:	
Biofouling Control:	

Electrical Interconnect

Description:	
Transmission details:	
Site arrangement:	

Fuel Supply

Fuel type:	
Fuel system description:	

Units 1 & 2

Unit Design:
Boiler Design:
Design Rating:
Unit History:

Original Owner:	
Air Pollution Control:	:

Pollutant	AQ Permit Limits	ARB Database Limits
ROC		
NOx		
CO		
PM		
SOx		
NH3		
Lead		
Other		

Description of Loading Management and/or Power Sales Arrangement:

Basic Unit Information

Unit	**1**	**2**
Dependable MW	46	55
Minimum Load MW	10	10
Online Date	Oct-1959	Sep-1964
RMR in 2004		
SCR Installed	Yes	Yes

2003 Performance

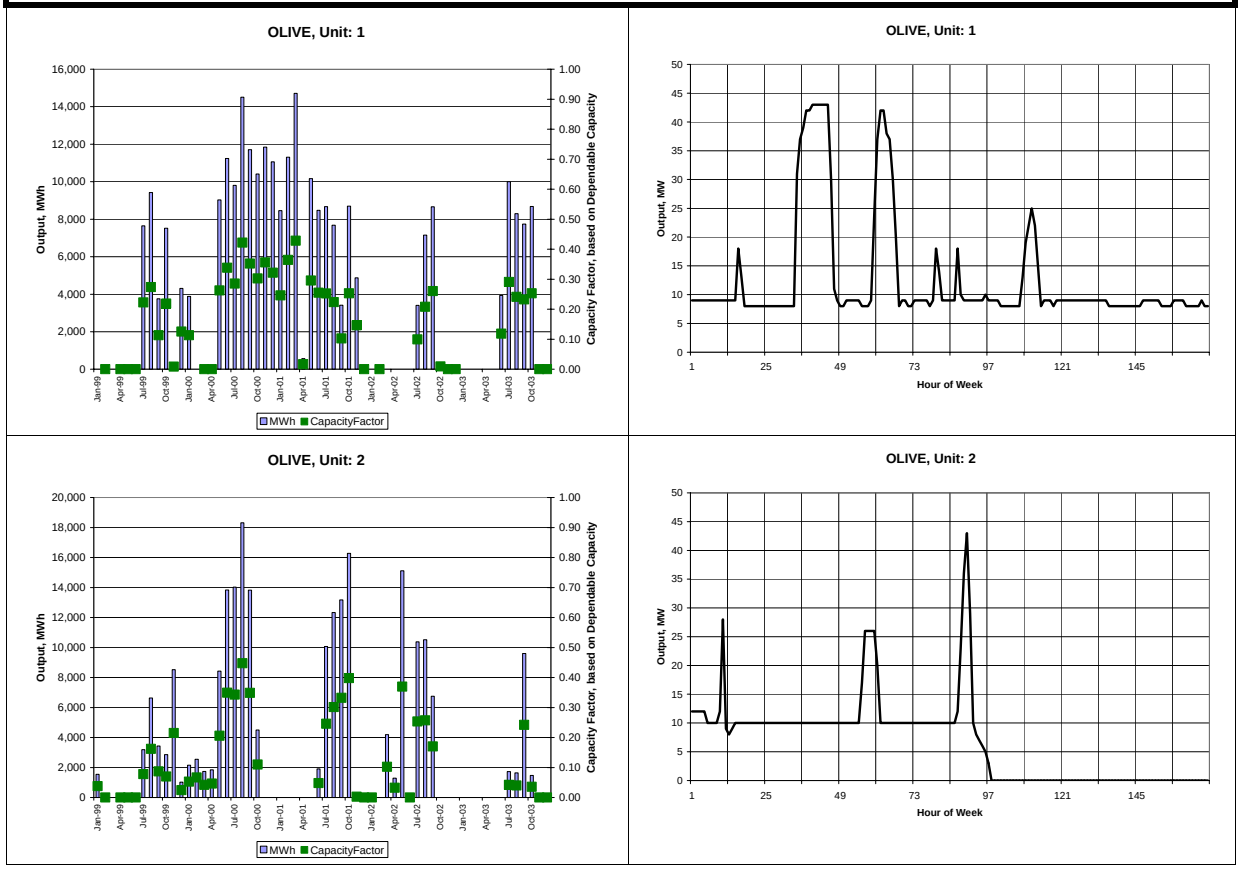
Unit	**1**	**1**
Capacity Factor	0.096	0.030
Heat Rate, Btu/kWh		
minimum load	14,013	15,020
average	12,946	14,117
maximum load	11,242	11,152
NOx Rate, lb/MMBtu	0.0059	0.0076
NOx Rate, lb/MWh	0.076	0.107

Past Five Years

Unit	**1**	**2**
Output, MWh		
1999	32,942	27,219
2000	93,490	81,226
2001	87,033	53,882
2002	19,535	48,249
2003	38,654	14,446

Fuel Use, MMBtu		
1999	418,639	328,074
2000	1,106,943	913,917
2001	1,047,091	631,616
2002	244,393	580,768
2003	500,421	203,941
NOx Emission, pounds		
1999	38,250	27,828
2000	116,034	122,338
2001	99,536	60,563
2002	22,739	45,568
2003	2,957	1,549

Charts



Permits/Agreements

Air:	▪
Water:	**Storm Water General Permit** ▪ Issuing Agency: Los Angeles Regional Board **National Pollution Discharge Elimination System permit – permit # CAS 004001** ▪ Issuing Agency: Los Angeles Regional Board

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	1997	1998	1999	2000	2001
NO_x						
PM_{10}						
VOC						
CO						
SO_x						

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x					
PM_{10}					
VOC					
CO					
SO_x					

.

Complaint Logs:

Notices of Violation (NOV):

Issued Date	Description	Status

Notices to Comply (N/C):

Class I Setting:

Attainment Status:

Pollutant	___ AQMD Attainment Status for 2002	
	Federal	State
Ozone – One hour		
CO		
NO_2		
SO_2		
PM_{10}		
Lead		

Source:

Emission Offset Availability:

Total Emission Reduction Credits Available (tons/year) as of

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: None identified in the surrounding area.

Listed Non-Marine Species:

Scientific Name	Common Name	Status	Habitat	Survey Timing Guidelines and Flowering Periods
Atriplex parishii	Parish's brittlescale	State Candidate	Alkali meadows, vernal pools, chenopod scrub, playas.	
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	State Endangered, Federal Candidate	Coastal scrub, sandy soils.	
Dudleya multicaulis	Many-stemmed dudleya	State Candidate	Chaparral, coastal scrub, valley and foothill grassland. endemic to southern California.	

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual Resources	
Visual screening	
Perimeter fencing/walls, height of the fencing/wall (ft)	
Landscaping	
Visual plumes – number and size	

Any Existing Plume Abatement Measures:

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income		
2000 Minority		

Source:

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of		
Total Population		
Households		
Total Housing Units		
Labor Force		
Los Angeles County		
Total Population		
Households		
Total Housing Units		
Labor Force		

Source:

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Ormond Beach

CEC ID: G0421 EIA ID: 350

Address: 6635 South Edison Drive
Oxnard, CA 93030

County: Ventura

Directions: From Highway 101, take the CA-1 South/Oxnard Boulevard exit. Proceed on North Oxnard Boulevard for approximately 2.5 miles to South Oxnard Boulevard. Proceed on South Oxnard Boulevard for approximately 0.9 mile to Saviers Road. Proceed on Saviers Road for approximately 2.9 miles. Turn east (left) on East Hueneme Road. Turn south (right) on Edison Drive. Proceed for approximately 1 mile to the plant entrance.

Facility Overview

Plant nominal capacity:	1,500 MW (online)
Generating units:	Units 1 & 2 – Steam Turbine, 750 MW (each), gas fueled, ocean water cooled.
Cooling system:	Seawater once through cooling (Units 1-2)

Plant Owner/Operator

Owner name: Reliant Energy Ormond Beach, LLC

Operator name: Reliant Energy Ormond Beach, LLC

Owner address:	6635 South Edison Dr. Oxnard, CA 93033	***Operator address:***	same
Owner contact:	Remmele J. Young, Houston (713) 207-5509 ryoung@reliant.com	***Operator contact:***	G.K. Malik, Station Manager (805) 986-7241 gmalik@reliant.com

Site

Size:	The total site is 693 acres. Of that, 37 acres is power generation facilities owned by the owner listed above. Southern California Edison (SCE) Company owns the remaining 656 acres for various purposes.
Description:	The power block has two power generation units, related retention basins, and an ocean-fed cooling system. Additional facilities include an administration building, shop and warehouse building. SCE owns the following assets located at the plant site: a fuel storage and transportation system, cutter stock tanks, fuel-oil heaters and associated pumps and piping; a switchyard system comprised of a 220 kV switchyard, circuit breakers, towers, lines, structures and buildings and electrical protection; SCEnet communication equipment; and other assets unrelated to power generation, including wetlands and farmland and a mariculture laboratory.
Surrounding area:	The facility is located in an area primarily characterized by agricultural, industrial, and federal government uses. The Pacific Ocean abuts the southwest side of the property, and the U.S. Navy's Mugu Naval Air Missile Test Center lies southeast of the facility. The plant itself is surrounded by farmland on the remaining sides. Most of the SCE site is in agricultural use, except for southernmost area, adjacent to the ocean, which includes the generating station and tanks. Land uses north of the SCE agricultural land consists of a variety of heavy industrial facilities. There are no residences in the vicinity of the station. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	City of Oxnard 2020 General Plan and the City of Oxnard Coastal Land Use Plan.

General Plan: Industrial Area Public Utility/Energy Facility	**Local Coastal Program (Coastal Zoning Ordinance)**: Predominantly designated as EC (Coastal Energy Facility Zone) with a small area on the westerly portion of the site designated as RP (Coastal Resource Protection Zone) and a small area on the eastern corner designated as M-2 (Heavy Manufacturing).

Cooling	
Cooling system	Once-through cooling water system
Cooling sources:	Pacific Ocean
Cooling discharge:	Pacific Ocean at Ormond Beach
Cooling system details:	Ocean water is supplied to the station through a 14-foot inside diameter concrete conduit at a flow rate of 475,000 gpm. The intake is located 1,950 ft. offshore. It is fitted with a concrete 'velocity cap' to discourage fish entry. Seawater flows to the intake structure located within the station. At the intake structure there are two pumps per unit that deliver water to the condensers, one for each generating unit. Heated water is discharged from an outfall coffer (Discharge 001) to the ocean through a 14-foot inside diameter conduit that terminates about 1,790 ft. offshore.
Cooling system	The NPDES permit (Order No. 01-092; NPDES Permit No. CA0001198) allows a maximum discharge of 688.2 MGD of wastes consisting of once-through cooling water from two steam electric generating units (four condenser halves), metal cleaning wastes, and low volume wastes. Units 1 and 2 each have two circulation pumps. Approximately 238,000 gpm of ocean water is supplied to each unit.
Screening system:	Travelling screens are provided in front of each circulating water pump. Screens have a mesh of approx. 1 inch. Trash bars and associated rakes are in front of the screens for protection from large debris.
Biofouling Control:	Heat treatment to control marine fouling is typically conducted every five (5) weeks and lasts for about two (2) hours per conduit. The condenser tubes are arranged in banks of two per generating station. Biological growth on the condenser tubes is controlled by intermittently injecting chlorine in the form of sodium hypochlorite into the cooling water system. There are two chlorination cycles per day. Each cycle consists of 20 minutes per condenser half, plus 20 minutes for the bearing cooling water heat exchangers. There are two generating units and the condenser halves are chlorinated sequentially. The resulting total chlorination time is 80 minutes per generating unit per day, 100 minutes per cycle and 200 minutes per day. Calcareous shell debris accumulates in the intake structure as a result of heat treatments. Approx. once per year, this shell debris is physically removed and disposed of in bins collected by the City of Oxnard.

Electrical Interconnect

Description:	SCE 220-kV switchyard is located at the plant site.
Transmission details:	There are four transmission lines from the station, each terminating at the SCE Moorpark Substation.
Site arrangement:	A 'breaker and a half' configuration is used for a single bus structure.

Fuel Supply

Fuel type:	Natural gas. The station was originally designed to burn oil fuel as well.
Fuel system description:	Gas supply is by Southern California Gas Company.

Units 1 & 2

Unit Design:	Rankine cycle, unitary design, supercritical steam conditions of 3500 psig/ 1000°F/1000°F. Single control room for both units.
Boiler Design:	Foster-Wheeler, front and rear wall firing. Single chimney per unit. At full load, the boiler of each unit produces 5.7 MMlb/hr (2.6 million kg/hr) of steam.
Design Rating:	Steam Generator heat input of 7400 MMBtu/hr (2169 MW thermal). Operated at 750 MW electrical (each).
Unit History:	Units 1 and 2 were started-up in 1971 and 1973, respectively. The transmission towers leaving the station are the first "Drefus Design" towers; solid steel rather than lattice type.
Original Owner:	Southern California Edison
Air Pollution Control:	Low NOx burners installed originally. SCR with ammonia injection installed in the last few years.

Emissions Limits Steam Generator Unit No. 1 and No. 2:

Pollutant	AQ Permit Limits	ARB Database Limits
ROC	19.73 lbs/hr, 86.43 tons/yr ROC Calculated Throughput = 123,247 MMcf/yr	---
NOx	141.06 lbs/hr 621.47 tons/yr	---
CO	634.30 lbs/hr 2,778.17 tons/yr	---
PM	35.24 lbs/hr 154.34 tons/yr	---
SOx	8.46 lbs/hr, 37.04 tons/yr Unit No. 1 = 4488 tons/yr Unit No. 2 = 4550 tons/yr	---
NH3	66.25 lbs/hr 290.16 tons/yr	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	The Ormond Beach units are NOT designated Reliability Must Run (RMR) by CAISO.

Basic Unit Information

Unit	**1**	**2**
Dependable MW	750	750
Minimum Load MW	200	50
Online Date	Aug-1971	Mar-1973
RMR in 2004	No	No
SCR Installed	Yes	Yes

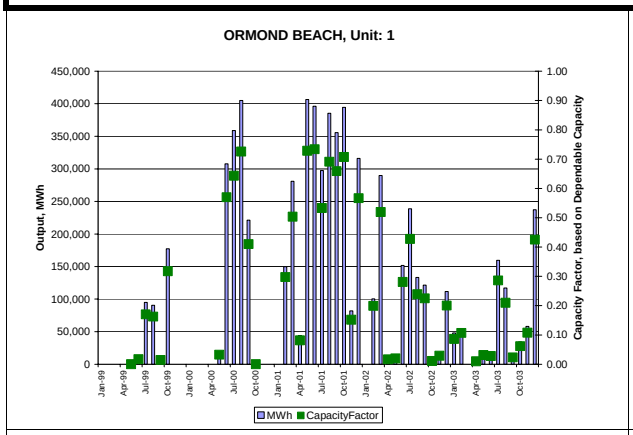
2003 Performance

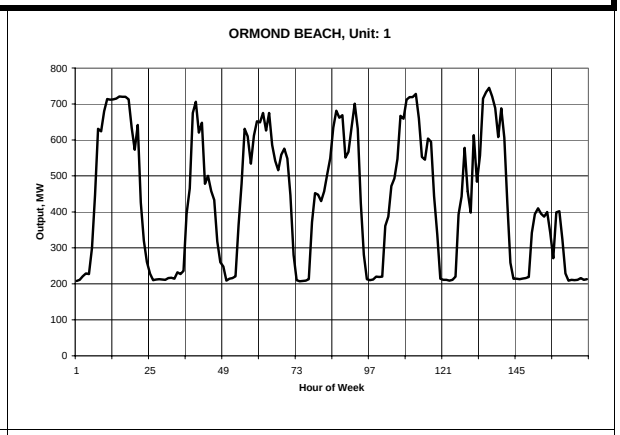
Unit	**1**	**1**
Capacity Factor	0.116	0.171
Heat Rate, Btu/kWh		
minimum load	10,909	16,841
average	10,301	10,542
maximum load	9,409	9,200
NOx Rate, lb/MMBtu	0.0077	0.0070
NOx Rate, lb/MWh	0.079	0.074

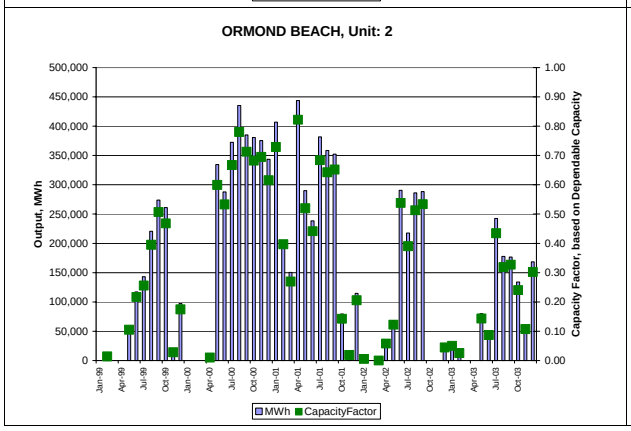
Past Five Years

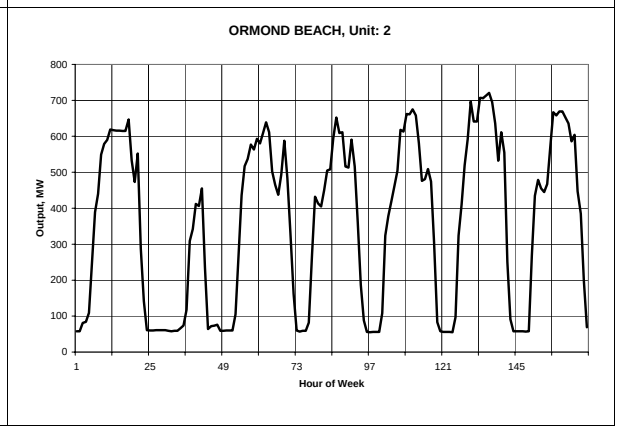
Unit	1	2
Output, MWh		
1999	380,073	1,193,952
2000	1,311,444	2,920,007
2001	3,109,591	3,026,036
2002	1,189,349	1,210,342
2003	759,186	1,125,014
Fuel Use, MMBtu		
1999	3,943,042	11,901,999
2000	12,919,972	28,231,140
2001	30,586,135	29,394,545
2002	12,028,930	12,059,145
2003	7,820,643	11,859,464
NOx Emission, pounds		
1999	31,036	73,193
2000	85,959	186,437
2001	237,471	218,906
2002	93,499	93,552
2003	60,352	83,338

Charts









Permits/Agreements

Air:	▪ Part 70 Permit (to Operate), April 12, 2000. The Part 70 permit serves as a permit to operate pursuant to Rule 33.1. Issued by Ventura County Air Pollution Control District (Facility I.D.# 65) ▪ Part 70 Permit Issued: October 1, 1998. Part 70 Permit Expiration Date: September 30, 2003 ▪ Title IV Acid Rain Permit, May 17, 1999 (40CFR72-78) ▪ Title IV Permit Issued: January 1, 1998. Title IV Permit Expiration Date: December 31, 2002
Water:	**NPDES Permit No. CA0001198** ▪ Issuing Agency: Los Angeles RWQCB ▪ Effective Date: May 14, 2001, Revised June 28, 2001. ▪ Expiration Date: May 10, 2006. ▪ Order No. 01-092 (Waste Discharge Requirements) Serves as the NPDES Permit. ▪ The permit was originally issued to Southern California Edison (SCE). Houston Industries, Inc., acquired the Ormond facility in 1998 and changed the name to Ormond Beach Power Generation L.L.C. In 1999, Houston Industries changed their name to Reliant Energy. At that time, Ormond Beach Power Generation L.L.C. became Reliant Energy Ormond Beach, L.L.C. Concurrently, the name of the power station reverted to Ormond Beach Generating Station.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	---	57.9	42.7	56.8	136.6
PM_{10}	---	19.9	13.5	19.1	49.0
VOC	---	11.0	8.2	10.6	27.4
CO	---	352.7	242.6	341.9	882.6
SO_x	---	6.6	3.2	4.5	11.8

Source: Annual Reports from Ventura County Air Pollution Control District for Facility ID #65.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	35.6	57.9	42.7	56.8	42.7
PM_{10}	15.9	19.9	13.5	19.1	13.5
VOC	9.9	11.7	8.2	10.6	8.2
CO	286.9	352.7	242.6	341.9	242.6
SO_x	3.8	6.6	3.2	4.5	3.2

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs: No complaints received between 1996 and 2001.

Notices of Violation (NOV):

Issued Date	Description	Status
07/11/00	Excess NOx Emissions from Unit #2. Rule 59.B.1	Settlement 09/26/01
09/01/98	Excess Ammonia Emissions from Unit #2. Rule 59.B.4	Settlement 09/23/98

Notices to Comply (N/C):

Issued Date	Description	Status
02/07/02	Received revisions to Title V Annual Compliance Certification on 03/18/02. Rule 29.C	Closed 03/27/02
04/13/01	Received reply for deficiencies on annual Title V Certification. Rule 29	Closed 06/07/01

Class I Setting: Located within 100 km of San Rafael Wilderness area.

Attainment Status:

Pollutant	Ventura County Attainment Status for 2002	
	Federal	**State**
Ozone – One hour	Severe Nonattainment	Severe Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm

Emission Offset Availability: No data at this time.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: None identified in the surrounding area.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
Ormond Regions				
Charadrius alexandrinus nivosus	Western snowy plover	FT	Coastal shores, reservoirs, braided river channels, and playas.	In California, can primarily be seen during the breeding period from mid-March - mid-September, some wintering on Southern California beaches.
Sterna antillarum browni	California least tern	FE, SE	Known to occur on sandy beaches along marine and estuarine environments, salt ponds, and other sparsely vegetated sites near fish bearing water. Occurs in California May - September	In California, can primarily be seen during the breeding period from May - September.
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Generating Station located adjacent to snowy plover critical habitat. Nearby resources include coastal beaches.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Ormond Regions				
Cordylanthus maritimus ssp maritimus	Salt marsh bird's-beak	FE, SE		Annual herb-May-October
Lasthenia glabrata ssp coulteri	Coulter's goldfields			Annual herb-February-June
Passerculus sandwichensis beldingi	Belding's savannah sparrow	SE	Salt marsh wetlands	Year round
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	Multiple layers of mature vegetation (trees and shrubs) used to partially screen the front and sides of the facility. No other visual treatments were observed.
Perimeter fencing/walls, height of the fencing/wall (ft)	Two rows of 8-foot cyclone fence with barbed wire surrounded the facility.
Landscaping	The facility is surrounded by thick vegetation including mature bottle brush, eucalyptus and Australian tea trees. Ornamental plantings and manicured lawns were observed within the facility. Native riparian vegetation exists outside the landscaping on the west and north sides of the facility.
Visual plumes – number and size	Two 600-foot plumes were visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 1 and 2), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The power boiler exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	154,684	19,065 (12.3%)
2000 Minority	184,996	141,101 (76.2%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Oxnard		
Total Population	170,358	4.7% minority
Households	43,576	3.85 persons/household
Total Housing Units	45,166	3.5% vacancy rate
Labor Force	86,030	6.4% unemployment
Ventura County		
Total Population	753,197	30.0% minority
Households	243,234	3.04 persons/household
Total Housing Units	251,712	3.4% vacancy rate
Labor Force	424,100	4.4% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database lisings for the subject property and surrounding sites.

Pittsburg

CEC ID: G0450 EIA ID: 271

Address: 696 West 10th Street
Pittsburg, CA 94565

County: Contra Costa

Directions: From Highway 4, take the Railroad Avenue exit towards Pittsburg. Keep left at the fork in the ramp. Proceed north (left) on Railroad Avenue to West 10th Street. Proceed west (left) on West 10th Street for approximately 0.75 mile to the plant entrance.

Facility Overview

Plant nominal capacity: 1,350 MW (Units 5-7)
Unit 1-4 have retired

Plant Owner/Operator

Owner name: Mirant Delta, LLC

Owner address: 1350 Treat Blvd., Suite 500, Walnut Creek, CA 94596

Operator name: Mirant Delta, LLC

Operator address: same

Owner contact:	Bettie Yee-Joe Phone: (925) 287-3110 Fax: (925) 281-4436 bettie.yee-joe@marant.com Alternate: Steven A. Huhman West Mgr. Of Regulatory Affairs Phone: (925) 287-3100 Fax: (925) 947-3002 P.O. Box 192 Pittsburg, CA 94565 Mark A. Gouveia Production Manager Phone: (925) 427-3510	***Operator contact:***	Joseph H. Bittner, Plant Manager Phone: (925) 427-3597

Site

Size:	The site size is 2,140 acres total, including the land west of the site. Utility facilities, with active operations, cover roughly 280 acres of that land. In addition, 39 acres are dedicated to marina uses, and approximately 90 acres to a waste disposal site. The remainder of the site includes mostly unused marshy lands. The Contra Costa plant is 5 miles upstream, the Los Medanos and Delta Energy Centers are also close by.

Description:	In 1951, Pacific Gas & Electric (PG&E) purchased a 280-acre parcel of agricultural land used for grazing and dairy farming. Subsequent property acquisitions thru 1974 resulted in the current property area of approx. 2,140 acres. The majority of this added acreage was obtained from 1972-1979 and included the acquisition of shell pond, the carbon pile, and a detached parcel located south of McAvoy Boat Harbor. The power plant is situated on the eastern end of the property. A large cooling water canal is located immediately west of the power plant. Mallard Slough bisects the property and contains a Contra Costa Water District water supply pumping plant. A former ammonia plant, owned and operated by Shell Oil Company, was located in the western portion of the property, approximately three miles west of the switchyard, and reportedly operated from 1930 to1967. The ammonia manufacturing process produced a byproduct called "carbon black" that was stockpiled on the property. Adjacent to the 11-acre carbon black stockpile is a 72-acre pond that historically received discharge water from the ammonia plant. The power plant consists of seven boilers, seven steam turbines, and associated facilities (e.g., an electric switchyard, cooling water intake structures, a cooling water canal and a cooling tower, fuel oil tanks, an off-site pipeline terminus, and an on-site marine terminal dock). The plant site also contains non-operational areas and acreage leased for agriculture. Located on the plant site are four service tanks and twelve aboveground storage tanks capable of storing fuel oil. Of these sixteen tanks, nine are essentially empty, seven contain usable fuel oil, and one contains displacement oil to purge and preheat pipes when switching from burning natural gas to residual fuel oil in the boilers. The combined fuel oil storage capacity for the plant is approximately 5.7 million barrels of oil. The Pittsburg Power Plant has been in operation in its current facility design and discharge configuration since 1972. Since 1977, the plant has been granted Thermal Plan exemptions.
Surrounding area:	Surrounding land uses include light industrial, residential, and marina uses. The site is bounded by Suisun Bay to the north; the Southern Pacific Railroad and Willow Pass Road to the south; the Pittsburg Marina and residential property to the east; and the Harris Yacht Harbor and commercial property to the west. Several manufacturing and storage facilities, auto repair shops and dismantling yards, and sewage treatment plants are in the neighboring area. Residential areas and the boating marina are located to the east of the main power plant portion of the site. A parochial elementary school is located about one-half mile southeast of the plant. *Refer to the attached Site Visit Report for additional information.*

General Plan and Zoning Designations:	The Contra Costa General Plan guides land use planning and policy in the unincorporated portions of the county. The Pittsburg General Plan guides Land use planning activities in nearby Pittsburg. The power plant is within the sphere of influence of the City of Pittsburg. The property is currently being annexed by the city from the county so it does not have a zoning map designation yet. The city's most recent General Plan update does include an Industrial designation for the property but the zoning designation will not occur until the annex is complete. Heavy Industrial (HI) is the General Plan designation for roughly the eastern half of the site, which includes the power plant facility, and Open Space (OS) is the designation for the western half.

Cooling

Cooling system type:	Once-through cooling water for Units 1-6. Unit 7 is cooled by cooling towers. Dependable plant capacity is limited to 720 MW by cooling system constraints.
Cooling sources:	Suisun Bay for Units 1-6 and a cooling water canal for Unit 7, which is fed by Suisun Bay.
Cooling discharge:	Suisun Bay for Units 1-6. Unit 7 cooling tower blowdown is returned to the canal, where it is cooled by natural evaporation and makeup from the Bay.
Cooling system details:	Units 1-6 utilize once-through cooling, whereas Unit 7 utilizes wet cooling tower technology. Although make-up water is diverted for Unit 7 to replace losses from cooling tower blowdown and atmospheric drift, Unit 7 is not restricted in operation as are Units 1-6 by cooling water temperature limitations. Units 1-6 can potentially be affected by limitations on temperature for discharge of cooling water. A Resources Management Plan (RMP) for mitigating impacts to Striped Bass, as referenced by the RWQCB in its June 1986 NPDES Permit (Order 86-47), limits cooling water temperatures from exceeding 86°F between May 1 and mid July. This period is considered sensitive for Striped Bass eggs. The 86°F cooling water discharge temperature limit applies regardless of Sacramento and San Joaquin River spring runoff or delta tidal conditions. The RMP also requires coordination of the operation of the Pittsburg plant with the operation of the Contra Costa plant in order to minimize impacts to the fishery. It requires the dispatch of Pittsburg Unit 7 (closed-cycle system) prior to dispatching other units at either plant and provides other provisions to minimize environmental impacts.

Cooling system	The NPDES permit (Order No. R2-2002-0072; NPDES Permit No. CA0004880) allows a maximum discharge of 1,070 MGD (Units 1-6) of once-through cooling water from Outfall E-001, with an annual average flow of 658 MGD. Annual maximum flow of other streams (intake screen wash, blowdown, chemical metal cleaning, etc.) from Outfall E-001 is 26.407 MGD, with an annual average flow of 18.0794 MGD.
Screening system:	Screens are used for Units 1-6.
Biofouling Control:	Per EPA 316(b) Case Studies, intake design criteria have been implemented at Pittsburg Units 1-7 to minimize impingement, including an intake approach velocity of 0.8 fps, configuration of the intake structure to include lateral fish escape routes, and location of intake screens parallel to the shoreline. In 1986, the San Francisco Bay RWQCB and Central Valley RWQCB established additional NPDES permitting requirements for the Pittsburg and Contra Costa facilities to protect striped bass. Adjustments include the preferential use of Pittsburg Unit 7, which is equipped with a closed-cycle system, during spring when young striped bass are present, and the installation of variable-speed circulating water pump controls for the once-through cooling system of Pittsburg Units 1-6 and Contra Costa Units 6 & 7.

Electrical Interconnect

Description:	A 230-kV switchyard is connected to seven transmission lines, which connect to PG&E substations. A 115-kV sub is also located here.
Transmission details:	Line 1 and 2 are to Sobrante sub, lines 3, 4 & 5 are to Moraga sub, and lines 6 & 7 are to Tesla substation.
Site arrangement:	Two single section busses using Breaker and a half confiugration.

Fuel Supply	
Fuel type:	Natural Gas and residual fuel oil (emergency only)
Fuel system description:	Two of the three boilers associated with Units 5-7 are capable of burning residual fuel oil. BAAQMD Regulation 9, Rule 11, prohibits burning residual fuel oil, except for limited testing purposes and in the event of natural gas curtailment. Natural gas is delivered to the plant via a 20-inch transmission pipeline from PG&E's Antioch Gas Terminal. Between 1974 and 1976, a 42-mile-long underground pipeline was constructed between Richmond and Antioch to transport fuel oil from Chevron's Richmond Refinery to the Pittsburg and Contra Costa Power Plants. The Richmond-Pittsburg portion of the pipeline has not been used for continuous deliveries of oil for power generation since 1982. Four other major refineries are either currently connected to or may connect to the fuel oil line that supplies the Pittsburg tank farm. The marine terminal dock supports a 12-inch and a 20-inch pipeline for unloading oil to the storage tanks. The terminal has not been used in about ten years, but is still available for oil deliveries.

Units 5 & 6	
Unit Design:	Electric Generation, Rankine cycle, reheat.
Boiler Design:	Babcock & Wilcox, radiant reheat. Individual chimneys
Design Rating:	Boiler heat input of 3300 MMBtu/hr (967 MW thermal each). Operated at 325 MW electrical (each)
Unit History:	Unit 5 and 6 were started up in 1960 and 1961, respectively.
Original Owner:	Pacific Gas & Electric

Air Pollution Control:

Unit 5 proposed combustion modifications in 1997, planned for low NOx burners in 2001, in-duct SCR with 30% FGR in 2003. Unit 6 similar but SCR/FGR in 2004. Currently, only SCR reported in the Air Quality Permits.

Emissions Limits Boiler Unit No. 5 and No. 6:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	0.057 lb/MMBtu (2002), 0.037 lb/MMBtu (2004), and 0.018 lb/MMBtu (2005), 1-hr avg. 175 ppmvd @ 3% O2 (natural gas), 1-hr avg. 300 ppmvd @ 3% O2 (oil firing), 1-hr avg.	175 ppmv @ 3% O2
CO	400 ppmvd @ 3% O2 steady state compliance source tests 1000 ppmvd @ 3% O2, 1-hr avg. for all other periods of operation	1000 ppmv @ 3% O2
PM	0.15 grains/dscf @ 6% O2	0.15 grains/dscf @ 3% O2
SOx	GLC 0.5 ppm (3 min. avg.), 0.25 ppm (1-hr avg.), 0.05 ppm (24-hr avg.) 300 ppmvd Sulfur content of non-gaseous fuel < 0.5 wt% Boiler No. 5 = 285 tons/yr Boiler No. 6 = 3725 tons/yr	300 ppmv @ 3% O2
NH3	10 ppmvd @ 3% O2, rolling 1-hr avg. except during startup/shutdown	10 ppmv @ 3% O2
Lead	6.75 kg/day 1.0 $\mu g/m^3$	---

Description of Loading Management and/or Power Sales Arrangement:

All Pittsburg units are Reliability Must Run designation by the ISO, since divestiture and continuing to today.

Unit 7

Unit Design:

Electric Generation, supercritical 4000 psig/1000 °F/1000 °F cycle. Tandem compound (single shaft HP, IP, LP) 2 pole/3600 rpm.

Boiler Design:

Combustion Engineering, supercritical combined circulation. Tangential fired, FGR. Individual chimney.

Design Rating:

Boiler heat input of 6854 MMBtu/hr (2009 MW thermal). Operated at 720 MW electrical.

Unit History:

Unit 7 was started up in 1972.

Original Owner:

Pacific Gas & Electric

Air Pollution Control:	Combustion modifications in 1997, planned for conventional SCR in 2003. Emissions Limits Boiler Unit No. 7:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	0.057 lb/MMBtu (2002), 0.037 lb/MMBtu (2004), and 0.018 lb/MMBtu (2005), 1-hr avg. 175 ppmvd @ 3% O2 (natural gas), 1-hr avg. 300 ppmvd @ 3% O2 (oil firing), 1-hr avg.	175 ppmv @ 3% O2
CO	400 ppmvd @ 3% O2 steady state compliance source tests 1000 ppmvd @ 3% O2, 1-hr avg. for all other periods of operation	1000 ppmv @ 3% O2
PM	0.15 grains/dscf @ 6% O2	0.15 grains/dscf @ 3% O2
SOx	GLC 0.5 ppm (3 min. avg.), 0.25 ppm (1-hr avg.), 0.05 ppm (24-hr avg.) 300 ppmvd Sulfur content of non-gaseous fuel < 0.5 wt% Boiler No. 7 = 740 tons/yr	300 ppmv @ 3% O2
NH3	10 ppmvd @ 3% O2, rolling 1-hr avg. except during startup/shutdown	10 ppmv @ 3% O2
Lead	6.75 kg/day 1.0 $\mu g/m^3$	---

Description of Loading Management and/or Power Sales Arrangement:	All Pittsburg units are Reliability Must Run designation by the ISO, since divestiture and continuing to today.

Basic Unit Information

Unit	**5**	**6**	**7**
Dependable MW	325	325	720
Minimum Load MW	50	50	100
Online Date	Sep-1960	Jun-1961	Dec-1972
RMR in 2004	Yes	Yes	Yes
SCR Installed	Yes	Yes	Yes

2003 Performance

Unit	**5**	**6**	**7**
Capacity Factor	0.276	0.073	0.179
Heat Rate, Btu/kWh			
minimum load	12,516	12,950	12,956
average	10,284	11,346	10,468
maximum load	9,388	9,946	8,847
NOx Rate, lb/MMBtu	0.0101	0.0099	0.0294
NOx Rate, lb/MWh	0.104	0.113	0.307

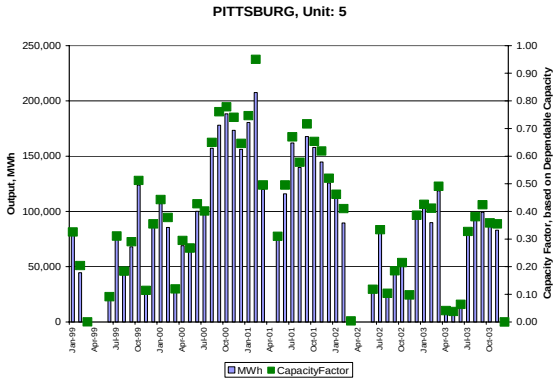
Past Five Years

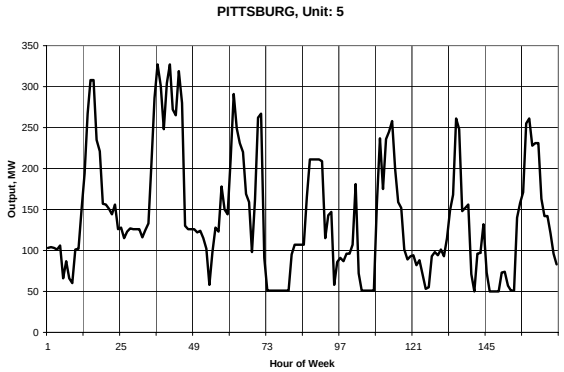
Unit	5	6	7
Output, MWh			
1999	568,697	777,942	1,794,379
2000	1,405,206	1,062,161	3,498,781
2001	1,596,868	1,818,227	4,715,572
2002	547,082	703,877	2,760,981
2003	785,460	209,148	1,127,364
Fuel Use, MMBtu			
1999	5,800,012	8,011,230	17,430,929
2000	14,178,568	10,061,265	33,730,261
2001	15,584,881	17,344,164	44,837,115
2002	5,653,002	7,523,094	27,536,326
2003	8,078,030	2,372,975	11,801,038
NOx Emission, pounds			
1999	385,739	417,195	758,317
2000	951,362	490,235	1,793,674
2001	978,798	892,013	2,761,840
2002	132,775	88,369	1,113,653
2003	81,973	23,571	346,565

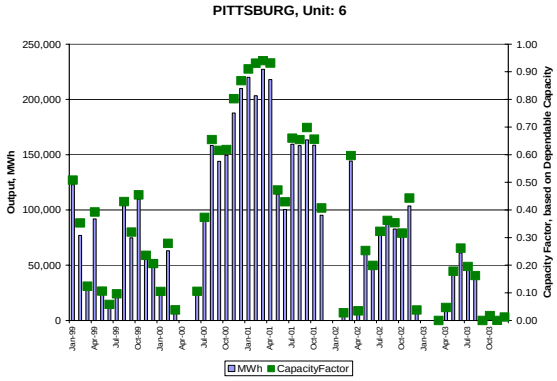
Charts

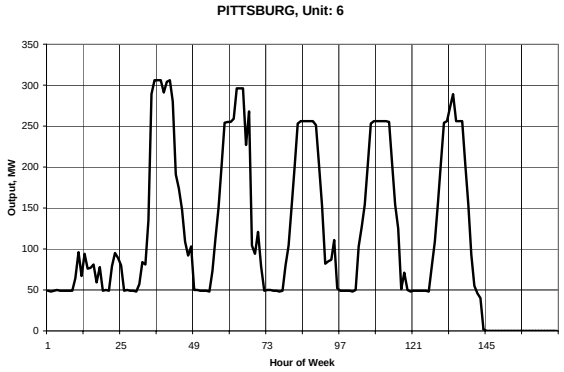
Monthly Output & Capacity Factor

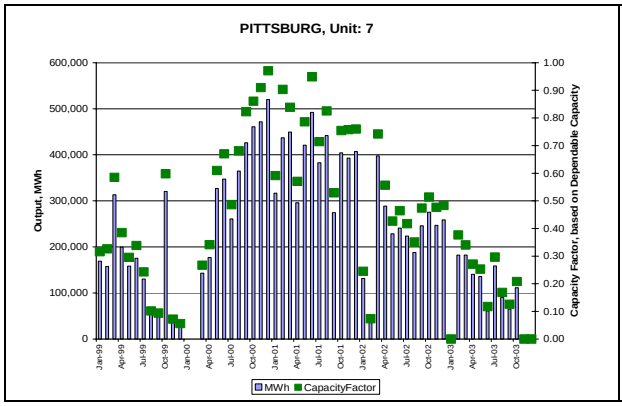
Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)

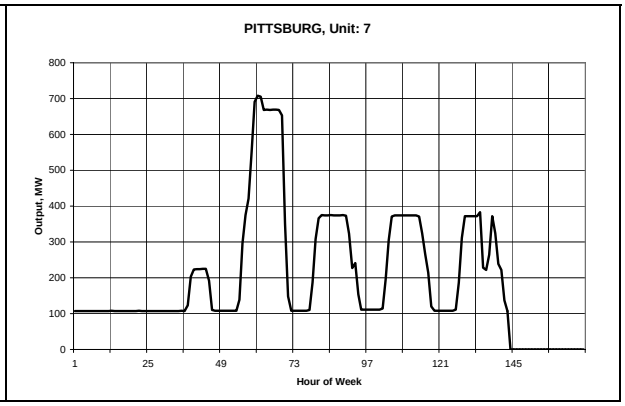












Permits/Agreements

Air:	▪ Final Major Facility Review Permit, November 20, 2001: Issued by the Bay Area Air Quality Management District (Facility I.D.# A0012) ▪ Permit Expiration Date: September 14, 2003
Water:	**NPDES Permit No. CA0004880** ▪ Issuing Agency: San Francisco Bay RWQCB ▪ Effective Date: July 1, 2002. ▪ Expiration Date: May 31, 2007. ▪ Order No. R2-2002-0072 (Waste Discharge Requirements) Serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	**1997**	**1998**	**1999**	**2000**	**2001**
NO_x	6305.18	1720.32	2206.97	2995.18	2248.43	2265.49
PM_{10}	212	44	60	76	57	107
VOC	150.6	28	36	46	35	64
CO	1547	570	783	992	750	1412
SO_x	512.38	12	12	15	11	21

Source: Annual Summary from Bay Area Air Quality Management District for Facility ID # A0012.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	1921	1719.1	2045.3	1579	2045.3
PM_{10}	69.6	43.8	75.5	57	75.5
VOC	18.7	12.8	20.4	15.7	20.4
CO	739.8	569.9	992.3	749.6	992.3
SO_x	11	11.7	15	11.2	15

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4931). Accessed October 2001.

Complaint Logs:

Date Received	**Description**
09/14/99	Odors of 'rotten eggs'.
08/01/96	Dark brown smoke.

Notices of Violation (NOV):

Issued Date	**Description**	Status
10/07/00	Failure to report an inoperative CEM. Regulation 1-522.4	Pending Final Disposition.
12/14/99	ID #6534: 14 minutes > 30% opacity. Regulation 6-302	Settled Out of Court, MS
10/25/98	ID #5928: Episode reported late. Regulation 1-522.7	Settled Out of Court, MS
09/02/97	ID #5180: CO > 1200 ppm @ 3% O_2. Regulation 9-11-310	Settled Out of Court, MS
08/17/96	ID #4445: Failure to report on time. Regulation 1-522.7	Settled Out of Court, MS
07/01/96	ID #4262: CO > 1200 ppm @ 3% O_2/Hr. average. Regulation 9-11-310	Settled Out of Court, MS
06/05/96	ID #5180: CO > 1200 ppm @ 3% O_2. Regulation 9-11-309	Settled Out of Court, MS
04/16/96	ID #4086: > 30% opacity 3 min/hr. Regulation 6-302	No Further Action, Enf
04/16/96	ID #4086: > 30% opacity 3 min/hr. Regulation 6-302	No Further Action, Enf
02/04/96	ID #3774: > 30% opacity 3 min/hr @ 11 minutes. Regulation 6-302	No Further Action, Enf
02/04/96	ID #3774: > 30% opacity 3 min/hr @ 11 minutes. Regulation 6-302	No Further Action, Enf

Notices to Comply (N/C): None provided.

Class I Setting: Located within 100 km of Point Reyes National Seashore Recreation Area.

Attainment Status:

Pollutant	**Bay Area Attainment Status for 2002**	
	Federal	**State**
Ozone – One hour	Not Classified/Moderate [1]	Serious Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note (1): San Francisco Bay Area is designated "Not Classified / Moderate" under 23 U.S.C. Section 104(b)(2) and has a 2006 attainment deadline.

Emission Offset Availability: www.baaqmd.gov/permit/banking/banking.htm

Total Emission Reduction Credits Available (tons/year) as of May 7, 2002.

PM	140
POC	3,339
NO_x	1,750
SO_2	1,030
CO	1,088
NPOC	459
PM_{10}	222

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: None identifed in the surrounding area.

Listed Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines
Pittsburg Regions				
Sterna antillarum browni	California least tern	FE, SE	Known to occur on sandy beaches along marine and estuarine environments, salt ponds, and other sparsely vegetated sites near fish bearing water. Occurs in California May - September	In California, can primarily be seen during the breeding period from May - September.
***Status Legend: FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Nearby resources include Sacramento-San Joaquin River Delta/Estuary and Grizzly Island Complex/Suisun Marsh.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Pittsburg Regions				
Aster lentus	Suisun marsh aster			Perennial herb-May-November
Blepharizonia plumosa SSP plumosa	Big tarplant			Annual herb-July-October
Coastal brackish marsh	Coastal brackish marsh			
Lathyrus jepsonii var jepsonii	Delta tule pea			Perennial herb-May-September
Lilaeopsis masonii	Mason's lilaeopsis	SR		Perennial herb-April-November
Coastal brackish marsh	Coastal brackish marsh			
Aster lentus	Suisun marsh aster			Perennial herb-March-September
Melospiza melodia maxillaris	Suisun song sparrow		Endemic to Suisun Bay in emergent wetland vegetation (scirpus and typha marsh).	Year round
Oenothera deltoides ssp howellii	Antioch dunes evening-primrose	FE, SE		Perennial herb-March-September
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	Turbines enclosed in architectural concrete building with electrical components screened by 8-10 foot solid wall. Large berms located on the east and southern perimeter of the facility.
Perimeter fencing/walls, height of the fencing/wall (ft)	An 8-foot solid wall encloses facility not shielded by building.
Landscaping	Very dense landscaping of oleander, peppers and palms along extended main entrance. Dense mature plantings of large evergreen trees, shrubs and understory vegetation surround the facility. No landscaping observed along the northern bay side of the facility.
Visual plumes – number and size	Two small (25-foot) plumes visible and one small brown plume visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling, which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler (Units 1 through 7) exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	109,193	12,442 (11.4%)
2000 Minority	123,735	58,079 (46.9%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Pittsburg		
Total Population	56,729	56.4% minority
Households	17,741	3.17 persons/household
Total Housing Units	18,300	3.1% vacancy rate
Labor Force	28,300	6.6% unemployment
Contra Costa County		
Total Population	948,816	34.5% minority
Households	344,129	2.72 persons/household
Total Housing Units	354,577	2.9% vacancy rate
Labor Force	515,700	4.7% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department Labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Potrero

CEC ID: G0462 EIA ID: 273

Address: 1201 Illinois Street
San Francisco, CA 94107

County: San Francisco

Directions: From Interstate 280, take the Army Street exit. Proceed north on Pennsylvania for approximately 0.5 mile to Illinois Street. Head east (toward the San Francisco Bay) on 22nd Street. Turn left on Illinois Street to the plant entrance.

Facility Overview

Plant nominal capacity:	363 MW
Generating units:	Unit 3 – Steam Turbine, rated at 207 MW, dual-fuel capable, ocean water cooled. Units 4-6 – Combustion Turbine, 52 MW (each), distillate fuel oil, air cooled. (Not part of this study) Units 1 & 2 of 50 MW each are retired.
Cooling system:	Seawater once through cooling.

Plant Owner/Operator

Owner name:	Mirant Potrero, LLC	***Operator name:***	Mirant Potrero, LLC
Owner address:	1350 Treat Blvd., Suite 500 Walnut Creek CA 94596	***Operator address:***	same

Owner contact:	Bettie Yee-Joe Phone: (925) 287-3110 Fax: (925) 281-4436 bettie.yee-joe@marant.com Steven A. Huhman Mgr. Of Regulatory Affairs West Phone: (925) 287-3100 Fax: (925) 947-3002	***Operator contact:***	same

Site

Size:	26 acres in total formerly occupied by a manufactured gas plant. Two miles north of the Hunters Point power plant. Two miles south of the San Francisco-Oakland Bay Bridge.
Description:	The site currently consists of one gas-fired conventional steam turbine/boiler unit and associated cooling water system, three combustion turbines (peakers), and associated facilities (e.g., a switchyard, a control building, fuel oil tanks, and a firewater tank). The fuel tank farm along the northern boundary of the plant consists of three aboveground storage tanks with a combined storage capacity of 21.7 million gallons. Two tanks store residual fuel oil for the boiler, while the third tank stores distillate fuel for the combustion turbines.
Surrounding area:	The plant is bounded by 22nd Street and a paved parking lot to the north; 23rd Street to the south; Illinois Street to the west; and the San Francisco Bay to the east. Surrounding land uses primarily include heavy industrial uses to the north, light industrial and commercial uses immediately to the south, and residential areas on Potrero Hill approximately one-half mile west of the site. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	The Central Waterfront Area Plan of the General Plan addresses land use and planning near the Potrero Power Plant. **General Plan:** Heavy Industry | **Zoning:** Heavy Industrial (M-2)

Cooling

Cooling system type:	Once-through cooling water system (Unit 3 and proposed Unit 7)
Cooling sources:	Lower San Francisco Bay
Cooling discharge:	Lower San Francisco Bay
Cooling system details:	Cooling water is taken from a shoreline surface water intake structure in Lower San Francisco Bay. The cooling water is circulated once through non-direct contact condensers and then discharged back to the Bay through a channel outfall cut into the seawall. Discharge structures are located on the San Francisco Bay

	shore. The proposed intake structure will be a 54.4-foot by 203.5-foot rectangular structure with the longer dimension parallel to the shoreline. There will be two 31.6-foot by 33-foot pumpwells at the rear of the structure. Installed in each pumpwell will be two 50% capacity circulating water pumps (two 70,000 gpm/100.8 MGD and two 79,000 pgm/110.6 MGD respectively). One set of pumps will provide cooling water to Unit 3 and the other to Unit 7. Mirant is proposing to discharge the cooling water from Units 3 and 7 back to the San Francisco Bay through separate outfalls. Each outfall would consist of two 200-ft long diffusers located at the terminal ends of a 54-inch diameter discharge pipe terminating approximately 900 feet offshore. The separation between the Unit 3 and Unit 7 diffuser sections averages approximately 200 feet.
Cooling system	The NPDES permit (Order No. 94-056; NPDES Permit No. CA0005657) allows a maximum discharge of 226 MGD of once-through cooling water (Unit 3), and 0.124 MGD of other wastes (intake screen wash, blowdown, storm water, etc.). Circulating water design flow for Unit 3 is 157,000 gpm (226 MGD) at a condenser temperature rise of 15°F. At full power production (210 MW), the temperature rise is approximately 19°F. Outfall 001 has historically carried an average flow of 266 MGD of once-through cooling water and minor volumes of process water and stormwater runoff. Outfall 002 has historically carried a minor amount of thermal demusseling water. Outfalls 003 through 005 carry stormwater runoff. The circulating water requirement for Unit 7 will be approximately 158,000 gpm (228 MGD). The new intake structure proposed for the Unit 7 Project will have a capacity of 315,000 gpm (454 MGD) to meet the cooling water requirements of both the existing Unit 3 and the new Unit 7.
Screening system:	The Unit 3 intake structure uses a slide screen system. The Unit 7 Project intake structure will consist of a series of parallel separation walls forming 16 flow chambers. Each chamber will have a trash rack stop log and a fish screen. The screen mesh will be a smooth wire with openings no larger than 5/32 inches. The screens are vertical and will rotate through a two stage cleaning section where any organisms and debris that adhere to the screen are washed off with water sprays. Fish and other aquatic organisms are washed off and returned to the bay while debris is collected and disposed.

Biofouling Control:	Heat treatment is performed up to twice a month. The Unit 7 Project proposes cleaning the intake and discharge structures with sodium hypochlorite and sodium bisulfate. The cooling water will initially be dosed with sodium hypochlorite, which will be converted to chlorine to treat microfouling. The sodium bisulfate will then be added and will act as a chlorine scavenger, removing the chlorine before it can be discharged into the Bay. Thermal demusselling would continue to occur when the power production level is low. The expected receiving water temperature rise for the new combined cycle unit will be 20°F; however, the temperature rise during demusselling will exceed the 20°F differential.

Electrical Interconnect

Description:	A switchyard is located in the southwest portion of the site along the east side of Illinois Street. The switchyard consists of a 12-kV control building and associated equipment. Power generated at the plant is delivered to the switchyard for transmission to the electrical grid system. The switchyard is owned by Pacific Gas and Electric (PG&E).
Transmission details:	The Unit 7 Project proposes two 115-kV transmission cables to connect Unit 7 to the PG&E Hunters Point Substation via an underground route.
Site arrangement:	Indoor 12-kV substation on-site

Fuel Supply

Fuel type:	Natural gas, residual fuel oil (emergency only), and distillate fuel oil (Units 4-6). The existing Potrero Power Plant is one of two power plants in California that are required to maintain dual-fueled capabilities by the California Independent System Operator (Cal-ISO) as stated in the Final Staff Assessment for Unit 7.

Fuel system description:	The boiler that powers the steam turbine (Unit 3) is capable of burning natural gas or Bunker C (residual) fuel oil. Its normal, and current, mode of operation is natural gas firing. Conversion of Unit 3 to use Bunker C, if required due to partial or full loss of other generation and/or transmission sources, would take approximately 10 days. Even though residual fuel oil has not been burned in Unit 3 in recent years, residual fuel oil is present in tanks on site. BAAQMD Regulation 9, Rule 11 prohibits burning residual fuel oil, except for limited testing purposes and in the event of natural gas curtailment. The amount of residual fuel oil stored on site is intended to suffice for three weeks of boiler operation under such an event. The combustion turbines burn only distillate fuel oil. Tanks Numbers 3 and 4 are filled with Bunker C fuel oil for emergency operation of Unit 3 should natural gas service be interrupted. Tank Number 5 holds the distillate fuel for the peaking Units 4-6. Residual fuel oil and distillate fuel oil may be delivered by truck to the Pier 70 marine terminal, one-half mile north of the plant, and then delivered to the site via a 20-inch residual fuel oil pipeline and a 12-inch distillate fuel pipeline. Distillate fuel is also delivered by truck. Natural gas is delivered to the plant via transmission pipelines that connect to PG&E's San Francisco Load Center.

Unit 3

Unit Design:	Steam Turbine, Electric Generation, Rankine cycle
Boiler Design:	Riley Stoker is the manufacturer, turbo furnace. 350 ft chimney for this unit.
Design Rating:	Boiler heat input of 2150 MMBtu/hr (630 MW thermal). Operated at 207 MW electrical.
Unit History:	Unit 3 was started up in 1965. In 1901, Spreckles sugar company built Station A, a large brick structure that housed a steam-powered electrical generating plant. It was soon purchased by San Francisco Gas & Electric, which was later renamed Pacific Gas & Electric. Station A was the largest steam electric plant west of the Rocky Mountains between 1903 and 1913 and supplied almost all of San Francisco's electricity during this period. Later, when cheaper hydroelectric power became available, Station A was used to supplement the hydroelectric power during periods of peak use. With continuing equipment upgrades, Station A remained in operation until 1983. The Potrero gas plant was one of two in the city that survived the 1906 earthquake and was expanded as the city was rebuilt. There are five structures on the power plant property over 45 years old. Three of the structures were part of the Station A power plant and consist of the large Station A building, the Pump House, and the Gate House. However, as a result of the demolition of the boiler room in 1983, only about 50 percent of the original Station A

	building remains. The remaining part of the original Station A structure consists of the turbine room and the office. No turbines or other equipment remain inside the building. The Pump House and Gate House are east of the Station A building along 23rd Street. The other two structures of historic age on the power plant property are the Compressor House and the Meter House. No equipment remains in the Meter House. Other than a control panel and booth, no equipment remains in the Compressor House.
Original Owner:	Pacific Gas & Electric, although the earlier owner of Station A was Spreckles, a sugar company.
Air Pollution Control:	Combustion modifications in 1997, over-fire and FGR in 1999, low-NOx burners in 2001, SCR in 2003. Emissions Limits Boiler Unit No. 3-1:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	0.057 lb/MMBtu (2002), 0.037 lb/MMBtu (2004), and 0.018 lb/MMBtu (2005), 1-hr avg. 175 ppmvd @ 3% O2 (natural gas), 1-hr avg. 300 ppmvd @ 3% O2 (oil firing), 1-hr avg.	175 ppmv @ 3% O2
CO	400 ppmvd @ 3% O2 steady state compliance source tests 1000 ppmvd @ 3% O2, 1-hr avg. for all other periods of operation	1000 ppmv @ 3% O2
PM	0.15 grains/dscf @ 6% O2	0.15 grains/dscf @ 3% O2
SOx	GLC 0.5 ppm (3 min. avg.), 0.25 ppm (1-hr avg.), 0.05 ppm (24-hr avg.) 300 ppmvd Federal - GLC of 140 ppb, 24-hr avg., once per year and 30 ppb, annual avg. State - GLC of 40 ppb, 24-hr avg., and 250 ppb, 1-hr avg. Boiler No. 3-1 = 321 tons/yr	300 ppmv @ 3% O2
NH3	10 ppmvd @ 3% O2, rolling 1-hr avg.	10 ppmv @ 3% O2
Lead	6.75 kg/day 1.0 $\mu g/m^3$, 24-hr avg.	---

Description of Loading Management and/or Power Sales Arrangement:	At divestiture and up until date of this report, the plant is in a Reliability Must Run arrangement with Cal ISO.

Basic Unit Information

Unit	**3**
Dependable MW	207
Minimum Load MW	50
Online Date	Dec-1965
RMR in 2004	Yes
SCR Installed	No

2003 Performance

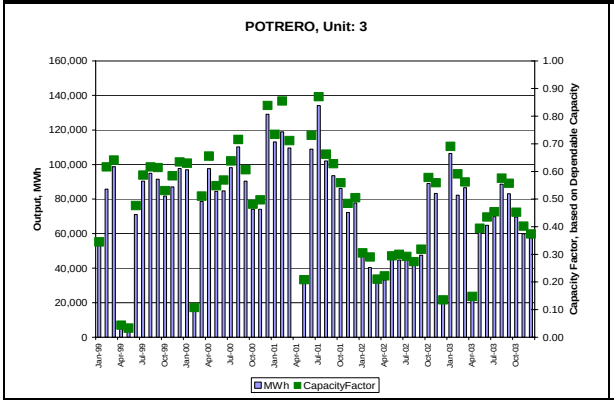
Unit	**4**
Capacity Factor	0.470
Heat Rate, Btu/kWh	
minimum load	10,685
average	10,094
maximum load	9,981
NOx Rate, lb/MMBtu	0.0675
NOx Rate, lb/MWh	0.682

Past Five Years

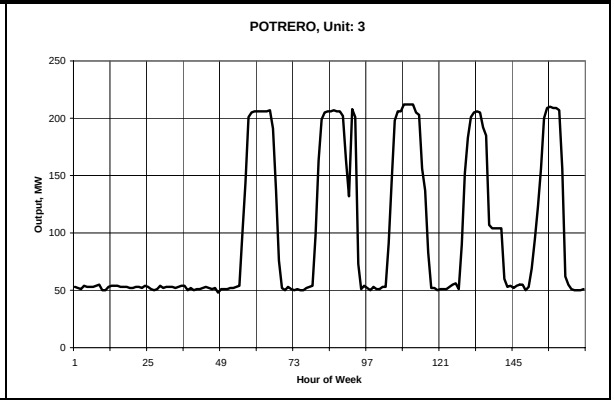
Unit	
Output, MWh	
1999	863,610
2000	1,034,181
2001	1,048,178
2002	570,643
2003	851,453
Fuel Use, MMBtu	
1999	8,601,629
2000	10,395,133
2001	10,489,378
2002	5,927,281
2003	8,594,584
NOx Emission, pounds	
1999	742,400
2000	818,238
2001	893,097
2002	325,827
2003	580,494

Charts

Monthly Output & Capacity Factor



Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)



Permits/Agreements

Air:	▪ Final Major Facility Review Permit, September 14, 1998: Issued by the Bay Area Air Quality Management District (Facility I.D.# A0026) ▪ Permit Expiration Date: September 14, 2003
Water:	**NPDES Permit No. CA0005657** ▪ Issuing Agency: San Francisco Bay RWQCB ▪ Effective Date: May 18, 1994. ▪ Expiration Date: May 18, 1999 (This permit has been administratively extended to May 18, 2004). ▪ Order No. 94-056 (Waste Discharge Requirements) serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2001 (t/yr)					
	1996	**1997**	**1998**	**1999**	**2000**	**2001**
NO_x	1230.77	746.06	669.52	978.68	749.86	555.23
PM_{10}	23	19	30	32	27	49
VOC	21	11	11	14	12	16
CO	206	185	153	234	178	227
SO_x	61	54	205.85	160.93	151.38	48

Source: Annual Summary from Bay Area Air Quality Management District for Facility ID # A0026.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	**1997**	**1998**	**1999**	**2000**
NO_x	648.9	745.4	680.3	533.1	680.3
PM_{10}	14.9	18.5	31.3	26.2	31.3
VOC	5.6	5.6	7.7	6.4	7.7
CO	164	184.5	234	178	234
SO_x	33.4	54.6	160.9	151.2	160.9

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4931). Accessed October 2001.

Complaint Logs:

Date Received	Description
02/01/00	While smoke. Unconfirmed.

Notices of Violation (NOV):

Issued Date	Description	Status
05/19/00	Failure to meet permit condition. Regulation 2-1-307	No Further Action, Enf
05/19/00	Failure to meet permit condition. Regulation 2-1-307	No Further Action, Enf
02/09/00	Failure to wet waste (RACM). Regulation 11-2-304	Settled Out of Court, MS

Notices to Comply (N/C): No Notices to Comply were provided.

Class I Setting: Located within 100 km of Point Reyes National Seashore Recreation Area.

Attainment Status:

Pollutant	Bay Area Attainment Status for 2002	
	Federal	**State**
Ozone – One hour	Not Classified/Moderate [1]	Serious Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Unclassified/Attainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note: 1. San Francisco Bay Area is designated "Not Classified / Moderate" under 23 U.S.C. Section 104(b)(2) and has a 2006 attainment deadline.

Emission Offset Availability: www.baaqmd.gov/permit/banking/banking.htm

Total Emission Reduction Credits Available (tons/year) as of May 7, 2002.

PM	140
POC	3,339
NO_x	1,750
SO_2	1,030
CO	1,088
NPOC	459
PM_{10}	222

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: Nearby resources include San Francisco Bay.

Listed Marine Species: No marine species listed in the California Natural Diversity Database within one-mile of the generating station site.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: None were identified in the surrounding area.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Potero Regions				
Astragalus tener var tener	Alkali milk-vetch			Annual herb-March-June
Fritillaria liliacea	Fragrant fritillary			Perennial herb-February-April
Layia carnosa	Beach layia	FE, SE		Annual herb-March-July
Linanthus rosaceus	Rose linanthus			Annual herb-April-June
Sanicula maritima	Adobe sanicle	SR		Perennial herb-February-May
Triphysaria floribunda	San Francisco owl's-clover			Annual herb-April-June
***Status Legend: **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	The north and south sides of the facility are screened by adjacent large industrial buildings. The west side is screened by the PG&E switchyard and associated buildings. No access to the bay side of the facility to assess screening.
Perimeter fencing/walls, height of the fencing/wall (ft)	An 8-foot cyclone fence with both concertina and barbed wire encloses the facility.
Landscaping	None visible
Visual plumes – number and size	No plume visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Unit 3), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler (Unit 3) exhaust can creates fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

The turbine exhausts from the simple cycle turbines (Units 4 through 6) are too hot to form visible water vapor plumes.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	729,720	90,293 (12.4%)
2000 Minority	775,604	446,957 (57.6%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City & County of San Francisco		
Total Population	776,733	50.3% minority
Households	329,700	2.30 P persons/household
Total Housing Units	346,527	4.9% vacancy rate
Labor Force	432,400	6.6% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department Labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Redondo Beach

CEC ID: G0490 EIA ID: 356

Address: 1100 Harbor Drive
Redondo Beach, CA 90277

County: Los Angeles

Directions: From LA Airport area, proceed on Interstate 405 South towards San Diego for approximately 9 miles. Take the Rosecrans Avenue West exit towards Manhattan Beach. Turn right on West Rosecrans Avenue to Aviation Boulevard. Proceed south (left) on Aviation Boulevard for approximately 3.1 miles. Proceed south (left) on CA-1 for approximately 0.6 mile and head west (right) on Herondo Street. Turn left (south) on North Harbor Drive and proceed approximately 0.1 mile to the plant entrance.

Facility Overview

Plant nominal capacity: 1,310 MW (Units 5, 6, 7 and 8)

Generating units:	Units 1-4 – Steam Turbine units are inactive and have been placed into long term return-to-service status, meaning their capacity is not counted as dependable operating capacity. Necessary permits for operation have been relinquished. These four small units have not been included in this report. Units 1 & 3 each have 66 MW of nameplate capacity, and Units 2 & 4 each have 69 MW of nameplate capacity. Units 5 & 6 – Also called "Plant 2", Steam Turbines, Rankine Cycle, 175 MW (each), gas fueled, ocean water cooled. Units 7 & 8 – Steam Turbines, Rankine Cycle, 480 MW (each), gas fueled, ocean water cooled. Miscellaneous generating systems not discussed in detail: Boiler No. 17, fuel oil, natural gas, refinery gas, Babcock and Wilcox, 514.14 MMBtu/Hr. Emissions limits include: CO: 2000 ppmv, NOx: 55 lbs/1000 gal fuel oil, NOx: 400 ppmv fuel oil, PM: 0.1 grains/scf, SO2 Acid Rain Provisions: 0 tons/yr, and SOx: 500 ppmv fuel oil. Boiler Units No. 11 through 16 are retired.
Cooling system:	Seawater once through cooling, two systems; one system serving Units 5 & 6 (Units 1-4 discontinued), one system serving Units 7 & 8.

Plant Owner/Operator

Owner name:	AES Redondo Beach, LLC	***Operator name:***	AES Redondo Beach, LLC
Owner address:	1100 Harbor Drive Redondo Beach, CA 90277	***Operator address:***	same
Owner contact:	James A. Bresnahan, team leader, 310-318-7513 Fax 310-318-7593 James.bresnahan@aes.com	***Operator contact:***	same

Site

Size:	56 acres total, of which 31 acres are owned as a generating station by the owner provided above. The remaining area is owned by Southern California Edison (SCE), including the switchyards (220-kV and 66-kV), fuel oil storage and transportation facilities, and other areas.
Description:	The power block has four active units, related retention basins, and three ocean fed cooling systems, two of which are active. Additional facilities include a main administration building and a small satellite building. SCE owns the fuel oil system and on-site switchyard. Additional land uses situated on the site include a railroad right-of-way, the Redondo Marine Biology Laboratory, and the Redondo Marine Education Center.

Surrounding area:	Properties immediately northwest of the facility across Herondo Street consist of professional office and high-density residential uses, and are located within the City of Hermosa Beach and within 50 ft of the plant fence line. Two hotel properties are located immediately south of the facility, and another lies across Harbor Drive near the western corner of the property. An assortment of light industrial uses occupies the area east of the generating station across Francisca Avenue and Catalina Avenue, and commercial areas prevail to the south and southwest across Beryl Street and Harbor Drive. The west side of Harbor Drive, adjacent to King Harbor, is lined with a variety of restaurants, boat yards, and commercial uses. *Refer to the attached Site Visit Report for additional information.*
General Plan and Zoning Designations:	City of Redondo Beach General Plan, City of Redondo Beach Zoning Ordinance, and the City of Redondo Beach Harbor/Civic Center Specific Plan. **General Plan**: Designated P (Public and Institutional) **Zoning Ordianance:** Public-Generating Plant zone (P-GP); **Harbor/Civic Center Specific Plan:** Catalina Avenue Sub Area Policy Zone 2

Cooling

Cooling system type:	Two once-through cooling water systems: one serving Units 5 & 6 (Units 1-6 originally), and one serving Units 7 & 8.
Cooling sources:	King Harbor (Units 5 & 6) and Santa Monica Bay (Units 7 & 8)
Cooling discharge:	King Harbor (Outfall 002) and Pacific Ocean, offshore (Outfall 001)
Cooling system details:	Intake No. 001: Seawater enters Units 5 & 6 from the Santa Monica Bay through two concrete conduits (3-meter inside diameter), each extending approximately 1,600 feet offshore, drawing water from a depth of 20 feet below MLLW. Warmed water is discharged to the King Harbor Marina through Discharge Serial No. 001, which consists of two conduits that extend approximately 1,600 feet offshore and discharge at an approximate depth of 25 feet MLLW. Intake No. 002: Seawater enters Units 7 & 8 from the Santa Monica Bay through one conduit (4.25-meter inside diameter), extending approximately 2,000 feet offshore, drawing water from a depth of 20 feet below MLLW. Warmed water is discharged to King Harbor through Discharge Serial No. 002, which consists of a 14-foot inside diameter concrete conduit that terminates about 300 feet off the beach at King Harbor in Redondo Beach.

Cooling system	The NPDES permit (Order No. 00-085; NPDES Permit No. CA0001201) allows a maximum discharge of 898 MGD of wastes consisting of once-through cooling water, treated chemical metal cleaning wastes, groundwater seepage, and low volume wastes. Discharge No. 001 discharges 215 MGD of once-through cooling water from steam electric generating Units 5 & 6, five MGD of groundwater seepage, and four MGD of low volume wastes. The maximum flow from Discharge 001 is 223.57 MGD. Discharge No. 002 discharges 674 MGD of once-through cooling water from Units 7 & 8, with small amounts of condensate overboard overflow, fuel oil tank farm rainfall run-off, and yard drains. The maximum flow from Discharge 002 is 674.00 MGD. The maximum once-through cooling water flow (Discharge 001 and Discharge 002) is 889 MGD. 1,146 MGD maximum permitted per Los Angeles RWQCB, 2002. Eight pumps for Units 5 & 6 (144,000 gpm), and four pumps for Units 7 & 8 (468,000 gpm), for a total flow of 612,000 gpm (881 MGD).
Screening system:	Two active screening facilities serving Units 5 & 6 and Units 7 & 8, respectively. The third screening facility for Units 1-4 is inactive.
Biofouling Control:	Heat treatment is typically conducted every six weeks and lasts for about two hours per conduit. During the heat treatment, the temperature of the water discharged through the intake conduit must be raised to 125°F (except during gate adjustment) for two hours to kill the fouling organisms. During gate adjustments, the discharge temperature is allowed to reach 135°F for no more than 30 minutes. Calcareous shell debris accumulates in the intake structure as a result of heat treatments. Approximately once a year, this shell debris is physically removed form the intake structure and disposed in the Ocean. To control biological growths, the condenser tubes are treated by intermittently injecting chlorine (in the form of sodium hypochlorite), for a maximum of two hours per generating unit per day, into the cooling water stream.

Electrical Interconnect

Description:	SCE switchyard system with 220-kV and 66-kV switchyards.
Transmission	There are two transmission lines to La Fresa Substation, one to Mesa Substation, and one to Lighthipe Substation, for a total four transmission lines. Since the removal of Units 1-4, it can be assumed that capacity exists for an additional (66 MW x 2 + 69 MW x 2 = 270) 270 MW with typical utility criteria.
Site arrangement:	Two section breaker and half design 220-kV switchyard.

Fuel Supply

Fuel type:	All units were originally designed for gas or fuel oil, but are now limited to gas fuel only by air quality permit.
Fuel system description:	The Southern California Gas Company supplies natural gas.

Units 1-4

Unit Design:	Originally, circa 1946, the plant was designed on a steam header system so that 7 boilers served 4 steam turbines (Rankine cycle).
Boiler Design:	7 boilers and 4 chimneys, balanced draft boilers, dual fuel.
Design Rating:	800 psig 850 °F
Unit History:	Units 1 & 2 were started up in 1948. Units 3 & 4 were started up in 1949. The units were in service before the King Harbor Marina was built. Operating history includes condenser failure, generator hydrogen explosion, and a retrofit of the central control room.
Original Owner:	Southern California Edison
Air Pollution Control:	N/A
Unit Performance:	These units are inactive.
Description of Loading Management and/or Power Sales Arrangement:	N/A

Units 5 & 6

Unit Design:	Rankine Cycle, nominally 1850 psig/1000 °F/1000 °F single reheat, ocean cooled. Steam Turbines (one per unit) are General Electric Tandem Compound triple flow with down exhaust, 1½ inches mercury exhaust, and single hydrogen cooled generator, 3600 rpm. Unitary system of single boiler, turbine, condenser, cooling system, major auxiliaries per unit. One control room for Units 1 & 2. Sister units (essentially identical design) to Alamitos Units 1 & 2 and El Segundo Units 1 & 2.
Boiler Design:	Babcock & Wilcox balanced draft front fired with Ljungstrom regenerative air preheaters, single chimney per unit. Staged combustion.
Design Rating:	Boiler heat input of 1,785 MMBtu/hr (523 MW thermal each). Steam turbines rated at 156,250-kW nameplate, operated at 175 MW (each).
Unit History:	Units 5 & 6 were started up in 1954 and 1957, respectively. Design and construction by Bechtel Power Corp. Dual (oil & gas) fired originally and for most of their life. Low NOx burners installed in approximately 1970. AES Redondo Beach, LLC, acquired the Redondo Generating Station from SCE in 1998.
Original Owner:	Southern California Edison
Air Pollution Control:	Low NOx burners, SCR, staged combustion, and oxygen content control.

Emissions Limits Boiler No. 5 and No. 6:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	---	---
CO	500 ppmv 2000 ppmv	---
PM	0.1 grains/dscf	0.1 grains/dscf @ 3% O2 (Unit 6)
SOx	Boiler No. 5 = 80 tons/yr Boiler No. 6 = 105 tons/yr	Boiler No. 5 = 80 tons/yr Boiler No. 6 = 105 tons/yr
NH3	10 ppmv	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Redondo Units 5 & 6 are Reliability Must Run (RMR) designated units. 40% and 65% respectively of their generation was sold as RMR energy, the remaining as market. Units 5 & 6 are part of the contract between Williams Energy Marketing and Trading Company and California DWR, and also part of the contract between Alleghany Energy Supply Co. and DWR.

Units 7 & 8

Unit Design:	Rankine cycle, supercritical 3,500 psig/1000 °F/1000 °F single reheat ocean cooled. Steam Turbine General Electric cross compound (i.e., two turbines per unit) 4 flow down exhaust, 1½ inches mercury exhaust pressure. Both turbines at 3,600 rpm, hydrogen cooled generators.

Boiler Design:	Babcock & Wilcox dual fuel opposed firing supercritical once-through, Ljungstrom air preheaters, pressurized furnace, single chimney per unit. Staged combustion.
Design Rating:	Boiler heat input of 4,752.2 MMBtu/hr (1,393 MW thermal each). Operated at 480 MW electrical (each).
Unit History:	Units 7 and 8 were started up in 1967. Design/construction management by SCE. Dual (oil and gas) fuel fired originally. Units divested from SCE in 1997.
Original Owner:	Southern California Edison
Air Pollution Control:	Limited to natural gas fuel, using low NOx burners, flue gas recirculation, and oxygen content control. SCR installed on both boilers in the last few years.

Emissions Limits Boiler No. 7 and No. 8:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	10.75 lbs/1000 gal fuel oil	---
CO	2000 ppmv	500 ppmv @ 3% O2
PM	0.1 grains/dscf	0.1 grains/dscf @ 3% O2
SOx	Boiler No. 7 = 554 tons/yr Boiler No. 8 = 596 tons/yr 500 ppmv (fuel oil)	Boiler No. 7 = 554 tons/yr Boiler No. 8 = 596 tons/yr
NH3	20 ppmv	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	These units are NOT designated as Reliability Must Run (RMR) by CAISO. Units 5-8 are part of the contract between Alleghany Energy Supply Co. and the California DWR.

Basic Unit Information

Unit	**1**	**2**	**3**	**4**
Dependable MW	175	175	480	480
Minimum Load MW	10	10	130	130
Online Date	Oct-1954	Jul-1957	Feb-1967	Jul-1967
RMR in 2004	No	No	No	No
SCR Installed	Yes	Yes	Yes	Yes

2003 Performance

Unit	**1**	**2**	**3**	**4**
Capacity Factor	0.083	0.020	0.123	0.085
Heat Rate, Btu/kWh				
minimum load	27,080	27,820	10,845	11,363
average	14,461	13,889	10,350	10,383
maximum load	10,645	9,846	9,581	9,466
NOx Rate, lb/MMBtu	0.0083	0.0374	0.0141	0.0290
NOx Rate, lb/MWh	0.121	0.520	0.146	0.302

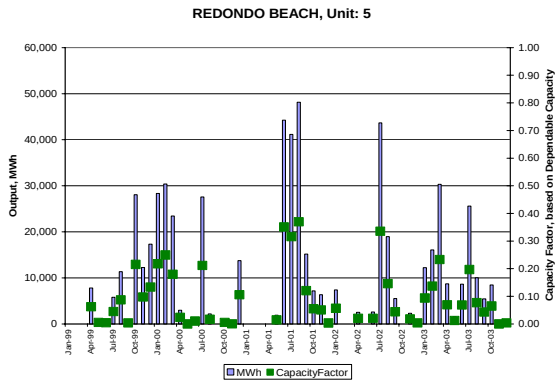
Past Five Years

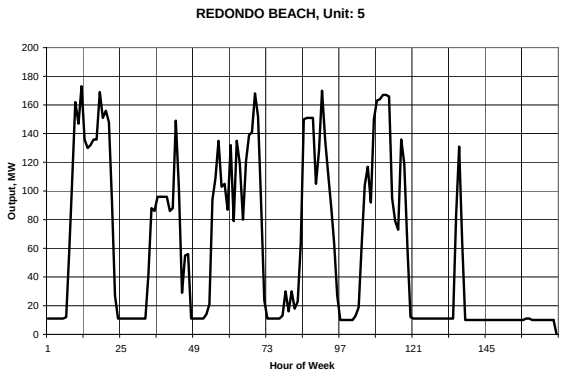
Unit	1	2	3	4
Output, MWh				
1999	84,402	35,551	418,911	792,294
2000	130,657	280,573	1,813,899	1,054,487
2001	164,530	383,478	2,828,873	2,847,052
2002	83,476	47,302	965,701	984,254
2003	127,576	30,554	519,163	358,398
Fuel Use, MMBtu				
1999	1,082,422	483,681	4,058,425	7,442,038
2000	1,796,997	3,896,448	17,434,509	10,190,293
2001	2,040,611	4,831,773	28,245,271	28,296,045
2002	1,127,504	670,004	9,843,846	9,695,742
2003	1,844,915	424,362	5,373,134	3,721,106
NOx Emission, pounds				
1999	204,823	88,495	61,622	166,507
2000	325,136	367,244	195,783	95,939
2001	63,568	441,311	146,770	202,492
2002	79,601	24,896	130,367	92,965
2003	15,396	15,882	75,875	108,071

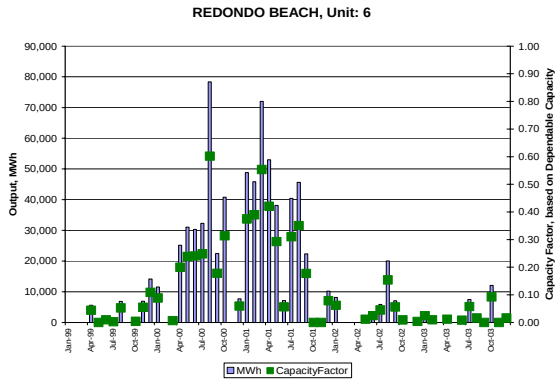
Charts

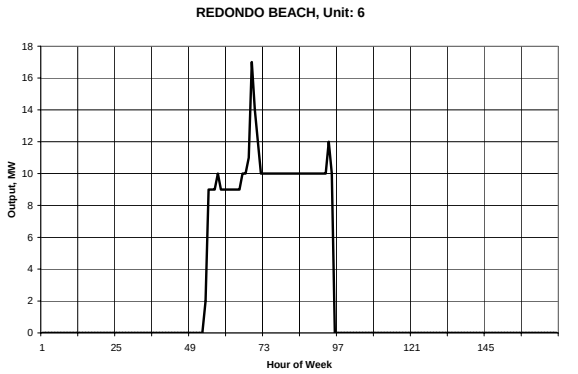
Monthly Output & Capacity Factor

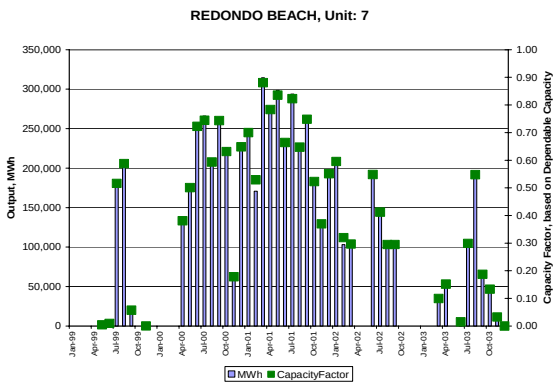
Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)



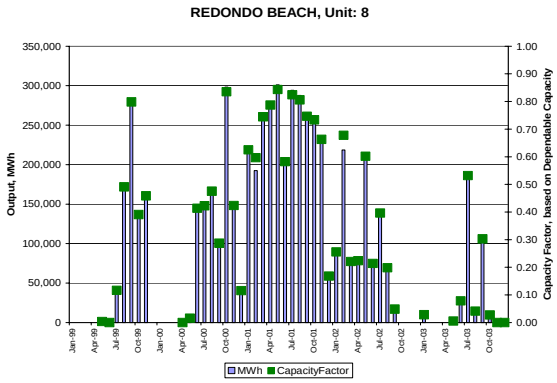


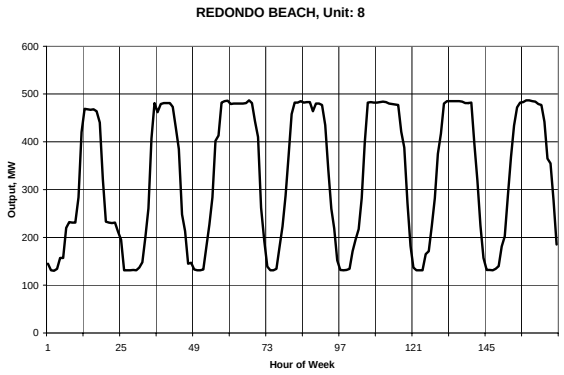






Not in Operation this week.





Permits/Agreements

Air:	▪ Facility Permit to Operate, January 01, 2000: Issued by South Coast Air Quality Management District (Facility I.D.# 115536) ▪ Facility Permit to Operate, January 01, 2001 ▪ Initial Title V Permit Issued: August 19, 1999. Title V Permit Expiration Date: August 18, 2004
Water:	**NPDES Permit No. CA0001201, CI 0536** ▪ Issuing Agency: Los Angeles RWQCB ▪ Effective Date: May 9, 2000, Revised June 29, 2000. ▪ Expiration Date: May 10, 2005. ▪ Order No. 00-085 (Waste Discharge Requirements) Serves as the NPDES Permit. ▪ The permit was originally issued to Southern California Edison (SCE), the previous owner of the facility. AES Redondo Beach, LLC, acquired the Redondo Generating Station in 1998.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	7/95 - 6/96	96 - 97	97 - 98	98 - 99	99 - 2000
NO_x	---	---	12.28	327.00	580.53
PM_{10}	---	---	2.24	17.11	25.20
VOC	---	---	1.61	12.41	18.14
CO	---	---	13.47	103.31	151.21
SO_x	---	---	0.77	5.89	8.67

Source: Annual Reports from South Coast Air Quality Management District for Facility ID #115536.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x	247.1	391.3	391.3	391.3	391.3
PM_{10}	31.7	30.2	30.2	30.2	30.2
VOC	22	24.3	25.4	24.3	25.4
CO	190.4	181.2	181.2	181.2	181.2
SO_x	10.6	10	10	10	10

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs:

Date Received	Description
11/22/00	Oily substance from possible power plant fallout on boats in Port Royal King Marina causing rust stains. AES Redondo Beach was willing to have the stains cleaned but not detail the entire boats.

Notices of Violation (NOV):

Issued Date	Description	Status
09/05/01	Facility NO_x emissions for 1999 compliance year exceeded RTCs in account. Rule 2004 (d)(1)	---
08/28/01	Facility NO_x emissions for 1999 compliance year exceeded RTCs in account by 3003 pounds. Rule 2004 (d)(1)	---
04/13/01	NO_x emissions exceed annual allocation. Rule 2004 (d)(1)	---

Notices to Comply (N/C):

Issued Date	Description	Status
11/17/99	Rule 41960 (2)(e)	Achieved Compliance 12/16/99

Class I Setting: Located within 100 km of San Gabriel Wilderness and Cucamonga Wilderness areas.

Attainment Status:

Pollutant	South Coast Attainment Status	
	Federal	State
Ozone – One hour	Extreme Nonattainment	Extreme Nonattainment
CO	Serious Nonattainment	Nonattainment [1]
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Serious Nonattainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note (1): Only L.A. County is in nonattainment for CO. All other areas of the South Coast APCD are in attainment.

Emission Offset Availability: No data at this time.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals:

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: Nearby resources include Redondo Beach Marina and King Harbor.

Listed Marine Species: No marine species listed in the California Natural Diversity Database within one mile of the power plant site.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: None identified in the surrounding area.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Redondo Beach Regions				
Atriplex pacifica	South coast saltscale			Annual herb-March-October
Atriplex parishii	Parish's brittlescale			Annual herb-June-October
Cicindela hirticollis gravida	Sandy beach tiger beetle		No information	No information
Dithyrea maritima	Beach spectaclepod	ST		Perennial March-May
Phacelia stellaris	Brand's phacelia			Annual herb-March-June
***Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	The west facing side of the facility is enclosed by a 60-foot concrete façade that includes architectural details and a large mural. Several gaps in the screening are visible on the south and east sides. No visual screening on east side with low storage units partially screening substation. North side screened by concrete wall with trees up to 15-feet in height. Trees up to 15-feet in height screened the south side.
Perimeter fencing/walls, height of the fencing/wall (ft)	Mixture of 6 to 8-foot concrete walls and 8-foot cyclone fencing, some sections with barbed wire, surround the facility. Heavy steel gate at entrance to facility.
Landscaping	North and west sides of facility are well landscaped with trees, grasses, and shrubs. South side is landscaped with a mixture of evergreen trees. No landscaping exists on east side of plant.
Visual plumes – number and size	Visible plumes (600-foot) from two of five main stacks. No smaller plumes are visible.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 5 through 8), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	457,731	33,485 (7.3%)
2000 Minority	499,232	261,166 (52.3%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Redondo Beach		
Total Population	63,261	22.0% minority
Households	28,566	2.21 persons/household
Total Housing Units	29,543	3.3% vacancy rate
Labor Force	44,560	3.0% unemployment
Los Angeles County		
Total Population	9,519,338	51.3% minority
Households	3,133,774	2.98 persons/household
Total Housing Units	3,270,909	4.2% vacancy rate
Labor Force	4,857,500	6.5% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.

Scattergood

CEC ID: G0490 EIA ID: 404

Address: 12700 Vista Del Mar
Playa Del Rey, CA 90293-8599

County: Los Angeles

Directions: From Interstate 5, proceed on Interstate 405 South towards San Diego Fwy South/Santa Monica for approximately 22.4 miles. Take the CA-90 West/Slauson Avenue exit towards Marina Del Rey and merge on CA-90 West for approximately 1.5 miles. Proceed left on Culver Boulevard for approximately 2.1 miles to Vista Del Mar. Turn left on Vista Del Mar for approximately 2.7 miles to the plant entrance.

Facility Overview

Plant nominal capacity:	803 MW
Generating units:	Units 1 & 2 – Steam Turbines, 179 MW (each), gas fueled, ocean water cooled Unit 3 – Steam Turbine, 445 MW, gas fueled, ocean water cooled
Cooling system:	Seawater once through cooling

Plant Owner/Operator

Owner name: Los Angeles Department of Water and Power (LADWP)

Operator name: LADWP

Owner address:	111 N. Hope St. P.O. Box 111 Los Angeles, CA 90051-0100	***Operator address:***	same
Owner contact:	John Hormozi (213) 367-2157 john.hormozi@ladwp.com William McCarley (213) 481-4211	***Operator contact:***	Karen Iseri (213) 367-2365

Site

Size:	The 56-acre Scattergood Generating Station (SGS) was constructed in approximately 1960.
Description:	The basic power generation activities and corresponding facility areas at SGS include fuel storage tanks, fuel unloading area, electrical switching and receiving, and power generation units. 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.
Surrounding area:	The facility is bounded to the west by the Pacific Ocean; to the east by a residential neighborhood of single-family dwellings; to the south by Grand Avenue, beyond which is the Chevron El Segundo Refinery; and to the north by the Hyperion Wastewater Treatment Plant. 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. The SGS is surrounded by industrial, recreational, and residential land uses. Industrial uses in the project vicinity include the Chevron El Segundo Refinery, a power generating station owned and operated by Dynergy Power Corporation to the south; and the Hyperion Wastewater Treatment Plant to the north-northwest. 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. The El Segundo Generating Station is located about 1 mile to the south, and the Redondo Generating Station is approximately 8 miles south. *Refer to the attached Site Visit Report for additional information.*

General Plan and Zoning Designations:	The SGS is designated as heavy Industrial in the Westchester-Playa Del Rey Community Plan. The site is zoned as M-3 and P. This zoning allows current and future uses as well as additions and facility modifications. (Final EIR for Proposed Los Angeles Department of Water and Power's Electrical Generation Stations Modifications Project, Appendix A, Section 3.5.)

Cooling

Cooling system type:	Once-through cooling water system
Cooling sources:	Pacific Ocean, Santa Monica Bay
Cooling discharge:	Pacific Ocean, Santa Monica Bay
Cooling system details:	Wastewater is discharged through an outfall (Discharge Serial No. 001 servicing Generating Units 1, 2, and 3) located approximately 1,200 feet offshore, at a depth of 15 feet Mean Lower Low Water (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. In the same vicinity is the discharge from the City of Los Angeles Hyperion Water Treatment Plant, the El Segundo Generating Station, and Redondo Generating Station.
Cooling system flow:	The NPDES permit (Order No. 00-083; NPDES Permit No. CA0000370) allows a maximum discharge of 496 MGD of wastes consisting of once-through cooling water (495.36 MGD), pretreated metal cleaning wastes (0.014 MGD), low volume wastes (0.234 MGD).
Screening system:	Traveling screens
Biofouling Control:	To control marine fouling, heat treatment is typically conducted every two (2) months for a duration of about two (2) to six (6) hours for all three generating units. Calcareous shell debris accumulates in the intake structure as a result of this heat treatment. Approximately once a year, this shell debris is physically removed and disposed in the ocean. To control biological growths, the condenser tubes (arranged in two banks per generating unit, each bank is called a condenser half) are treated by intermittently injecting exclusively chlorine (in the form of sodium hypochlorite), or a combination of chlorine and sodium bromide into the cooling water system. The condenser halves are currently chlorinated for 40 minutes per chlorination cycle, with a maximum of three chlorination cycles each day, resulting in a total chlorination time of two hours for each unit.

Electrical Interconnect

Description:	230 kV switchyard
Transmission details:	Underground to Station K
Site arrangement:	Two bus sections, each breaker and a half. One transmission line to Station K substation of LADWP. This is an underground cable connection.

Fuel Supply

Fuel type:	Natural gas
Fuel system description:	All three units predominantly burn natural gas to provide the thermal heat to produce electricity. However, the three units do have the ability to fire distillate fuel oil in the case natural gas is not available in an emergency situation. It should be noted that the two 179-MW units at SGS fire a mixture of natural gas and digester gas. The digester gas is supplied from the Hyperion Wastewater Treatment Plant, which is located to the north of the plant. The digestor gas fuel source is pre-scrubbed at the Hyperion Wastewater Treatment Plant prior to transport to Scattergood. To prevent catalyst fouling in the SCR systems in the two 179-MW units, the Hyperion Wastewater Treatment Plant uses sodium hydroxide scrubbers to reduce the concentration of hydrogen sulfide in the digester gas. The scrubbing system at Scattergood consists of two activated carbon tanks, each holding 5,000 pounds of activated carbon. This system, installed to protect the catalyst in the SCR units, reduces the concentration of siloxanes to less than five parts per billion. The concentrations of other organic gases are also reduced. (Final EIR for Proposed Los Angeles Department of Water and Power's Electrical Generation Stations Modifications Project) Natural gas is supplied by Southern California Gas Company.

Units 1 & 2

Unit Design:	Steam Turbine General Electric manufacture, tandem compound. Rankine cycle, conditions of 1850 psig/1000 °F/1000 °F single reheat. Condenser rated at 1.5 inches of mercury.
Boiler Design:	Combustion Engineering single drum rated 1850 psig/1000 °F/1000 °F single reheat, main steam flow of 1,200,000 lbs/hr (each).
Design Rating:	Heat 1200 MMBtu/hr (352 MW thermal each). Operated at 179 MW electrical (each). Units 1 & 2 share a chimney (Unit 3 being the second chimney).

Unit History:	1961 & 1962 initial operation (per Haynes EIR). Modifications to Units 1-3 to install SCR systems to reduce NO_x emissions, and install three 30,000-gallon aqueous ammonia storage tanks have been completed.
Original Owner:	LADWP
Air Pollution Control:	Oxygen content control and urea injection system including three injection loops, with a total of twelve injection nozzles, with selective noncatalytic reduction for NOx. SCR installed on the Scattergood units in 2002. Emissions Limits Boiler Unit No. 1 and No. 2:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	12.37 lbs/1000 gal fuel oil 6 7 ppmv	---
CO	500 ppmv 2000 ppmv	500 ppmv @ 3% O2
PM	0.1 grains/dscf	0.1 grains/dscf @ 3% O2
SOx	500 ppmv (fuel oil) Boiler Unit No. 1 = 747 tons/yr Boiler Unit No. 2 = 654 tons/yr	---
NH3	10 ppmv	10 ppmv @ 3% O2

Description of Loading Management and/or Power Sales Arrangement:	Municipal Utility operation. Temporary power sales of excess made to Cal-ISO in 2001.

Unit 3

Unit Design:	Steam Turbine manufacturer is Asea Brown Boveri. Turbine is tandem compound (single generator). Rankine cycle, supercritical 3500 psig/1000 °F /1000 °F single reheat with condenser exhaust at 1.5 inches of mercury nominal.
Boiler Design:	Combustion Engineering boiler with conditions to match the cycle, and flow of 3,131,100 pounds of steam per hour (AQ permit 9/12/2001)
Design Rating:	Heat 4600 MMBtu/hr (1348 MW thermal), operated at 445 MW electrical. Single chimney for unit 3.
Unit History:	SCR installed in 2002.
Original Owner:	LADWP

Air Pollution Control:	Staged combustion, flue gas recirculation, oxygen content control, and SCR. Emissions Limits Boiler Unit No. 3:

Pollutant	AQ Permit Limits	ARB Database Limits
NOx	0.2 lbs/MMBtu (natural gas) 7 ppmv	0.2 lbs/MMBtu
CO	2000 ppmv	2000 ppmv @ 3% O2
PM	0.1 lbs/MMBtu (natural gas) 0.1 grains/dscf	0.1 grains/dscf @ 3% O2
SOx	Boiler Unit No. 3 = 262 tons/yr	---
NH3	10 ppmv	---

Description of Loading Management and/or Power Sales Arrangement:	Municipal utility operation

Basic Unit Information

Unit	**1**	**2**	**3**
Dependable MW	179	179	445
Minimum Load MW	45	45	60
Online Date	Dec-1958	Jul-1959	Oct-1974
RMR in 2004	No	No	No
SCR Installed	Yes	Yes	Yes

2003 Performance

Unit	**1**	**2**	**3**
Capacity Factor	0.289	0.307	0.364
Heat Rate, Btu/kWh			
minimum load	12,250	12,035	13,034
average	10,752	10,463	9,959
maximum load	9,459	9,564	9,276
NOx Rate, lb/MMBtu	0.0048	0.0045	0.0045
NOx Rate, lb/MWh	0.051	0.047	0.044

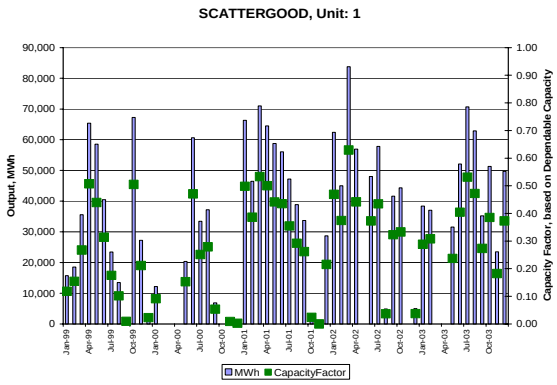
Past Five Years

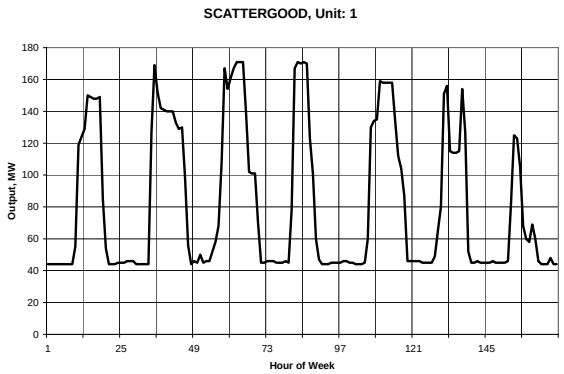
Unit	1	2	3
Output, MWh			
1999	369,908	550,831	1,071,740
2000	172,139	678,260	1,374,439
2001	514,836	361,903	965,150
2002	449,830	523,083	259,997
2003	452,455	481,452	1,418,190
Fuel Use, MMBtu			
1999	3,747,613	5,579,858	10,325,062
2000	1,698,408	6,866,122	13,085,078
2001	5,138,279	3,487,141	9,399,847
2002	4,508,073	5,234,277	2,567,998
2003	4,864,775	5,037,274	14,124,051
NOx Emission, pounds			
1999	459,460	596,808	684,675
2000	180,163	533,520	759,531
2001	407,082	56,388	191,754
2002	26,317	24,232	15,979
2003	23,138	22,635	63,048

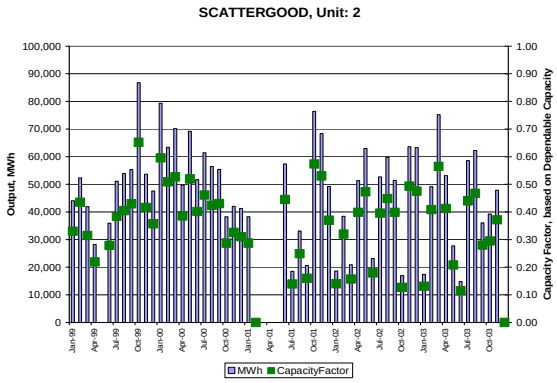
Charts

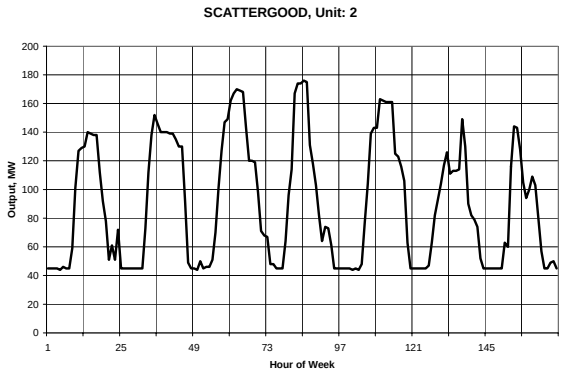
Monthly Output & Capacity Factor

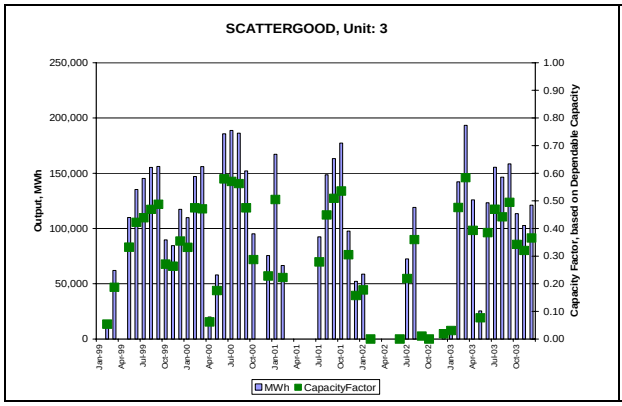
Hourly Output During CAISO Peak Week in 2003
(7/19/2003 - 7/25/2003)

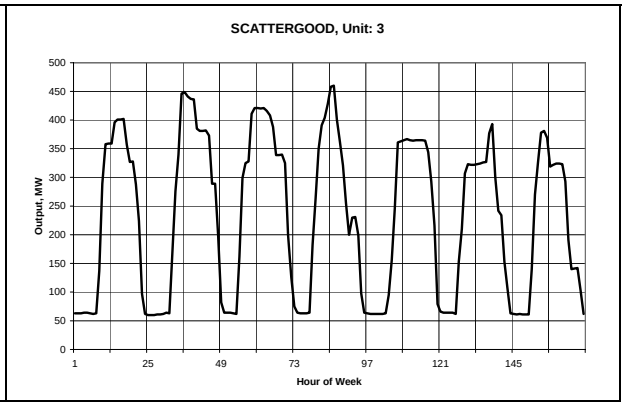












Permits/Agreements

Air:	▪ Facility Permit to Operate, January 01, 2000: Issued by South Coast Air Quality Management District (Facility I.D.# 800075) ▪ Facility Permit to Operate, January 01, 2001 ▪ Facility Permit to Operate, September 12, 2001 ▪ Initial Title V Permit Issued: August 19, 1999. Title V Permit Expiration Date: August 18, 2004
Water:	**NPDES Permit No. CA0000370, CI-1886** ▪ Issuing Agency: Los Angeles RWQCB ▪ Effective Date: May 16, 2000, Revised June 29, 2000. ▪ Expiration Date: May 10, 2005. ▪ Order No. 00-083 (Waste Discharge Requirements) Serves as the NPDES Permit.

Environmental Information: Air Quality

Plant Emissions:

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	7/95 - 6/96	96 - 97	97 - 98	98 - 99	99 - 2000
NO_x	470.93	408.54	454.30	879.79	931.35
PM_{10}	16.48	36.60	38.93	67.39	103.32
VOC	58.65	39.76	39.92	65.19	102.48
CO	99.16	171.46	182.36	314.94	482.38
SO_x	5.31	3.34	3.36	6.46	8.91

Source: Annual Reports from South Coast Air Quality Management District for Facility ID #800075.

Pollutant	Reported Emissions 1996 – 2000 (t/yr)				
	1996	1997	1998	1999	2000
NO_x	471	530.6	530.6	530.6	530.6
PM_{10}	16.5	36.6	36.6	36.6	36.6
VOC	62.4	39.8	41.8	39.8	41.8
CO	99.2	171.5	171.5	171.5	171.5
SO_x	5.3	3.3	3.3	3.3	3.3

Source: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php - Facility Query Input Form (Facility SIC 4911). Accessed October 2001.

Complaint Logs: No complaints found.

Notices of Violation (NOV):

Issued Date	Description	Status
4/13/01	Exceeded the annual NOx emissions allocation for the compliance year 01/01/98 through 12/31/98. Rule 2001 (d)(1)	---
12/18/98	Rule 2004 (d)(1) and Rule 2012 (c)(3)(A)	---

Notices to Comply (N/C): No Notices to Comply provided.

Class I Setting: Located within 100 km of San Gabriel Wilderness and Cucamonga Wilderness areas.

Attainment Status:

Pollutant	South Coast Attainment Status for 2002	
	Federal	State
Ozone – One hour	Extreme Nonattainment	Extreme Nonattainment
CO	Serious Nonattainment	Nonattainment [1]
NO_2	Unclassified/Attainment	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Serious Nonattainment	Nonattainment
Lead	No Designation	Attainment

Source: www.epa.gov/region9/air/maps/maps_top.html and www.arb.ca.gov/desig/adm/adm.htm
Note (1): Only L.A. County is in nonattainment for CO. All other areas of the South Coast APCD are in attainment.

Emission Offset Availability: No data available.

Environmental Information: Water Quality

Operational Limits on Water Withdrawals: 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 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.

Pertinent Waste Discharge Requirements:

Current Monitoring Data:

Adaptive Management Studies/Resultant Changes in Operation:

Environmental Information: Marine Biology

Nearby National Marine Sanctuaries, Sensitive Habitat Areas, and/or Designated Critical Habitats for Endangered Marine Species: No nearby marine resources were identified.

Listed Marine Species: No marine species listed in the California Natural Diversity Database within one-mile of the generating station site.

316(a) and 316(b) Studies: *Refer to the attached 316(a) and 316(b) Studies Summary.*

Environmental Information: Terrestrial Biology

Nearby Habitat Management Plans, Habitat Conservation Plans, and/or Designated Critical Habitats for Endangered Non-Marine Species: Nearby resources include Dockweiler State Park.

Listed Non-Marine Species:

Scientific Name	Common Name	Status*	Habitat	Survey Timing Guidelines and Flowering Periods
Scattergood Regions				
Astragalus tener var titi	Coastal dunes milk-vetch	FE, SE		Annual herb-March-May
Brennania belkini	Belkin's dune tabanid fly		Only in Ballona Creek	Adults fly in May-July
Cicindela senilis frosti	Tiger beetle			No info.
Dithyrea maritima	Beach spectaclepod	ST		Perennial herb-March-May
Euphilotes battoides allyni	El Segundo blue butterfly	FE	El Segundo dunes	Emerges in the summer
Perognathus longimembris pacificus	Pacific pocket mouse	FE	sandy sustrate in coastal sage scrub, coastal strand, and alluvial riverbeds within 4 km of the coast	No info.
Southern dune scrub	Southern dune scrub			
***Status Legend: **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **SR** = State Rare, and **ST** = State Threatened				

Source: California Natural Diversity Database - One-mile Radius Search.

Environmental Information: Visual Resources

Screening and Visual Enhancement Measures: *From the attached Site Visit Report*

Visual screening	The power block and offices are enclosed in material to visually obscure the power plant. Landscaping and visual screening very sparse. Bottle brush trees at fenceline under 10-feet in height.
Perimeter fencing/walls, height of the fencing/wall (ft)	6-foot cyclone with double-strand barbwire (double fence in areas)
Landscaping	Minimal landscaping was observed at the facility however the entrance was planted with small shrubs, groundcover and palm trees. Oleander (6-foot), scattered native palms (15-feet by entrance and 50-ft at front), were located along the western edge of the facility. Exposed slopes were covered with scattered populations of non-native grassland and ice plant.
Visual plumes – number and size	One large plume extending several hundred feet from the main stack, 6 small plumes (6-10 feet) from small vents, and from chillers.

Any Existing Plume Abatement Measures:

This plant uses once-through cooling (Units 1 through 3), which creates no visible water vapor plumes. When compared to traditional evaporative wet cooling (i.e., cooling towers) the use of once-through cooling is considered a type of plume abatement.

The existing power boiler exhausts can create fairly large water vapor plumes during periods of cold/wet weather. The boiler exhaust water vapor plumes are unabated.

Environmental Information: Socioeconomics

Census Percent Low Income and Percent Minority Within a Six-Mile Radius:

Census Data	Total Population	Affected Population
1990 Low-Income	496,833	56,829 (11.4%)
2000 Minority	526,165	321,967 (61.2%)

Source: CEC Cartography, 2002

See the attached six-mile radius minority and low-income population maps (Figures 1 and 2).

Demographic Profile of City or Community in Which the Plant is Located:

City of Los Angeles		
Total Population	3,694,820	53.1% minority
Households	1,275,412	2.83 persons/household
Total Housing Units	1,337,706	3.5% vacancy rate
Labor Force	1,948,600	7.4% unemployment
Los Angeles County		
Total Population	9,519,338	51.3% minority
Households	3,133,774	2.98 persons/household
Total Housing Units	3,270,909	4.2% vacancy rate
Labor Force	4,857,500	6.5% unemployment

Source: 2000 (U.S. Census, 2002). http://factfinder.census.gov/servlet/BasicFactsServlet.
State of CA Employment Development Department Labor Market Information Division, 2000

Environmental Information: Hazardous Materials

Refer to the attached tables of federal, state, and local database listings for the subject property and surrounding sites.