5.15 Water Resources

This section provides a discussion of the existing water resources near the Contra Costa Generating Station (CCGS) site and assesses the potential effects of project construction and operations on water resources. Specifically, this chapter discusses the CCGS and its potential effects in the following areas:

- Water supply and quality
- Disposal of wastewater
- Compliance with state water policies
- Stormwater discharge
- Flooding

Section 5.15.1 discusses the existing hydrologic environment. Potential environmental effects of the CCGS construction and operation on water resources are discussed in Section 5.15.2. A discussion of cumulative project effects is presented in Section 5.15.3. Section 5.15.4 discusses proposed mitigation measures that will prevent significant impacts. Section 5.15.5 presents applicable laws, ordinances, regulations and standards (LORS) related to water resources. Section 5.15.6 describes permits that relate to water resources, lists contacts with relevant regulatory agencies, and presents a schedule for obtaining permits. References cited are listed in Section 5.15.7.

5.15.1 Affected Environment

5.15.1.1 Water Features, Rainfall, and Drainage

The CCGS site is located near the southern bank of the San Joaquin River, east of the Antioch (John A. Nejedly) Bridge, approximately 7 miles upstream of the confluence with the Sacramento River. A 0.62-acre mitigation wetland, called Wetland E, previously constructed by DuPont, is located on the northwestern corner of the project site (wetlands are described in Section 5.2, Biological Resources). Major surface water features in the vicinity of the CCGS project site include the San Joaquin River and the Sacramento-San Joaquin Delta (Figure 5.15-1). The San Joaquin River is the only natural perennial surface water within 1 mile of the site. Naturally occurring wetlands are located adjacent to the San Joaquin River approximately 0.25 mile north of the project site.

The San Joaquin River basin covers approximately 15,880 square miles (Central Valley RWQCB, 2007). In the Delta, the Sacramento and San Joaquin rivers combine with tidal action to produce a biologically rich estuarine environment. The San Joaquin River contributes approximately 13 percent of the flow to the Delta, compared to 84 percent from the Sacramento River (Saleh et al., 2003). The Delta has been highly modified by channelization and water diversions for municipal, industrial, and agricultural uses. As a result, the Delta is a patchwork of numerous islands and tracts surrounded by natural and man-made channels and sloughs. Because the majority of Delta islands are below sea level, they are protected by an extensive levee system.

The Regional Water Quality Control Boards (RWQCBs) make critical water quality decisions for their designated region, including setting standards, issuing waste discharge requirements, determining compliance with those requirements, and taking appropriate

enforcement actions. The RWQCB adopts water quality control plans, or Basin Plans, which establish water quality objectives to ensure the reasonable protection of beneficial uses and a program of implementation for achieving water quality objectives within the Basin Plans. For those waters not attaining water quality standards, the RWQCB establishes total maximum daily loads (TMDLs) and a program of implementation to meet the TMDL.[1]

The CCGS project site is within the boundaries of the Central Valley RWQCB. Beneficial uses for the San Joaquin River in the vicinity of the CCGS project site include municipal and domestic supply; agricultural supply, including stock watering; industrial service supply; industrial process supply; navigation; water contact recreation; non-contact water recreation, including aesthetic enjoyment; commercial and sport fishing; aquaculture; warm freshwater habitat; cold freshwater habitat; warm migration of aquatic organisms; cold migration of aquatic organism; warm spawning, reproduction, and/or early development; and wildlife habitat (Central Valley RWQCB, 1998). Table 5.15-1 lists the pollutants for which the San Joaquin River does not meet water quality objectives and the proposed TMDL completion dates.

TABLE 5.15-1
Clean Water Act Section 303(d) List of Water Quality Impairments in the San Joaquin River (Stanislaus River to Delta Boundary)

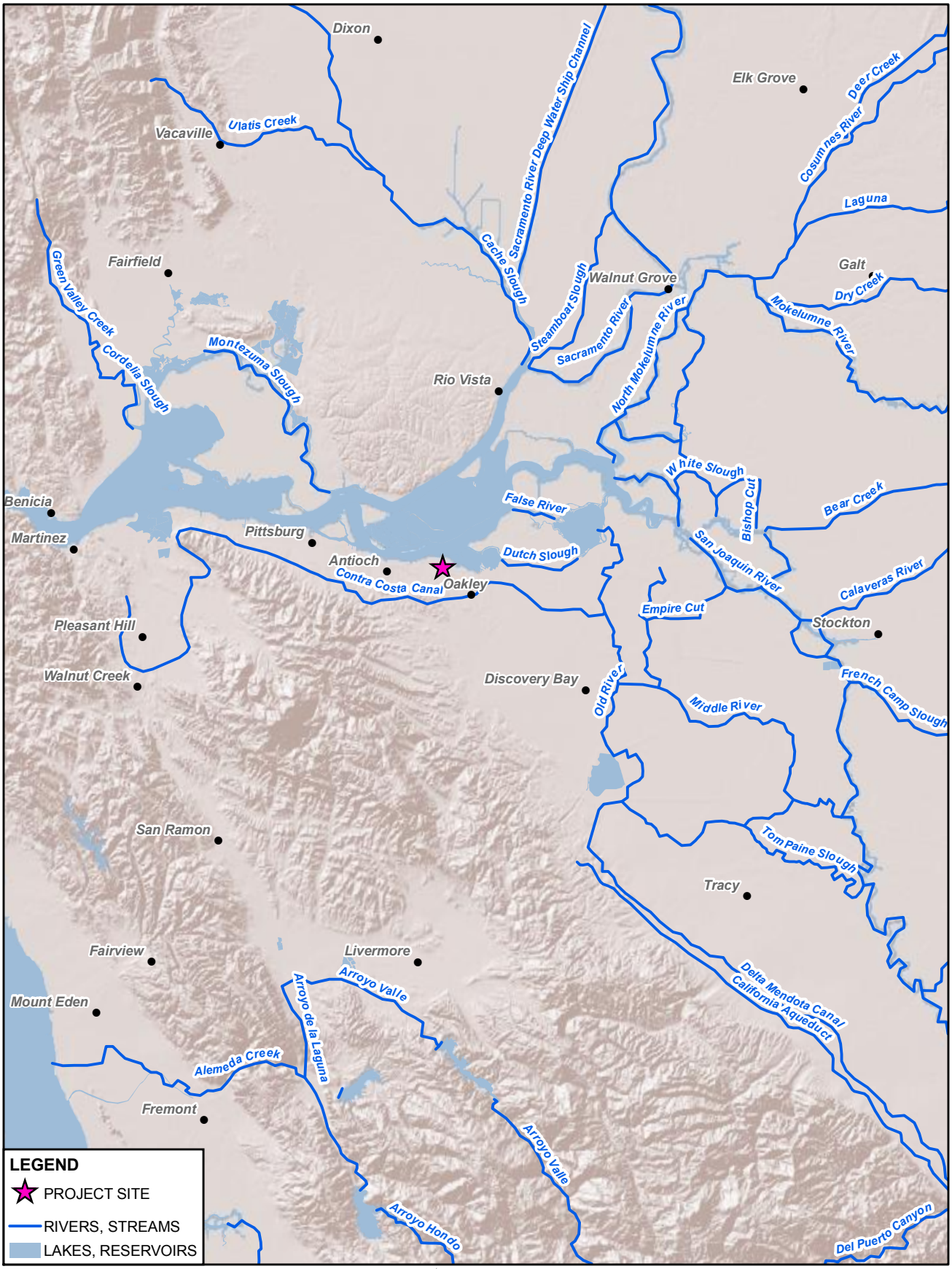
Pollutant/Stressor	Potential Sources	Proposed TMDL Completion
Boron	Agriculture	2004*
DDT	Agriculture	2011
Electrical Conductivity	Agriculture	2004*
Group A Pesticides	Agriculture	2011
Mercury	Resource Extraction	2020
Toxaphene	Source Unknown	2019
Unknown Toxicity	Agriculture	2019

*In progress

Source: State Water Resources Control Board (SWRCB), 2006

RWQCB boundaries are based on watersheds; however, due to its complexity and size, the Delta falls under the jurisdiction of both the Central Valley RWQCB and the San Francisco Bay RWQCB. The area under the San Francisco Bay RWQCB's jurisdiction comprises all of the San Francisco Bay segments extending to the mouth of the Delta (Winter Island near Pittsburg). The San Francisco Bay Basin Water Quality Control Plan (Basin Plan) designates beneficial uses for the Delta. Beneficial uses include agricultural supply; municipal and

[1] Section 303(d) of the Clean Water Act requires that the states make a list of waters that are not attaining water quality standards. For waters on this list, the states are to develop total maximum daily loads or TMDLs. A TMDL must account for all sources of the pollutants that caused the water to be listed. Federal regulations require that the TMDL, at a minimum, account for contributions from point sources (federally permitted discharges) and contributions from nonpoint sources. TMDLs are established at the level necessary to implement the applicable water quality standards. In California, the State Water Resources Control Board has interpreted state law (Porter-Cologne Water Quality Control Act, California Water Code Section 13000 et. seq.) to require that implementation be addressed when TMDLs are incorporated into Basin Plans. The Porter-Cologne Act requires each RWQCB to formulate and adopt Basin Plans for all areas within its region. It also requires that a program of implementation be developed that describes how water quality standards will be attained. TMDLs can be developed as a component of the program of implementation, thus triggering the need to describe the implementation features, or alternatively as a water quality standard. When the TMDL is established as a standard, the program of implementation must be designed to implement the TMDL (SWRCB, n.d.).



Notes:
1. Source: USGS, the National Atlas of the United States, Environmental Systems Research Institute (ESRI). Water Bodies - 2004, River and Streams - 2006.

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

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FIGURE 5.15-1
SURFACE WATER RESOURCES
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

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domestic supply; groundwater recharge; industrial service supply; industrial process supply; ocean, commercial, and sport fishing; estuarine habitat; fish migration; preservation of rare and endangered species; fish spawning; wildlife habitat; contact and non-contact water recreation; and navigation (San Francisco Bay RWQCB, 2007).

Water quality objectives for the Delta are contained in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary prepared by the SWRCB (SWRCB, 1995). The Delta is considered an impaired water body. In response to growing concerns related to protection of beneficial uses in the Delta, staff from the SWRCB, San Francisco Bay RWQCB, and Central Valley RWQCB formed the Bay-Delta Team to develop a coordinated and comprehensive plan to address protection of beneficial uses in the San Francisco Bay and the Delta. Table 5.15-2 lists the pollutants for which the Delta does not meet water quality objectives and the proposed TMDL completion dates.

TABLE 5.15-2
Clean Water Act Section 303(d) List of Water Quality Impairments in the Sacramento-San Joaquin River Delta

Pollutant/Stressor	Potential Sources	Proposed TMDL Completion
Chlordane	Nonpoint	2008*
DDT	Nonpoint	2008*
Dieldrin	Nonpoint	2008*
Dioxin Compounds	Atmospheric Deposition	2019
Exotic Species	Ballast Water	2019
Furan Compounds	Atmospheric Deposition	2019
Mercury	Multiple	2006*
Nickel	Unknown	2019
PCBs (Polychlorinated biphenyls)	Unknown Nonpoint	2006*
PCBs (dioxin-like)	Unknown Nonpoint	2019
Selenium	Multiple	2019

*In progress

Source: SWRCB, 2006

In addition, the Delta Protection Commission (Commission), established under the Delta Protection Act of 1992, is required to prepare and adopt a Land Use and Resource Management Plan for the Delta. The Delta is divided into a Primary Zone, which comprises the principal jurisdiction of the Commission, and a Secondary Zone, which is outside of the Primary Zone, but still within the legal Delta, that is not within the planning area of the Commission. The CCGS project is located within the Secondary Zone as defined by the Commission.

Contra Costa County has a moderate climate, similar to a Mediterranean climate. The influence of coastal fog is felt in the western and central portions of the county. The mean annual precipitation (January 1955 to December 2008) is 13.17 inches per year. The minimum and maximum annual precipitation for the period of record is 5.87 inches and 27.75 inches, respectively. Table 5.15-3 provides average historical rainfall from the meteorological station in Antioch, California.

TABLE 5.15-3
Rainfall near the Proposed Project Site (1955-2008)

Precipitation	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	13.17	2.78	2.39	1.96	0.9	0.37	0.09	0.02	0.04	0.19	0.65	1.58	2.2
Maximum	27.75	6.97	9.03	6.26	3.97	2.09	0.8	0.46	0.74	1.84	4.85	4.83	7.14
Minimum	5.87	0.13	0.0	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Western Regional Climate Center (WRCC), 2008.

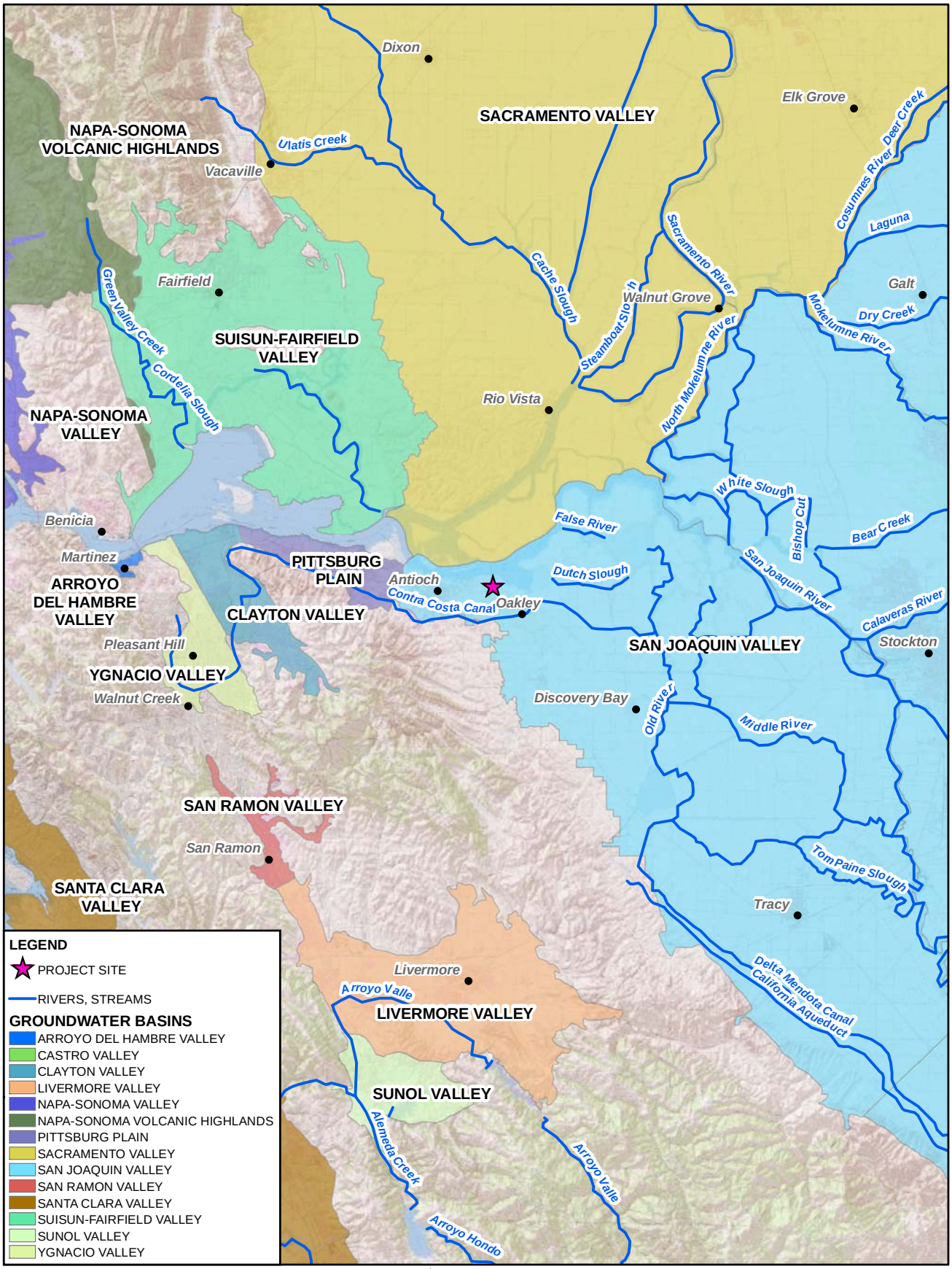
5.15.1.2 Groundwater

The CCGS site is within the San Joaquin Valley Basin, Tracy subbasin (Figure 5.15-2). The Tracy subbasin lies in the southwestern portion of the Sacramento Basin and the northern portion of the Sacramento-San Joaquin Delta. Elevation varies from 120 feet in the northwest corner to sea level in the south. Subbasin boundaries are defined by Putah Creek on the north, the Sacramento River on the east, the North Mokelumne River on the southeast, and the San Joaquin River on the south (DWR, 2006).

The primary water-bearing formations comprising the Tracy subbasin are continental deposits of Late Tertiary to Quaternary age (DWR, 2006). Fresh water-bearing units include younger alluvium, older alluvium, flood basin deposits, and the Tulare Formation. With the exception of seasonal variation resulting from recharge and pumping, the majority of water levels in wells have remained relatively stable over the last 10 years (DWR, 2006). Well yields in the subbasin range from 500 to 3,000 gallons per minute at an average depth of 188 feet for domestic wells and 352 feet for municipal and irrigation wells (DWR, 2006).

In general, the northern part of the subbasin is characterized by a sodium water type and the southern part of the subbasin is characterized by calcium-sodium water types (DWR, 2006). Areas of poor water quality exist throughout the subbasin. Areas of elevated chloride occur in several areas including along the San Joaquin River and areas of elevated nitrate exist in the northwestern part of the subbasin (DWR, 2006). Total dissolved solids (TDS) levels in the subbasin range from 210 to 7,800 milligrams per liter (mg/L) with an average of about 1,190 mg/L (DWR, 2006).

Unless otherwise designated by the Central Valley RWQCB or excluded based on the minimum beneficial use exception criteria described in Table 5.15-4, all ground waters are considered suitable or potentially suitable, at a minimum, for municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply (Central Valley RWQCB, 1998).



Notes:
1. Source: The Dept. of Water Resources, Groundwater Basin Map, 2004.

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

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FIGURE 5.15-2
GROUNDWATER RESOURCES
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

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TABLE 5.15-4
Minimum Beneficial Use Exception Criteria

Minimum Beneficial Use	Exception Criteria
Municipal and Domestic Water Supply	TDS exceeds 3,000 mg/L (5,000 mhos/cm, electrical conductivity) and is not reasonably expected to supply a public water system
Municipal and Domestic Water Supply, Agricultural Supply, Industrial Service Supply, and Industrial Process Supply	Contamination, either by natural processes or by human activity (unrelated to a specific pollution incident) cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices
Municipal and Domestic Water Supply, Agricultural Supply, Industrial Service Supply, and Industrial Process Supply	Does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day
Municipal and Domestic Water Supply, Agricultural Supply	The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations (CFR), Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR Section 261.3

Source: Central Valley RWQCB, 1998

5.15.1.3 Flooding Potential

The CCGS project site is located in Zone X as defined by the Federal Emergency Management Agency (FEMA), which is not within the 100-year floodplain (FEMA, 2002; Figure 5.15-3). Zone X delineates areas that are determined to be outside the 0.2 percent annual chance (500 year) floodplain.

5.15.1.4 Water Supply

This section describes the quantity of water required, the sources of the water supply, water treatment requirements, and water quality of the source and treated water.

5.15.1.4.1 Process Water

The CCGS will connect to the existing 24-inch potable water supply line that served the former DuPont facility. The CCGS will use potable water from the Diablo Water District for process water. As shown in the water balance diagrams (See Section 2.1.8 and Figures 2.1-6a and 2.1-6b), process water will be used for reverse-osmosis permeate, evaporative cooling blowdown makeup, and other purposes. A will-serve letter from Diablo Water District, included as Appendix 2I, shows that approximately 170 acre-feet per year of potable water is available for use at the CCGS.

While operating under ISO conditions at base load (59 degrees Fahrenheit [°F] dry bulb temperature and 60 percent relative humidity) with both combustion turbine generators (CTGs) at 100 percent load, inlet air evaporative cooling, water use will be about 95 gallons per minute. Under Peak July conditions (104°F dry bulb temperature and 18 percent relative humidity) with both CTGs operating at 100 percent load, CTG inlet evaporative cooling, water use will be about 369 gallons per minute. Average annual water use would be

approximately 240 acre-feet per year (assuming 8,449 hours of operation, of which 1,500 hours are at Peak July conditions). The potable water that will be provided to the CCGS for use as process water was previously allocated for industrial use at the DuPont facility. Currently, there is no back-up water supply planned for the project.

Table 5.15-5 shows the expected water quality of the CCGS source water from the Diablo Water District.

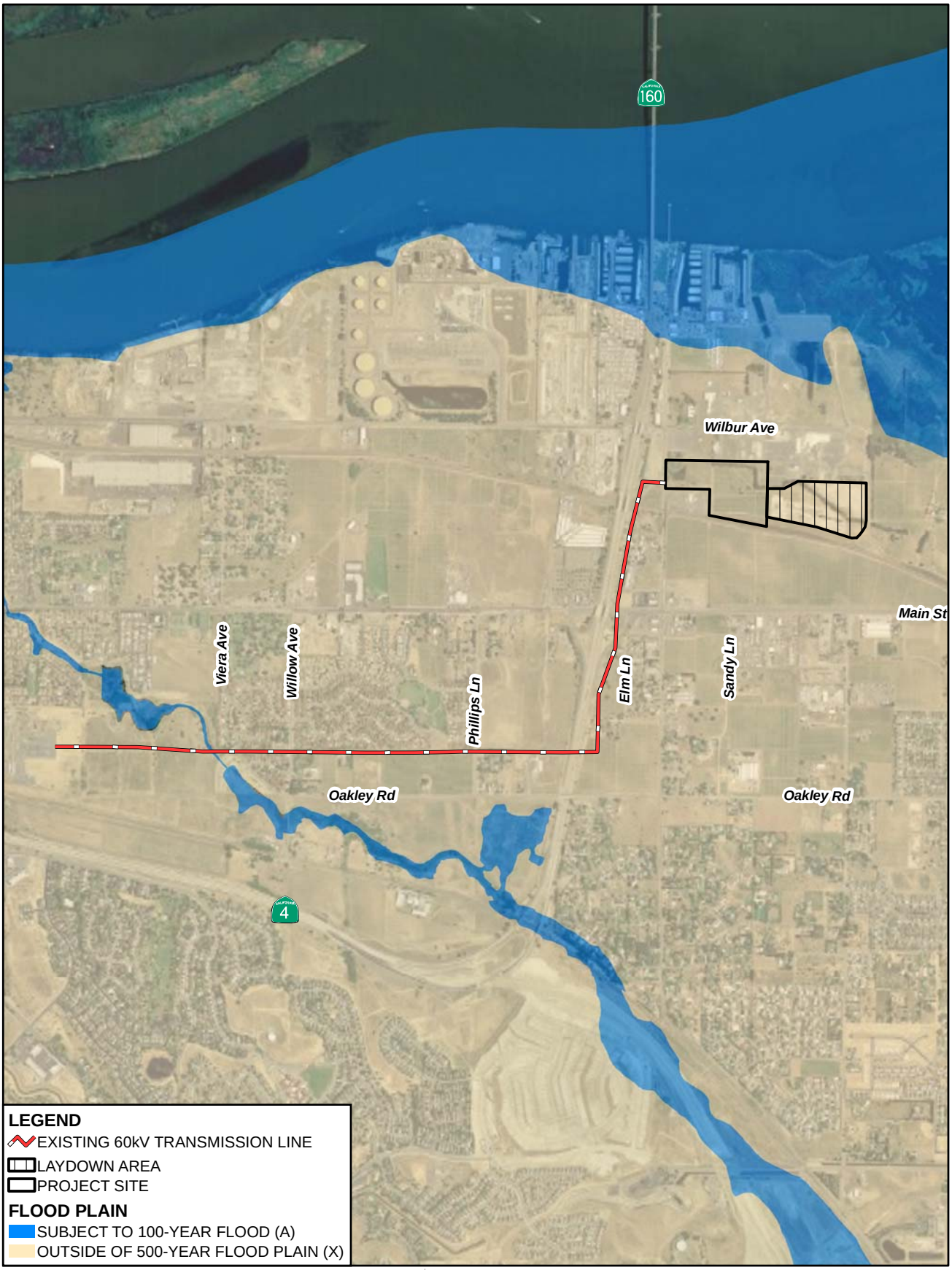
TABLE 5.15-5
Expected Water Quality from Diablo Water District

Parameter	Units	Average Value	Maximum Value
Alkalinity[a] ($CaCO_3$)	mg/L	92	100
Aluminum[b]	µg/L	ND	ND
Ammonia[a]	mg/L	0.31	0.44
Arsenic[b]	µg/L	1.2	1.2
Barium[a]	µg/L	ND	0.14
Boron[b]	µg/L	120	120
Bromide[a]	mg/L	0.16	0.23
Calcium[a]	mg/L	25	27
Total Organic Carbon[b]	mg/L	1.91	1.91
Chloride[a]	mg/L	69	91
Chlorine[a]	mg/L	1.8	3.7
Total Coliform[a]	Percent of positive monthly samples	0.3%	3.6%
Copper[b]	µg/L	3.1	3.1
Fluoride[a]	mg/L	0.94	1.1
Hardness[a]	mg/L	121	134
Iron[b]	µg/L	ND	ND
Lead[b]	µg/L	0.87	0.87
Magnesium[a]	mg/L	14	16
Nitrate (NO_3)[a]	mg/L	ND	ND
Potassium[a]	mg/L	2.6	2.9
Silica[b]	mg/L	16	16
Sodium[a]	mg/L	59	71
Specific Conductance[a]	microsiemens per centimeter	543	580
Sulfate[a]	mg/L	64	80
Total Dissolved Solids[b]	mg/L	350	350
Total Suspended Solids[b]	mg/L	ND	ND
Turbidity[a]	NTU	0.08	0.42
Zinc[b]	µg/L	8.6	8.6

[a]Source: Contra Costa Water District, 2007

[b]Source: Alpha Analytical Laboratories, Inc., 2008

µg/L = micrograms per liter
ND = Not Detected
NTU = nephelometric turbidity units
ppm = parts per million



Notes:
1. Source: Federal Emergency Management Agency (FEMA), Contra Costa County, 1996.

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

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FIGURE 5.15-3
FEMA FLOODPLAINS
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

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5.15.1.4.2 Domestic and Sanitary Water Use

Water for domestic and sanitary uses will be provided by Diablo Water District from the existing onsite 24-inch water pipeline that serves the DuPont facility. A minimal amount of potable water will be used for sanitary use, drinking, eye wash, and safety showers, as well as fire protection water (less than one gallon per minute, as needed).

5.15.1.5 Wastewater Collection, Treatment, Discharge, and Disposal

The CCGS will connect to the existing sanitary sewer line that runs along Bridgehead Road via a new sewer line to be constructed along the site access road. Wastewater service at the project site is provided by Ironhouse Sanitary District (ISD), which owns and operates the ISD Wastewater Treatment Facility (WWTF) in the City of Oakley. Under ISO conditions, while operating at base load (59°F dry bulb temperature and 60 percent relative humidity) with both CTGs at 100 percent load, inlet air evaporative cooling, discharge to the sanitary sewer would be about 68 gallons per minute. Under Peak July conditions (104°F dry bulb temperature and 18 percent relative humidity) with both CTGs operating at 100 percent load, CTG inlet evaporative cooling, discharge to the sanitary sewer would be about 159 gallons per minute. Average annual wastewater discharged from the CCGS would be approximately 43 million gallons per year (assuming 8,449 hours of operation, of which 1,500 hours are at Peak July conditions). A will-serve letter stating that ISD has sufficient capacity to receive wastewater from the CCGS is included as Appendix 2J. Table 5.15-6 shows the expected wastewater quality from the CCGS project.

TABLE 5.15-6
Expected CCGS Wastewater Quality

Parameter	Units	Base Load Value[a]	Peak Load Value[b]
Alkalinity ($CaCO_3$)	mg/L	125	230
Aluminum	µg/L	NE	NE
Ammonia	mg/L	0.4	1
Arsenic	µg/L	1.6	2.8
Barium	µg/L	NE	0.3
Boron	µg/L	163	276
Bromide	mg/L	0.2	0.5
Calcium	mg/L	34	62
Total Organic Carbon	mg/L	2.6	4.4
Chloride	mg/L	94	209
Chlorine	mg/L	2.5	8.5
Total Coliform	Percent of positive monthly samples	NE	0.1%
Copper	µg/L	4.2	7.1
Fluoride	mg/L	1.3	2.5
Hardness	mg/L	135	308
Iron	µg/L	NE	NE
Lead	µg/L	1.2	2

TABLE 5.15-6
Expected CCGS Wastewater Quality

Parameter	Units	Base Load Value[a]	Peak Load Value[b]
Magnesium	mg/L	19	37
Oil and Grease[c]	ppm	NE	10
Nitrate (NO_3)	mg/L	NE	NE
Potassium	mg/L	3.5	6.7
Silica	mg/L	22	37
Sodium	mg/L	80	163
Specific Conductance	microsiemens per centimeter	740	1,335
Sulfate	mg/L	87	184
Total Dissolved Solids	mg/L	477	806
Total Suspended Solids[c]	mg/L	NE	350
Turbidity	NTU	0.1	1
Zinc	µg/L	12	20

[a]Base values are based on base load operation at ISO conditions with potable water values equal to the average values shown in Table 5.15-5.

[b]Peak values are based on base load operation at Peak July conditions with potable water values equal to the maximum values show in Table 5.15-5.

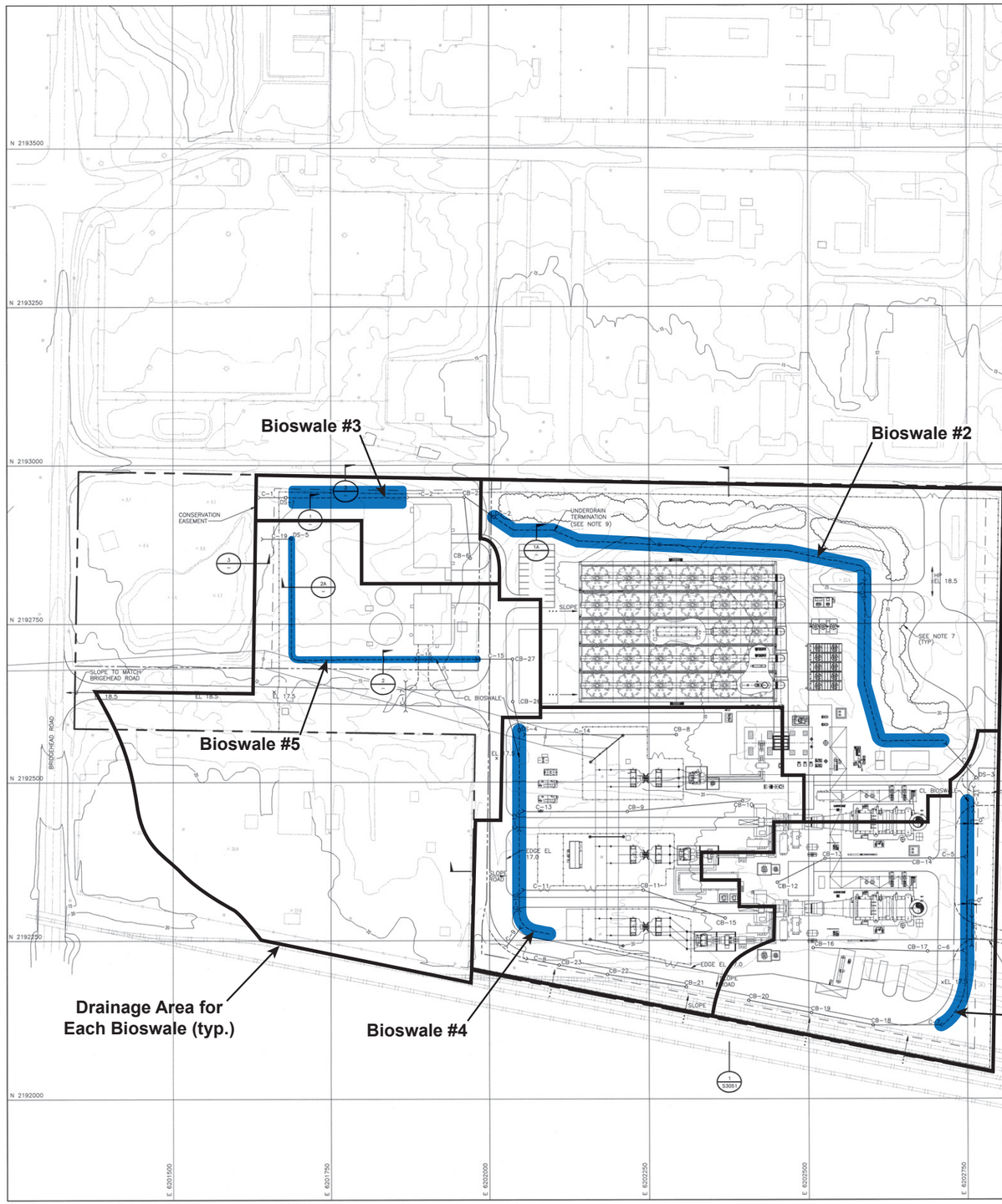
[c]Maximum value allowed per Ironhouse Sanitary District Sewer Use Ordinance No. 25.

NE = not expected

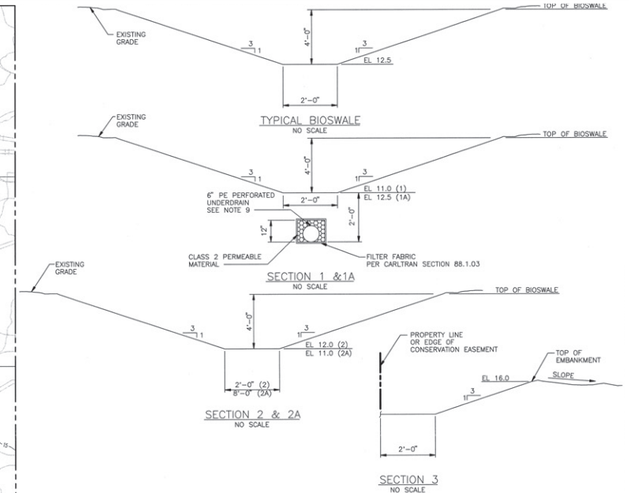
Source: Radback Energy, unpublished data

5.15.1.6 Stormwater

The project site is part of a former industrial facility and previously had no buildings, process equipment, or other facilities when the industrial facility was in operation. The plant site is currently a vineyard with a row of eucalyptus trees along the northeastern corner and has been tilled about twice a year. Five bioswales will be constructed within the plant site to collect and infiltrate stormwater. The locations of bioswales and delineated drainage areas for each bioswale are shown on Figure 5.15-4. Drop structures will be installed at the end of each bioswale such that sufficient depth of stormwater has to be collected in the bioswale before downstream discharge can occur. Stormwater runoff will be conveyed to the bioswales via 12-inch-diameter sewer pipes that are capable of conveying stormwater from a 10-year storm event (Appendix 5.15A). Downstream of the bioswales, 18-inch diameter sewer pipes that are capable of conveying peak runoff from a 50-year storm event, will be installed to discharge any overflow to Wetland E, which is located downstream of the project site, in addition to the drop structures. The wetland is capable of receiving runoff from the project site for a 100-year, 24-hour storm without overflowing to adjacent properties (Appendix 5.15A). Runoff from the power block area will be routed through an oil/water separator before being discharged to the sanitary sewer system and will not be discharged onsite. The stormwater system is designed so that it does not adversely affect the supply of runoff to the wetland or the quality of water flowing into it.



Source: Black and Veatch Corp., Drawing 163994-SS-3001, 04/16/09



ABBREVIATIONS APPLICABLE TO ALL SS-3000 SERIES DRAWINGS

APPROX	–	APPROXIMATE	LTR	–	LATER
ASPH	–	ASPHALT	MAX	–	MAXIMUM
AVG	–	AVERAGE	MH	–	MANHOLE
BND	–	BEND	MIN	–	MINIMUM
BLDG	–	BUILDING	MJ	–	MECHANICAL JOINT
B/MH	–	BOTTOM OF MANHOLE ELEVATION	MSL	–	MEAN SEA LEVEL
BOC	–	BOTTOM OF CONDUIT ELEVATION	NO.	–	NUMBER
BOD	–	BOTTOM OF DUCTBANK ELEVATION	NTS	–	NOT TO SCALE
BOP	–	BOTTOM OF PIPE ELEVATION	OD	–	OUTSIDE DIAMETER
BU	–	BELL-UP	OWS	–	OIL WATER SEPARATOR
C	–	CULVERT	OWMH	–	OILYWASTE MANHOLE
CB	–	CATCH BASIN	PC	–	POINT OF CURVATURE
CD	–	CABLE DUCT	PE	–	PLAIN END
CHDPE	–	CORRUGATED HIGH DENSITY POLYETHYLENE PIPE	PI	–	POINT OF INTERSECTION
CL	–	CENTERLINE	PLCS	–	PLACES
CLR	–	CLEAR	PM	–	PLANT MANHOLE
CMH	–	CHEMICAL MANHOLE	POT	–	POINT OF TANGENT
CND	–	CONDUIT	PT	–	POINT TERMINATION
CONC	–	CONCRETE	PVC	–	POLYVINYL CHLORIDE PIPE
CO	–	CLEAN OUT	QTY	–	QUANITY
CS	–	CARBON STEEL	R	–	RADIUS
CW	–	CIRCULATING WATER	RCP	–	REINFORCED CONCRETE PIPE
DB	–	DUCTBANK	RD	–	ROOF DRAIN
DBC	–	DIRECT BURIED CABLE	REV	–	REVISION
DET	–	DETAIL	RGS	–	RIGID GALVANIZED STEEL
DIA	–	DIAMETER	RR	–	RAILROAD
DIP	–	DUCTILE IRON PIPE	SECT	–	SECTION
DWG	–	DRAWING	SIM	–	SIMILAR
DWP	–	DOUBLE WALL PIPE	SLS	–	SANITARY LIFT STATION
EC	–	ELECTRICAL CONDUIT	SMH	–	SANITARY MANHOLE
ECC	–	ECCENTRIC	STMH	–	STORM MANHOLE
EF	–	EACH FACE	STRL	–	STRUCTURAL
EHH	–	ELECTRICAL HANDHOLE	T/C	–	TOP OF CONCRETE ELEVATION
EL	–	ELEVATION	T/G	–	TOP OF GRADE ELEVATION
EMH	–	ELECTRICAL MANHOLE	THH	–	TELEPHONE SERVICE HANDHOLE
EW	–	EACH WAY	T/MH	–	TOP OF MANHOLE ELEVATION
FC	–	FIELD CHECK	T/P	–	TOP OF PAVEMENT ELEVATION
FDN	–	FOUNDATION	TP	–	MECH PIPE TERMINAL POINT
FF	–	FLAT FACE	TYP	–	TYPICAL
FRP	–	FIBERGLASS REINFORCED PIPE	UGL	–	UNDERGROUND LIGHTING CONDUIT
GR	–	GRADE	UNO	–	UNLESS NOTED OTHERWISE
HDM	–	HOT DRAIN MANHOLE	VERT	–	VERTICAL
HDPE	–	HIGH DENSITY POLYETHYLENE PIPE	WGT	–	WEIGHT
HP	–	HIGH POINT	WTR	–	WATER
HYD	–	HYDRANT	W/	–	WITH
ID	–	INSIDE DIAMETER	W/O	–	WITHOUT
INV	–	INVERT	WP	–	WORK POINT
JBX	–	JUNCTION BOX	XFMR	–	TRANSFORMER
L	–	LENGTH			
LP	–	LOW POINT			

LEGEND APPLICABLE TO ALL S3000 DRAWINGS

	NEW CULVERT		NEW SLIDE GATE
	CL BIOSWALE		NEW SWING GATE
1 / S3000	SECTION OR DETAIL NUMBER / DRAWING DESIGNATION NUMBER		EXISTING POWER POLE
× 326.5	FINISHED SPOT ELEVATIONS	CB-101	NEW CATCH BASIN
			NEW DROP STRUCTURE
BM-1	SURVEY MONUMENT/CONTROL POINT		PROPERTY LINE
	EXISTING FENCE		BOUNDARY LINE
	NEW SECURITY FENCE	126	EXISTING CONTOURS
	TEMPORARY CONSTRUCTION FENCE		GRADE TO DRAIN (DIRECTION OF ARROW)
TR-1	EROSION CONTROL METHOD		

NOTES APPLICABLE TO ALL SS-3000 SERIES DRAWINGS

1. COORDINATES ARE BASED ON CALIFORNIA COORDINATE SYSTEM CCS83, ZONE 3. ELEVATION ARE BASED ON, NGVD 29 DATUM. BENCHMARK IS NATIONAL GEODETIC SURVEY BENCH MARK "W 563", LOCATED ADJACENT TO THE FLAGPOLE AT THE DUPONT PLANT ENTRANCE, ELEVATION = 11.168 FEET. TO OBTAIN DUPONT PLANT DATUM ELEVATION, ADD 0.70 FEET TO THE ELEVATIONS SHOWN. TOPOGRAPHIC DATA IS BASED ON AERIAL PHOTOGRAPH DATED JUNE 11, 2001. AERIAL SURVEY INFORMATION WAS OBTAINED BY RONALD GREENWELL & ASSOCIATES, INC.
2. NEW GRADE ELEVATIONS SHOWN ON THE SITE GRADING AND DRAINAGE PLANS INDICATE FINISH GRADE UNLESS NOTED OTHERWISE.
3. ALL CUT AND FILL SLOPES SHALL BE 3 HORIZONTAL TO 1 VERTICAL OR FLATTER, UNLESS NOTED OTHERWISE.
4. SEE DWG SS-3050 FOR GRADING AND DRAINAGE DETAILS INCLUDING CULVERT, CATCH BASIN AND DROP STRUCTURE CHARTS.
5. TOP OF CONCRETE ELEVATIONS AND FINISH FLOOR ELEVATIONS FOR ALL EQUIPMENT AND BUILDINGS IS EL 18.0. FINISH GRADE ADJACENT TO ALL FOUNDATIONS IS EL 17.5.
6. CL OF ALL PAVED ROADS IS EL 17.5 UNO.
7. TREES TO REMAIN. GRADE TO REMAIN UNCHANGED WITHIN 20' OF TREE BASE.
8. TEMPORARY ROAD FROM LAYDOWN AREA. ROAD AND CULVERT UNDER ROAD TO BE REMOVED AT END OF CONSTRUCTION.
9. UNDERDRAIN CONTINUOUS UNDER BIOSWALE FROM UNDERDRAIN TERMINATION TO CONSERVATION EASEMENT. UTILIZE UNPERFORATED PIPE BETWEEN DS-2 TO C-2 OUTLET AND DS-1 TO C-1 OUTLET.

NOT TO BE USED FOR CONSTRUCTION

THE DISTRIBUTION AND USE OF THE NATIVE FILE FORMAT OF THIS DRAWING OUTSIDE OF BLACK & VEATCH IS UNCONTROLLED AND SHALL BE USED FOR REFERENCE PURPOSES ONLY.

FIGURE 5.15-4
DRAINAGE PLAN
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

Most of the construction laydown area is covered by bare soil with little vegetation; however, the northeastern portion is covered by existing pavement. The entire construction laydown area will be graded with the exception of the existing paved area. A bioswale will be constructed at the center of the laydown area and the area will be graded such that runoff is collected in the bioswale. At the eastern end of the bioswale, a pump will be installed so that if the stormwater in the bioswale exceeds its volume capacity, the extra water will be pumped out to a location offsite.

Appendix 5.15A contains the Preliminary Stormwater Management Design for the project, which includes stormwater calculations and the pre- and post-development drainage plans.

5.15.1.7 Construction

Construction of the CCGS is scheduled to last 33 months. Grading at the site will occur over a 2-month period. The CCGS construction site is approximately 22 acres and the majority of the site will be paved or covered with CCGS facilities. The construction laydown area is approximately 20 acres, of which 6 acres are currently paved. The laydown area for the transmission tower replacement is approximately 0.5 acre. Minimal grading will be required of the construction laydown areas because they are relatively flat.

During construction of the project, water will be required primarily for dust suppression (8 hours per day for approximately 30 months). Construction activities would require a relatively limited amount of water (an average of approximately 50 gallons per minute per 1 hour for dust control and soil compaction, and approximately 200 gallons per minute at peak use). The construction water supply will come from the onsite water main.

5.15.2 Environmental Analysis

Project effects on water resources can be evaluated relative to significance criteria derived from the California Environmental Quality Act (CEQA) Appendix G checklist. Under CEQA, the project is considered to have a potentially significant effect on water resources if it would:

- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which will result in substantial erosion or siltation on- or offsite, or in flooding on- or offsite.
- Create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff.
- Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level (for example, the production rate of pre-existing nearby wells will drop to a level which will not support existing land uses or planned uses for which permits have been granted).

- Place within a 100-year flood hazard area structures that will impede or redirect flood flows.
- Cause inundation by seiche, tsunami, or mudflow.

5.15.2.1 Wastewater Collection, Treatment, Discharge, and Disposal

Wastewater from the CCGS will be discharged to a sanitary sewer system operated by ISD. A will-serve letter stating that ISD has sufficient capacity to receive wastewater from the CCGS is included as Appendix 2J. Furthermore, wastewater discharge from the CCGS will meet all requirements set forth by ISD. Because the ISD WWTF discharges to both land and surface water under Waste Discharge Requirements (WDRs) set by the Central Valley RWQCB, impacts related to wastewater collection, treatment, discharge, and disposal will be less than significant.

5.15.2.2 Stormwater Runoff and Drainage

Currently, runoff at the CCGS site drains to Wetland E, on the northwest corner of the project site. Post-development drainage at the site will be designed to maintain the natural drainage pattern and continue to discharge to the wetland. Bioswales will be constructed within the plant site to collect and infiltrate stormwater. The wetland is capable of receiving runoff from the project site for a 100-year, 24-hour storm without overflowing to adjacent properties (Appendix 5.15A). Runoff from the power block area will be routed through an oil-water separator before being discharged to the stormwater system. No stormwater runoff or drainage impacts will occur.

5.15.2.2.1 Construction Effects on Water Quality

Potential water quality impacts from construction will be controlled through implementing a Stormwater Pollution Prevention Plan (SWPPP) and associated best management practices (BMPs), and practicing proper housekeeping at the construction site. The site grading and drainage will be designed to comply with all applicable LORS. The general site grading will establish a working surface for construction and plant operating areas, and will provide positive drainage from buildings and structures.

Successful implementation of the SWPPP will ensure that construction impacts on water resources are mitigated to a less-than-significant level. SWPPP procedures include submitting a Notice of Intent (NOI) to the Central Valley RWQCB and developing the SWPPP prior to the start of construction activities.

Water used for dust control and soil compaction during construction will not result in discharge. During the construction period, sanitary waste will be collected in portable toilets (no discharge) supplied by a licensed contractor for collection and disposal at an appropriate receiving facility. Equipment wash water will be collected and disposed of offsite. With the implementation of the SWPPP and BMPs, described in Section 5.15.4, construction effects on water quality will be less than significant.

5.15.2.2.2 Water Supply during Construction

During project construction, water will be required primarily for dust suppression (8 hours per day for approximately 30 months). Because of the short duration of construction activities and the relatively limited water requirements (an average of approximately 50 gallons per minute per 1 hour for dust control and soil compaction and approximately

200 gallons per minute at peak use) of the construction phase of the project, no significant adverse impacts on water supply are expected to result.

5.15.2.3 Groundwater

The CCGS would make no direct use of groundwater resources and would have no effect on groundwater quantity or quality.

5.15.2.4 Flooding Potential

The CCGS is located outside of any FEMA-designated floodplains. In addition, project implementation will not result in any structures that will impede or redirect flood flows, nor cause inundation by seiche, tsunami, or mudflow, and therefore no impacts will occur.

5.15.2.5 DuPont Soil Stockpiles

DuPont has requested the use of any excess soils resulting from initial leveling and grading of the CCGS site. Figure 1.1-2 shows the locations of the three soils stockpile areas where DuPont proposes to store the stockpiled soil. DuPont plans to use this material during build-out of the DuPont Oakley Specific Plan. The Applicant will move the soils and create and stabilize these soil piles in accordance with all applicable BMPs. After this takes place, stockpiled, the soil stockpiles will be owned and maintained by DuPont in accordance with all applicable BMPs.

5.15.3 Cumulative Effects

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code §21083; California Code of Regulations, Title 14, §15064(h), 15065I, 15130, and 15355).

The CCGS would have little or no adverse impact on stormwater runoff/erosion, groundwater resources, or wastewater discharge. Therefore, the project would be very unlikely to cause cumulative impacts when its effects are considered in combination with those of other projects.

Cumulative impacts to water supply are addressed by the water service provider, Diablo Water District, in its water supply planning process. Diablo Water District seeks to maintain water service to its customers; as such, the will-serve letter included as Appendix 2I is evidence that the water use by CCGS will not result in a cumulative impact when considered in combination with other water users.

5.15.4 Mitigation Measures

This section presents mitigation measures proposed to reduce impacts to water resources. These mitigation measures are prescribed by stormwater and erosion control management programs mandated under the National Pollutant Discharge Elimination System (NPDES) permitting system:

- Implement BMPs designed to minimize soil erosion and sediment transport during construction of the plant site in compliance with the statewide General Construction

Permit. Design appropriate erosion and sediment controls for slopes, catch basins, culverts, stream channels, and other areas prone to erosion.

- Conduct operations at the plant site in accordance with the statewide General Industrial Permit. Implement a suite of good housekeeping requirements including steps to identify and mitigate pollutants and conditions of concern. Select BMPs to address material loading and storage areas, spill and leak prevention, waste handling, and employee training. Conduct inspections, monitoring, and sampling per the permit requirements.

These programs have been in place for a number of years and the prescribed measures have proven effective. Under the General NPDES Permits for Construction and Industrial Stormwater, various specific measures are prescribed and a monitoring program is required. Compliance with these programs should ensure that all residual impacts associated with the proposed project are mitigated to a less-than-significant level. To qualify for the General NPDES Permits for Construction and Industrial Stormwater, prior to construction and operation, CCGS will be required to develop a Construction SWPPP and Industrial SWPPP, respectively, to prevent the offsite migration of sediment and other pollutants, and to reduce the effects of runoff from the project site to offsite areas.

5.15.5 Laws, Ordinances, Regulations, and Standards

Federal, state, and local LORS applicable to water resources and anticipated compliance are discussed in this section and summarized in Table 5.15-7.

5.15.5.1 Federal LORS

In California, discharges of wastewater and stormwater into surface waters are regulated by the SWRCB and RWQCBs under the Clean Water Act and the Porter-Cologne Water Quality Control Act. Relevant NPDES permits for stormwater quality management are discussed below under state and local LORS.

TABLE 5.15-7
Laws, Ordinances, Regulations, and Standards for Water Resources

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
Federal			
Clean Water Act/Water Pollution Control Act. P.L. 92-500, 1972; amended by Water Quality Act of 1987, P.L. 100-4 (33 USC 466 et seq.); NPDES (CWA, Section 402)	Prohibits discharge of pollutants to receiving waters unless the discharge is in compliance with an NPDES permit. Applies to all point-source discharges, including stormwater runoff from construction (including demolition). Applies to non-point sources through municipal NPDES permits.	Central Valley RWQCB	Compliance with existing statewide NPDES permit for construction and industrial stormwater (Section 5.15.5.1)

TABLE 5.15-7
Laws, Ordinances, Regulations, and Standards for Water Resources

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
State			
Federal Clean Water Act (implemented by State of California)	Implements and enforces the federal NPDES permit program.	Central Valley RWQCB	NPDES permits for construction (including demolition) and industrial stormwater prior to construction and plant operation (Sections 5.15.5.2.1 and 5.15.5.2.2)
Porter-Cologne Water Quality Control Act	Controls discharge of wastewater to surface water and groundwater of California.	Central Valley RWQCB	CCGS will discharge industrial and sanitary wastewater to the ISD WWTF (Section 5.15.1.5)
California State Constitution, Article X, Section 2	Prohibits waste or unreasonable use of water.	Central Valley RWQCB	The CCGS will use potable water for plant processes because no recycled water is available (Chapter 2, Section 2.1.8)
California Water Code, Section 13550	States that use of potable water for non-potable purposes is an unreasonable use of water.	Central Valley RWQCB	The CCGS will use potable water for plant processes because no recycled water is available (Chapter 2, Section 2.1.8)
State Water Board Resolution 75-58	Encourages use of wastewater for power plant cooling.	Central Valley RWQCB	The CCGS will use potable water for plant processes because no recycled water is available (Chapter 2, Section 2.1.8)
Local			
Contra Costa County Clean Water Program	Requirements for stormwater compliance for construction activities	City of Oakley Public Works and Engineering Department	Construction compliance with the Contra Costa Clean Water Program (C.3) (Section 5.15.5.3.1)
City of Oakley Municipal Code	Permit requirements for construction activities conducted within the city's jurisdiction	City of Oakley Public Works and Engineering Department	Construction compliance with the Contra Costa Clean Water Program (C.3) (Section 5.15.5.3.2)

5.15.5.2 State LORS

5.15.5.2.1 Industrial Stormwater NPDES Permit

The SWRCB implements regulations under the federal Clean Water Act requiring that point source discharges of stormwater (which is a flow of rainfall runoff in some kind of discrete conveyance such as a pipe, ditch, channel, or swale) associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit (SWRCB, 1997). The SWRCB has issued WDRs for discharges of stormwater associated with industrial activities (SWRCB Order 97-03-DWQ), excluding construction activities. The Central Valley RWQCB requires an NOI

to be filed prior to any stormwater discharge from industrial activities, and that the SWPPP be implemented and maintained onsite. An Industrial SWPPP will be completed prior to the operation of the CCGS.

5.15.5.2.2 Construction Stormwater NPDES Permit

The federal Clean Water Act effectively prohibits discharges of stormwater from construction sites unless the discharge is in compliance with an NPDES permit. The SWRCB is the permitting authority in California and has adopted a statewide General Permit for Stormwater Discharges Associated with Construction Activity (SWRCB Water Quality Order No. 99-08-DWQ; SWRCB, 1999) that applies to projects resulting in 1 acre or more of soil disturbance. The proposed project would result in disturbance of more than 1 acre of soil. Therefore, the project will require the preparation of a construction SWPPP that would specify site management activities to be implemented during site development. These management activities will include construction stormwater BMPs, dewatering runoff controls, and construction equipment decontamination. The Central Valley RWQCB requires an NOI to be filed prior to any stormwater discharge from construction activities, and that the SWPPP be implemented and maintained onsite. A Construction Drainage Erosion and Sediment Control Plan/SWPPP will be completed prior to the beginning of construction activities.

5.15.5.3 Local LORS

5.15.5.3.1 Contra Costa County

The Contra Costa Clean Water Program was developed in compliance with the municipal NPDES permit issued by the state to Contra Costa County, and participating municipalities include most of the cities, including the City of Oakley, within the county. The Clean Water Program requires that, for development projects resulting in 1 acre or more of impervious surfaces, treatment and source control measures must be developed and implemented, plus runoff flow must be controlled so that post-project runoff does not exceed estimated pre-project rates or durations. Requirements applicable to the proposed project, including construction of the proposed bioswale, are described in the Stormwater C.3 Guidebook (Contra Costa County, 2008).

5.15.5.3.2 City of Oakley – Municipal Code

The Municipal Code contains provisions for design of slope drainage, including earthen swales (6.9.502). The bioswales feature planned for the project site to carry stormwater runoff toward the mitigation wetland would need to conform to these requirements. BMPs and standards are found in Section 6.11.212 of the Municipal Code. All projects that could potentially contribute pollutants to the City's stormwater system must following the BMPs specified in this section. Construction activities are required to conform to the requirements of the California Stormwater Quality Association Stormwater Best Management Practices Handbook for Construction Activities, the Association of Bay Area Governments Manual of Standards for Erosion and Sediment Control Measures, the City's grading and erosion control ordinance and other generally accepted engineering practices for erosion control.

5.15.6 Agency Contacts, Permits, and Permit Schedule

Agency contacts and required permits are listed in Table 5.15-8.

TABLE 5.15-8
Agency Contacts, Permits, and Permit Schedule for Water Resources

Permit	Agency Contact	Schedule
National Pollution Discharge Elimination System Construction Activities Stormwater General Permit	Jacque Kelly Central Valley RWQCB 11020 Sun Center Dr., #200 Rancho Cordova, CA 95670-6114 (916) 464-3291 FAX: (916) 464-4645	Submit NOI to use the permit at least 30 days prior to construction
City of Oakley: Stormwater Compliance	Keith Coggins City of Oakley, Public Works and Engineering Department (925) 625-7155	Prior to commencement of construction

5.15.7 References

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Western Regional Climate Center (WRCC). 2008. Antioch, California (Station 040232 Antioch Pump Plant 3). Online Information: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0232. Website accessed April 24, 2009.