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8.14 WATER RESOURCES

This section evaluates the effects of the proposed project on water resources in the area of the Colusa Generating Station. Water for the project will be provided by GCID and conveyed to the plant via the Tehama-Colusa Canal and a new water supply pipeline. The facility will incorporate two combustion gas turbines that will burn natural gas and a steam turbine driven with steam generated by HRSGs. Each combustion gas turbine and the steam turbine will be connected to one of three separate electric generators. Output of the generators will be connected to step-up transformers and then to a new PG&E switchyard. The project will use an air cooled condenser as the ultimate heat sink, and will employ a zero liquid discharge system. Sanitary wastewater will be processed through a septic system and leach field.

The project consists of the following project areas:

- Project site: a new power plant and switchyard
- Temporary construction area: construction parking, construction trailers, and construction laydown area
- Raw water pipeline and unpaved road leading to water intake
- Natural gas pipeline
- Two new bridges to replace existing bridges

The power generation facility and switchyard will occupy approximately 31 acres within the 100-acre project site, as illustrated in Figures 8.14-1 and 3.3-1. A 2.2-acre-foot stormwater detention basin will occupy approximately 2.2 acres immediately southwest of the power plant area. The site is currently undeveloped agricultural land used for grazing cattle. The site topography is rolling hills that range from 175 to 190 feet above mean sea level (msl). A portion of the site will be cut and filled to provide a level area for the power generation facility, switchyard, and construction laydown areas at an approximate elevation of 183 feet above msl.

The temporary construction area will include a laydown area, construction trailers and construction parking. The construction trailers and parking area will be located east of the plant and switchyard area. The construction laydown area will be located north of the switchyard area (Figure 8.14-2). The estimated total area of disturbance associated with the plant construction, which includes the power generation facility area, the switchyard area, the stormwater detention basin, and the temporary construction areas, is approximately 74 acres. After construction is completed, the temporary construction areas will be returned to grazing land. The stormwater detention basin will be an unlined basin. The power facility area will be covered in gravel, except for designated roads, tanks, and buildings, and will be approximately 23 percent impervious (i.e., approximately 5 acres will be impervious). The switchyard area will be covered with crushed rock.

Linear facilities include a new 1,500-foot-long natural gas interconnecting pipeline to the existing natural gas distribution system and a new 2,700-foot-long water supply pipeline to deliver water to the site from the Tehama-Colusa Canal. A new access road between the plant and the new water supply intake on the Tehama-Colusa Canal will be provided; this will be an unpaved road approximately 12 feet wide. The estimated area to be disturbed during installation of these pipelines and construction of the access road is approximately 7.7 acres. The areas along the natural gas and water supply pipelines will be returned to existing conditions after construction has been completed.

The transmission interconnection will require approximately 12 new towers and 48 new tower footings. Four of the towers (16 footings) will be within the project site (i.e., within the switchyard area); eight of the towers (32 footings) are estimated to be outside of the 100-acre site and construction laydown area. The area of disturbance associated with the construction of the 8 towers outside of the 100-acre site is

approximately 7.3 acres based on 10,000 square feet per footing. After construction, the areas around the footings outside of the switchyard will be returned to grazing land.

To allow for transportation to the site of some of the heavier equipment, the following two bridges would be replaced: (1) a bridge on Dirks Road over the Glenn-Colusa Canal, and (2) a bridge on McDermott Road over Teresa Creek. In addition, the eastern side of the Delevan/McDermott Road intersection would be slightly widened. After construction is completed, local access roads will be repaved or resurfaced as necessary and appropriate. The estimated area of disturbance associated with these bridge and road improvements is approximately 8.4 acres.

The aspects of water resources that could potentially be affected by the proposed project include water supply, water quality, and flood hazards. The CEQA Guidelines and applicable laws, ordinances, regulations, and standards define significance criteria for compliance in each of these areas. The impacts of the project on beneficial water uses are expected to be too small to be significant.

8.14.1 Affected Environment

This section describes the environment relative to water resource features in the area of the proposed project site.

8.14.1.1 Groundwater

The CGS site is located in the Sacramento Valley west of the Sacramento River. The Sacramento Valley is underlain by sediments that have been transported from the surrounding mountains by the Sacramento River and its tributaries. The site is located at the junction of three groundwater storage units within the Sacramento Valley Groundwater Basin: (1) the Colusa Basin; (2) the Stony Creek Alluvial Fan; and (3) an alluvial fan that extends from Delevan to Zamora (see Figure 8.14-2). The principal sources of groundwater in the basins are geologic formations known as the Plio-Pleistocene Tehama Formation and the overlying Quaternary alluvium. Estimated groundwater storage capacities and specific yields of these three groundwater storage units are summarized in Table 8.14-1. In the vicinity of the site, near the foothills west of the Sacramento River, groundwater may not be available as reliably as surface water sources. Although delineated on the map as distinct units, the boundaries of the groundwater basins are not well defined. When groundwater is found in the foothills, the supply generally is not reliable because the subsurface reservoirs are small and may dry up during the summer months (Colusa County, 1989). Based on conversations with local water agencies and well drillers, the area surrounding the site has not historically produced significant amounts of groundwater due to the availability of surface water and low production of groundwater.

Groundwater generally flows from the north in a southeast direction to the Sacramento River. In the winter, groundwater recharge occurs primarily by deep percolation of precipitation and stream water. Groundwater levels in Colusa County usually drop during the summer months but are recharged during the rainy winter season. Most recharge occurs in the northern Sacramento Valley, in Glenn and Tehama counties where rainfall is more abundant. During the summer, applied irrigation water also infiltrates to the groundwater basin.

The Sacramento River groundwater basin is the water source for community water delivery systems in Arbuckle, Colusa, Grimes, Maxwell, Princeton, and Williams (these communities are shown on Figure 8.14-3), as well as the Glenn-Colusa Irrigation District (GCID). Wells in these areas generally are 100 to 500 feet deep (Colusa County, 1989). The water supply system nearest to the site, the Maxwell Public Utility District, provides water service to about 325 commercial and residential customers and operates a 100,000-gallon water storage tank and three wells with pumping capacities of 500, 800, and 1,000 gallons per minute (gpm). Water is supplied without treatment (Colusa County, 1989).

GCID's service area covers approximately 175,000 acres within Glenn and Colusa counties. While primarily a surface water provider, GCID supplements its water supply with groundwater from its own wells and from more than 160 privately owned wells. The aquifer system within GCID includes both confined and unconfined zones within the Colusa Basin of the Sacramento Valley Groundwater Basin. Historically, depths to groundwater in the region range from approximately 5 to 50 feet below ground surface (bgs). Water-bearing sediments can be up to 2,000 feet thick in some areas. Transmissivities range from very low in the fine-grained, silty clay materials of the lower basin that occur predominantly south of Willows, to high in the clean, coarse sands and gravel within the Stony Creek fan located in the northern portion of the basin. Groundwater flows generally to the east and southeast, ultimately to the Sacramento River.

The main water-bearing formation in the Colusa Basin is the Tehama Formation. In the northern portion of the basin, the formation contains extensive deposits of interbedded gravel from the ancestral Stony Creek, which are typically productive and yield a large quantity of water to wells. However, in the southern portion of the basin, the Tehama Formation is less productive with only isolated zones of high yield. GCID owns and operates a groundwater supply well located northeast of Willows and adjacent to the Glenn-Colusa Canal. This well, which is installed into the Tehama Formation, discharges up to approximately 6 to 7 cubic feet per second (2,700 gpm to 3,100 gpm) into the canal. The water-bearing zone occurs between 270 and 500 feet bgs (CH2M Hill, 1989).

In addition, the Tuscan Formation is a water-bearing unit in the northeastern portion of the Colusa Basin, although at present it is not significantly used. This formation interfingers with the Tehama Formation at depths between 300 and 1,000 feet. GCID is in the process of installing a new well that will be drilled into the Tuscan Formation with a total depth on the order of 1,100 feet. It is expected that the pumping capacity of this well will be approximately the same as the existing well drilled into the Tehama Formation. The new well will be located approximately 15 miles upstream of GCID's existing well.

Only limited groundwater development has occurred in the vicinity of the CGS. In the township where the site is located, only about 400 acre-feet were pumped in 1961, and 700 acre-feet in 1970 (DWR, 2003). Similarly, available well log data from 1978 indicate that relatively few wells were in this area. In addition, wells located along the western margin of the Sacramento Valley generally yield less than 500 gpm, and provide less than 35 gpm per foot of drawdown. These well characteristics are consistent with a low transmissivity value of about 8,700 square-feet per day (or about 65,000 gpd per foot) for the aquifer. Similar information was obtained from the DWR (Stanton, 2006). Based on DWR's review of well records for several townships in the vicinity of the proposed project, the largest well yield was 700 gpm, and most wells produced significantly less. These wells typically only have limited perforated intervals, which is consistent with limited production capability.

More specific information at the site was collected and evaluated in 2001. The purpose of that investigation was to assess the availability, quantity, and quality of local groundwater for a similar power generation project proposed at that time. The groundwater investigation program is documented in Appendix O. Three pilot holes (exploratory borings #1, #2, and #3 shown on Figure 8.14-2) were drilled in the vicinity of the project site to a depth of approximately 300 feet bgs. Depth to water was observed at approximately 45 feet bgs. Coarse-grained water-bearing zones were encountered in two of the three holes drilled; at approximately 135 to 145 bgs in boring #1 and at approximately 210 to 240 feet bgs in boring #3. No coarse-grained water-bearing zones were encountered within the total depth of 320 feet in boring #2. Boring #3 had a 30-foot-thick coarse-grained zone, and therefore was selected for a pump testing. Based on that test, the specific capacity was about 0.91 gpm per foot of drawdown. The results of the test suggest that a potential yield for a well completed in the producing horizon between depths of about 220 to 240 feet at this location would be on the order of 200 gpm. A sustained safe yield for year-round use was not evaluated.

8.14.1.1.1 Groundwater Quality

As described in the Colusa County General Plan (1989), groundwater quality in the Sacramento Valley as a whole is considered good for irrigation and domestic uses. The DWR monitors domestic and agricultural wells for mineral content, primarily naturally occurring heavy metals. The DWR's primary concern relative to water quality in Colusa County is high concentrations of boron in some irrigation water and high concentrations of nitrates and chloride in some domestic water. The DWR has found that areas with higher than normal concentrations of nitrates are generally associated with sewage effluent as opposed to pesticides and herbicides. According to the DWR, there are currently no critical water quality problems in the county. The Central Valley Regional Water Quality Control Board (CVRWQCB) found no confirmed evidence of groundwater contamination in drinking water well tests that were recently conducted. However, higher than normal concentrations of several constituents have been found in certain areas of the county, including the area along the Sacramento River between Colusa and Grimes, which contained high concentrations of sodium and sulfate. In other instances, particularly where domestic wells are in close proximity to septic systems, nitrate contamination has been recorded by the Colusa County Environmental Health Department (Colusa County, 1989).

Water quality investigations performed by the DWR for the Colusa Subbasin indicate that the overall quality of groundwater is considered good to excellent for most agricultural purposes, but often poor for municipal purposes (DWR, 2003). Data for GCID's groundwater well and other wells within 0.5 mile of GCID's well are summarized in Table 8.14-2. The GCID well and most of the vicinity wells generally meet drinking water standards.

The chemical analysis of groundwater pumped from onsite boring #3, reported in Appendix O and summarized in Table 8.14-3, indicates that for the constituents analyzed, the groundwater meets drinking water standards, with the exception of turbidity and total dissolved solids. As described above, the water-producing zone for this test well was between 220 and 240 feet bgs.

8.14.1.1.2 Groundwater Beneficial Uses

Groundwater in the vicinity of the site has not been greatly developed for consumptive uses due to availability of surface water and low production potential of groundwater. Elsewhere in the county, groundwater is used as a source of drinking water.

8.14.1.2 Surface Water

The site is located within the Sacramento River Basin. Surface water runoff from the site and surrounding area is conveyed via both man-made canals and natural streams to the Sacramento River. Natural streamflows are interrupted by the various man-made canals and levees throughout the region. Surface water features are shown on Figure 8.14-1 at a scale of 1:100,000, and the hydrogeologic setting in the vicinity of the site is shown on Figure 8.14-2 at a scale of 1:24,000. The Tehama-Colusa and Glenn-Colusa Canal systems are shown on Figure 8.14-4.

The Sacramento River is the largest river in California. It starts west of Mount Shasta in Northern California and flows southward into Shasta Reservoir, through the Sacramento Valley, and then joins the San Joaquin River in the delta east of Suisun Bay. The Sacramento Valley extends from Red Bluff to the mouth of the Sacramento River at Suisun Bay, a distance of about 240 miles along the river. The area of the Sacramento Valley is approximately 5,000 square miles; the total area of the Sacramento River drainage basin is 25,548 square miles (Olmsted and Davis, 1961).

As shown on Figure 8.14-1, Hunters Creek flows to the east into the Colusa Drain/Trough, which flows south along the Delevan National Wildlife Refuge. Farther south and downstream, the Colusa Trough flows through and along the Colusa National Wildlife Refuge to the Colusa Basin Drainage Canal, and

eventually discharges into the Sacramento River at Knights Landing, 20 miles north of downtown Sacramento. The site is located within the portion of the Hunters Creek watershed that is west of I-5 and upstream of the confluence with Logan Creek and the Colusa Drain (see Figures 8.14-1 and 8.14-4). The total natural drainage area of the Hunters Creek watershed above Delevan is approximately 82 square miles.

Historical streamflow data are not available for Hunters Creek. However, data are available for two nearby creeks, South Fork Willow Creek and Stone Corral Creek, located north and south of the Hunters Creek drainage, respectively, as shown on Figure 8.14-4. Table 8.14-4 summarizes mean monthly streamflows for these two creeks. Flows for Hunters Creek at Delevan, California are estimated using drainage area proportioning of the flows for Stone Corral Creek, which has a longer period of record than does South Fork Willow Creek. The estimated flows for Hunters Creek also are summarized in Table 8.14-4. Historical streamflow data for the Sacramento River above Red Bluff downstream of the Tehama-Colusa Canal diversion and near Hamilton City downstream of the Glenn-Colusa Canal diversion are also summarized in Table 8.14-4.

As shown on Figure 8.14-2 the proposed project is located approximately 0.5 mile east of the Tehama-Colusa Canal, 0.8 mile south of the Canal Cross Tie, 0.7 mile north of a west-to-east-flowing unnamed stream, and 0.75 mile west of the Glenn-Colusa Canal. The man-made canals convey water to various irrigation districts.

The Tehama-Colusa Canal is owned by the U.S. Bureau of Reclamation (USBR) and operated and maintained by the Tehama-Colusa Canal Authority (TCCA). Most of the water for the Tehama-Colusa Canal comes from the Sacramento River at the Red Bluff Diversion Dam. According to environmental and regulatory requirements, water from the Sacramento River can only be diverted into the canal at the dam from May 15 through September 15. Two practices are used to provide water to the canal when the dam gates are raised (i.e., no diversions to the canal). The first is to pump water from the Sacramento River into the canal using four pumps, each with a capacity of between 80 and 100 cfs. The second practice is to create a reverse flow diversion at Stony Creek in Orland, California. With these practices, the demands of water users have been met throughout the year. The concrete-lined canal is 110.9 miles long (USBR, 2001), starting at the Red Bluff Diversion Dam, passing through Tehama, Glenn, and Colusa counties, and into Yolo County, and terminating about 2 miles south of Dunnigan, California. The canal consists of 26 pools, which are operated so as to be kept full and to meet target water elevations for each pool. At the start of the canal, its capacity is 2,530 cubic feet per second (cfs); at the end, 1,700 cfs (USBR, 2001). The Tehama-Colusa Canal provides water to 14 water districts, including Colusa County lands west of Maxwell, Williams, and Arbuckle. In 1989, Colusa County was allocated 175,000 acre-feet and used about 100,000 acre-feet of water from the Tehama-Colusa Canal (Colusa County, 1989). Flow data for 2000 are summarized in Table 8.14-5.

The Glenn-Colusa Canal is 65 miles long and is owned, operated, and maintained by the GCID. Water for the Glenn-Colusa Canal comes primarily from the Sacramento River at Hamilton City and is supplemented from Stony Creek in Glenn County several miles north of the site and from groundwater. GCID diverts a maximum of 3,000 cfs from the Sacramento River. Average monthly flows in 2000 for the Glenn-Colusa Canal at Hunters Creek are provided in Table 8.14-6. As reported in the Colusa County General Plan, an estimated 462,600 acre-feet of water was transported and delivered to Colusa County via the Glenn-Colusa Canal (Colusa County, 1989).

The natural drainage swale on the southwestern corner of the site flows southeast for about 0.7 mile. It joins another drainage and flows east for 0.7 mile to the Glenn-Colusa Canal. It passes under the canal and heads east into a ditch that flows east for 2 miles and then joins Hunters Creek.

The seasonal drainages north of the site flow northeast towards the Canal Cross Tie. The natural flow of this drainage, which is tributary to Hunters Creek, is impeded by the Canal Cross Tie and the Glenn-Colusa Canal and becomes seasonally ponded against the canal embankments.

8.14.1.2.1 Existing Surface Water Quality

In general, Colusa County's surface water supplies are thought to be of good quality for agricultural and domestic use. Several studies have been conducted on water supplies downstream and upstream of the county to determine the effects of agricultural herbicides and pesticides, and to ensure that drinking water is safe. Although these studies have uncovered isolated problems, water quality on the whole is good (Colusa County, 1989).

Contamination of irrigation runoff with residues from rice-growing herbicides has led to concern over downstream water quality in the Sacramento River. These herbicides—Ordram, Bolero, and Basagran—are commonly used by rice growers for weed abatement purposes. Monitoring studies conducted by the California Department of Fish and Game (CDFG) and others have shown that fish losses in the Colusa Basin Drain and chemical residues in drinking water are due in part to contamination from the herbicides. In 1982, various state agencies and the rice industry began efforts to mitigate these problems. The California Department of Health Services and CDFG set action guidelines to protect public health and aquatic life, while the Department of Food and Agriculture (DFA) established a rice herbicide control program, which is administered by the local Agricultural Commissioner (Colusa County, 1989).

In 1986, California voters passed Proposition 65, the Safe Drinking Water and Toxics Enforcement Act, which prohibits businesses from discharging chemicals that cause cancer or reproductive damage into the drinking water supply, unless the business can prove that the chemical does not pose a significant risk. The effects of Proposition 65 on agriculture remain to be seen (Colusa County, 1989).

The State Water Resources Control Board (SWRCB) has been studying the Sacramento River since 1984 through its toxic substances monitoring program. Molinate and Thiobencarb, which are associated with rice herbicides, were detected in various places, particularly north of Sacramento. Heavy metals were also detected. These were attributed to runoff from inactive mines on a tributary of the river near Redding (Colusa County, 1989).

The CVRWQCB performed an assessment of the water quality within its jurisdiction. This study noted the presence of pesticides, polychlorinated biphenyls (PCBs), and excessive sediments in the Sacramento River drainage system in Colusa County. The presence of the pesticides was attributed to agricultural runoff. Erosion of the surrounding foothills was seen as the cause of sedimentation. Rice herbicide control programs have reduced the levels of pesticides in the water, but the source of the PCBs is unknown (Colusa County, 1989).

Results of water quality analyses for water samples collected from the Tehama-Colusa Canal and Glenn-Colusa Canal are presented in Tables 8.14-7 and 8.14-8.

Recent water quality data for the Sacramento River near Hamilton City and the Sacramento River above Red Bluff are summarized in Table 8.14-9. Water quality data for Hunters Creek are not available. Limited water quality data are available for Stone Corral Creek, a nearby watershed. Data for Stone Corral Creek at USGS gaging station number 11390672 are summarized in Table 8.14-10. Between September 15 and May 15, water from Stony Creek is diverted into the Tehama-Colusa Canal. Water quality data for Stony Creek are summarized in Table 8.14-11. Data for 2001 indicate that the water quality of the water in the Tehama-Colusa Canal is similar to the water quality of the water in the Glenn-Colusa Canal. Because both canals receive most of their water from the Sacramento River, the water quality of the water in the canals is also expected to be similar to the water quality of the Sacramento River near Hamilton City and Red Bluff.

8.14.1.2.2 Surface Water Beneficial Uses

Beneficial uses of the Sacramento River include industrial, commercial, and domestic uses as well as irrigation, recreation, and the preservation of wildlife. The Tehama-Colusa and Glenn-Colusa canals currently provide water primarily for irrigation purposes.

8.14.1.3 Climate and Precipitation

The proposed project is located on the western side of the Sacramento River Valley. The subregion extends from Sacramento in the south to the Oregon border in the north. The climate is generally characterized by hot dry summers and mild wet winters. Climate data from 1952 through 1988 for Williams, California, which is located approximately 19 miles south of the site, are summarized in Table 8.14-12. Average July and January maximum temperatures for the period were approximately 97°F and 55°F, respectively. Average annual precipitation is 15.64 inches, with an average monthly maximum precipitation of 3.26 inches in January.

Based on the National Oceanic and Atmospheric Administration Atlas 2 (NOAA, 1973), the 25-year, 24-hour and the 100-year, 24-hour rainfall amounts for the project site are approximately 3.5 inches and 4 inches, respectively.

8.14.1.4 Current and Proposed Water Supply and Use

8.14.1.4.1 Water Supply

The site is currently undeveloped agricultural land used for cattle grazing. Water conveyed in the Tehama-Colusa and Glenn-Colusa canals is used primarily for irrigation purposes.

The project will use an air cooled condenser as the ultimate heat sink, will employ a zero liquid discharge system, and will recycle water through the plant. The combination of these technologies will minimize the required consumptive use of water for plant operation to the absolute minimum technically possible. No water is being evaporated for the plant heat sink systems. Usage is restricted to water for demineralization for the steam cycle, for combustion turbine inlet air evaporative cooling, fire water, service water, and potable water for eyewash stations, drinking, showers, and sanitation.

The project will use water purveyed by the GCID, transferred to Colusa County, and transported to the site vicinity via the Tehama-Colusa Canal. It will be delivered to the project site via a new water supply pipeline. The project has obtained contract rights to a sufficient quantity of water to supply all project water needs; the will-serve letter from GCID is shown on Figure 7.1-1.

The Glenn-Colusa Canal and the Tehama-Colusa Canal are proximate to the site. The water needs of the project could be provided by either canal. The proposed project's water requirements of approximately 126 acre-feet per year would be a small proportion of the water flowing through these systems, as described above. Existing water allocations to the GCID come from two primary sources: (1) GCID's Senior Water Rights (Pre-1914) and (2) Central Valley Project (CVP) Water which is provided under contract by the USBR. GCID is entitled to divert a minimum of 720,000 acre-feet of natural flows from the Sacramento River and Stony Creek and to purchase 105,000 acre-feet of CVP water for a total of 825,000 acre-feet per year (GCID, 1995). In addition, GCID supplements its water supply by conjunctive use of groundwater. Due to GCID's senior water rights, GCID's allocation is limited to a maximum curtailment of 25 percent. However, the water supply contract between GCID and the project will be a 100-percent supply agreement (i.e., no curtailment). Numerous water districts along the Tehama-Colusa Canal receive water from the USBR. The water allocations to these water districts is subject to unlimited curtailment. Based on these considerations, a water supply from the GCID was determined to best meet the needs of the proposed project.

Contractually, GCID will provide water to the plant through a transfer agreement with Colusa County, which will then deliver the water to the plant vicinity via the Tehama-Colusa Canal. Water will be transferred to Colusa County for delivery to the project because the site is not within GCID's service area. In addition, transfers must be made through existing USBR contractors in accordance with the CVP Improvement Act; Colusa County is a USBR contractor. The GCID has an existing wheeling agreement with the TCCA. This existing wheeling agreement allows water to be easily supplied by the GCID and extracted from the Tehama-Colusa Canal.

The project will install an intake at the Tehama-Colusa Canal instead of the Glenn-Colusa Canal. This was based on both physical and biological resource factors. Physically, the site will be located at an elevation of 183 feet. The water level in the Tehama-Colusa Canal in the vicinity of the project is at about elevation 205 feet and is generally maintained at this level with very little fluctuation throughout the year.

Several additional factors were considered when selecting the Tehama-Colusa Canal for the location of the intake. First, potentially sensitive biological resources are located directly west of the Glenn-Colusa Canal, where the water pipeline would need to be constructed. Conversely, potentially sensitive habitat located near the Tehama-Colusa Canal is more easily avoided, and therefore, would not be affected by the waterline. Furthermore, the Tehama-Colusa Canal does not feed directly into the Sacramento River and is concrete-lined, and therefore, does not provide potential habitat for sensitive species. In summary, the benefits of using the Tehama-Colusa Canal as a water supply source include minimizing impacts to potentially sensitive biological resources, and avoidance of disturbance to a canal (i.e., the Glenn-Colusa Canal) that feeds directly into the Sacramento River.

The will-serve letter from GCID is shown on Figure 7.1-1. Water for the CGS will be supplied by the GCID through a transfer agreement with the County of Colusa and conveyed via the Tehama-Colusa Canal through the existing wheeling agreement with the TCCA. The agreement with the GCID includes the following conditions:

1. USBR approval of the transfer of water
2. Approval of the project by the California Energy Commission
3. Approval by the Colusa County Board of Supervisors, if necessary
4. The completion of the appropriate CEQA and/or NEPA documentation by the appropriate lead agency, if necessary
5. The completion of any required consultations under the state and federal Endangered Species Acts
6. Mutually acceptable commercial terms for ensuring delivery of a water supply to the project, between GCID and E&L Westcoast

8.14.1.4.2 Water Use

As described in Chapter 3, water will be conveyed to the project vicinity via the Tehama-Colusa Canal. The project will install a new intake at the canal and a new 2,700-foot-long buried pipeline to convey the water from the canal to the generating facility. The water will be used to satisfy various process needs. The process needs include makeup water for the HRSGs and auxiliary boiler, water for the combustion turbine generator (CTG) inlet air evaporative coolers, general plant service water, stored firewater, and potable water.

A new intake will be constructed on the east side of the Tehama-Colusa Canal to withdraw water for the plant. The new intake will consist of a single 6-inch-diameter pipe laid down the slope of the canal embankment, and a submersible pump. The intake pipe will be anchored on the embankment, and the required electrical control enclosure will be placed on a small concrete pad at the top of the canal embankment. The only permanent impact to ground area is expected to be an area of about 100 square

feet for the control enclosure and access to the intake pipe. This area will be surrounded by a chain link fence for safety. The intake will have a screen to reduce the intake of debris into the pump. The intake will be designed and constructed in accordance with USBR and TCCA requirements. While the screen would prevent fish that might be present in the canal from entering the intake, a fish screen is not required due to the small amount of water to be extracted from the canal and the lack of salmonids expected to be present.

The new 4-inch pipeline will be installed using a chain style trenching machine, which will be done as a single cut, install, and cover technique to minimize ground disturbance. Topsoil will be removed and piled temporarily along the excavation trench, while the pipe is installed. The pipe will be made of high density polyethylene (HDPE), which will be delivered to the site in continuous rolls, fused at splices as required, and laid in the trench. To the extent possible, excavation spoils will be used for backfill. Where trenching spoils are not suitable, imported backfill will be used. The trenching machine will recover the trench during the same operation as cutting the trench, so impact time and impact area will be minimized. Following removal of any excess spoils, the construction area along the pipeline will be regraded and returned to its original condition. The pipeline will terminate at the project's raw water/firewater storage tank.

The Water Balance Diagram (Figures 3.4-5A and 3.4-5B) and Water Balance Table (Table 3.4-5), show the power plant's water treatment processes and the distribution of treated water. Water treatment varies according to the quality required for each of the plant's various water uses. Details about the plant's water uses and treatment are provided in Chapter 9, Alternatives, and in Section 3.4.6. Briefly, the water uses at the plant include:

- Water for the HRSGs must meet stringent specifications for suspended and dissolved solids. To meet these specifications, recovered (distilled) water from the evaporator of the zero liquid discharge system is routed to the demineralizer. Demineralization is accomplished using ion exchange equipment. Storage of demineralized product water is provided in a covered water storage tank with a nominal capacity of 200,000 gallons, which provides sufficient capacity for 48 hours of peak load operation coinciding with one redundant train of demineralizers not operating.

- Makeup water for the CTG evaporative coolers is supplied from the raw water/firewater storage tank. Water evaporates from the cooler and passes through the CTG. Minerals are concentrated in the remaining water that is not evaporated. To prevent minerals from concentrating to levels above the CTG design, a portion of the blowdown is routed to the microfiltration system to make demineralized water. As required, makeup water is added to replace the water that is lost to evaporation and blowdown.

- Closed cooling water, which will be used to cool equipment such as the CTG and steam turbine generator (STG) lubrication oil coolers, the CTG generator coolers, air compressor after-coolers, steam cycle sample coolers, etc.

- A raw water/firewater storage tank will have a combined capacity of 400,000 gallons. Of this, 300,000 gallons will be dedicated to the plant's fire protection water system. The remaining 100,000 gallons will satisfy 8-hour plant operation at summer peak conditions in case of water supply interruption and other plant needs.

- Potable grade water will be raw water treated for potable water use in toilets, showers, and emergency eyewash and shower stations.

- Bottled water will be provided for drinking water purposes.

Average and annual water consumptive requirements are summarized in Table 8.14-13. Average requirements are based on continuous plant consumption on an average annual operating condition of 59ºF dry bulb temperature (DBT) and 60 percent relative humidity. Both CTG inlet air evaporative coolers are not in-service and there is no duct firing. Maximum requirements are based on water consumption at maximum operating conditions of 94ºF (DBT) and 25 percent relative humidity. Both CTG inlet air evaporative coolers are in-service at maximum duct firing. Annual requirements are derived from the weighted average requirements based on the plant operating 50 percent of the time with duct burners on, and with the CTG evaporative coolers operating for six months out of the year (May to October). Average annual usage assumes that the plant has an equivalent availability of 100 percent, or 8,760 operating hours per year. Table 3.4-5, Water Balances, provides the estimated continuous water flow rates in gallons per minute corresponding to the heat and material balance case descriptions presented in Table 3.4-1.

During construction, water will be supplied by truck until the water intake at the Tehama-Colusa Canal is installed. Average daily use of construction water is estimated to be about 8,000 gallons. Water will be used primarily for dust suppression. A maximum daily water usage is estimated at 85,000 gallons during hydrotests of plant facilities (e.g., tanks and pipes). Approximately 5,000 gallons of water would also be used to hydrotest the new gas pipeline. There will be three cycles of water to be disposed of during the hydrotest. Depending on the test or washing cycle, the water to be discharged may include some metals or detergents. The water used during the hydrotest will be tested. If suitable for discharge, it will be routed to the stormwater detention basin. If the water quality is not suitable for discharge, it will be transported by trucks to an approved offsite disposal facility.

8.14.1.4.3 Water Policy

The CEC has the responsibility to apply state water policy to minimize the use of fresh water, promote alternative cooling technologies, and minimize or avoid degradation of the quality of the state's water resources. The state's water policy, adopted by the SWRCB, is specified in Resolution 75-58. The CEC's 2003 Integrated Energy Policy Report (IEPR) provides that "...the Commission will approve use of fresh water for cooling purposes…only where alternative water supply sources and alternative cooling technologies are shown to be 'environmentally undesirable' or 'economically unsound.'" Economically unsound is defined as economically or otherwise infeasible. Feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, legal, social, and technological factors.

The CEC's regulations require the Applicant to provide information on the source of water supply, the rationale for its selection, and if fresh water is to be used for cooling purposes, to discuss all other potential sources and why they were not considered feasible.

Alternative Plant Cooling System Considerations

In selecting a water supply for a power plant, the evaluation must consider the plant's water requirements to meet process needs and the availability of alternative water supplies. Power plant water requirements, other than for general maintenance and personnel needs, are related to cooling and to the steam cycle. All of the generation technologies that include a steam cycle (generation of steam to drive a steam turbine generator) require water for steam generation. A heat transfer medium is also required to condense the low-quality steam at the end of the cycle. Two methods of steam condensing are typically used: circulating cooling water through a condenser, and direct condensation of the steam in an air cooled condenser. The use of a circulating cooling water system entails the use of cooling towers, which can have a significant impact on plant water requirements.

Cooling system alternatives that are available range from wet cooling towers to air cooled condensers (dry system). An intermediate alternative is a hybrid system that incorporates a portion of both the wet

and dry technology. Since wet towers and an air cooled condenser system represent the extremes in water requirements these two cooling system alternatives were evaluated. A comparison of the general features of these two systems shows:

- Installed costs for the air cooled condenser are significantly more than for a wet cooling tower.
- When using an air cooled condenser, more fuel is used to maintain plant output compared to using a wet cooling tower.
- Water requirements for the air cooled condenser are typically on the order of 2,000 to 2,500 acre-feet per year, but can be on the order of 4,000 acre-feet per year less than the wet cooling tower, depending on the climate at the plant location.

Despite higher capital costs and impacts on plant output, the air cooled condenser for steam condensing was selected for the project based on the reduced water requirements of the air cooled condenser.

Alternative Water Supply Considerations

The Applicant evaluated several different alternative water supply and conservation options as part of the project. Based on annual water requirement of approximately 126 acre-feet per year, which is less than 0.03 percent of the amount of water transported and delivered to Colusa County via both the Tehama-Colusa Canal and the Glenn-Colusa Canal, the use of GCID water is preferred as the primary water supply option for the project. Selection of this source is based on the following:

- Both the Tehama-Colusa Canal and Glenn Colusa Canal are located near the site. Offsite linear facilities therefore are not extensive and no new interconnections are required.
- GCID has senior water rights; therefore, supply is not curtailed more than 25 percent.
- Water transfers can be made through Colusa County since the County is a Central Valley Project contractor.
- GCID has an existing wheeling agreement with TCCA that allows water supplied by GCID to be conveyed via the Tehama-Colusa Canal to the site vicinity.
- The water supply and quality meets the requirements for the project.
- A more-than-adequate water supply from GCID and robust storage capacity is available at the project site.

Other potential sources of water, as listed in SWRCB Resolution 75-58, were considered but deemed to be infeasible as summarized below.

Alternative 1: Ocean Water

Ocean water is not considered a feasible alternative since this water source is not locally available.

Alternative 2: Brackish Water from Irrigation Return Flow or Groundwater

Irrigation return flow is considered infeasible due to the cost of infrastructure that would be required to deliver the water to the project site and the unreliability of the flows.

GCID operates eleven drains within its system. These drains receive irrigation return flow which consists primarily of water from rice fields, as well as from row crops, orchard or pasture lands. GCID allows

fields to release water into its system in accordance with established polices and rules (e.g., herbicides cannot be released into the drain system). Information on the eleven drains is summarized in Table 8.14-14.

The use of irrigation return flow from the GCID drains is considered impracticable for the following reasons:

- An extensive and costly infrastructure system would be required to deliver the water from the drain to the site. The three closest drains are located between 7 and 10 miles east of the site and are east of I-5. Pipelines would need to be constructed within the existing road rights-of-way; therefore, the length of the pipeline would be considerably longer than the direct-line distance between the site and the drain. The pipeline routes would cross several creeks and canals/ditches. A pump station would be required for all locations.

- The drains provide an unreliable source of water. The amount of water that is available at each drain depends on how the fields are operated, which depends on the crop, climate, etc. Based on data from GCID for the period 1996 through 2005, outflow at the eleven drains is highly variable throughout the year. Typically there is no outflow during February and March, and there is no sustained minimum outflow at any of the drains during the remainder of the year.

- As a result of increased water conservation measures by upstream users, including more efficient irrigation practices and conversion to more water-efficient crops, irrigation return flows have become an increasingly unreliable source of water (USBR, 2005b).

- The irrigation return flow may require treatment for use at the plant. Limited water quality data are available for the return flows, but based on the nature of the water and electric conductivity data, the water from these drains would be expected to have elevated amounts of salts and minerals.

Limited information is available regarding the use of poorer quality groundwater from deeper zones in the vicinity of the project. The base of the fresh water occurs about 400 feet below mean sea level at the site (DWR, 2003) or about 550 to 600 feet below the site. The limited data available indicate the deeper strata may be largely non–water-bearing. Few wells have been drilled to these depths. An exploratory well was drilled on the west side of the valley near Willows in the last few years to a depth of about 1,000 feet. No significant water producing materials were encountered below a depth of about 80 feet (Stanton, 2006). While it is conceivable that a water supply could be developed from those deeper materials, determining whether that supply exists could entail substantial expense in drilling exploratory wells to find strata that might yield significant amounts of water to wells. Furthermore, even if promising water-bearing strata were identified, substantial uncertainties would remain as to the sources of recharge for those strata, and the long-term viability of production from such zones. Therefore, use of poorer quality groundwater from deeper zones is considered infeasible.

Alternative 3: Municipal Wastewater

The use of reclaimed municipal wastewater for power plant cooling at the CGS has been determined to be infeasible, primarily because the site is located in a rural area. Factors that make this source infeasible include: (1) the site is not within the service area of any sanitation district; (2) the closest treatment plant does not produce reclaimed water and even if it did, it still does not process sufficient quantities of waste water; and (3) the next closest wastewater treatment plants are more than 10 miles away from the site and extensive infrastructure would be required to deliver reclaimed water, if even available, to the site. These factors are described in more detail below.

The CGS would require approximately 190,000 gpd (132 gpm) of water. The nearest wastewater treatment plant to the CGS site is the Maxwell Public Utility District plant, approximately 5 miles southeast of the site. This plant has a design capacity of 0.2 mgd (million gallons per day) (139 gpm) and processes approximately 0.14 mgd (97 gpm) on average. As of 2006, the plant served approximately 800 to 900 residents, with approximately 414 sewer connections (Colusa LAFCO, 2006). The plant currently does not have the facilities to provide reclaimed water. Even if the plant did produce reclaimed water and assuming a conservative 90 percent recovery rate, the amount of reclaimed water would not be adequate to supply the plant.

The next closest plants are in Willows and Williams, which are located approximately 12 miles north and approximately 15 miles south of the site, respectively. The Willows wastewater treatment plant has a design capacity of 2.62 mgd (1,819 gpm) and processes an average of 1.22 mgd. This plant currently does not produce reclaimed water. The Williams wastewater treatment plant processes approximately 300,000 gpd (208 gpm) of wastewater; the quantity of reclaimed water produced at this plant, if any, is unknown. Costs and potential environmental impacts that would be associated with construction of infrastructure to convey reclaimed water to the project from these plants would be expected to be significant. Therefore, use of reclaimed water from these plants, even if it was available, is not considered feasible.

Alternative 4: Other Inland Waters

The following inland water supply sources were considered for the project:

- Groundwater at or near the project site. In 2001, three test wells were drilled on site to provide information about the local groundwater regime. The test program, detailed in Appendix O and summarized in Section 8.14.1.1, suggested that a sustained potential yield of about 200 gpm might be available from one onsite location. A sustained safe yield for year-round use was not determined. Because of uncertainty about whether a reliable source of sufficient groundwater is available to meet the proposed project's water supply needs, the use of groundwater as a water supply source was determined to be infeasible based on its lack of reliability.

- Potable water from the Maxwell Public Utility District. The nearest water supply system is in Maxwell, approximately 5 miles southeast of the site. Its annual production capacity is about 3,700 acre-feet. Due to distance and limited capacity of the system, use of this system was determined to be infeasible.

No other inland waters exist; therefore, inland water alternatives are considered environmentally and economically infeasible.

8.14.1.5 Wastewater Discharge

The power plant is designed to have no process wastewater discharge. The system is designed as a zero liquid discharge system, such that most process water will be recycled within the plant, with a small amount evaporated or concentrated in the dryer.

The Water Balance Diagram (Figures 3.4-5A and 3.4-5B) and the Water Balance Table (Table 3.4-5), summarize the power plant's wastewater streams and the disposition of wastewater. There will be two separate wastewater collection systems. The first is the plant wastewater system, which will collect wastewater from the CTG evaporative coolers and HRSGs, water treatment system, chemical feed area drains, and general plant drains. The second is the sanitary system, which will collect sanitary wastewater from sinks, toilets, and other sanitary facilities and discharge it to an onsite septic system. The sanitary system is based on gravity flow and may include lift stations if required.

The plant wastewater system will collect all wastewater generated in the operation of the plant and deliver it to a zero liquid discharge system. Wastewater streams, including CTG evaporative cooler and HRSG boiler blowdowns, are recycled through the water purification system and are returned to the demineralizer as a makeup supply. Reject streams are concentrated and the solids are then disposed at an approved landfill.

The plant's wastewater streams and treatments are described below in more detail.

Evaporative Cooler Blowdown

The concentration of dissolved solids in the evaporative cooler water is maintained below given limits, primarily for total dissolved solids (TDS), by withdrawing a portion of the evaporative cooler water (i.e., evaporative cooler blowdown) and replacing it with fresh makeup water from the raw water storage tank and recycling the evaporative cooler blowdown. The blowdown stream is sent to the demineralization water treatment system for reuse.

HRSG Blowdown

Water circulating in the plant's steam cycle accumulates dissolved solids that must be maintained below given limits to prevent deposition of solid particles on the steam turbine blading. The concentration of dissolved solids is maintained below such limits by withdrawing a portion of the water from the HRSG steam drums (i.e., HRSG blowdown), and replacing it with product water from the demineralization process described previously. HRSG blowdown is routed to the demineralization water treatment system for reuse.

Water Treatment System Demineralizer

The water treatment system demineralizer includes a micro filtration system, first and second pass reverse osmosis (RO) systems, and an electro-deionizer unit. The demineralizer receives recycled feed water that is distillate water from the evaporator unit of the zero liquid discharge system. Demineralized water from the demineralizer is sent to the demineralized water storage tank.

The electro-deionizer equipment consisting of a membrane and ion exchange system will continuously produce a concentrated reject water stream that contains all of the dissolved solids removed from the distillate water stream. This reject water stream will be routed to the evaporator and dryer of the zero liquid discharge system.

Chemical Feed Area Drainage

Chemical feed area drainage consists of spillage, chemical tank overflows, and maintenance operations, and is collected in corrosion-resistant piping separate from the general plant drainage system. The chemical feed area drainage is routed to a neutralization tank, adjusted to neutral pH, and then routed to the evaporator and dryer of the zero liquid discharge system.

General Plant Drainage

General plant drainage consists of wastewater collected by sample drains, equipment drains, equipment leakage, and area wash downs. Wastewater collected in the general plant drainage system is routed to the storm drain system. General plant drainage that potentially contains oil or grease is routed through an oily water separator, combined with the plant process wastewater and then discharged into the storm drain system. Water is then conveyed to the stormwater detention basin.

Sanitary Wastewater System

The sanitary system will collect sanitary wastewater from sinks, toilets, and other sanitary facilities and discharge it to an onsite septic system serviced by a tank and leach field located a the southeastern corner of the site. The sanitary system will be based on gravity flow and may include lift stations if required.

No county or municipal sanitary treatment facilities are located in the vicinity of the plant. Wastewater from sanitary facilities will be run through the plant septic tank. Wastewater effluent from the septic tank will be discharged into the ground through a leach field to be constructed just southeast of the septic tank (see Figure 3.4-1). Based on an average daily plant population of 31 permanent, full-time workers, with up to 16 employees during the day shift, an estimated 720 gallons per day of effluent will flow into the septic tank and out into the leach field. The septic tank will be permitted by Colusa County Department of Health and Human Services Environmental Health Division. Effluent discharge through the septic tank and into the leach field will be approved by the CVRWQCB. The septic leach field will be designed to be in conformance with the CVRWQCB's "Guidelines for Waste Disposal from Land Developments." The leach field will be designed to be more than 100 feet away from existing domestic wells, public wells, and flowing streams, and more than 50 feet away from ephemeral streams and the property line.

A series of percolation tests was performed by Lux Engineering & Surveying, Inc., to provide a basis for leach field design. The results of this program are contained in Appendix P.

8.14.1.6 Site Drainage

The 31-acre site will be graded to accommodate the proposed power generating facility and switchyard. Temporary construction areas for construction trailers, parking, and laydown will also be graded. During construction, stormwater runoff from the power generating facility area will be directed to a 2.2-acre-foot detention basin. The proposed site drainage plan during construction is shown on Figure 3.5-3.

During construction activities, BMPs such as silt fences, straw bales, covered stockpiles, etc., will be used to minimize the potential for erosion and discharge of pollutants off the site. Stormwater runoff from the plant area will be conveyed to a detention basin located near the southwestern portion of the site. This basin will be sized to allow sediments that may be carried in the runoff to settle and not be discharged off site. This temporary sediment basin would be converted to a permanent stormwater detention basin. A construction SWPPP that includes temporary BMPs to be implemented during construction will be prepared in accordance with the NPDES General Permit for Storm Water Discharge Associated with Construction Activities.

The power plant site is currently unoccupied agricultural land used for grazing. Estimated areas of land disturbance during construction and operation of the plant are shown in Table 3.6-3.

The CGS will implement the following BMPs during construction at the project site to minimize discharge of pollutants to surface waters:

- Sweep public roadways adjacent to the project site that are used by construction and worker vehicles at least twice a day.
- Treat the entrance roadways to the construction site with soil stabilization compounds.
- Place sandbags adjacent to roadways to prevent runoff to public roadways.
- Install windbreaks at the windward sides on construction areas prior to soil being disturbed. The windbreaks shall remain in place until the soil is stabilized or permanently covered.

- Replace ground cover in disturbed areas as quickly as possible.
- Employ tire washing and gravel ramps prior to entering a public roadway to limit accumulated mud and dirt deposited on public roadways.
- Cover all trucks hauling dirt, sand, soil, or other loose materials and maintain a minimum of 6 inches of freeboard between the top of the load and the top of the trailer.
- Apply covers or dust suppressants to soil storage piles and disturbed areas that remain inactive for more than two weeks and during the rainy season.
- Schedule construction activities to minimize disturbed soil area during the rainy season to the extent practicable.
- Implement temporary soil stabilization and erosion control measures throughout the defined rainy season (October 15 through April 15). BMPs will be implemented prior to the start of the rainy season and be inspected prior to forecasted storm events, during extended rain events and after storm events that cause runoff from the construction site.
- During the rainy season, implement temporary erosion controls at the draining perimeter of the disturbed soils areas, at the toe of slopes, at storm drain inlets and at outfall areas at all times.
- Protect creeks and canals to prevent discharge of sediments, debris, and wastes associated with construction activities from entering the watercourses. BMPs could include directing water away from work areas, using covers or platforms to collect debris if working over water, and placing stockpiles away from watercourses.
- Non–stormwater discharges into drainage systems or waterways are prohibited. Examples of prohibited discharges common to construction activities include:
  - Vehicle and equipment wash water, including concrete washout water
  - Slurries from concrete cutting, asphalt grinding, and paving operations
  - Slurries from concrete or mortar mixing operations
  - Runoff from dust control applications of water
  - Sanitary and septic wastes
  - Chemical leaks and/or spills of any kind including but not limited to petroleum, paints, cure compounds, etc.
- For temporary stream crossings (e.g., at the Teresa Creek Bridge) stabilize construction roadways, adjacent work area, and stream bottom against erosion.

Following completion of construction, grassland areas outside the project's permanently disturbed areas will be restored. In laydown areas where topsoil has been removed and crushed rock (gravel) placed for construction, the rock material will be removed, and compacted soils loosened. Disturbed areas to be restored will be reseeded with appropriate native plants.

The switchyard will be covered with crushed rock and the plant area will be covered with gravel, buildings, tanks, and roads. Approximately 5 acres will be impervious (i.e., buildings, tanks, and roads). The proposed site drainage plan is shown on Figure 3.5-2. Stormwater runoff from the 22-acre plant area will be collected by a surface drainage system and conveyed to a 2.2-acre-foot storm water detention basin. The basin will be designed to detain the difference in runoff before-construction (pre-development) and after-construction (post-development) conditions due to increased impervious area.

The basin will also detain stormwater runoff to allow particles and associated pollutants, if any, to settle. The detention basin will be designed to accommodate the peak runoff of the pre-development condition resulting from a 10-year, 24-hour storm event and provide the required detention time for pollutant removal. The flow of stormwater will generally follow the existing drainage pattern.

A portion of the plant area will be curbed (e.g., equipment areas with the potential for leakage) and storm water within these curbed areas will be collected and visually inspected, and then routed to the detention basin or to the oil/water separator and then to the detention basin. Design criteria for the site drainage system are provided in Appendix A, Civil Engineering Design Criteria. The drainage ditches will be designed to convey the 10-year, 24-hour rainfall runoff and will be protected by erosion control fabric, riprap, concrete paving, or soil-cement to minimize erosion. As shown on Figure 3.5-5, the detention basin will be constructed with engineered earth dikes. A standpipe outlet structure will be used to regulate discharge from the basin. The outlet will be protected with riprap, or other similar materials, to prevent erosion. The basin would be emptied within 48 hours or less after the cessation of a storm event to eliminate the potential for mosquito breeding. An SWPPP that describes the post-construction stormwater management system and BMPs to be implemented to prevent the discharge of pollutants off the site will be prepared in accordance with the NPDES General Permit for Storm Water Discharge Associated with Industrial Activities.

Heavy-haul deliveries will require replacement of the Teresa Creek Bridge and Glenn-Colusa Canal Bridge, and widening of the shoulders at the eastern half of the intersection of Delevan Road and McDermott Road. At the completion of construction activities, Delevan Road from I-5 to McDermott Road, McDermott Road to Dirks Road, and Dirks Road to the plant access road will be repaved/ resurfaced. A description of these improvements is provided in Section 3.6.3.

8.14.1.7 Flooding

The plant is located on a site that is elevated well above the local valleys. The current site topography is rolling hills that range in elevation from 175 to 190 feet above msl. After construction, the plant site will be at an approximate elevation of 183 feet above msl. As shown on Figure 8.14-2, the plant site is not within the 100-year flood zone. The Colusa County General Plan map is based on the FEMA Flood Insurance Rate Maps (FIRMs) from 1989. FEMA recently updated the FIRMs for Colusa County. FIRM Community Panel Number 06011C0310F, with an effective date of May 15, 2003, indicates a 100-year flood zone along Glenn-Colusa Canal (FEMA, 2003).

8.14.2 Environmental Consequences

To evaluate the environmental consequences of the proposed project relative to water supply, water quality, and flood hazards, the following criteria were used to determine whether project-related impacts would be significant. Impacts would be considered significant if the project would affect (by bulleted category):

- Groundwater
  - Substantially degrade groundwater quality.

- Surface Water
  - Substantially alter surface water chemistry or temperature;
  - Substantially alter the volume of water in a surface water body;
  - Contaminate a public water supply;
  - Substantially reduce the amount of water otherwise available for public water supplies;

  - Change currents or the course of direction of water movements in marine or fresh waters; or
  - Obstruct or alter any navigable water of the United States.

- Flood Hazard
  - Substantially increase the risk of flooding, erosion, or siltation; or
  - Change absorption rates, drainage patterns, or the rate and amount of surface runoff.

8.14.2.1 Groundwater

Construction, operation, and maintenance of the facility will not use groundwater. However, construction, operation, or maintenance of the facility could potentially impact groundwater quality through inadvertent spills or discharge that could then infiltrate and percolate down to groundwater. Excavation dewatering during construction is not anticipated. The maximum depth of excavation is estimated to be approximately 10 feet, which is considerably less than observed water levels near the site of approximately 45 feet bgs.

A limited amount of dewatering may be required as part of the construction for the abutments of the new bridge over the Glenn-Colusa Canal. Due to the proximity to the canal, any water encountered during bridge construction activities would be expected to have similar water quality as the canal water and would be considered low-threat water discharge. Infiltration from the septic leach field could potentially impact groundwater. The leach field will be permitted through the County Public Health Department, which will require the system to be protective of groundwater supplies.

Due to the clayey soils and depth to groundwater (in excess of 40 feet), degradation of groundwater is not expected. With implementation of the mitigation measures proposed in Section 8.14.4.1, Groundwater BMPs, the potential impacts to groundwater would not be significant.

8.14.2.2 Surface Water

The proposed project will withdraw surface water from the Tehama-Colusa Canal, and pipe it to the proposed project site. GCID will provide the water through a transfer agreement with Colusa County, which will deliver the water to the vicinity of the project via the Tehama-Colusa Canal. The project will withdraw approximately 126 acre-feet per year for consumptive uses, or a maximum of approximately 132 gpm. This volume is less than significant when compared to the approximately 2,000 cubic feet per second (9 million gpm) of canal flow past the site. Therefore, there would be no adverse impact on water supply or other users of this source.

The GCID's current water allocation is 825,000 acre-feet of water per year. This allocation is based on the contractual right pursuant to a Sacramento River water settlement contract with the U.S. Bureau of Reclamation. GCID's annual customer deliveries vary between 700,000 acre-feet per year and 825,000 acre-feet per year. GCID's large water allocation coupled with their existing conservation programs ensures that the required 126 acre-feet per year will be available for the Colusa Generating Station. Due to GCID's senior water rights in California, GCID's allocation is limited to a maximum curtailment of 25 percent. In the last 10 years only two curtailments have been imposed on GCID and none have occurred in the last 6 years (Tenney, 2001). GCID has never been curtailed in excess of the 25 percent legal limit. Per the project's agreement with GCID, there will be no curtailment of water supply to the project. CGS's usage of 126 acre-feet per year constitutes less than 0.02 percent of GCID's total water allocation. Given that the supply to the CGS is such a small proportional amount of GCID's overall allotment, it would not cause a significant impact on GCID or its customers.

TCCA operates the Tehama-Colusa Canal and its 26 pools to keep it full throughout the year. The project would extract water from the canal between check structures 15 and 16, which are located at mile 60.5 and 66.0, respectively (as measured downstream along the canal). The new intake structure for the project would be installed at approximately mile 63.3. The target water level for this pool of the canal is elevation 205 feet. The depth of water in this pool is approximately 11 to 13.5 feet. The project would not change or result in any adverse effects to TCCA's operations of the canal.

There will be no discharge of process water to surface water bodies because the project will use a zero liquid discharge system as described in Section 3.4.7. Therefore, there would be no significant impacts to canal or river water quality.

Construction, operation, or maintenance of the facility could impact surface water quality of local streams, canals, and the Sacramento River through inadvertent spills or discharges. Construction activities could also increase the potential for erosion and uncontrolled runoff of stormwater contaminated with sediments or other pollutants that could impact surface water quality and sedimentation. The site drainage plan and erosion control plans of the proposed facility during and after construction are shown in Figures 3.5-2 and 3.5-3. BMPs such as silt fences, hay bales, etc., will be used during construction to minimize the potential for erosion. A stormwater detention basin will be provided to detain stormwater runoff and sediment. With the project as designed and implementation of the BMPs proposed in Section 8.14.4.2, the impacts to surface water quality will be less than significant.

All of the switchyard and most of the plant area will be covered with crushed rock or gravel. Stormwater collected in curbed areas of the plant will be collected and routed through an oily water separator before being conveyed to the stormwater detention basin. Stormwater within the curbed area has the highest likelihood of coming into contact with potential contaminants. Since no stormwater from the curbed areas would be discharged directly to local streams or canals, there would be no impact to surface water quality.

There will be minimal ground disturbance associated with construction of the water supply intake and pipeline. The intake structure at the Tehama-Colusa Canal will be an over-the-bank type system. Disturbance to the canal embankment will be limited to installation of the electrical control enclosure, anchoring of the intake, and burial of a short section of the intake pipe under the maintenance road within the canal. BMPs would be implemented to prevent discharge of sediments and pollutants into the canal. The pipeline from the canal to the plant would be installed using a trenching machine to minimize ground disturbance. A new unpaved access road between the canal and plant would be provided. Again, BMPs would be implemented during construction of the pipeline and access road to prevent discharge of sediments and pollutants into surface waters.

The project would not alter currents or direction of general site water flow since there would be no significant increase in discharges off site and site topography would not be altered except in the area of construction. The general site drainage pattern would be similar to that shown in Figure 3.5-1, Pre-Construction Runoff and Drainage Pattern Plan. Nor would the project obstruct or alter navigable waters, since nearby streams are ephemeral. More detailed plans of the post-construction drainage pattern are shown on Figures 3.5-2 and 3.5-3.

The total natural drainage area of the Hunters Creek watershed above Delevan is approximately 82 square miles. The estimated area to be disturbed by the proposed site during construction is approximately 97 acres or about 0.15 square mile. After construction, the project would add approximately 5 acres or less than 0.008 square miles of impervious area. Any changes in the quantity of runoff due to the project would be small compared to the total amount of runoff within the watershed, therefore, the impact to downstream water users of Hunters Creek would be insignificant.

Project features designed to be protective of water quality include the zero liquid discharge system, which will eliminate offsite discharge of process wastewater, a stormwater detention basin to collect and manage stormwater runoff from the project site, and secondary spill containment around chemical delivery and storage areas, diesel fuel tanks, and transformers. The site is not located in a floodplain. Impacts to water resources would be less than significant.

Two bridges will be replaced: the Teresa Creek Bridge and the Glenn-Colusa Canal Bridge. These bridges will be designed and constructed to minimize potential for scour of Teresa Creek and the unlined Glenn-Colusa Canal. Stormwater runoff from the bridge decks will be directed towards the shore and not discharged directly into the creek or canal. Impacts to water quality would be less than significant.

8.14.2.3 Flooding

The project would not increase the risk of flooding, erosion, or siltation. There would be only minimal changes in absorption rates, drainage patterns, or the rate or amount of surface runoff due to the additional surface paving and the placement of equipment associated with the project. The project site does not receive stormwater runoff from off site and is not within a 100-year floodplain.

Development of roads, buildings, and other paved and impermeable surfaces will reduce the amount of stormwater that infiltrates into the ground and will increase the amount of water that runs off the site. Runoff from most of the site will be routed through a detention pond that will reduce the rate of runoff leaving the site. Therefore, the project's impact on runoff volume and resulting increase in downstream flooding is considered less than significant.

The plant is located on a site elevated well above the 100-year floodplain. Stormwater runoff will be routed to the stormwater detention basin. Runoff from curbed equipment areas would be routed through the oil/water separator prior to discharge into the basin. The plant site will be graded, as shown on Figure 3.5-2, to promote drainage to prevent onsite flooding and minimize the potential for flooding to neighboring areas. All new structures must be designed to accommodate possible flooding in accordance with the Colusa County Building Code. No significant impacts related to flooding are expected as a result of the proposed project.

The temporary construction laydown area will be located north of the proposed switchyard area as shown on Figure 8.14-2. Equipment, materials, stockpiles, etc., will not be placed within the designated 100-year floodplain that is present north of the laydown area. Therefore, there would be no impacts to floodplains due to construction activities.

As described in Section 3.6.3, two bridges would be replaced with clear span bridges. Therefore, there would be no encroachment into Teresa Creek or the Glenn-Colusa Canal and no impediment to flood flows or flood elevations.

Therefore, the project's impact to flood flows and flood elevations in Teresa Creek and the Glenn-Colusa Canal is considered less than significant.

8.14.3 Cumulative Impacts

The project would use a very small amount of water (126 acre-feet per year). This would have a negligible effect on surface water availability in the region. Because the project would not increase net extraction from the canal and there would be no discharge to surface water bodies, it would not contribute to cumulative impacts to water resources in the area.

8.14.4 Best Management Practices

This section presents measures (BMPs) that should be implemented during construction and operation of the project so that effects on water resources are minimized or avoided.

8.14.4.1 Groundwater

WR-1 Proper implementation of BMPs during construction and throughout project operation (e.g., spill prevention and control, preventative maintenance, hazardous materials management), as well as adherence to all applicable codes and permits, will help minimize the potential for contamination of groundwater. No significant impacts to groundwater are anticipated.

8.14.4.2 Surface Water

WR-2 As discussed in Section 8.9.1.4, Agriculture and Soils; Soil Loss and Erosion, impacts to surface water from erosion are expected to be minimal during construction. Erosion will be controlled in accordance with an approved Erosion Control Plan as discussed in Section 8.9.2.2, Agriculture and Soils; Construction. In addition, all construction activities will be performed in accordance with the California NPDES General Permit for Storm Water Discharge Associated with Construction Activities (SWRCB, 1999), requiring the implementation of BMPs to control sediment and other pollutants mobilized from construction activities.

Temporary BMPs are discussed in Section 8.9.4.2, Agriculture and Soils; Temporary Erosion Control Measures, and may include revegetation, slope stabilization, construction of berms and ditches, and sediment barriers such as straw bales or silt fences to prevent sediment discharges from the site. These measures will be developed and described for the construction activities in a Construction SWPPP that must be prepared before construction begins. With proper implementation of BMPs, no significant impacts to surface water quality are anticipated during short-term construction activities. In addition, use of existing infrastructure will minimize physical impacts from construction activities. No significant impacts to surface water are anticipated as a result of construction activities.

WR-3 Permanent erosion control measures are discussed in Section 8.9.4.2, Agriculture and Soils; Permanent Erosion Control Measures, and include drainage systems and revegetation. Operation of the facility will be in conformance with the California NPDES General Permit for Storm Water Discharge Associated with Industrial Activities (SWRCB, 1997). In accordance with this permit, an industrial SWPPP will be developed, and BMPs will be implemented to control pollutants in stormwater discharges. BMPs will include refueling and maintenance of equipment only in designated lined and/or bermed areas, isolating hazardous materials from stormwater exposure, and preparing and implementing spill contingency plans in specified areas. With proper implementation of these and other BMPs in the SWPPP, no significant impacts to surface water quality are anticipated during the long-term operation of the facility.

8.14.4.3 Flooding

WR-4 The two new bridges, one across the Glenn-Colusa Canal and the other across Teresa Creek, will be designed as clear span bridges. Therefore there would be no encroachment into the canal and creek and no impacts to flood flows and flood elevations. To avoid or

minimize construction activities in floodplains, construction staging areas would be located outside floodplain limits.

8.14.5 Mitigation Measures

No mitigation measures are required for water resources.

8.14.6 Laws, Ordinances, Regulations, and Standards

The primary agency for regulating surface water and groundwater discharge in California is the Regional Water Quality Control Board (RWQCB). The State Water Resources Control Board (SWRCB) delegates authority for implementation of regulations to RWQCB and creates general policies and plans. The SWRCB and RWQCB are agencies within the California Environmental Protection Agency. The federal agencies (e.g., U.S. EPA) have delegated most authority on water pollution issues to the state. Consequently, the RWQCB determines allowable concentration limits for effluents, issues permits, and enforces the regulations.

Local water districts, water suppliers, and health departments may also act when a pollutant has the potential to threaten their drinking water supply. Effluent limitations, and toxic and effluent standards are established pursuant to Sections 301, 302, 303(d), 304, 307, and 316 of the Clean Water Act (CWA).

The RWQCB for the Central Valley Region produced the most recent *Central Valley Water Quality Control Plan* in 1998. This document outlines general water quality goals for the Sacramento and San Joaquin valleys. Industrial service supply water (e.g., process water supply) is identified as a beneficial use and as such has "essentially no water quality limitations except for gross constraints…" (CVRWQCB, 2004).

The proposed project will operate in accordance with all applicable laws, ordinances, regulations and standards (LORS). The LORS that are potentially applicable to the water resources components of this project are identified below. Several LORS involve conformance only by reporting to the applicable agency if a spill or release occurs or require notification/approval for structural work within a surface body, etc. The LORS that require permitting are discussed in Section 8.14.7. Project conformance with the LORS is summarized in Table 8.14-15.

8.14.6.1 Federal

The Clean Water Act of 1977 (including 1987 amendments) §402; 33 USC §1342; 40 CFR Parts 122-136

Administering Agency: RWQCBs

Compliance: In lieu of an NPDES Permit, the project will use Notices of Intent (NOIs) to comply with the general NPDES requirements that regulate stormwater and other discharges to water by establishing effluent limitations and monitoring and reporting requirements as described in Section 8.14.7.

Central Valley Project Improvement Act of 1992; Title 34, §3405(a) Water Transfers

Administering Agency: U.S. Bureau of Reclamation

Compliance: E&L Westcoast will secure required U.S. Bureau of Reclamation approval and required NEPA compliance, if any.

8.14.6.2 State

California Porter-Cologne Water Quality Control Act of 1998; California Water Code §13000-14957; Division 7, Water Quality

Administering Agency: SWRCB, RWQCB

Compliance: Discharge of waste to land, such as septic leach fields, must comply with the Waste Discharge Requirements.

The Porter-Cologne Act established the jurisdiction of the nine California RWQCBs, granting them the authority to issue Waste Discharge Requirements (WDRs) that impose annual discharge fees and establish discharge limits, operation and maintenance requirements for treatment equipment, and monitoring, record keeping, and reporting requirements.

The septic leach field will be designed pursuant to the Guidelines for Waste Disposal from Land Developments and will be permitted by the Colusa County Department of Health and Human Services, Environmental Health Division. Prior to issuance of a permit, a soil profile test must be performed and submitted to the County.

California Water Code (CWC) § 13550 et seq.

Administering Agency: SWRCB; RWQCB

Compliance: Requires use of reclaimed water where available and appropriate. The SWRCB also adopted Resolution 75-58, which encourages the use of wastewater for power plant cooling and established the following order of preference for cooling purposes:

1. Wastewater discharged to the ocean
2. Ocean water
3. Brackish water or irrigation return flow
4. Inland wastewater with low total dissolved solids
5. Other inland water

The project will use air cooling and a zero liquid discharge technology that will reduce the amount of water used by the plant. There are no adequate or reliable reclaimed water sources nearby.

California Water Code § 13260

Administering Agency: RWQCB

Compliance: Requires a Report of Waste Discharge (ROWD) for any discharge waste that could affect the "quality of the waters of the State, other than into a community sewer system." This relates to the discharge of waste in the septic leach field, which will comply with applicable LORS, as discussed above.

California Water Code §13271-13272; 23 CCR §2250-2260

Administering Agency: RWQCB; California Office of Emergency Services

Compliance: Requires filing a report of release of specified reportable quantities of hazardous substances including oil and petroleum products when the release is into or will likely discharge into waters of the State.

California Constitution, Article 10 §2

Administering Agency: SWRCB

Compliance: Prohibits waste or unreasonable use of water. The project will recycle water and will use a zero liquid discharge technology.

The California Safe Drinking Water and Toxics Enforcement Act (California Health and Safety Code 25249.5 et seq.)

Administering Agency: RWQCB

Compliance: Prohibits actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity. The project will not discharge process water.

8.14.6.3 Local

Colusa County General Plan (Colusa County, 1989)

Administering Agency: Colusa County

Compliance: The project will minimize sedimentation and erosion through control of grading, vegetation removal, and placement of roads (CO-14). There will be no development in the 100-year floodplain (SAFE-2). The project will protect local water rights and interests (WA-1). The project will use water from the Tehama-Colusa Canal for industrial use and thereby support efforts which enable waters of the canal to be used for municipal and industrial uses (WA-10). The project will avoid extensive alteration of natural creeks and destruction of riparian vegetation (FL-3). The project will not place structures in the floodplain (FL-6)

8.14.7 Involved Agencies and Agency Contacts

Issue	Agency/Address	Contact/Title	Telephone
Water quality	State of California Environmental Protection Agency California Regional Water Quality Control Board, Central Valley Region 11020 Sun Center Drive #200 Rancho Cordova, CA 95670-6114	Jacque Kelley Sanitary Engineer	(916) 464-4764
Water supply	Tehama-Colusa Canal Authority 5513 Highway 162 P.O. Box 1025 Williams, CA 95988	David Bird, General Manager and Chief Engineer	(530) 934-2125
Water supply	Glenn-Colusa Irrigation District 344 East Laurel Street P.O. Box 150 Williams, CA 95988	Thaddeus Bettner General Manager	(530) 934-8881
Water supply	U.S. Bureau of Reclamation 1140 West Wood Street P.O. Box 988 Williams, CA 95988	Rich Robertson Chief	(530) 934-1356
Water quality	Colusa County Department of Environmental Health 251 East Webster Street Colusa, CA 95932	Rob Kostlivy, Director of Public Health	(530) 458-0395

8.14.8 Permits Required and Permit Schedule

This section describes the required permits related to water resources for the CGS. The following table summarizes these required permits. Additional details on information required for each permit application and where the required information can be found in this document is provided in Table 8.14-16.

Responsible Party	Permit/Approval	Schedule
U.S. Bureau of Reclamation	Right-of-use from the Bureau of Reclamation (allows intake structures to be constructed at Tehama-Colusa Canal)	90 days prior to construction
Central Valley RWQCB	Construction Activities Stormwater General Permit; California RWQCB Water Quality Order 99-08-DWQ (addresses stormwater during construction)	30 days prior to construction
Central Valley RWQCB	Low Threat Water Discharge Permit; California RWQCB Central Valley Region Order 5-00-175 (allows discharge of short duration or low-threat wastewater)	30 days prior to construction
Central Valley RWQCB	Industrial Activities Stormwater General Permit; California RWQCB Water Quality Order 97-03-DWQ (addresses stormwater during plant operation)	30 days prior to start of plant operations
Colusa County Department of Health and Human Services, Environmental Health Division	Colusa County Regulations; Septic Facility Permit (allows operation of septic leach field)	30 days prior to start of plant operations

The proposed project will withdraw surface water from the Tehama-Colusa Canal. The U.S. Bureau of Reclamation requires application for right-of-use to construct water delivery facilities to withdraw water from the canal. The application is submitted to the TCCA for initial review prior to being forwarded to the U.S. Bureau of Reclamation for review and approval. The application will be submitted at least 90 days prior to start of construction.

The California SWRCB Water Quality Order 99-08-DWQ: "National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated With Construction Activity (General Permit)" authorizes a general permit for storm water discharges associated with construction activities that disturb more than 1 acre. Construction activities subject to the permit include cleaning, grubbing, grading, stockpiling, and excavation activities. The General Permit requires submittal of an NOI to comply with the permit and the development of a SWPPP for construction activities. The SWPPP will describe BMPs to prevent stormwater pollution during construction activities. BMPs include erosion controls, sediment controls, and other controls to prevent stormwater from contracting pollutants. The SWPPP will also include a stormwater monitoring program.

The CVRWQCB Order 5-00-175 "Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters" addresses potential discharges of low water quality-threat wastewater. Such discharges include: (1) short duration (four months or less) or (2) low flow (average dry weather discharge does not exceed 0.25 million gallons per day). Types of discharges covered by this permit include: (1) well development water; (2) construction dewatering; (3) pump/well testing; (4) pipeline/tank pressure testing; (5) pipeline/ tank flushing or dewatering; (6) condensate; (7) water supply system; and (8) miscellaneous dewatering and low-threat discharges. See Table 8.14-16, page 2, for information required on the permit application.

The SWRCB Water Quality Order No. 97-03-DWQ "General Permit to Discharge Storm Water Associated With Industrial Activity" authorizes a general permit to regulate industrial stormwater discharges. An NOI will be filed with the CVRWQCB prior to commencement of operation. In accordance with NPDES permit requirements, a SWPPP that addresses stormwater pollution prevention during operations must be developed. The SWPPP will identify BMPs to be used at the facility and a stormwater monitoring program.

The plant will operate as a zero liquid discharge system as described in Chapter 3, and there will be no discharge of process water to surface water bodies. Pursuant to the California Water Code Section 13260, a ROWD must be filed with the CVRWQCB if a project will discharge waste that could affect the quality of the waters of the state. Form 200, Application/Report of Waste Discharge, General Information for NPDES Permits and Waste Discharge Requirements, will be filled out and submitted to start the application process for waste discharge requirements for the discharge of wastewater to the septic leach field. This application is not required for the NPDES permit, since the project will use the permit NOIs to comply with the General NPDES permit requirements. All stormwater runoff outside the curbed areas will be discharged to the stormwater basin prior to being discharged offsite to surface water.

For compliance and control of sanitary wastewater, a permit will be obtained from the Colusa County Department of Health and Human Services, Environmental Health Division, for the septic leach field. The system will be designed in accordance with the CVRWQCB's "Guidelines for Waste Disposal from Land Developments." Soil profile test results will be submitted with the permit application.

8.14.9 References

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Table 8.14–1
Estimated Groundwater Storage Capacity

Ground-Water Storage Unit	Area (acres)	Depth (feet)							
		20-50		50-100		100-200		All Zones (20-200)	
		Specific Yield (percent)	Storage (acre-feet)	Specific Yield (percent)	Storage (acre-feet)	Specific Yield (percent)	Storage (acre-feet)	Specific Yield (percent)	Storage (acre-feet)
Colusa Basin	195,640	4.6	272,000	3.4	335,000	5.7	1,121,000	4.9	1,728,000
Stony Creek Alluvial Fan	185,840	10.4	583,000	9.6	891,000	7.7	1,438,000	8.7	2,912,000
Alluvial Fan, Delevan to Zamora	129,730	5.9	229,000	6.0	392,000	5.9	768,000	5.9	1,389,000

Reference: Olmsted and Davis, 1961.

Table 8.14-2
Groundwater Analyses for GCID Well and Vicinity

Water Quality Parameter	Units	GCID Well Near Willows				Vicinity Wells[c]
		Jul 12, 1989[a]	Jul 25, 1989[a]	Aug 1, 1989[a]	Sep 12, 2006[b]	
pH field	SU	7.5	7.5	7.7	7.8 (lab)	7.2 – 8.1
Total Dissolved Solids	mg/L	224	245	252	230	22 – 1320
Total Suspended Solids	mg/L	NA	NA	NA	<5	NA
Turbidity	NTU	NA	NA	NA	0.07	NA
Total Organic Carbon	mg/L	NA	NA	NA	<0.5	NA
Hardness as $CACO_3$	mg/L	NA	NA	NA	130	157 – 508
Boron	mg/L	0.16	0.16	0.16	0.18	<0.1 – 0.5
Calcium	mg/L	31.9	32.1	33.2	28	33 – 93
Magnesium	mg/L	17.5	17.6	17.6	15	18 – 67
Sodium	mg/L	29.0	27.6	28.5	21	11 – 265
Potassium	mg/L	<1.0	<1.0	<1.0	NA	<0.5 – 2.0
Manganese	mg/L	<1.0	<1.0	<1.0	<0.01	<0.001 – 0.116
Total Alkalinity as $CaCO_3$	mg/L	161	165	165	130	148 – 335
Sulfate	mg/L	18	18.6	20	13	11 – 427
Chloride	mg/L	22.3	22.7	24.4	19	6 – 226
Nitrate	mg/L	7.66	1.55	2.35	1.3	NA
Phosphorus	mg/L	NA	NA	NA	0.068	NA
Silica	mg/L	NA	NA	NA	18	NA
Specific Conductance	µmhos/cm	415	430	420	360	315 – 2245
Antimony	mg/L	NA	NA	NA	<0.06	NA
Arsenic	mg/L	NA	NA	NA	<.005	<0.001 – 0.002
Barium	mg/L	NA	NA	NA	0.12	<0.05 – 0.218
Beryllium	mg/L	NA	NA	NA	<0.002	NA
Cadmium	mg/L	NA	NA	NA	<0.005	<0.001
Chromium	mg/L	NA	NA	NA	0.011	0.005 – 0.031
Cobalt	mg/L	NA	NA	NA	<0.02	NA
Copper	mg/L	NA	NA	NA	<0.010	0.003 – 0.03
Iron	mg/L	<0.04	<0.04	<0.04	<0.1	<0.02 – 0.792
Lead	mg/L	NA	NA	NA	0.0085	<0.005 – 0.008
Mercury	mg/L	NA	NA	NA	<0.0002	NA
Molybdenum	mg/L	NA	NA	NA	<0.02	NA
Nickel	mg/L	NA	NA	NA	<0.02	NA
Selenium	mg/L	NA	NA	NA	<0.005	<0.0008-0.013
Silver	mg/L	NA	NA	NA	<0.005	NA
Thallium	mg/L	NA	NA	NA	<0.005	NA
Vanadium	mg/L	NA	NA	NA	<0.010	NA
Zinc	mg/L	NA	NA	NA	<0.02	0.01 – 0.024

bgs	below ground surface	mg/L	milligrams per liter	SU	standard units
µg/L	micrograms per liter	NA	not available	<	less than indicated reporting limit
µmhos/cm	micromhos per centimeter	NTU	nephelometric turbidity units	–	not analyzed

a Groundwater sample collected from test well; water –producing zones between 270-290 feet bgs and 374-408 feet bgs. Water Analyses by CH2M Hill, 1989.
b Sample collected from GCID pumping well on 9/12/06; analyses by C&T, 2006b.
c Data from DWR (2003). Results are for samples collected from 13 wells throughout the GCID area.

Table 8.14-3
Well #3 Water Analyses

Water Quality Parameter	Concentration
Turbidity	24 NTU
Color	10
pH	7.7
Total Suspended Solids	54 mg/L
Total Dissolved Solids	510 mg/L
Hardness as $CaCO_3$	166 mg/L
Calcium	17 mg/L
Magnesium	30 mg/L
Sodium	160 mg/L
Potassium	2.4 mg/L
Barium	0.2 µg/L
Beryllium	NA
Total Alkalinity as $CaCO_3$	410 mg/L
Bicarbonate	410 mg/L
Sulfate	13 mg/L
Chloride	77 mg/L
Nitrate	< 1 mg/L
Fluoride	0.3 mg/L
Arsenic	< 0.01 mg/L
Iron (Ferric)	0.2 mg/L
Boron	0.1 mg/L
Silica	24 mg/L

Water Analysis by STL Chroma Lab, 2001

Note:

Well #3 was drilled and tested in 2001 within the project site. See Appendix O for details.

µg/L micrograms per liter
mg/L milligrams per liter
NA not available
NTU nephelometric turbidity units

Table 8.14-4
Mean Monthly Streamflow for Sacramento River and Creeks in the Site Vicinity (cfs)

Month	Sacramento River above Bend Bridge near Red Bluff	Sacramento River near Hamilton City	Stony Creek below Black Butte Dam	South Fork Willow Creek near Fruto,	Stone Corral Creek near Sites	Estimated Hunters Creek at Delevan
January	18,400	22,100	1,290	24.4	31.7	68.0
February	20,400	22,900	1,620	29.0	39.2	84.2
March	17,700	15,900	892	13.1	21.2	45.5
April	12,000	13,500	510	3.30	8.13	17.5
May	12,700	10,600	416	0.62	1.35	2.90
June	12,600	8,970	272	0.079	0.21	0.45
July	13,200	8,830	250	0.001	0.17	0.36
August	11,700	8,590	231	0	0	0
September	8,540	7,220	164	0	0	0
October	6,900	6,880	89	0	0	0
November	8,940	9290	86	0.72	0.6	1.29
December	13,800	16,100	544	1.78	10.7	2.30

Notes:

cfs = cubic feet per second

1. Streamflow data for USGS Gaging Station No. 1137100 – Sacramento River above Bend Bridge near Red Bluff, California are available for October 1963 through September 2005. Flows are affected by dams and diversions upstream. The drainage area above the gaging station is 8,900 square miles.
2. Streamflow data for USGS Gaging Station No. 11383800 – Sacramento River near Hamilton City, California are available for April 1945 through October 1980. Flows are affected by dams and diversions upstream. The drainage area above the gaging station is 10,833 square miles.
3. Streamflow data for USGS Gaging Station No. 11383800 – Stony Creek below Black Butte Dam near Orland, California are available for July 1955 through October 1990. Flows are affected by dams and diversions upstream. The drainage area above the gaging station is 738 square miles.
4. Streamflow data for USGS Gaging Station No. 11390655 – South Fork Willow Creek near Fruto, California are available for July 1963 through September 1978. The drainage area above the gaging station is 38.9 square miles.
5. Streamflow data for USGS Gaging Station No. 11390672 – Stone Corral Creek are available for April 1958 through September 1964 and October 1965 through September 1985. The drainage area for Stone Corral Creek above the gaging station is 38.2 square miles.
6. Streamflow data for Hunters Creek are not available. Flows are estimated based on drainage area proportioning of streamflows for Stone Corral Creek near Sites which has a longer period of record than South Fork Willow Creek near Fruto. Drainage area for Hunters Creek at Delevan is approximately 82 square miles, based on USGS topographic maps at scale of 1:100,000. See Figure 8.14-1.
7. Mean Monthly Streamflow data from USGS, 2006.

Table 8.14-5
Average Monthly Flows in 2000
Tehama-Colusa Canal

Time Period	Flow (cfs)
January	47
February	0
March	59
April	194
May	324
June	633
July	525
August	414
September	138
October	62
November	2
December	1

Source: Data provided by Tehama-Colusa Canal Authority

Notes: cfs = cubic feet per second
Flows recorded at Check 16, the measuring station closest to the proposed point of diversion

Table 8.14-6
Water Flows and Water Quality in 2000
Glenn-Colusa Canal at Hunters Creek

Time Period	Electrical Conductance (mmhos/cm)	Flow (cfs)	Temperature (°F)
January	0.91	5	48
February	0.83	8	49
March	0.70	7	56
April	0.27	15	53
May	0.31	30	67
June	0.46	8	65
July	0.36	15	75
August	0.39	25	79
September	0.39	1	71
October	0.42	1	66
November	0.26	10	55
December	0.27	45	52
April-October Mean	**0.35**	**14**	**68**
Yearly Mean	**0.38**	**13**	**61**

Source: Data provided by GCID.

Notes: Electrical conductance (E.C.) is provided in millimhos per centimeter (mmhos/cm) and is an indication of Total Salt Content. E.C. in the range of 0 to 1 mmhos/cm is considered suitable for irrigation under most conditions.

cfs = cubic feet per second.
°F = degrees Fahrenheit.

Table 8.14-7
Tehama-Colusa Canal Water Analyses

Water Quality Parameter	Tehama-Colusa (3/5/01)[a]	Tehama-Colusa (4/11/01)[b]
Turbidity	–	3.8 NTU
Color	–	10
pH	8.3	–
Total Suspended Solids	35 mg/L	12 mg/L
Total Dissolved Solids	94 mg/L	92 mg/L
Hardness as $CaCO_3$	62 mg/L	69 (75) mg/L
Calcium	20 mg/L	15 mg/L
Magnesium	2.9 mg/L	7.6 mg/L
Sodium	8.0 mg/L	8.8 mg/L
Potassium	–	1.2 mg/L
Barium	28 µg/L	<0.1 mg/L
Beryllium	2.3 µg/L	–
Total Alkalinity	78 mg/L	60 mg/L
Bicarbonate	78 mg/L	60 mg/L
Sulfate	7.4 mg/L	8.1 mg/L
Chloride	5.4 mg/L	4.5 mg/L
Nitrate	–	1.2 mg/L
Fluoride	–	<0.1 mg/L
Arsenic	< 0.005 mg/L	<0.01 mg/L
Iron	–	<0.1 mg/L
Boron	–	<0.1 mg/L
Silica	–	8.8 mg/L

Notes:

µg/L micrograms per liter
mg/L milligrams per liter
NTU nephelometric turbidity units
– not analyzed

[a]Water Analysis by Curtis & Tompkins, Ltd.
[b]Water Analysis by STL Chromalab

Table 8.14-8
Glenn-Colusa Canal Water Analyses

Water Quality Parameter	Units	Glenn-Colusa (3/8/01)[a]	Glenn-Colusa (8/23/06)[b] S1	Glenn-Colusa (8/23/06)[b] S2	Glenn-Colusa (8/23/06)[b] S3
Turbidity	NTU	–	5.7	4.8	3.6
Color	Color units	–	5.0	5.0	5
pH	SU	7.7	7.4	7.5	7.5
Total Suspended Solids	mg/L	20	7	6	<5
Total Dissolved Solids	mg/L	88	120	110	110
Total Organic Carbon	mg/L	–	1.3	1.3	1.2
Hardness as $CaCO_3$	mg/L	46	46	44	45
Specific Conductance	µmhos/cm	–	110	130	110
Calcium	mg/L	–	10	9.7	9.7
Magnesium	mg/L	–	5	4.9	5
Manganese	mg/L	–	0.0077	0.008	0.0076
Sodium	mg/L	–	4.9	4.9	4.9
Total Alkalinity as $CaCO_3$	mg/L	46	48	49	49
Bicarbonate	mg/L	46	48	49	49
Phosphorus	mg/L	–	0.12	0.15	0.12
Sulfate	mg/L	5.4	2.9	3.0	2.9
Chloride	mg/L	3.5	2.0	1.8	1.8
Nitrate	mg/L	–	<0.05	0.05	<0.05
Antimony	µg/L	–	<1.0	<1.0	<1.0
Arsenic	µg/L	<5	2.1	2.1	1.8
Barium	µg/L	40	17	16	16
Beryllium	µg/L	<2	<1	<1	<1
Cadmium	µg/L	–	<1	<1	<1
Chromium	µg/L	–	1.9	1.7	1.9
Cobalt	µg/L	–	<1	<1	<1
Copper	µg/L	–	1.6	1.7	1.6
Mercury	µg/L	–	<0.2	<0.2	<0.2
Molybdenum	µg/L	–	<1	<1	<1
Nickel	µg/L	–	1.9	1.7	1.9
Lead	µg/L	–	<1.0	<1.0	<1.0
Selenium	µg/L	–	<1	<1	<1
Silver	µg/L	–	<1	<1	<1
Thallium	µg/L	–	<1	<1	<1
Vanadium	µg/L	–	4.1	3.3	3.8
Zinc	µg/L	–	<5.0	7.9	<5.0
Iron	mg/L	–	0.25	0.20	0.25
Silica	mg/L	–	17	16	15

Notes:

µg/L	micrograms per liter	NTU	nephelometric turbidity units	<	less than indicated reporting limit
µmhos/cm	micromhos per centimeter	SU	standard units	–	not analyzed
mg/L	milligrams per liter	NA	not available		

a Water Analyses by Curtis & Tompkins, Ltd., 2001.
b Water Analyses by Curtis & Tompkins, Ltd., 2006a
S1 sampled from near the water surface; S2 and S3 sampled from approximately 5 feet below the water surface.

Table 8.14-9
Sacramento River Water Quality Data

Parameter	Units	Near Hamilton City				Above Bend Bridge near Red Bluff			
		Minimum	Maximum	Average	Number of Values	Minimum	Maximum	Average	Number of Values
pH	Standard units	6.3	8.4	7.1	21	7.1	8.0	7.6	27
Total Dissolved Solids	mg/L	51	107	87	27	–	–	–	–
Total Suspended Solids	mg/L	0.5	318	30.8	27	2	21	7	12
Hardness as $CaCO_3$	mg/L	46	70	55	27	42	58	52	14
Calcium	mg/L	9	15	12	21	–	–	–	–
Magnesium	mg/L	5	8	6.2	21	–	–	–	–
Manganese	µg/L	1.8	272	30.5	21	–	–	–	–
Alkalinity as $CaCO_3$	mg/L	38	70	59	21	71	79	75	7
Phosphorus	mg/L	0.01	0.17	0.04	26	<0.01	0.23	0.05	26
Arsenic	µg/L	1.3	3.2	1.8	21	–	–	–	–
Chromium	µg/L	0.64	18.9	2.6	21	–	–	–	–
Copper	µg/L	0.73	18.7	3.1	21	NA	NA	11	1
Lead	µg/L	0.01	3.2	0.4	21	NA	NA	2	1
Nickel	µg/L	0.59	30.7	3.9	21	NA	NA	43	1
Selenium	µg/L	0.09	0.4	0.2	21	–	–	–	–
Zinc	µg/L	0.44	35.0	4.7	21	–	–	–	–
Specific conductance	µS/cm	95	166	130	12	105	152	121	27

Notes:

1. Water quality data available for Sacramento River near Hamilton City, California (USGS Gaging Station 11383800) from April 2001 through May 2006.
2. Water quality data available for Sacramento River above Bend Bridge near Red Bluff, California (USGS Gaging Station 11377100) from October 1977 through May 2000.

– Not analyzed
mg/L milligrams per liter
µg/L micrograms per liter
µS/cm microsiemens per centimeter
NA Not available

Table 8.14-10
Water Quality for Stone Corral Creek

Parameter	Temperature (Deg. C)	Discharge (cfs)	Sediment Suspended Concentration (mg/L)	Sediment Discharge, Suspended (tons/day)
Minimum	5	0.1	4	0
Maximum	26.7	852	3,880	8,080
Average	11.6	6,284	202	184
Number of Values	155	156	156	156

Notes:

Deg. C = degrees Celsius
cfs = cubic feet per second
mg/L = milligrams per liter

1. Water quality data available for Stone Creek Corral (USGS Gaging Station 11390672) from November 17, 1965 through June 3, 1968.
2. Data from http://water.usgs.gov/ca/nwis

Table 8.14-11
Water Quality Data for Stony Creek below Black Butte Dam

Parameter	Units	Minimum	Maximum	Average	Number of Values
pH	Standard units	7.3	8.6	8.1	187
Turbidity	NTU	7	330	63	9
Total Dissolved Solids	mg/L	NA	NA	NA	0
Total Suspended Solids	mg/L	2	4190	396	53
Hardness as $CaCO_3$	mg/L	84	280	140	161
Manganese	µg/L	10	20	13	3
Nitrate	mg/L	ND	3.5	0.5	26
Alkalinity as $CaCO_3$	mg/L	NA	NA	139	1
Copper	µg/L	<20	20	<20	3
Iron	µg/L	600	690	643	3
Lead	µg/L	ND	ND	ND	3
Zinc	mg/L	<20	20	20	3
Specific conductance	µS/cm	194	634	330	200

Notes:

1. Water quality data available for Stony Creek below Black Butte Dam near Orland, California (USGS Gaging Station 11383000) from October 1957 through September 1979 and for October 1995.
2. Total suspended solids (TSS) data available for November 1957 through August 1962, plus one event in August 1965 (TSS = 60 mg/L). Black Butte Dam was completed in 1963.

– Not analyzed
mg/L milligrams per liter
µg/L micrograms per liter
µS/cm microsiemens per centimeter
NA Not available
ND non detect; detection limit not specified
NTU nephelometric turbidity units

Table 8.14-12
Climate Summary for Williams, California
Period of Record: 1952 to 1988

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	54.5	60.8	65.8	73.2	82.1	91.2	96.6	94.6	89.1	79.2	64.6	55.4	75.6
Average Min. Temperature (°F)	36.1	39.0	41.3	44.8	52.0	58.3	60.4	58.4	54.8	48.3	40.6	36.5	47.5
Daily Max. Extreme Temp. (°F)	83	83	88	97	102	112	113	115	109	100	91	76	115
Daily Min. Extreme Temp. (°F)	22	25	27	31	35	45	45	46	39	33	23	21	21
Average Total Precipitation (inches)	3.26	2.61	1.80	1.00	0.27	0.20	0.03	0.07	0.34	0.80	2.37	2.88	15.64
Average Total Snowfall (inches)	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Average Snow Depth (inches)	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: WRCC, 2006.

Table 8.14-13
Daily and Annual Average Water Consumption Requirements

Stream Name	Average Flow (gpm)	Maximum Flow (gpm)	Average Annual Usage (acre ft/year)
Sanitary Waste	5	5	8
Minor Losses	1	1	1.6
CTG Cooler Evaporation [1, 2, 3]	0	96	77.4
HRSG Blowdown Evaporation [2, 3, 4]	12.3	19.1	25.3
Steam Cycle Leakage [2, 3, 4]	5.5	9.0	11.7
Crystallizer Evaporation [2, 3, 4]	1.0	1.5	2.1
Total Plant Water Usage Requirements	**24.8**	**131.6**	**126.1**

Notes:

1. Average annual usage based on CTG evaporative cooler operation ON for six months per year.
2. Average flow rates are calculated with duct firing OFF and CTG evaporative cooler OFF.
3. Maximum flow rates are calculated with duct firing ON and CTG evaporative cooler ON.
4. Average annual usage assumes duct firing operation 50 percent of the time.

Table 8.14-14
Summary of Drains

Drain ID	Drain Name	Approximate Distance from Site (miles)	Approximate Elevation (feet above msl)	Drain Outflow			Electrical Conductance		
				Minimum Annual (acre-feet)	Maximum Annual (acre-feet)	Minimum Daily (cfs)	Minimum (mmhos/cm)	Maximum (mmhos/cm)	Mean Annual (mmhos/cm)
D1	Salmon Hole	11 NE	83	1,000 (1996)	10,333 (2003)	0	0.29 (Dec)	0.58 (Apr)	0.37
D2	Bondurant	17 NE	103	8,000 (1998)	16,023 (2002)	0	0.33 (Dec)	0.47 (Apr)	0.37
D3	Drain 55	15 NE	95	5,800 (1998)	16,943 (2002)	0	0.28 (May and Oct)	3.00 (Sep)	0.48
D4	Logan Creek	7 E	68	3,700 (1996)	43,486 (2003)	0	0.31 (Jan)	0.53 (Mar)	0.36
D5	2047 Sidds	19 NE	95	20,600 (1997)	43,676 (2002)	0	0.29 (Jan)	0.52 (Apr)	0.33
D6	Willow Creek	12 NE	85	13,000 (1996 and 1997)	72,328 (2003)	0	0.22 (Jan)	0.63 (Apr)	0.36
D7	Hunter Creek	8 E	66	6,100 (1996)	28,564 (2001)	0	0.24 (May)	0.73 (Apr)	0.39
D8	Stone Corral	9 SE	64	16,000 (1996)	57,982 (2002)	0	0.23 (May)	0.74 (Feb)	0.38
D9	Kuhl Weir	11 SE	61	12,500 (1996)	36,765 (2001)	0	0.27 (Nov)	0.77 (Apr)	0.36
D10	Section 25	13 SE	62	11,600 (1996)	35,350 (2002)	0	0.28 (May)	0.77 (Apr)	0.38
D11	Freshwater	15 SE	57	16,100 (1996)	18,781 (2001)	0	0.0.34 (Nov)	1.15 (Feb)	0.51

Notes:
1. Distance from site represents direct-line distance between drain location and site (i.e., as the crow flies). Distances measured from map provided by GCID (1.5 inch = 1 mile).
2. Elevation of drain location based on USGS topographic maps (source: www.topozone.com).
3. Drain outflows based on period of record from 1996 through 2005. Data for 1996-2000 only available for April through October. Data for 2001-2005 available for January through December (GCID, 2006).
4. Electrical conductance (E.C.) is an indication of total salt content and suitability for irrigation. Data only available for 2005 (GCID, 2005). Suitability for irrigation is as follows:
   Class I (EC = 0-1 mmhos/cm) – suitable for irrigation under most conditions
   Class II (EC = 1-3 mmhos/cm) – depends on crop, climate, etc
   Class III (EC above 3 mmhos/cm) – unsuitable under most conditions.

cfs cubic feet per second
E east
mmhos/cm millimhos per centimeter
msl mean sea level
NE northeast
SE southeast

Table 8.14-15
Applicable Water Resources Laws, Ordinances, Regulations, and Standards

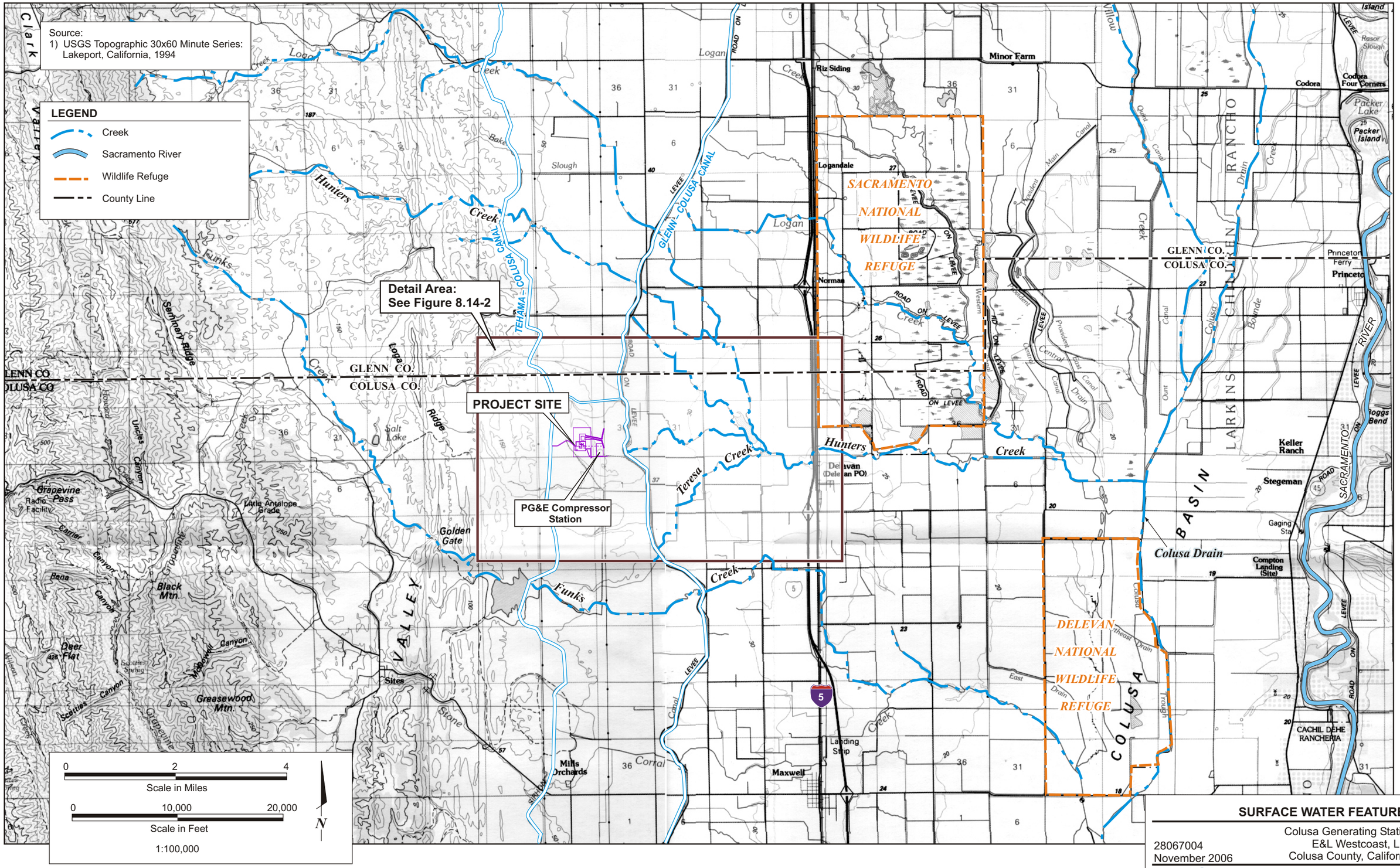
Laws, Ordinances, Regulations, and Standards	Administering Agency	Applicability	AFC Section
Federal			
CWA	RWQCB	Regulates discharges of wastewater and stormwater to protect nation's waters. Applies to wastewater discharged to septic leach field and stormwater runoff.	Discharges of wastewater subject to WDR permit and stormwater subject to NPDES permits (Sections 8.14.2.1 and 8.14.2.2). Permits to be obtained through RWQCB (Section 8.14.7).
RCRA	RWQCB	Controls storage, treatment, disposal of hazardous waste.	Hazardous waste will be handled and stored in conformance with Subtitle C. Section 8.13.4.
CERCLA	RWQCB	Places responsibility for releases of hazardous materials into the environment.	Obtain waste generator number and waste discharge/disposal permits as appropriate. Section 8.13.
National Environmental Policy Act (NEPA)	U.S. Bureau of Reclamation	Right-of-use for structure at Tehama-Colusa Canal	Section 7.1 Water intake structure will be constructed on the canal.
State			
SWRCB Water Quality Orders	RWQCB	Regulates industrial stormwater discharges during construction and operation of the facility.	Part of federal NPDES permit requirements. Compliance monitored by CVRWQCB. Section 8.14.2.2.
Porter-Cologne Water Quality Control Act	RWQCB	Controls discharge of wastewater to the surface and groundwaters of the state. Applies to wastewater discharged to septic leach field.	Discharge will be in accordance with CWA/Porter-Cologne NPDES/WDR permit. Section 8.14.5.2.
Safe Drinking Water and Toxic Enforcement Act	RWQCB	Proposition 65 prohibits certain discharges to drinking water sources.	Part of federal NPDES permit requirements. Compliance monitored by RWQCB. Section 8.14
California Water Code Section 461 and SWRCB Resolution 77-1	RWQCB	Encourages conservation of water resources.	Effective practices for water conservation and reuse were engineered into the facility design. Section 8.14.
California Environmental Quality Act (CEQA)	Colusa County	Water supply superseded by CEC process	Section 7.1 CEC review of CEQA equivalent process
Local			
General Plan	County	Address issues such as drainage, erosion control, hazardous material spill control, facility siting in flood zones, and stormwater discharge.	Project will comply with the General Plan of Colusa County. Sections 8.14.3 and 8.14.4.

Notes:

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
CVRWQCB Central Valley Regional Water Quality Control Board
CWA Clean Water Act
NPDES National Pollutant Discharge Elimination System
RWQCB Regional Water Quality Control Board
SWRCB State Water Resources Control Board
WDR Waste Discharge Requirements

Table 8.14-16 Colusa Generating Station Permits Summary (Page 1 of 2)	
Form 1 – Consolidated Permits Program – General Information	
Requirement	**AFC Section/Figure Number**
Topographic map – 1 mile beyond facility, showing existing and proposed intake and discharge structures and surface water bodies	Figure 3.5-3
Description of nature of business	Section 1.4, Facility Description; Chapter 7, Water Supply
Form 200 – Application Report of Waste Discharge General Information for NPDES Permits and Waste Discharge Requirements[a]	
Type of discharge	Sections 3.4.7.1, 3.5.6
Characterization of the discharge including design flows, list of constituents, and discharge concentration of each constituent, description and schematic drawing of treatment processes, description of BMPs and description of disposal methods.	Sections 3.4.7.1, 3.5.6
Site map at 1:24,000 scale	Figure 3.5-3
Form 2E – Facilities Which Do Not Discharge Process Wastewater	
List of outfalls and name of receiving waters	Section 8.14, Figure 3.5-3
Effluent characteristics	Section 3.5.7
Frequency of flow and duration	Section 3.5.7
Treatment systems	Section 3.4.7
NOI to Comply with General Order 99-08-DWQ – Permit to Discharge Stormwater Associated with Construction Activities	
Area of construction activity including access roads	Section 3.6.4, Figure 3.5-2
Area to be disturbed by construction activities	Section 3.6.4, Figure 3.5-2
Percentage of site that is impervious before and after construction	Section 8.14, Figures 3.5-1 and 3.5-3
Receiving water information	Figure 3.5-2
Status of the SWPPP	Section 8.14.7
Status of development and monitoring program	Section 8.14.7
Vicinity map showing construction site 8.5 × 11 or 11 × 17	Figure 3.5-2

Table 8.14-16 Colusa Power Plant Permits Summary (Page 2 of 2)	
Form 1 – Consolidated Permits Program – General Information	
Requirement	**AFC Section/Figure Number**
NOI to Comply with Order No. 5-00-175 – Dewatering and other Low Threat Discharges to Surface Waters	
Discharge location and map at scale 1:24,000 that shows treatment system, discharge point, and surface waters	Figure 3.5-3
Type of discharge (pipeline tank/pressure testing)	Section 3.6.2.4
Evaluate and rule out containment or re-use discharge	Section 3.6.2.4
Treatment system schematic drawing	Figure 3.5-3
Receiving water information	Figure 3.5-2
Identify primary pollutants likely to be in discharge	Section 8.14.1.2.5
NOI to Comply with SWRCB Water Quality Order No. 97-03-DWQ, NPDES General Permit to Discharge Storm Water Associated with Industrial Activities No. CAS000001	
Total size of the facility in acres and percentage of site that is impervious	Section 3.4
Receiving water information	Section 8.14.1
Status of SWPPP and Monitoring Program	Section 8.14.7
Site map	Figure 3.5-3
Application for Sewage Disposal System Permit	
Soil profile characterization, including percolation tests, leach field design	Appendix P
Application for Right-of-Use from the Bureau of Reclamation	
Brief description of the proposed project	Section 3.1
Legal land description	Section 3.2
Maps and drawings including plan and profile for proposed construction (e.g., turnouts, siphons, and other water delivery installations)	to be prepared during detailed design, see Section 7.2
Description of environmental impacts	Sections 8.2 and 8.14
Note: General Information Forms to be submitted with NPDES applications.	



SURFACE WATER FEATURES

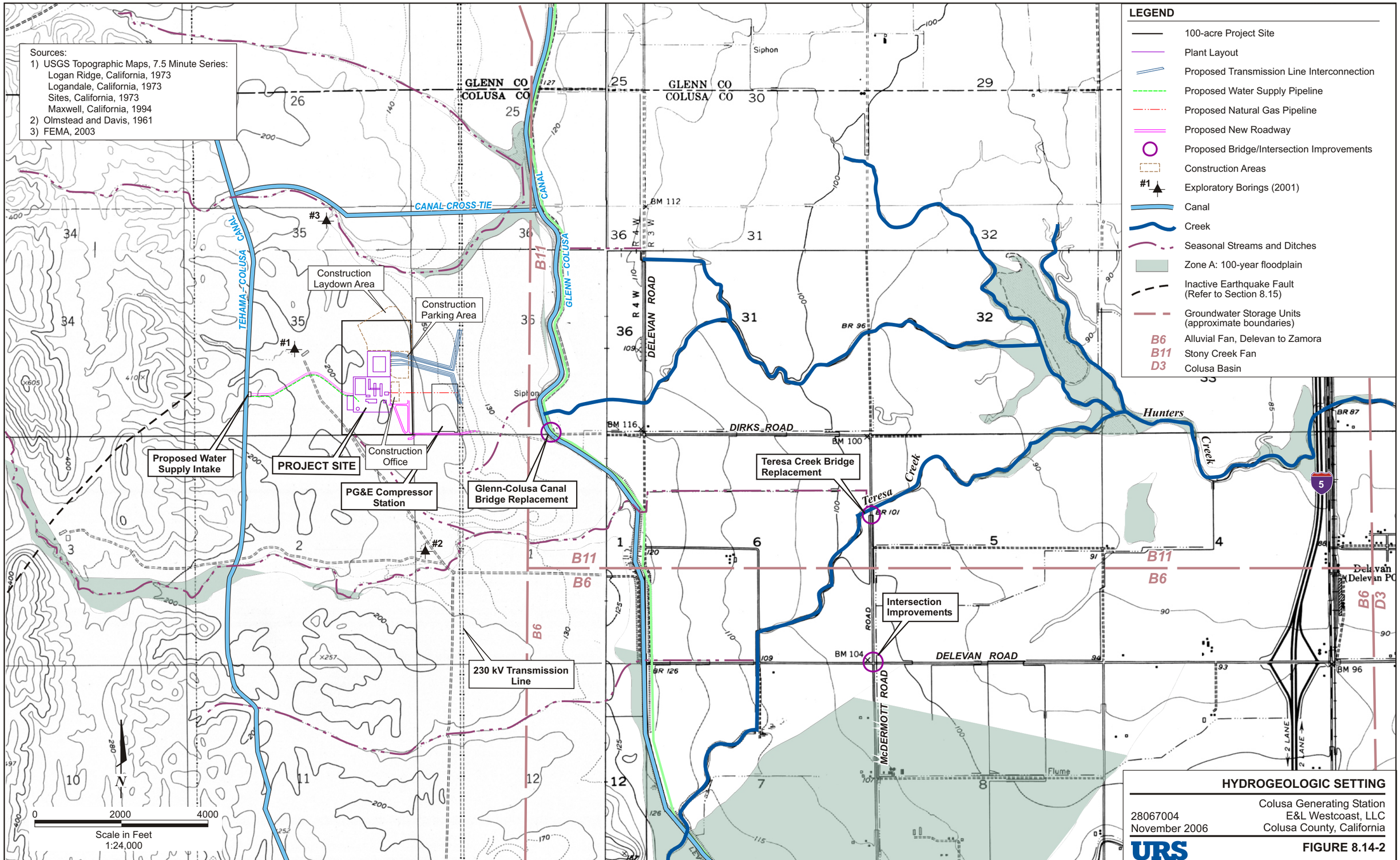
Colusa Generating Station
E&L Westcoast, LLC
Colusa County, California

28067004
November 2006

URS

FIGURE 8.14-1

11/02/06 vsa ..\28067004 CPV Colusa\8.14 Water Resources\8.14-1_sfc water.cdr



HYDROGEOLOGIC SETTING

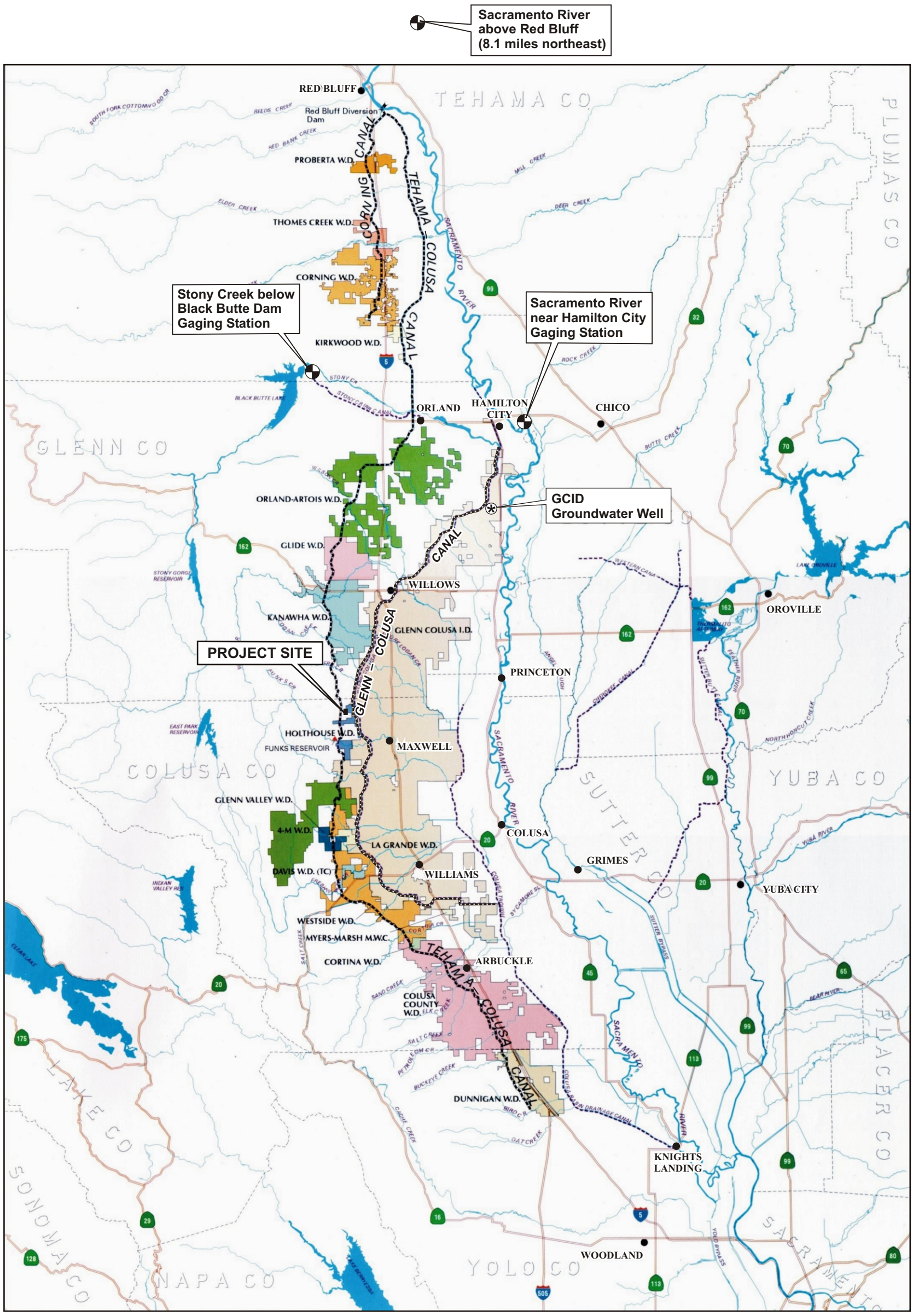
Colusa Generating Station
E&L Westcoast, LLC
Colusa County, California

28067004
November 2006

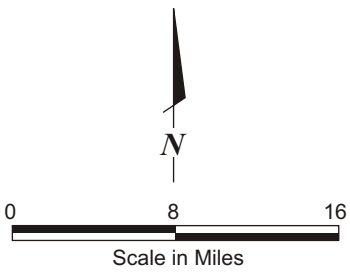
URS

FIGURE 8.14-2

11/02/06 vsa ..\28067004 CPV Colusa\8.14 Water Resources\8.14-2_hydro.cdr



Source:
Tehama-Colusa Canal Authority, July 1996



LEGEND

- Gaging Station
- Groundwater Well

TEHAMA-COLUSA CANAL AND GLENN-COLUSA CANAL SYSTEMS

28067004
November 2006

Colusa Generating Station
E&L Westcoast, LLC
Colusa County, California

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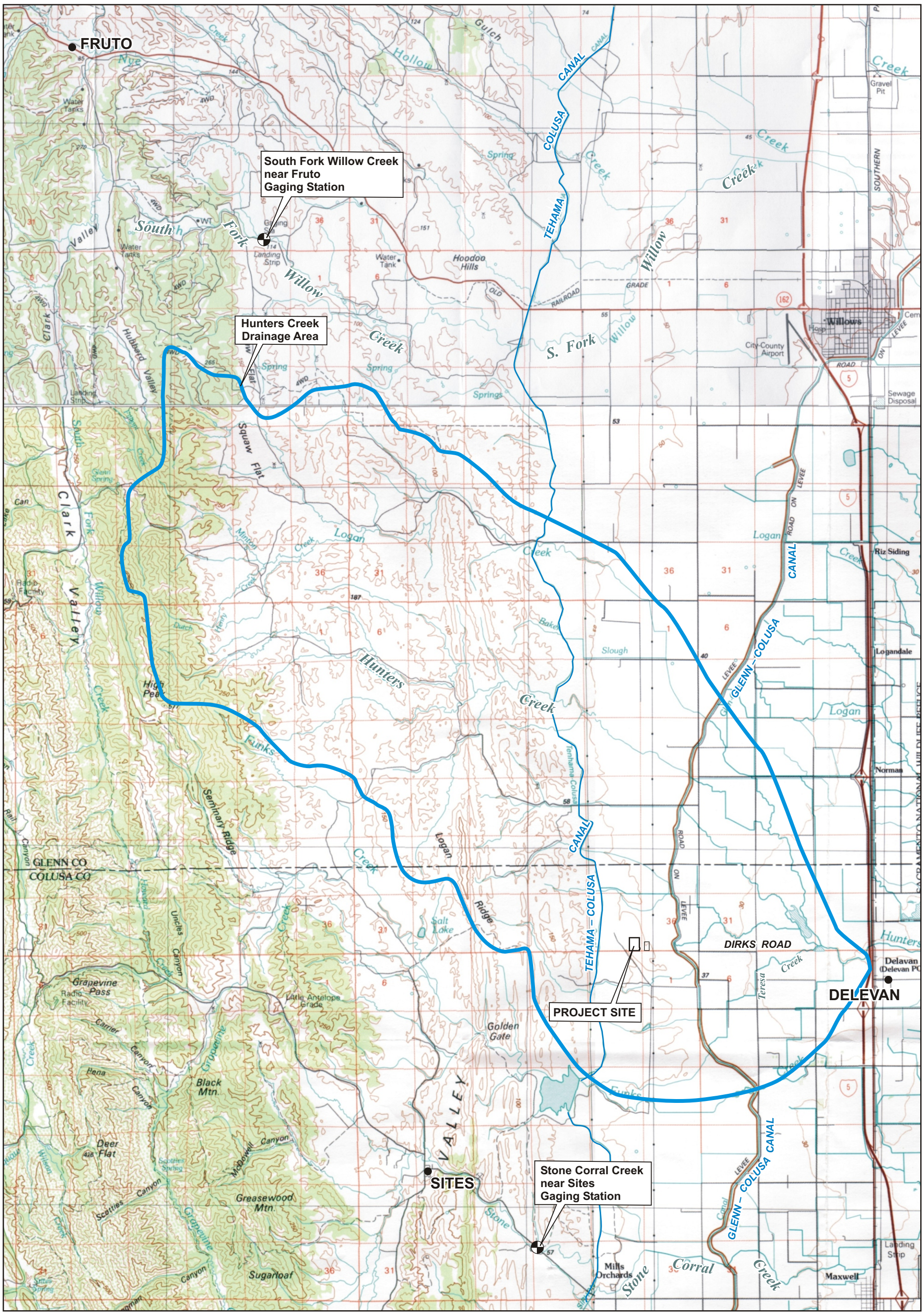
FIGURE 8.14-3

10/25/06 vsa ..\28067004 CPV Colusa\8.14 Water Resources\8.14-3_canal system.cdr



Source:
USGS Topographic 30x60 Minute Series:
Lakeport, California, 1994
Willows, California, 1987

N

0 2 4

Scale in Miles
1:100,000

HUNTERS CREEK DRAINAGE

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Colusa Generating Station
E&L Westcoast, LLC
Colusa County, California

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FIGURE 8.14-4

10/25/06 vsa ..\28067004 CPV Colusa\8.14 Water Resources\8.14-4_Hunters crk.cdr