8.14 Water Resources

8.14.1 Introduction

This subsection evaluates the effect of the Walnut Energy Center (WEC) project on water resources. Subsection 8.14.2 presents the LORS compliance strategy. Subsection 8.14.3 describes the hydrologic setting, Subsection 8.14.4 characterizes water use and disposal, and Subsection 8.14.5 discusses precipitation, storm runoff, and drainage. Subsection 8.14.6 discusses the project's effects on water resources. Mitigation is discussed in Subsection 8.14.7. Subsection 8.14.8 provides the proposed monitoring plans and compliance verification procedures. Subsection 8.14.9 discusses cumulative impacts. Subsection 8.14.10 lists the permits required and agency contacts. Subsection 8.14.11 provides the references consulted in preparing this subsection.

Water resources potentially affected by the proposed WEC project include the following:

- Effects on water supply
- Effects on surface waters
- Effects on groundwater recharge, degradation, or depletion
- Effect of stormwater
- Effects on flooding

These issues are addressed in detail below.

8.14.2 Applicable Laws, Ordinances, Regulations, and Standards

Federal, state, county, and local laws, ordinances, regulations, and standards (LORS) applicable to water resources and conformance are discussed in this subsection and summarized in Table 8.14-1.

8.14.2.1 Federal

The Clean Water Act (CWA) authorizes the U.S. Environmental Protection Agency (USEPA) to regulate discharges of wastewater and stormwater into surface waters by issuing National Pollutants Discharge Elimination System (NPDES) permits. The Central Valley Regional Water Quality Control Board (RWQCB) implements these permits at the state level, but USEPA may retain jurisdiction at its discretion. The CWA's primary effect on WEC is with respect to the control of soil erosion during construction and the need to prepare and implement site-specific erosion control plans and measures for the construction of each project element that will require disturbance of surface soil.

Section 404 of the CWA regulates wetland fill and dredge in jurisdictional waters, and provides guidance on crossing waterways. The U.S. Army Corps of Engineers (USACE) administers Section 404 permits for fill of waterways. If any of the waterways crossed by pipelines or the project are considered jurisdictional, the project will be required to acquire 404 and 401 permits. Compliance with 404 permits are described in more detail in Subsection 8.2, Biological Resources.

Section 401 of the CWA requires a water quality Certification or Waiver to be issued in combination with a 404 permit.

TABLE 8.14-1
Laws, Ordinances, Regulations, and Standards Applicable to WEC Water Resources

LORS	Applicability	How Conformance Is Achieved	Agency/Contact
Federal			
Clean Water Act (CWA) as implemented by the Regional Water Quality Control Board (RWQCB)	Regulates stormwater discharge by issuing Construction Activity NPDES Stormwater Permit	NPDES permits for construction stormwater prior to construction and plant operation.	RWQCB George Day RWQCB 3443 Routier Road Sacramento, CA 255-3506
Clean Water Act Section 401	Water Quality Certification	Requires water quality certification for any Section 404 permit; delegated to RWQCB.	RWQCB George Day RWQCB 3443 Routier Road Sacramento, CA 255-3506
Clean Water Act Section 404	Wetlands disturbance	Section 404 permit for work in jurisdictional wetlands, if any. Required prior to any work below the high-water mark of the creek.	USACE Kathy Norton Environmental Engineer 1325 J Street Sacramento, CA 95814-2922 916-557-5260
State			
NPDES permit for stormwater, construction, or temporary dewatering	Regulates stormwater discharge (see above)	NPDES permits for construction and industrial stormwater prior to construction and plant operation.	George Day RWQCB 3443 Routier Road Sacramento, CA 255-3506

TABLE 8.14-1
Laws, Ordinances, Regulations, and Standards Applicable to WEC Water Resources

LORS	Applicability	How Conformance Is Achieved	Agency/Contact
Title 22 of the CCR	Requirements for the use of sewage effluent in cooling towers	City of Turlock WWTP effluent will meet Title 22 requirements.	Greg Vaughn RWQCB 3433 Routier Road Sacramento, CA 255-3142 Joe Spano DHS Stockton, CA (209)948-7696 Dan Madden Wastewater Manager Department of Public Utilities Turlock Wastewater Plant Turlock, CA 93706
California Water Code 13550 et seq. and Resolution 75-58	Encourages reuse of water for beneficial use	Not applicable since project is not applying to the State Water Resources Control Board (SWRCB) for a new appropriation of water. However, project is proposed to use recycled water.	Paul Lillebo State Water Resources Control Board Environmental Specialist IV 901 P Street Sacramento, CA 95812 916-341-5551
CDFG (Fish and Game Code, Section 1601)	Streambed Alteration Agreement	May be required to construct gas pipeline under Lateral No. 5.	CDFG Dr. Andrew Gordus Environmental Specialist IV 1234 East Shaw Avenue Fresno, CA 93710 559-243-4014

TABLE 8.14-1
Laws, Ordinances, Regulations, and Standards Applicable to WEC Water Resources

LORS	Applicability	How Conformance Is Achieved	Agency/Contact
Local			
City of Turlock	Approval by City of Grading Plan includes stormwater control requirements	Requires erosion and sediment control plan, drainage control features, and City approval.	City of Turlock Brad Koehn Engineering Technician Turlock, California 93660 209-668-5590
Turlock Grading Ordinance	Permits Grading, Erosion, and Sediment Control	Required prior to site grading. Application also comprises CEQA, Geotechnical Report, and Erosion and Sediment Control Plan.	City of Turlock Brad Koehn Engineering Technician Turlock, California 93660 209-668-5590
Turlock Water and Sewer Permit	Required for septic, leachfield, or other disposal systems.	Planning Review	Bela Bidal Stanislaus County Environmental Resources Department Modesto, CA (209)525-6700 Jim Steinman City of Turlock Turlock, California 93660 (209) 668-5542 ext 2217

8.14.2.2 State

State LORS applicable to this project are compliance with California Environmental Quality Act (CEQA), the Porter Cologne Act, and California Department of Fish and Game (CDFG) administration of the streambed alteration program.

8.14.2.2.1 California Environmental Quality Act

CEQA requires that projects approved by state agencies be evaluated for their potential to cause adverse environmental impacts, and that impacts be mitigated to the extent feasible. The California Energy Commission (CEC) Preliminary and Final Staff Assessments are the CEQA-equivalent process.

8.14.2.2.2 State Water Resources Control Board and Central Valley Regional Water Quality Control Board

The RWQCB requires a notice of intent to be filed prior to construction activities. Stormwater Pollution Prevention Plans (SWPPPs) must be prepared prior to filing both the Construction and General Industrial Stormwater NPDES permits. The State Water Resources Control Board (SWRCB) Water Quality Order No. 99-08-DWQ applies to construction activity NPDES stormwater permits for construction areas of greater than 5 acres. SWRCB Order 97-03-DWQ authorizes general industrial stormwater permits.

8.14.2.2.3 California Water Code Sections 13550, 13551, 461, and SWRCB Resolution No. 75-58

These water code sections and policy statements encourage the conservation of water resources and the maximum reuse of wastewater, particularly in areas where water is in short supply.

8.14.2.2.4 Title 22 of the California Code of Regulations

Title 22 addresses the use of recycled water; in particular Section 60306 sets forth the criteria for the use of recycled water for cooling. Such cooling water is defined as disinfected tertiary recycled water in Section 60401.230.

8.14.2.2.5 Fish and Game Code Section 1601 Streambed Alteration Agreement

CDFG administers the Streambed Alteration Agreement (SAA) for actions that will disturb beds and banks of surface streams. An SAA may be required for gas pipeline construction at irrigation canals. CDFG has not yet determined if the gas pipeline crossing under Lateral 5 will require an SAA.

8.14.2.2.6 Water Quality Certification

If a Section 404 permit for fill is required by USACE, it must be accompanied by a Section 401 permit issued by RWQCB. A permit may be required for gas pipeline construction at irrigation canals.

8.14.2.3 Local Policies

Local ordinances focus on flood control concerns, stormwater protection, and erosion control as well as use of recycled water for cooling. The City of Turlock General Plan and Stanislaus County General Plan specify policies that are summarized in Table 8.14-2. The conformance of the project with these policies is also provided.

TABLE 8.14-2
Stanislaus County and City of Turlock General Plans, Goals, and Policies for Water Supply and Delivery Applicable to the Project

Element	Goal/Policy	Conformance
Stanislaus County General Plan		
CONSERVATION/OPEN SPACE	2. Conserve water resources and protect water quality in the County.	Project will conform by using recycled water.
	POLICY FIVE Protect groundwater aquifers and recharge areas, particularly those critical for the replenishment of reservoirs and aquifers.	Project will conform by using recycled water within the County.
	1. Proposals for urbanization in groundwater recharge areas shall be reviewed to ensure that (1) as much water as possible is returned to the recharge area, (2) the development will not cause discharge of materials detrimental to the quality of the water, and (3) the development will not result in significant groundwater overdrafting or deterioration in quality. The Department of Environmental Resources shall require: A. In those areas where groundwaters are susceptible to overdrafting, the project proponent shall perform a hydrogeological analysis and include appropriate mitigation measures in the proposal. B. In those areas where groundwater quality is susceptible to deterioration or is already of reduced quality, the level of wastewater treatment shall be such that it will not cause further quality deterioration.	Project will conform by using recycled water within the County.
	2. The Department of Environmental Resources shall identify and require control of point sources for pollutants stored, handled or disposed of on the surface of the soil or in the vadose zone that is located in the zone or aeration immediately above the groundwater level. Potential sources of pollutants to the groundwater may also include high densities of individual onsite sewage treatment units and/or the use of community package treatment plants. The Department of Environmental Resources shall require the adoption of groundwater monitoring programs for projects where hydrogeological assessments indicate the potential for groundwater deterioration is likely. Responsible Department: Environmental Resources.	Project will conform by implementing BMPs to avoid pollutants entering stormwater drainage.

TABLE 8.14-2
Stanislaus County and City of Turlock General Plans, Goals, and Policies for Water Supply and Delivery Applicable to the Project

Element	Goal/Policy	Conformance
	3. Eliminate reliance on dry wells as a means of street drainage in urban areas. Dry wells collect and discharge toxic, hazardous, and designated contaminants into aquifers having beneficial uses. New projects shall have stormwater disposal systems that: (1) are designed not to pollute receiving surface or groundwaters, and (2) which could be integrated into an areawide groundwater recharge program whenever feasible. Responsible Departments: Environmental Resources, Public Works, Planning Commission, Board of Supervisors.	Project will conform by implementing BMPs to avoid pollutants entering stormwater drainage.
	4. During the project and environmental review process, encourage new development to incorporate water conservation measures to minimize adverse impacts on water supplies. Possible measures include, but are not limited to, low-flow plumbing fixtures, use of recycled wastewater for landscaping when feasible, and use of drought-tolerant landscaping.	Project will conform by using recycled water.
	5. Continue to implement the landscape provisions of the Zoning Ordinance, which encourage drought-tolerant landscaping and water-conserving irrigation methods. Responsible Departments: PlannIng Department, Planning Commission, Board of Supervisors.	Project will conform by using drought tolerant species for landscaping to the extent feasible.
	6. New development that does not derive potable water from pre-existing potable and public water supply systems shall be required to have a documented water supply that does not adversely impact Stanislaus County water resources.	Project will conform by deriving recycled water from the public water supply system.
	IMPLEMENTATION MEASURES	
	1. Proposals for development to be served by new water supply systems shall be referred to appropriate water districts, irrigation districts, community services districts, the State Water Resources Board, and any other appropriate agencies for review and comment.	
	2. Review all development requests to ensure that sufficient evidence has been provided to document the existence of a water supply sufficient to meet the needs of the project without adversely impacting the quality and quantity of existing local water resources.	The City of Turlock has provided TID with a will serve letter for supplying water to the project.

TABLE 8.14-2
Stanislaus County and City of Turlock General Plans, Goals, and Policies for Water Supply and Delivery Applicable to the Project

Element	Goal/Policy	Conformance
City of Turlock General Plan		
Water Quality and Conservation	6.2-a Continue efforts to safeguard the quality and availability of Turlock's water supply.	Project has been evaluated for impacts on existing water sources and distribution facilities.
	6.2-b Undertake steps to minimize the depletion of groundwater reserves.	Project will use recycled water to reduce impacts to groundwater.
	6.2-c Continue to participate in studies investigating future potable water supply alternatives; evaluate future source alternatives.	Project supports using alternatives to groundwater by using recycled water.
	6.2-d Continue water conservation efforts.	Project will support water conservation by recycling water to the extent practicable.
Turlock Municipal Code		
6-5-115	c) No person shall install or connect with the water system any evaporative type air-conditioning cooler or unit unless it is equipped with a recirculating pump and equipped with a thermostat or pressure control valve properly adjusted to regulate the flow of cooling water through the units so that the minimum amount of cooling water as determined by the manufacturer's specifications shall be used.	Evaporative type air-conditioning coolers or units will not be used.
	d) No person shall connect to the water system any refrigerating or air-conditioning equipment unless such equipment is air-cooled or has a water tower or evaporation condenser so that only makeup water is used.	The project will use air-cooled condensers for refrigerators and building air conditioning units.
	e) No person shall waste water.	The project will make efficient use of water and recycle to the extent practicable.

Source: Stanislaus County General Plan (2000), City of Turlock General Plan (2002), Turlock Municipal Code, (2002).

8.14.3 Hydrologic Setting

The climate in the project area is typical of the Central San Joaquin Valley with hot dry summers and mild winters. Daytime temperatures during the summer months range between 80°F and 100°F, with peak days up to 110°F. The rainy season generally extends from November through March. Occasional rains occur during the spring and fall months, but summer months are dry. Average annual precipitation is approximately 12 inches. Elevation on the site is approximately 85 feet MSL.

The project site is located near the center of the valley, approximately midway between the Sierra Nevada to the east, and the Coast Range to the west. The San Joaquin River is the nearest major surface water passing approximately 8 miles west of the project site. The Turlock Main Canal is a man-made channel that conveys water south of Turlock and passes less than 0.5 mile south of the project site. The banks of the canal are elevated, such that local drainage only enters the canal from pumps.

Potable water supplies for the City of Turlock are entirely groundwater from local wells. Potable groundwater is generally deep and alkaline, although there is a very shallow groundwater table due to local irrigation. Groundwater is used to meet local potable demands and surface water is used to meet local irrigation demands.

8.14.3.1 Surface Water

The Tuolumne River is 11 miles to the north, the Merced River is 10 miles to the south, and the San Joaquin River is 8 miles west of the project site. Groundwater and surface water are pumped into numerous surface canals and drains that deliver irrigation water to and from agricultural fields throughout the region. These canals are packed earth or concrete-lined and generally lack the meanders, vegetation, biota, and other features of natural streams. There are no significant lakes or reservoirs within 10 miles, although small farm ponds are relatively common. They all carry water of excellent quality at their sources in the Sierra Nevada Mountains, but as they flow through the valley, their quality is impaired by each successive use. Both agricultural and potable use and return contribute to this degradation. As flows decrease seasonally, concentrations of total dissolved solids, silt, algae, and pollutants increase to the extent that in the valley the rivers are turbid, warm, slow-moving, or seasonal with high amounts of algae and silt.

There are no significant natural water features on or adjacent to the project area. There is one man-made canal, (Turlock Main Canal) that delivers irrigation water from Turlock reservoir, which originates in the Tuolumne River, east of Turlock. Small distribution canals crisscross farm fields and parallel roads, and cross the proposed project linears (gas and water lines) in two places. The major rivers listed above are far enough away to be unaffected by the project, and therefore are not described in detail (Figure 8.14-1).

8.14.3.2 Groundwater

Groundwater is the major source of potable and industrial water in Stanislaus County, and is provided by the City of Turlock. Many industries and rural farms have onsite wells for supply.

Groundwater resources under the project site and the City of Turlock were evaluated in the Groundwater Management Plan for the Turlock Basin (1997), Water System Master Plan (1993), and Master Environmental Assessment for the City General Plan (City of Turlock 2002a).

Depth to groundwater in the City of Turlock ranges from 35 feet in the eastern part to 15 feet in the west, and depth to the west was projected to increase as much as 90 feet by the year 2020 (Brown and Caldwell 1988). Between 1976 and 1988, overall water level in the Turlock Irrigation District (TID) area dropped about 10 feet. In the City of Turlock, static water levels dropped during the last drought, but after several wet years in the 1990s, water levels have climbed back to predrought levels (City of Turlock 2002b). The depth to groundwater east of the San Joaquin River, where the project is located, does not have the serious problems that exist on the west side.

Groundwater levels fluctuate with seasonal rainfall, withdrawal, and recharge. The large demand for groundwater has caused subsidence in some areas of the valley. However, there are no records of such subsidence in the Turlock area (City of Turlock 2002b). Figure 8.14-2 shows the groundwater in the project area. Additional geological detail is provided in Subsection 8.15 (Figure 8.15-2).

In the Turlock area, recharge to the unconfined/ semi-confined aquifer is primarily by irrigation water. Rainfall, at about 12 inches per year, is much less than evapotranspiration, resulting in an average water deficit of about 30 inches (City of Turlock 2002b). The difference is made up by imports to the watershed of about 27 inches (600,000 acre-feet) and a net withdrawal of about 3 inches (72,500 acre-feet) from aquifer storage. Urban use is about 5 percent of the draw or 30,000 acre-feet per year (afy).

The overall quality of groundwater supplying the City is good, although some chemicals are present in varying amounts that might eventually cause some problems. These are chloride, nitrate, arsenic, sodium, calcium, magnesium, carbonate, DBCP, bicarbonate, and sulfate. Groundwater pumping around Modesto, improperly sealed wells, and past dairy practices have contributed to increasing concentrations of certain chemicals.

8.14.3.3 Flooding Potential

Federal Emergency Management Agency (FEMA) flood zone maps show that the WEC project site and all surrounding areas for a distance of approximately 2 miles are outside the 100-year flood boundary (Figure 8.14-3). For all practical purposes, the community will not be inundated by a 100-year flood.

The area south of the Tuolumne River is near the New Don Pedro Dam. According to the USACE standards, the City and the project site are within the dam failure inundation area. Dam failure models show that the entire area would be flooded if the New Don Pedro Dam were to fail completely within a 1-hour period (City of Turlock 2002b). Such an occurrence is considered highly unlikely.

8.14.4 Water Sources and Disposal

This subsection characterizes the sources of water needed for power generation at WEC, water quality, and disposal of wastewater. Average and maximum daily and annual water demand are provided in Table 8.14-3.

TABLE 8.14-3
Average Daily, Maximum Daily, and Maximum Annual Water Usage and Wastewater Discharge for WEC

Water Use	Average Daily Use (gpd)	Maximum Daily Use (gpd)	Maximum Annual Use (afy)
Process and Cooling Water	1,400,000	2,000,000	1,800
Potable Water Service	2,000	2,000	3
Sanitary Wastewater Discharge (to onsite septic and leachfield)	2,000	2,000	3

8.14.4.1 Cooling Water

The proposed cooling water supply for the project is recycled water from the Turlock Wastewater Treatment Plant (WWTP). The City of Turlock is in the process of permitting and building a Title 22 facility at its WWTP to meet new NPDES permit requirements. The Turlock City Council has approved the funding mechanism for the plant and intends to have the treatment plant on line by May 1, 2006.

Once the Title 22 plant becomes operational, the City has agreed to provide 1,800 afy of recycled water. Given that the Title 22 plant is not expected to be online until May 2006 and that TID intends to commence start-up by the fourth quarter 2005, there will likely be an interim period between the initial operation of the WEC facility and the availability of recycled water. The City has confirmed that it can deliver a "bridge" supply of water from its existing facilities to meet the water needs of the WEC until the Title 22 plant is operational. The City of Turlock has provided TID with a will serve letter for the use of recycled and potable water (Appendix 8.14a). The potential impacts of these uses are described in Subsection 8.14.6 below.

Blowdown from the cooling tower will be treated onsite via a zero-liquid discharge (ZLD) system. Distillate from the ZLD system will be used to provide process makeup water. Details of the plant water cycle and process makeup water treatment are discussed in Section 2.0, Project Description.

8.14.4.2 Bridge Water Supply

To bridge the time between the WEC online service and the expected operational date of the Title 22 plant, TID proposes to use potable water from the City of Turlock. This water would be diverted from the potable water main located at South Tegner Road approximately 0.9 mile east of the WEC site. The project will already require the construction of a potable water pipeline for potable, plant service, and fire protection water needs. An additional pipeline will not be required for the bridge supply.

As an example, until recycled water is available, the plant would be estimated to use one-half of the annual maximum, or 900 acre-feet (approximately 1.4 millions gallons per day [mgd]) of water. This represents approximately 2 percent of the 45 mgd currently available from City wells.

The projections of population growth, development, land use, and agricultural conversion through the year 2020 were evaluated by the City of Turlock to determine whether water supplies were adequate to serve future customers. Between the years of 1982 and 1991, the City population grew at a rate of 5 percent. Since then, population growth has slowed slightly and was estimated to increase 3.7 percent by year 2020. This will put the population at approximately 126,000 in 2020 (Turlock 2002).

Considering projected land use, the average day water consumption for 1995 was 9,700 gallons per minute (gpm), which will increase to approximately 19,400 gpm by the year 2020 (City of Turlock 1993). These estimates and demand coefficients correspond to the land use development predicted by the City Planning department, and include implementation of the Water Conservation and Education ordinance passed in 1991.

The regional demand for City water depends on climate, land use, cost of water, availability of alternative sources of water, lawn sprinkling, and cultural attitudes. Because Turlock is generally warm and dry, annual use is higher than national averages. This is primarily because of additional lawn sprinkling and cooling requirements (City of Turlock 1993). Water demand normally fluctuates throughout the year, and normally peaks in June or July. Similarly, water availability and recharge fluctuates with peak availability during winter months (December and January).

8.14.4.3 Recycled Water Supply

The City of Turlock owns and operates a regional WWTP that serves all of Turlock and the community service districts of Keyes and Denair as well as several industrial facilities. Currently the WWTP provides secondary treatment and chlorination. The effluent is discharged to Harding Drain, which in turn discharges to the San Joaquin River, approximately 8 miles east of the facility.

In response to recent changes in the effluent discharge criteria, the City is constructing a Water Recycling Project to upgrade wastewater treatment standards from secondary to tertiary treatment. Treatment facilities will include high-rate flocculation, filtration, and new chlorination and dechlorination facilities. The resulting effluent will be high-quality water that can meet Title 22 California Water Recycling Criteria (CWRC) for unrestricted reuse by May 2006. The design flow for the tertiary facilities will be 20 mgd, with peak flows of 30 mgd. The City is committed to completing this project, and a schedule for operations is included in Appendix 8.14B. The items in section A are required prior to delivering recycled water. Items under "B" and pipeline and post aeration are not required to deliver recycled water.

8.14.4.4 Recycled Water Quality

As noted above, recycled water quality will meet all Title 22 requirements. Table 8.14-4 summarizes estimated recycled water quality from the City of Turlock's recycled water system based on water quality data from the City of Turlock, and the City's Title 22 pilot testing program. For each constituent or parameter, the highest concentration observed was used, except where the constituent is reduced by Title 22 treatment (e.g., turbidity and suspended

solids). The project will be designed to accommodate variations from this quality, as the final quality will not be known until the project becomes active in early 2006. The quality of the potable "bridge" water is expected to be similar, but better, than the recycled water.

TABLE 8.14-4
Estimated Recycled Water Quality

Constituent	Recycled Water (mg/l except as noted)
Alkalinity-Bicarbonate	206
Alkalinity-Total	206
Aluminum	0.100
Ammonia	<57
Arsenic	0.010
Barium	0.080
Biological Oxygen Demand	<10
Boron	0.200
Cadmium	0.002
Chemical Oxygen Demand	<30
Chloride	104
Chromium	0.004
Copper	0.020
Fluoride	0.380
Hardness-Calcium	82
Hardness-Magnesium	9.9
Hardness-Total	143
Iron	0.440
Lead	0.012
Manganese	0.047
Molybdenum	0.010
Nickel	0.010
Nitrate Nitrogen	<20
pH, pH units	6.5-7.5
Potassium	20
Selenium	0.010
Silica	57
Silver	0.003
Sodium	145

TABLE 8.14-4
Estimated Recycled Water Quality

Constituent	Recycled Water (mg/l except as noted)
Specific Conductance, umhos/cm	1,011
Sulfate	45
Total Dissolved Solids	537
Total Suspended Solids	<1
Turbidity, NTU	2, or less
Zinc	0.080

8.14.4.5 Alternative Cooling Water Sources

The SWRCB Policy 75-58 specifies that to protect water quality and quantity, water rights applications for cooling water for power plants can only be approved if other sources of water are not feasible. Since the project is not applying for new water rights, Policy 75-58 is not applicable; however the following is a discussion of the alternative sources of cooling water listed in Policy 75-58 for consideration (in order of preference).

1. Wastewater being discharged to the ocean
2. Ocean
3. Brackish water from natural sources or irrigation return flow
4. Inland wastewater of low total dissolved solids (TDS)
5. Other inland waters

The proposed WEC will be over 100 miles from the ocean, and therefore, the first two water sources are not feasible alternatives. Similarly, there are no sources of naturally brackish water in the vicinity. The dominant agricultural uses in the project area are irrigated but the return flow supply would be of variable quality and the quantity during the year. Although use of irrigation return flow might be technically feasible, it is not as reliable a supply as recycled water from the WWTP and would be more costly to treat in the ZLD system. The nearest practical source of irrigation return water would be the Harding Drain, located approximately 3 miles south of the project site. The additional cost of constructing a pipeline to the Harding drain makes this a less attractive alternative than using recycled water. In addition, the use of irrigation return water would require a significantly larger ZLD system to process cooling tower blowdown, consuming greater amounts of chemicals and energy, and producing greater amounts of salt cake.

In the case of WEC, one of the dominant reasons why the site was selected was the availability of a large quantity of recycled water from the WWTP and the short interconnection to the electric transmission facilities. The project would also benefit Stanislaus County by reducing the amount of wastewater that the City of Turlock must discharge to the San Joaquin River.

The use of recycled water from the WWTP is appropriate, will benefit the City of Turlock, and is consistent with the order of preference stated in Policy 75-58.

With respect to using water from the Turlock potable supply until the recycled water is available, the bridge supply is a reasonable use, since it requires only the infrastructure that will be necessary for the permanent potable system to be installed.

8.14.4.6 Potable Water

The project proposes to use potable water from the City of Turlock for all potable plant service water, and fire protection needs.

8.14.4.3.1 Potable Water Supply

The City supplies potable water to approximately 12,000 residential, industrial and commercial connections from 23 deep groundwater wells, with a combined capacity of 45 mgd. Water consumption in Turlock has grown 14 percent over the last 4 years and the system is currently operating at near-capacity levels during summer months (City of Turlock 2002b). The City has plans to install three additional wells, which will add 2 mgd of capacity.

The WEC project will require 0.4 gpm for potable water use and another 1.0 gpm for plant service water, which represents less than 0.01 percent of City water use. This usage is considered insignificant when compared to water demands of the City, and is not likely to cause any adverse effects. A will serve letter is provided in Appendix 8.14A.

8.14.4.3.2 Potable Water Quality

Potable water quality from the City meets all EPA Maximum Contaminant Levels (MCL) for drinking water.

8.14.4.7 Wastewater Discharges

As discussed in Section 2.0, process wastewater at the site will be recycled in a ZLD treatment system (see Subsection 8.13). No industrial wastewater will be discharged offsite. Because there will be no liquid discharges, no table of water quality or quantity is provided for discharges. As a final step in the ZLD process, concentrated brine will pass through a crystallizer and press producing a relatively dry salt cake. This salt cake will be collected for offsite disposal at an appropriate landfill.

Sanitary wastewater estimated at 0.4 gpm will be discharged to an onsite septic system and leachfield meeting the requirements of the City and County regulations.

8.14.4.8 Water Flow and Treatment

The mass balances of water flow and treatment include varying water requirements for different operational conditions. Section 2.0 discusses the facilities for treatment and use of project water. Water balances are presented on Figures 2.2-6a and 2.2-6b. Section 7.0 discusses the water pipelines for conveyance.

8.14.5 Precipitation, Stormwater Runoff, and Drainage

Most of the precipitation in the project area falls between November and April. Monthly average rainfall in Turlock, which is similar to that at the project site, is presented in Table 8.14-5. The total annual average rainfall in Turlock is 12 inches.

TABLE 8.14-5
Average Monthly Rainfall Near the Proposed Project Site

Precipitation	Sum	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Avg	11.93	0.56	1.27	1.96	2.36	2.03	2.01	1.02	0.43	0.06	0.02	0.02	0.20
Max	24.50	2.68	4.87	6.11	7.22	8.47	7.08	3.96	2.65	0.93	0.84	0.55	2.68
Min	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Monthly Rainfall at Turlock; DWR # B00 9073 003257 00.

8.14.5.1 Stormwater Runoff Prior to Construction

The project site is located in the northeast corner of a 69-acre parcel currently used for agriculture. The field gradually slopes from northeast to southwest. The 69-acre parcel is bound by higher ground on all sides and the soil types found on the site allow for excellent drainage. Currently, stormwater from the 69-acre parcel percolates into the ground with no discharge offsite. Table 8.14-3 shows the rainfall depth expected at various return frequencies and the corresponding total runoff expected at the project site prior to construction. The total runoff values indicated in Table 8.14-6 are based on the runoff from a site area of 14 acres. This allows a direct comparison to the portion of the final developed site area that will be directed to the proposed stormwater pond.

TABLE 8.14-6
Stormwater Runoff Prior to Construction

Return Period of Storm (years)	Rainfall Depth for 24-hr Storm[a] (inches)	Total Runoff from Site for 24-hr Storm (cubic feet of water)
10	2.05	15,450
25	2.41	18,200
50	2.66	20,000
100	2.91	21,800

[a] Source: Rainfall Depth-Duration-Frequency for Turlock 5 SW; B00 9073 00

8.14.5.2 Stormwater Runoff After Construction

Site Plan Review through the City of Turlock is applicable to this project. Site Plan Review and grading requirements will be pursuant to Title 7, Chapter 4 of the Turlock Municipal Code including City Ordinance 981-CS (Grading, Erosion, and Sediment Control). An erosion and sediment control plan will be prepared to prevent increased discharge of sediment during grading and development pursuant to the Site Plan Review. After construction, the site will drain stormwater runoff to one or more onsite stormwater pond(s) via a system of pipes, drains, and swales. Figure 8.14-4 shows the post-construction runoff

and drainage patterns for the developed site. If more than one stormwater pond is used, the drainage patterns will be modified slightly to direct stormwater to the ponds. There will be no offsite discharge of stormwater. The stormwater pond(s) will be designed as percolation ponds in accordance with City of Turlock's Specifications and Design Standards. The remaining portion of the 69-acre parcel will be restored to pre-construction conditions.

Table 8.14-7 shows the calculated quantity of runoff for various storm return periods. Section 17 SD-7C of the City of Turlock's Specifications and Design Standards requires that the stormwater pond(s) be sized to contain 3-inches of rainfall over the impervious area of the new development, which is in excess of the 100-year event assuming no deduction for pre-development runoff (Koehn, B. City of Turlock, Personal Communication). The runoff associated with 3 inches of rainfall is estimated to be 74,957 cubic feet, or 1.72 acre-feet. The stormwater pond(s) will be designed to contain approximately 2 acre-feet.

TABLE 8.14-7
Stormwater Runoff Following Construction

Return Period of Storm (years)	Rainfall Depth for 24-hr Storm (inches)	Total Runoff from Site for 24-hr Storm (cubic feet of water)
10	2.05	51,501
25	2.41	60,590
50	2.66	66,649
100	2.91	72,708

[a] Source: Rainfall Depth-Duration-Frequency for Turlock 5 SW; B00 9073 00

8.14.6 Project Effects on Water Resources

Significance criteria are derived from the CEQA Appendix G checklist. The project is considered to have a potentially significant effect if it would:

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

- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures that will impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Cause inundation by seiche, tsunami, or mudflow.

8.14.6.1 Effects on Surface Water

There are no significant natural surface waters in the project vicinity. The project site is flat, and will remain generally flat after development. The project will not substantially alter existing drainage patterns. Therefore, the project will cause no substantial erosion or siltation on- or offsite. Similarly, the volume and rate of runoff from the project site will not be substantially altered as a result of project development, nor will the project alter the course of any stream or river. The project will capture and detain stormwater runoff in an onsite stormwater basin, so the project will not exceed the capacity of existing or planned stormwater drainage systems.

8.14.6.2 Effects on Groundwater

During operation, the City of Turlock will supply potable water for sanitary needs, plant service water, and fire protection to the project. The main source of this water is groundwater from local wells. The amounts of water required for potable supply and service water is estimated at approximately 2 afy, as compared to the much greater requirements for cooling tower makeup (1,800 afy of recycled water). Although the region has generally experienced some water table drop related to groundwater pumping, the primary uses are agricultural, not potable. The potable supply to the project represents less than 0.01 percent of the annual groundwater provided by the City to other users, and will not substantially deplete groundwater supplies or interfere with groundwater recharge. No wells will be expected to drop to a level that will not support existing land uses.

Because WEC is scheduled to require water for testing and operation prior to completion of the recycled water plant, WEC proposes to temporarily use City of Turlock potable water for cooling. The total water use during this period would be less than 1.4 mgd, which represents 5 percent of the 45 mgd currently available.

Figure 8.14.5 shows the annual fluctuations in water demand based on data from 1989-1991[1]. Water use in winter is much less than summer, and the City, as a matter of practice shuts down more than half its available wells during winter months (D. Madden, personal comment). In Figure 8.14-5, the stacked bar shows the additional demands that 1.5 mgd would place on the regional system for the bridge supply. It is evident that water use would increase demands slightly during winter months, when regional demands are lower, and have no effect on summer demands during the bridge supply.

[1] Data from 1989-91 were used because these were readily available. Actual water use in 2002 is greater but follows the same pattern as shown.

Once recycled water is available, the WEC project will require 2,000 gpd for potable and plant service water, which represents less than 0.01 percent of City water use. This increment is considered insignificant when compared to water demands of the City, and is not likely to cause any adverse effects.

Best Management Practices (BMPs) will be implemented during construction to avoid contamination of groundwater from construction activities. As a result of these measures, groundwater in the project area will not be significantly affected by the project.

8.14.6.3 Effects on Recycled Water

The project will use recycled water from City of Turlock WWTP for cooling tower makeup. Recycled water use will have a net positive impact on water resources by reducing the amount of water discharged to the San Joaquin River and is consistent with the CEC objective for reusing water to the greatest extent practicable.

8.14.6.4 Effects on Stormwater

The project site is flat and has no offsite drainage. Development of the site will not change the general slope and aspect, and drainage will be conveyed to an onsite detention pond. Implementation of BMPs during construction and operation will be sufficient to control offsite runoff and prevent offsite sedimentation. During construction and operation, BMPs documented in the SWPPP (part of the NPDES permit) for erosion and sediment control will be implemented to avoid site runoff.

BMPs include designating locations for vehicle parking and maintenance, waste disposal areas, silt fencing, and installation of oil-water separators if necessary to prevent pollutants from entering the stormwater system. The project will have no offsite discharges to surface water and, therefore, will not violate water quality standards or waste discharge requirements nor substantially degrade water quality.

8.14.6.5 Effects on Water Quality

Local surface water and groundwater quality will not be affected by the project. In fact, as discussed in Subsection 8.14.6.3, the project's use of recycled water will have a net positive benefit on water resources by reducing the amount of water discharged into the San Joaquin River by the City. Process wastewater will be directed to the ZLD system for reuse. Sanitary wastes will be disposed to an onsite septic system, discharging to an onsite leachfield under permit from the City.

Onsite stormwater pond(s) will be provided to contain stormwater, allowing it to percolate into the ground. Thus, the project will not have a significant effect on the quantity and quality of stormwater runoff.

Stormwater runoff will be controlled during construction and plant operations through adherence to SWRCB SWPPPs. These plans will be prepared as part of the application for both the Construction and General Industrial Stormwater NPDES permits that will be required as part of the project. A description of current erosion conditions is provided in Subsection 8.9, Agriculture and Soils. Hazardous materials storage and handling and waste handling that must be thoroughly documented in the SWPPPs are presented in Subsections 8.12 and 8.13.

8.14.6.6 Effects on Flooding Potential

The State Reclamation Board has identified and adopted floodplains, defined in cubic feet per second of flow, along the San Joaquin River, Merced River, and Tuolumne River. Any nonagricultural encroachment into these areas requires a permit from the Reclamation Board, which will serve to prevent reduction in channel capacity of the waterways.

The project is located approximately 2 miles from the nearest 100-year floodplain defined by FEMA (see Figure 8.14-3). Therefore, it will not place housing or structures in the 100-year flood hazard area, nor place structures that will impede or redirect flood flows.

The project will convert up to 20 acres of the existing cultivated soil to packed gravel and pavement. An onsite stormwater pond will be used to contain stormwater, allowing it to percolate into the ground.

Project linears (gas, water, wastewater) will be buried below ground and therefore will not obstruct or impede flood waters at any time. The relative area that will be covered by linears is small relative to available percolation areas, and therefore will have no significant effect on the regions ability to absorb floodwaters.

The general region is flat, and there are no significant dams or levees in the vicinity. Therefore, the project will not expose people or structures to significant risk of loss, injury or death resulting from a levee or dam failure. Similarly the project is located approximately 105 miles from the Pacific Ocean, and any potential inundation from seiche, tsunami, or mudflow is remote.

8.14.7 Mitigation Measures to Reduce Impacts

Implementation of the WEC project with the following measures will effectively reduce impacts to ground or surface water to less-than-significant.

- The project will use recycled water provided by City of Turlock WWTP for cooling-tower makeup.
- Process wastewater will be disposed to a ZLD system to avoid offsite migration of wastewater products.
- No adverse impact to beneficial use of surface water will result from water supply to the project, and no mitigation is required.
- The project will use approximately 2 afy of groundwater for onsite potable and service water uses. This amount is insignificant relative to the productive capacity of the local aquifers. Therefore, no mitigation is required.
- The project will implement Best Management Practices during construction and operation to avoid contamination of any groundwater or surface waters.

8.14.8 Proposed Monitoring Plans and Compliance Verification Procedures

Routine monitoring and compliance verification will be required as part of the stormwater NPDES permitting of the project. The Applicant will be required to prepare an SWPPP specifying BMPs, and monitoring and compliance measures to avoid adverse impacts to

water quality. No additional monitoring of surface or groundwater will be required because no water quality impacts are expected to occur.

8.14.9 Cumulative Impacts

Cumulative impacts to water resources could occur through the use of recycled water, the contribution of potable sewage, the use of groundwater, or stormwater runoff.

None of these categories of water use is expected to result in significant cumulative impacts to area water resources:

- **Surface Water:** The project area is relatively flat and there are no natural surface water features in the vicinity. Implementation of BMPs during construction and operation will reduces the potential for adverse impacts to surface water from the project.
- **Recycled Water**: The use of recycled water will have a net positive benefit for water supplies in the region.
- **Plant Sewage**: The proposed plant staff of approximately 21 employees will generate insignificant volumes of treated, potable sewage that will be discharged to an onsite septic and leachfield as permitted by the City and County. The cumulative impacts from this additional waste load will not be significant.
- **Groundwater**: The project's groundwater requirements of 2 afy are a very small portion of the overall water demands of the City of Turlock and will not be significant. Therefore, no adverse impacts to groundwater resources are predicted.
- **Stormwater**: Implementation of the project will increase runoff on up to 14 acres, due to packed earth and gravel, or pavement construction. The impacts of the increased runoff will be mitigated through the use of an onsite stormwater pond designed to contain stormwater, allowing it to percolate into the ground.

8.14.10 Permits Required and Agencies Consulted

Water quality permits required for the project include the following:

- City of Turlock Water and Sewer Permit
- RWQCB Construction Activity NPDES Stormwater Permit, General Permit
- RWQCB General Industrial NPDES Stormwater Permit, General Permit
- Streambed Alteration Agreement (Section 1601) for modifications to any creek, if required for construction of the gas pipeline
- USACE Wetlands fill permit Section 404 for fill in jurisdictional wetlands, if required for construction of the gas pipeline
- Water Quality Certification Section 401, from the RWQCB, if 404 permit required

A summary of required permits and agency contacts is provided in Table 8.14-8.

TABLE 8.14-8
Permits and Permitting Agencies for WEC Water Resources

Permit	Schedule	Agency
City of Turlock Grading Plan Approval	90 days prior to site grading	City of Turlock Brad Koehn Engineering Technician Turlock, California 93660 209-668-5590
City of Turlock Water and Sewer Permit	90 days prior to connection	Jim Steinman Turlock, California 93660 (209) 668-5542 ext 2217
		Stanislaus County Environmental Resources Department Bela Bidal Modesto, CA (209)525-6700
Construction Activity NPDES Stormwater Permit and Section 401 Certification	90 days prior to site grading	RWQCB Brian Erlandsen 559-445-5116
Streambed Alteration Agreement 1601	90 days prior to crossing stream	CDFG Craid Kindlin and Annette Jennings 1234 East Shaw Ave Fresno, CA 93710 559-243-4014
City of Turlock Encroachment Permit and Grading Permit City of Turlock Municipal Code, Title 7	120 days prior to construction	City of Turlock Brad Clavenough City Engineer Public Works Dept. 901 S. Walnut Turlock, CA 95380 (209) 668-5590

8.14.11 References

Brown and Caldwell. 1988. Phase I Final Report: Drinking Water Supply Study.

City of Turlock. 1993. Water System Master Plan. Prepared by Boyle Engineering Corporation, September.

City of Turlock. 2002a. Turlock General Plan: 1992-2012. Drafted September 1992. Reviewed 2002.

City of Turlock. 2002b. Turlock General Plan Master Environmental Assessment/Draft Environmental Impact Report. Reviewed 2002.

Federal Emergency Management Agency (FEMA). 2000. Flood Insurance Rate Map, Stanislaus County.

Madden, D. 2002. City of Turlock Water Quality Engineer. Personal Communication to EJ Koford, CH2M Hill October 31, 2002.

Martin, Cliff. 2002. Memorandum to Steve Kyte, March 15, 2002. Wastewater Facility Discharge Permit/ Sewer Use Fees.

Stanislaus County. 1994. Stanislaus County General Plan.

Stanislaus County Planning Commission. 1990. Stanislaus County General Plan Support Documentation, Adopted 1987, Revised 1990.

Turlock Irrigation District. 1997. Turlock Groundwater Basin Groundwater Management Plan. October 14.

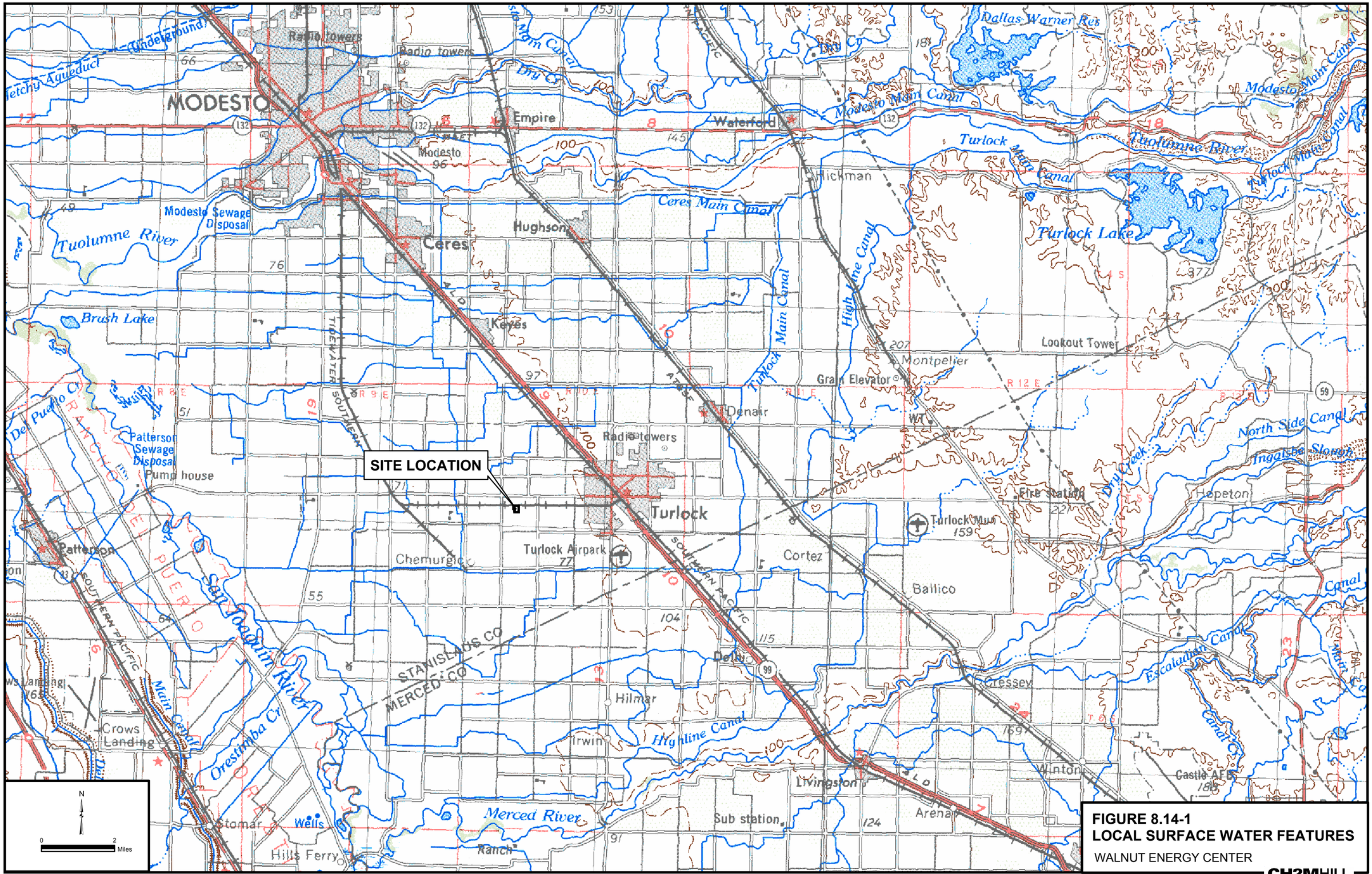

FIGURE 8.14-1
LOCAL SURFACE WATER FEATURES
WALNUT ENERGY CENTER

CH2MHILL

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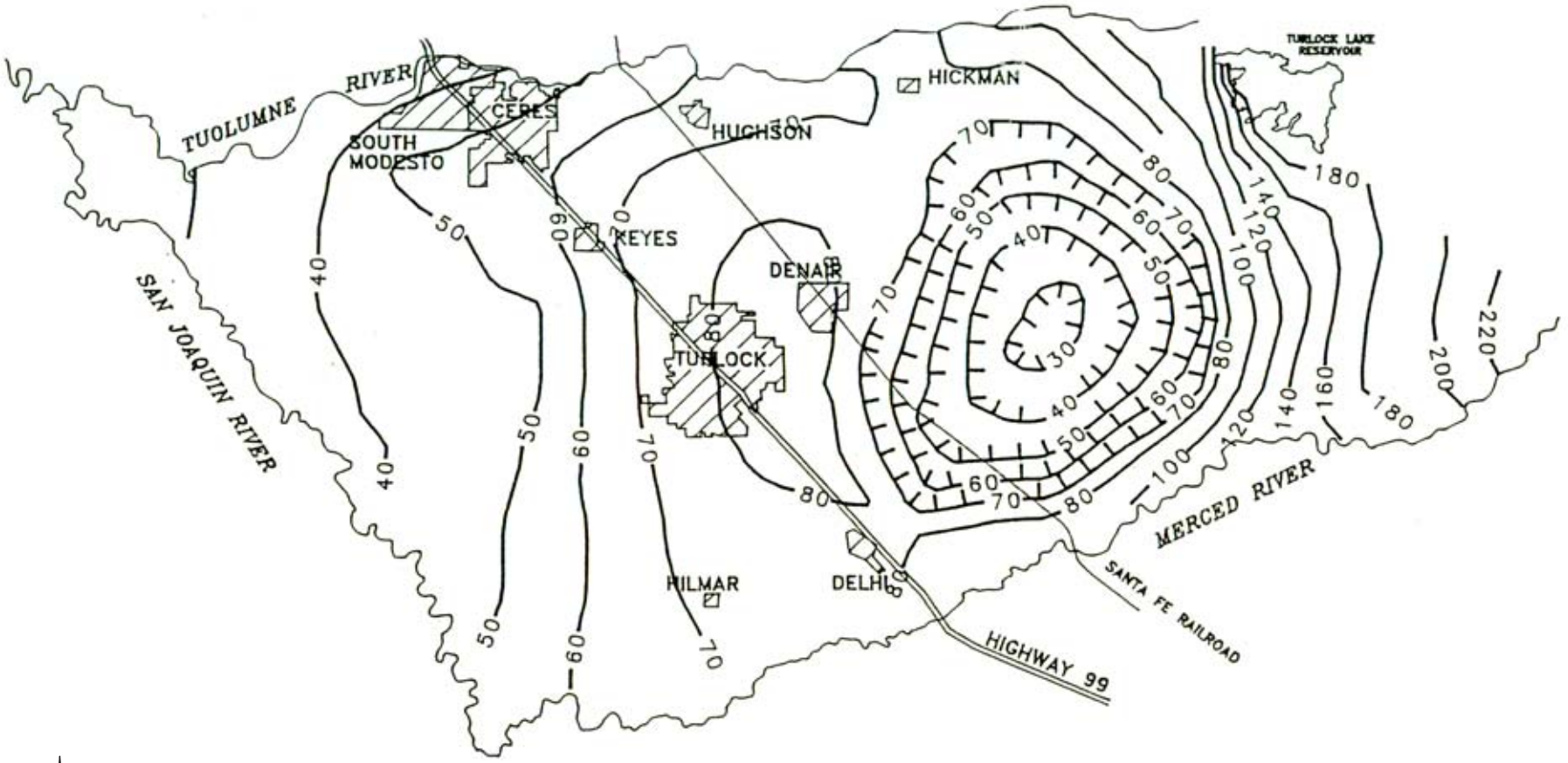
GROUNDWATER ELEVATIONS - FALL 1991



N

0 12.5 25 FEET

SCALE IS APPROXIMATE

EXPLANATION

— 300 — CONTOUR OF EQUAL ELEVATION.
Number indicates elevation
in feet from mean sea level.

FIGURE 8.14-2
GROUNDWATER ELEVATION
WALNUT ENERGY CENTER

CH2MHILL

D102002006RDD_01

WEC

3-MILE RADIUS

FLOOD AREAS

AREA NOT INCLUDED

AREAS OUTSIDE 100-YEAR FLOOD PLAINS

3-MILE RADIUS

NOTE: THERE ARE NO AREAS WITHIN THE 100-YEAR FLOOD PLAIN SHOWN IN THIS FIGURE

SOURCE: FEMA FLOOD DATA, 1996

N

0 1 Miles

FIGURE 8.14-3
WATER INUNDATION ZONES, 100 YEAR FLOOD MAP
WALNUT ENERGY CENTE

CH2MHILL

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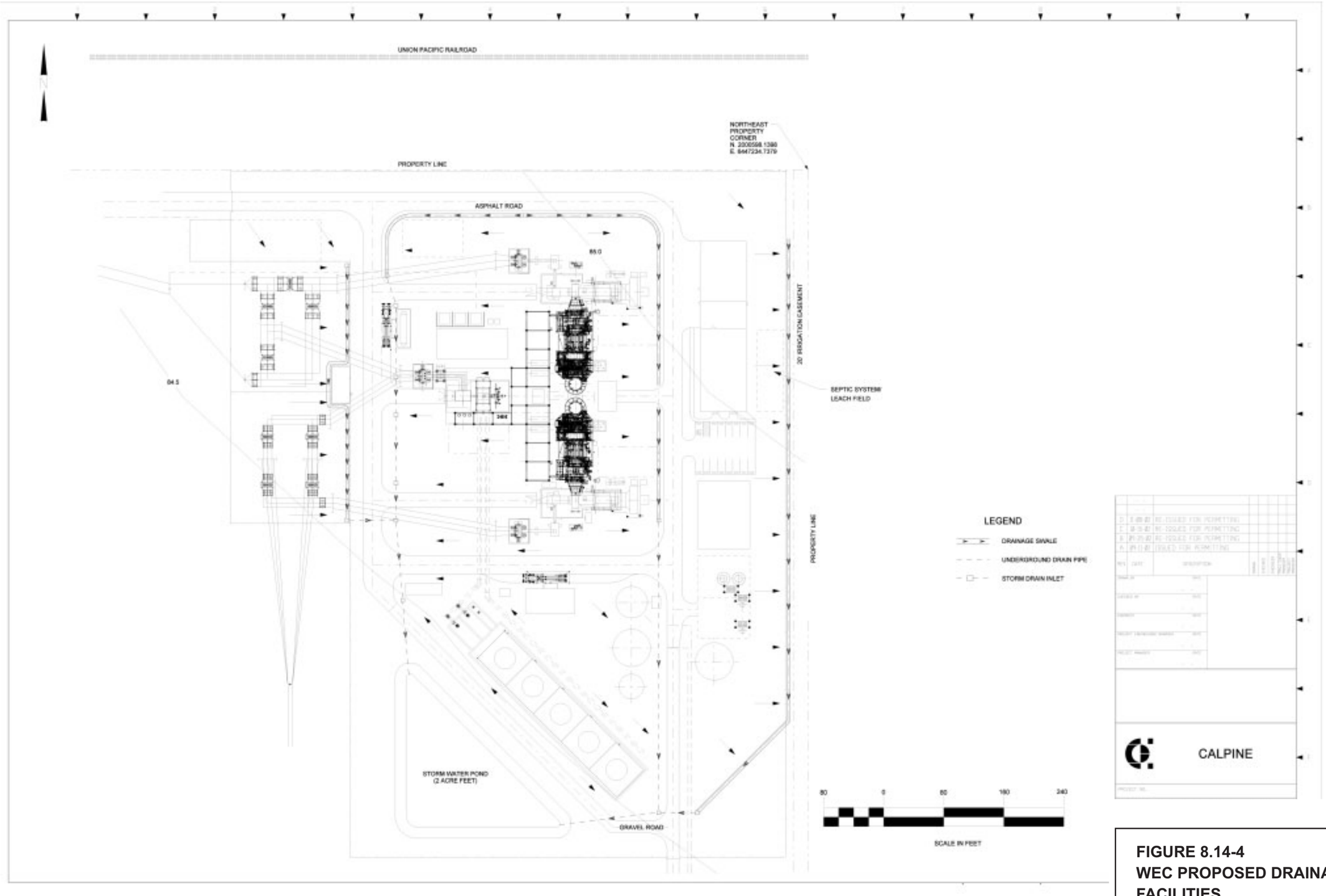

FIGURE 8.14-4
WEC PROPOSED DRAINAGE FACILITIES
WALNUT ENERGY CENTER

CH2MHILL

TID W102002011SAC FIG8_14_4.ai 11-15-2002sbm

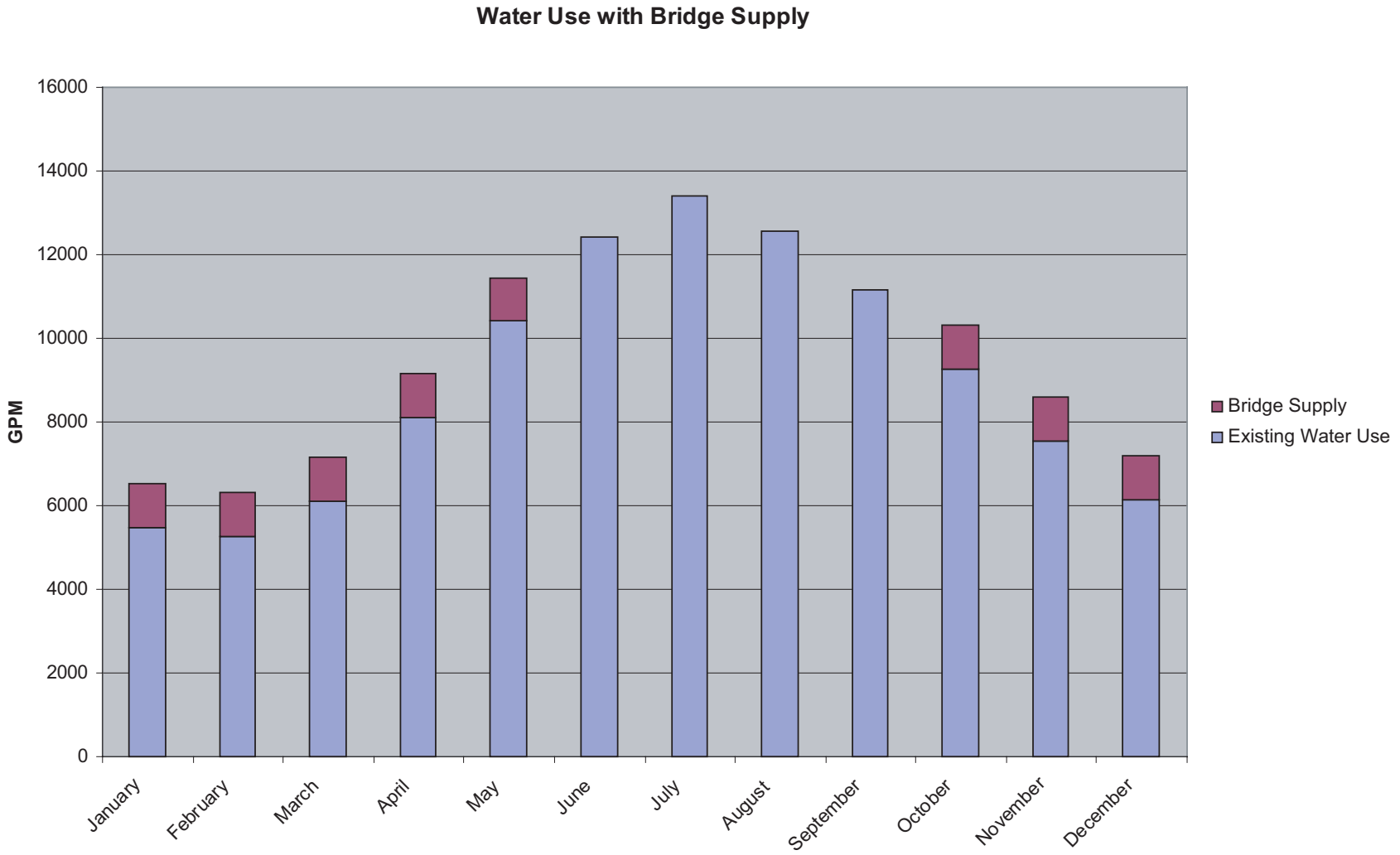

FIGURE 8.14-5
BRIDGE WATER SUPPLY
WALNUT ENERGY CENTER

CH2MHILL

D102002006RDD_35 (11/11/02)