5.15 Water Resources

This section provides a discussion of the existing water resources at the Mariposa Energy Project (MEP) site and assesses the potential effects of project construction and operations on water resources. Specifically, this chapter discusses MEP and its potential effects in the following areas:

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

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

5.15.1 Affected Environment

5.15.1.1 Water Features, Rainfall, and Drainage

The MEP site is located in the San Joaquin Basin, which includes the San Joaquin Valley, the eastern slope of the Coast Ranges, and the western slope of the Sierra Nevada. The principal streams in the basin are the San Joaquin River and its larger tributaries: the Cosumnes, Calaveras, Mokelumne, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno rivers. Major reservoirs include Pardee, New Hogan, Millerton, McClure, Don Pedro, and New Melones. Runoff from the Sierra Nevada and Coast Ranges supplies the San Joaquin River with fresh surface water before eventually flowing out to the Sacramento–San Joaquin Delta. The MEP site is not located near any of these surface water features.

In addition to the rivers, surface water is imported to the basin through several main canals via the State Water Project (SWP) and the federal Central Valley Project (CVP). These canals include the Delta-Mendota Canal (CVP) and the California Aqueduct (SWP). The Delta-Mendota Canal and California Aqueduct carry fresh water from the Sacramento and San Joaquin river systems to a network of local canals and irrigation ditches. These sources provide water to agricultural lands as well as cities and industries throughout the San Joaquin Valley region and Southern California. The California Aqueduct is adjacent to the MEP site, and the Delta-Mendota Canal is less than 0.5 miles northeast of the site (Figure 5.15-1).

The MEP site is arid to semiarid, with hot summers and mild winters. Most of the yearly precipitation falls between October and May. Table 5.15-1 lists the average monthly maximum temperatures, the average monthly minimum temperatures, and the average monthly rainfall recorded at the Tracy Pumping Plant weather station from 1955 through 2007. Average annual rainfall is 12.19 inches.

TABLE 5.15-1
Monthly Climate Summary at Tracy Pumping Plant Weather Station (February 1, 1955 to December 31, 2007)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	54.6	61.2	66.4	72.2	79.7	87.2	92.6	91.9	87.5	78.4	64.7	55.2	74.3
Average Min. Temperature (°F)	38.2	41.8	44.6	47.7	53.3	57.6	60.4	60.4	58.1	52.2	44.0	38.5	49.8
Average Total Precipitation (inches)	2.62	2.15	1.59	0.84	0.41	0.11	0.03	0.06	0.24	0.62	1.60	1.93	12.19

Source: Western Regional Climate Center, 2008.

°F = degrees Fahrenheit

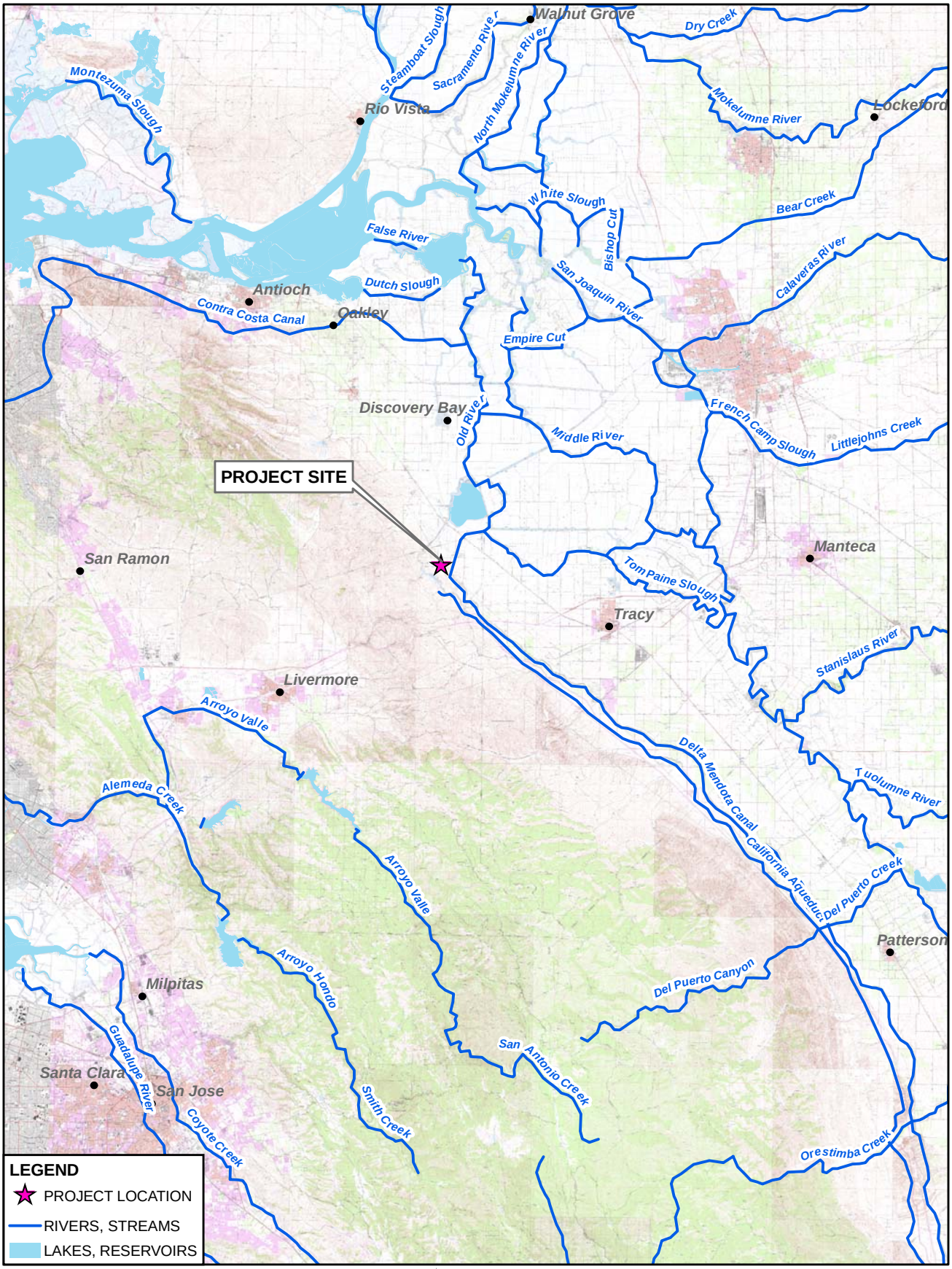
MEP will mitigate storm runoff with a series of inlets and storm drain pipes that will convey runoff to a proposed onsite extended detention basin located on the north end of the site. Figures 5.15-2a and 5.15-2b show pre- and post-construction drainage conditions for the site. The extended detention basin is designed to release site stormwater runoff from the design storm over a 48-hour period to allow particles and associated pollutants to settle. The multi-stage discharge structure will discharge to one of the swales routing upgradient stormwater around the site, as shown in Figure 5.15-2b.

5.15.1.2 Groundwater

The MEP site is located in the southern two-thirds of the Central Valley aquifer system, which is made up of post-Eocene continental rocks and deposits and contains most of the fresh water in the valley. Below the continental deposits are tertiary marine sediments that contain mostly saline water, except in certain areas where an influx of fresh water has flushed out the saline water.

Figure 5.15-3 shows the groundwater resources surrounding the MEP site. The MEP site is located in the San Joaquin Valley. The aquifer system in the San Joaquin Valley generally consists of an upper and a lower aquifer, which are separated by a relatively thick clay layer of regional extent called the Corcoran Clay member of the Tulare Formation. Several of these clay beds were deposited in a lake that once occupied the San Joaquin Valley trough. The Corcoran Clay is approximately 450 feet below ground surface and is approximately 50 to 100 feet thick. The Corcoran Clay is silty, diatomaceous clay with low permeability and is one of the largest confining bodies in the region, underlying an area of approximately 5,000 square miles. In general, clay zones are impermeable aquitards that restrict vertical and lateral movement of groundwater. Movement of groundwater through soil can be retarded or terminated by aquitards.

Although the Corcoran Clay is believed to be a competent barrier between the upper and the lower aquifers in the southern sections of the San Joaquin Valley, the Corcoran Clay pinches out and begins to disappear as it moves north toward the MEP site. Where the Corcoran Clay disappears, the lower aquifer is no longer isolated from the upper aquifer. The absence of the Corcoran Clay allows the regional groundwater flow to be affected by numerous lenses of fine-grained materials that are distributed throughout the aquifer. These fine-grained lenses have a combined thickness of several thousand feet.



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

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

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FIGURE 5.15-1
SURFACE WATER RESOURCES
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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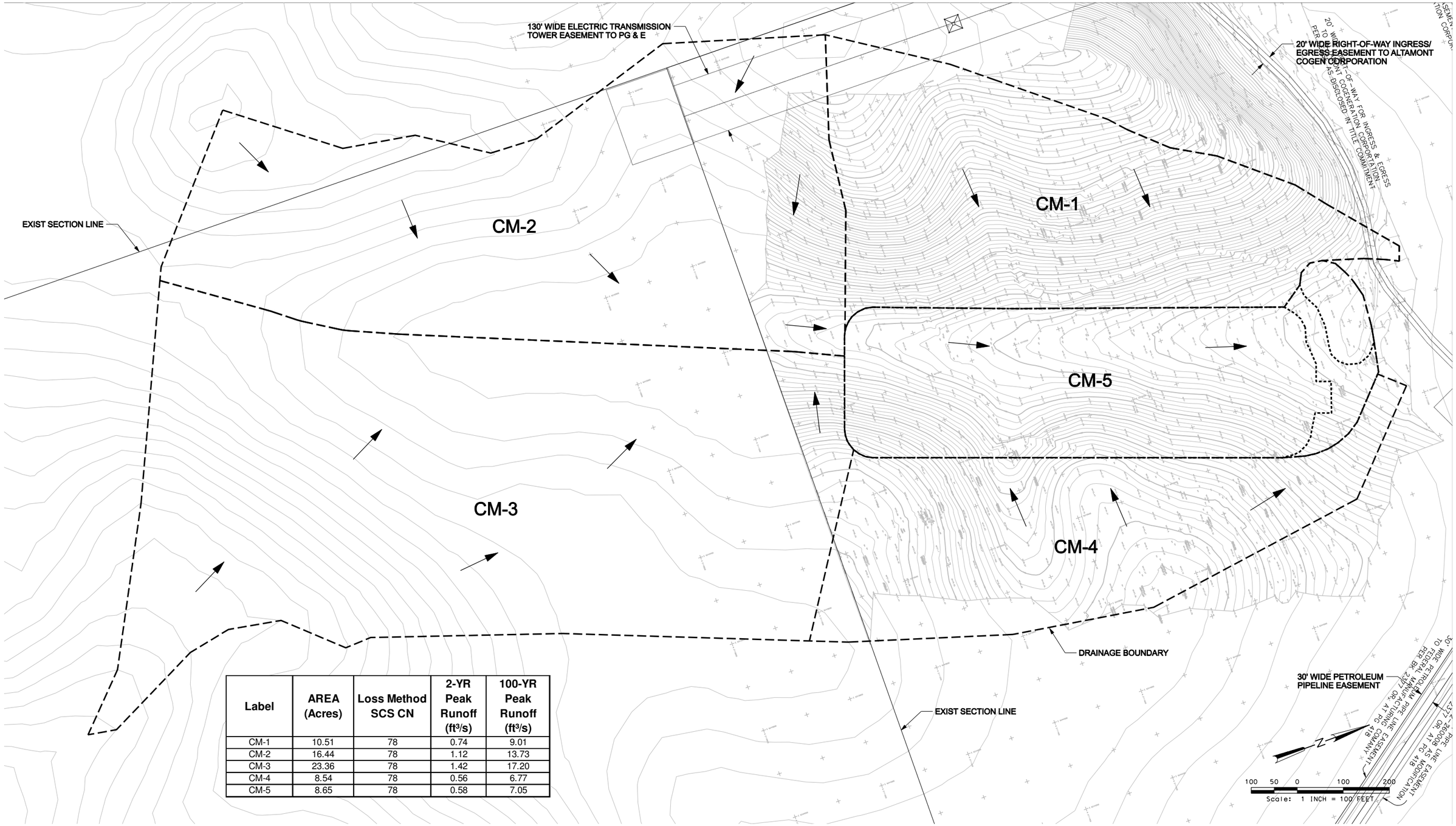


Label	AREA (Acres)	Loss Method SCS CN	2-YR Peak Runoff (ft^3/s)	100-YR Peak Runoff (ft^3/s)
CM-1	10.51	78	0.74	9.01
CM-2	16.44	78	1.12	13.73
CM-3	23.36	78	1.42	17.20
CM-4	8.54	78	0.56	6.77
CM-5	8.65	78	0.58	7.05

FIGURE 5.15-2A
PRE-CONSTRUCTION DRAINAGE CONDITION
Mariposa Energy Project
Alameda County, California

Label	Loss Method SCS CN	Area (acres)	2-YR Peak Runoff (ft^3/s)	100-YR Peak Runoff (ft^3/s)
S-1	93	7.53	5.09	16.51
S-2	93	0.59	0.45	1.49

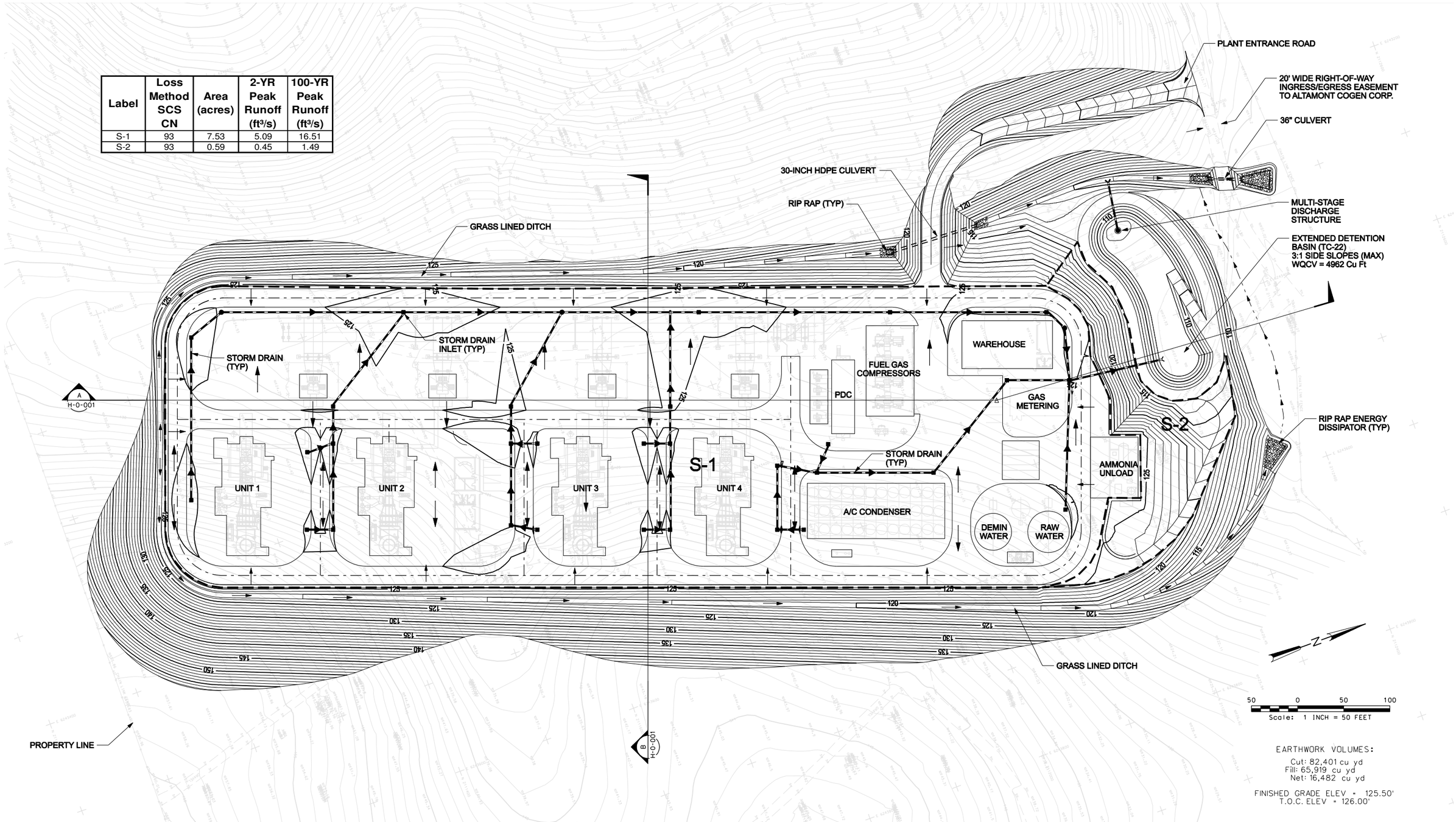
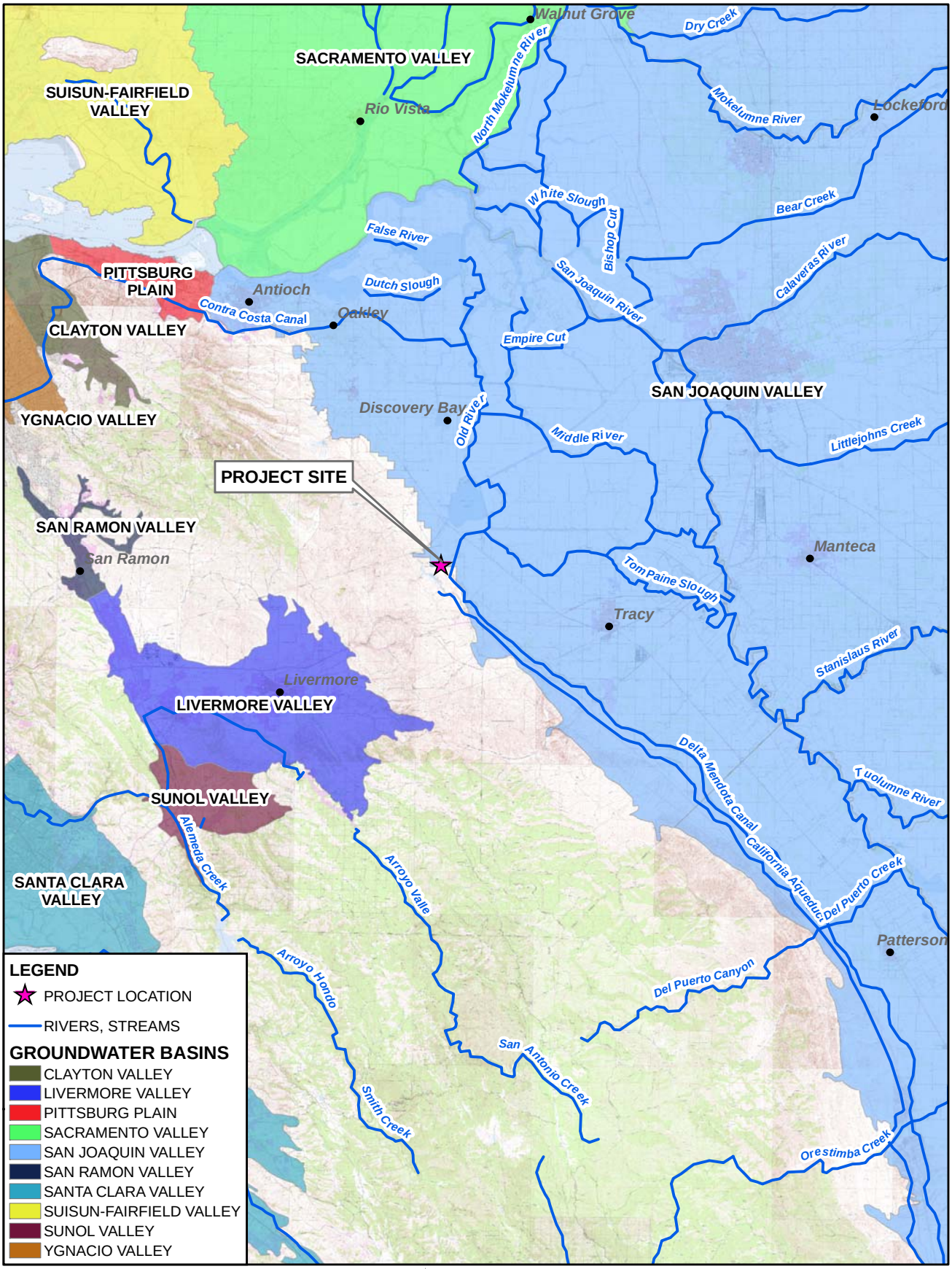


FIGURE 5.15-2B
POST-CONSTRUCTION DRAINAGE CONDITION
Mariposa Energy Project
Alameda County, California



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

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

FIGURE 5.15-3
GROUNDWATER RESOURCES
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

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5.15.1.3 Flooding, Tsunami, and Seiche Potential

The Federal Emergency Management Agency has not published flood insurance rate maps for the area where the MEP site is located. No nearby areas, however, are designated as special flood hazard areas; therefore, it is unlikely that the project site is subject to flooding. The MEP site is not in an area subject to flooding from a tsunami or seiche.

5.15.2 Environmental Analysis

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

- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which will result in substantial erosion or siltation on- or offsite, or in flooding on- or offsite.
- Create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff.
- Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level (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 within a 100-year flood hazard area structures that will impede or redirect flood flows.

5.15.2.1 Water Use and Water Quality

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

5.15.2.1.1 Water Supply

MEP will use water supplied by the Byron Bethany Irrigation District (BBID) via a new 6-inch-diameter, 1.8-mile water supply pipeline placed in or along the east side of Bruns Road, from existing Canal 45 south to the plant site. Approximately 1,000 feet of pipeline will be located adjacent to Bruns Road on BBID property from the pump station to the new BBID headquarters facility. South of the BBID headquarters, the route will be located within the Bruns Road right-of-way under the paved section of road. The pipeline route will follow the MEP site access road from Bruns Road to the project site. Associated facilities will include a concrete turnout structure at the canal bank and a small pump station consisting of a pre-cast concrete manhole wet well, redundant vertical turbine pumps, pipe manifold and valving, electrical cabinet, and instrumentation. This source will provide water for process water, safety showers, fire protection, service water, and domestic uses.

As described in Section 2.0, in the unlikely event of continuous, maximum permitted operation at the average expected annual temperature of 59°F, MEP would use approximately 187[1] acre-feet per year of water for plant uses, assuming 4,000 hours per year of operation (174 acre-feet per year) plus 300 startup and shutdown events (13 acre-feet per year). The estimated water usage for start and stop cycles is based on the conservative assumption of a half hour duration per each start and stop at the operational water usage rates. Actual start and stops may have a shorter duration and lower water usage rates. At a more realistic operating scenario of 600 hours per year (see Section 2.0) and 200 startup and shutdown events, MEP will use about 34.8[2] acre-feet per year (26.1 acre-feet per year for 600 hours of operation and 8.7 acre-feet per year for 200 starts and stops). To put this amount of water in context, it is estimated that a family of four uses approximately 1 acre-foot of water per year (Beckman, 2009). Therefore, MEP's expected annual water usage of 34.8 acre feet per year is extremely small, equivalent to the consumption of approximately 35 homes.

Water balance diagrams representing two operating conditions are included in Section 2.0 as Figures 2.1-5a and 2.1-5b. These diagrams represent: (1) annual average operation at 59°F with four combustion turbine generators (CTGs) operating at 100 percent load, and (2) representative summer high temperature operation at 93°F with four CTGs operating at 100 percent load.

BBID is the main water provider for projects in the area where MEP is located. As a peaking power plant, the project will operate only a small percentage of the time, and water use therefore will be minimal compared with a baseload facility. Additionally, MEP has incorporated cost-effective water conservation features to minimize the use of water.

A will-serve letter from BBID included in Appendix 2D, indicates that BBID has available water supply to serve MEP in excess of project needs. Existing BBID water supplies are sufficient to provide the estimated MEP usage of 187 acre-feet per year for maximum permitted operation.

Mariposa Energy has incorporated water conservation measures directly into the project design and operation. MEP design incorporates mechanical chillers rather than evaporative cooling or fogging for turbine inlet air cooling. Mechanical chillers have air-cooled condensers instead of evaporative cooling towers. Additionally, MEP will recycle process waste water discharge and collect condensate for reuse at the facility. Table 5.15-2 shows the relatively low water use of MEP compared to other proposed power plant projects and municipal users in the project area. As the table demonstrates, the expected water use from MEP is less than 5 percent of the expected water usage of the East Altamont or Midway Power facilities, and is comparable with the expected water usage of other proposed peaking units.

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[1] Based on 236.3 gallons per minute (0.0435 acre-feet per hour) usage rate at 59°F for 4,300 hours, including operation and starts/stops. At higher or lower temps this value will increase or decrease slightly even for the same number of operating hours and startup/shutdown events.

[2] Based on 236.3 gallons per minute (0.0435 acre-feet per hour) usage rate at 59°F for 800 hours, including operation and stars/stops. At higher or lower temps this value will increase or decrease slightly even for the same number of operating hours and startup/shutdown events.

TABLE 5.15-2
Water Usage by Facility

Facility	Size	Maximum Estimated Water Usage (acre-ft/yr)	Expected Water Usage (acre-ft/yr)
Mariposa Energy Project[a]	200 MW	187	34.8
East Altamont Energy Center[b]	1,100 MW	7,000	4,600
Midway Power[c]	1,120 MW	6,720	5,900
GWF Tracy[d]	314 MW	NA	54
Mountain House[e,f]	NA	9,415	4,641
Tracy Hills[e]	NA	3,006	1,700

[a] Based on 4,000 hours of operation plus 300 startup and shutdown events for maximum case, and 600 hours of operation plus 200 startup and shutdown events for the expected case, at annual average ambient conditions of 59°F.

[b] From page 264 of CEC Final Commission Decision, August 2003. http://www.energy.ca.gov/sitingcases

[c] From page 312 of CEC Final Decision, June 2004. http://www.energy.ca.gov/sitingcases

[d] From Table 5.15-3 of AFC submitted to the CEC, July 2008. http://www.energy.ca.gov/sitingcases

[e] Based on Senate Bill 610 Water Supply Assessment for Specific Plan III (West Yost Associates, 2004). 2010 usage projection shown as Expected Water Usage. Usage projected for 2020 and beyond shown as Maximum Estimated Water Usage.[f] Actual Mountain House 2008 Annual Usage was 915 million gallons, or 2,810 acre-feet (2008 Annual Report to the Drinking Water Program submitted to California Department of Public Health).

The potential availability of recycled water is discussed in Section 6.0, Alternatives. The nearest potential source of recycled water is Mountain House Community Services District Wastewater Treatment Plant, approximately 5.5 miles from MEP. Recycled water is also potentially available from the City of Tracy, approximately 11.5 miles from MEP. As discussed in Section 6.0, given the water conservation measures already incorporated into the project design, lack of a local reliable source of recycled water, the increase in potential environmental impacts associated with constructing additional and longer conveyance pipeline routes, and the relatively small quantity of water that is expected to be used at MEP, the use of recycled water is not economically feasible for this project.

In the 2003 Integrated Energy Policy Report, the CEC adopted a policy stating it will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound." MEP's water usage is consistent with State Water Resources Control Board (SWRCB) Resolution 75-58 and the CEC's fresh water policy because alternative cooling technology has been incorporated into the project design to avoid the use of fresh water for cooling purposes and the project has been designed to minimize water usage.

5.15.2.1.2 Process Water Use and Quality

Almost all of the water supplied to MEP (99.8 percent) will be used for various plant processes (see Figures 2.1-5a and 2.1-5b). Most of the incoming supply water from BBID will be treated by a truck-mounted ion exchange (IX) system and then stored in a 380,000-gallon

demineralized water storage tank (nominally sufficient for 27.5 hours of plant use). The high quality demineralized water will be used for the combustion turbine water injection for nitrogen oxides (NO_x) control, online water wash of the combustion turbine compressor section, and the normal operating mode of the PC SPRINT CTG. Trailer-mounted demineralizer equipment will include two cation resin vessels, three strong base anion resin vessels, and one mixed bed ion exchanger vessel. The demineralizer equipment will not include reverse osmosis units, and all demineralizer equipment will have offsite regeneration. As such there will be no demineralizer waste stream.

This treatment system has been designed to meet the demineralized water purity requirements of the LM6000 turbines. These requirements are shown on Table 5.15-3. The LM6000 requirements will be met following the proposed IX treatment system.

TABLE 5.15-3
LM6000 Demineralized Water Purity Requirements

Parameter	Units	Value
Total Solids	ppm	5.0
Total Dissolved Solids	ppm	3.0
Silica as Silicon dioxide (SiO_2)	ppm	0.1
Conductivity	micromhos/cm	< 0.1 @ 25°C
pH	Standard Units	6.5 - 7.5
Chloride	mg/L	0.5
Sulfate	mg/L	0.5

mg/L = milligrams per liter
ppm = parts per million
mmhos/cm = micromho per centimeter

Untreated supply water from BBID will be also used for general (nonpotable) needs such as landscaping, chiller fill and make-up, fire protection, and hose bibs (equipment and surface washdown). A combined service water/fire protection 520,000-gallon water storage tank will store raw supply water from BBID. Service water transfer pumps will provide fill and makeup water to the air-cooler chillers and will supply the truck-mounted demineralizer.

5.15.2.1.3 Domestic Water Use and Quality

As described above, 99.8 percent of the water supplied to MEP will be used for various plant processes. The remaining 0.2 percent (0.332 gallons per minute) will be used for domestic purposes such as eye-wash stations, safety showers, drinking water, and sanitary facilities. BBID raw water will be used for this purpose. Recycled water cannot be used for these domestic purposes.

The BBID raw water will be filtered through a 500-micron bag filter followed by a 5-micron cartridge filter prior to being injected with sodium hypochlorite for disinfection. The treated water will then be fed to a 1,000-gallon aboveground polyethylene chlorine contact tank providing a minimum 120 minute contact time. Sodium hypochlorite will provide disinfection and prevent biofouling in the potable water system.

This proposed treatment system has been designed to meet U. S. Environmental Protection Agency (EPA) primary and secondary drinking water standards. These requirements, along with existing water quality data, are shown on Table 5.15-4. EPA standards will be met following the proposed treatment system.

TABLE 5.15-4
Summary of Local Surface Water Quality

Constituent	Purpose	Units	Standard	DWR Data[a]	BBID Data[b]
Aluminum	EPA Secondary	mg/L	0.2	ND	0.38
Antimony	EPA Primary	mg/L	0.006	ND	0.0028
Arsenic	EPA Primary	mg/L	0.01	0.002	-
Barium	EPA Primary	mg/L	2.0	ND	0.037
Beryllium	EPA Primary	mg/L	0.004	ND	-
Cadmium	EPA Primary	mg/L	0.005	ND	ND
Chloride	EPA Secondary	mg/L	250.0	47	55
Chromium	EPA Primary	mg/L	0.1	0.003	0.0013
Coliform	EPA Primary	MPN/100 mL	5.0%	-	17,000
Copper	EPA Primary	mg/L	1.3	0.002	0.0031
Cyanide	EPA Primary	mg/L	0.2	ND	ND
Fluoride	EPA Primary	mg/L	4.0	ND	0.03
Iron	EPA Secondary	mg/L	0.3	0.009	0.5
Lead	EPA Primary	mg/L	0.015	ND	
Manganese	EPA Secondary	mg/L	0.05	0.01	0.026
Mercury	EPA Primary	mg/L	0.002	ND	ND
Nitrate	EPA Primary	mg/L	10.0	2.2	2.7
Nitrite	EPA Primary	mg/L	1.0	0.53	0.61
pH	EPA Secondary	Std. Units	6.5 – 8.5	6.6	7.85
Selenium	EPA Primary	mg/L	0.05	ND	ND
Sulfate	EPA Secondary	mg/L	250.0	30	40
Total Dissolved Solids	EPA Secondary	mg/L	500.0	212	230
Turbidity	EPA Primary	NTU	0.3	11	7.9
Zinc	EPA Secondary	mg/L	5.0	ND	ND

[a] Data from Harvey O. Banks Pumping Plant, sampled 2002 and 2003. (Department of Water Resources, 2007).
[b] Data from BBID, sampled July 1, 2008 (BBID, 2008)

5.15.2.1.4 Water Supply during Construction

During construction, water will be required primarily for dust suppression, but will also be used for concrete washout, soil compaction, and hydrostatic testing of the pipeline.

Because of the short duration of construction activities and the relatively limited water requirements (approximately 2,500 gallons per day) of the construction phase of the project, no significant adverse impacts to the water supply are expected.

5.15.2.2 Wastewater Collection, Treatment, Discharge and Disposal

MEP has been designed as a zero liquid discharge (ZLD) facility. The primary wastewater collection system will collect process wastewater and stormwater runoff from all of the plant equipment process areas and route it to sumps followed by the onsite oil/water separator before treatment by the activated carbon filtration ZLD system. The treated ZLD reclaim water then will be recycled to the raw water storage tank for plant process water usage. The secondary wastewater collection system will collect sanitary wastewater from sinks, toilets, showers, and other sanitary facilities, and route it to an onsite septic tank for either discharge through an onsite leach field or removal for offsite treatment. The onsite septic system will receive approximately 478 gallons per day. The water balance diagrams, Figures 2.1-5a and 2.1-5b, show the expected wastewater streams and flow rates for MEP.

General plant drains will collect containment area washdown, sample drain water, and facility equipment drainage. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping and routed through an oil/water separator prior to ZLD treatment.

The non-oily oil/water separator effluent stream will pass through a truck mounted ZLD treatment system before being sent to the 50,000-gallon waste water tank and eventually recycled back to the raw water storage tank. The truck-mounted ZLD system will include a walnut shell activated carbon vessel followed by a surge tank and 5 micron bag filters and pH adjustment if necessary. Any oily waste collected in the oil/water separator will be transferred to 55-gallon drums and hauled offsite for proper disposal.

Wastewater from infrequent combustion turbine water washes and from the fuel filtration skid(s) will be collected in holding tanks or sumps and will be trucked offsite for disposal at an approved wastewater disposal facility.

5.15.2.3 Stormwater Runoff and Drainage

The proposed facility will mitigate stormwater runoff with a series of inlets and storm drain pipes that will convey the runoff to a proposed onsite extended detention basin located at the north end of the site. The extended detention basin is designed to release site stormwater runoff from the design storm capture volume over a minimum 48-hour period. It is not designed to hold water for longer periods. The multi-stage discharge structure will discharge to one of two swales routing upgradient stormwater around the site (see Figure 5.15-2b).

Areas of potential oily water contamination will be sited within containment to prevent oily water from mixing with stormwater flowing to the extended detention basin. Impervious areas will be limited to paved loop and equipment access roads and the equipment to operate the plant. Forty-four percent of the MEP site will have impervious surfaces for equipment siting and roads.

Tables 5.15-5 presents the pre-development and post-development runoff peak for the site.

TABLE 5.15-5
Pre- and Post-development Runoff for the MEP Site

Scenario	Area (acres)	Runoff Peak (cfs) 2-year event	Runoff Peak (cfs) 100-year event
Pre-Development (Zone CM-5)	8.65	0.58	7.05
Post-Development Uncontrolled[a] (Zone S-1&2)	8.12[b]	5.4	17.8
Post Development Discharge Rate[c]	8.65	0.58	6.58

cfs = cubic feet per second

[a]Post-development runoff rate to the extended detention basin

[b]Post-develoment acreage is shown less than pre-development because the detention pond surface acreage is not considered in the hydrologic routing model.

[c]Post-development Discharge from extended detention basin to natural drainage.

The peak runoff for the two-year and one hundred-year storm events for the site in the pre- and post-development conditions was determined and compared. As shown in Table 5.15-5, overall runoff will increase between pre-development and post-development due to the proposed impervious surfaces (structures and asphalt paving of the facility roads) and the shortened drainage basin time of concentration (time for runoff to occur). The predevelopment basin is described as grass land and has capability to absorb the runoff more efficiently than the post-development case with structures and paved or gravel surfacing. Also, runoff occurs over a longer period of time in the predeveloped case. In the developed site, runoff will have a shorter time of concentration; the runoff will occur over a shorter time period due to the site drainage system. This decrease in concentration time causes the increase in peak flow rates for the developed site (higher flow rates for a shorter period of time). The extended detention basin outfall discharge rates will not be greater than pre-development site stormwater discharge rates. Additionally, the extended detention basin will improve the water quality by allowing sediments to settle out prior to discharge. Although road paving will increase site runoff, this measure will improve both the air and water quality by minimizing dust during the dry season and sedimentation of runoff during rain events.

The grading and drainage of the proposed plant was designed in accordance with the Alameda County Flood Control and Water Conservation District *C.3 Stormwater Technical Guidance*. Appendix 5.15A provides the preliminary stormwater management design for the project, which includes stormwater calculations and the pre- and post-development drainage plans.

5.15.2.4 Construction Effects on Water Quality

Potential water supply impacts from construction will be limited to surface water runoff during excavation and construction. Such construction impacts are minor and can be controlled by implementing a Stormwater Pollution Prevention Plan (SWPPP) and associated best management practices (BMPs), and practicing proper housekeeping at the construction site.

The site grading and drainage will be designed to comply with all applicable LORS. The general site grading will establish a working surface for construction and plant operating areas, and will provide positive drainage from buildings and structures, as well as adequate ground coverage for subsurface utilities.

During construction, approximately 10 acres of land associated with the plant will be disturbed. Additional soil disturbance areas will include the project linear features and laydown areas. Temporary construction facilities will include a 5-acre worker parking and laydown area immediately east of the project site, a 1-acre water supply pipeline parking and laydown area located at the BBID headquarters facility on Bruns Road, and a 0.6-acre laydown area along the transmission line route adjacent to the PG&E Kelso Substation and Bethany Compressor Station.

Surface water impacts are anticipated to be related primarily to short-term construction activity and will consist of increased turbidity due to erosion of newly excavated or placed soils. Activities such as grading can potentially destroy habitat and increase rates of erosion during construction. Additionally, construction materials could contaminate runoff or groundwater if not properly stored and used. Compliance with engineering and construction specifications, following approved grading and drainage plans, and adhering to proper material handling procedures will ensure effective mitigation of these short-term impacts. BMPs for erosion control will be implemented. Erosion and sediment controls, surface water pollution prevention measures, and other BMPs will be developed and implemented for both construction and operational phases. These plans will be prepared in accordance with local agency requirements and the National Pollutant Discharge Elimination System (NPDES) construction permit issued by the SWRCB.

To qualify for the NPDES statewide General Permit for Storm Water Discharges Associated with Construction Activity (General Construction Permit), prior to construction, Mariposa Energy will be required to develop a SWPPP to prevent the offsite migration of sediment and other pollutants, and to reduce the effects of runoff from the construction site to offsite areas. Successful implementation of the SWPPP will ensure that construction impacts to water resources are mitigated to a less-than-significant level. SWPPP procedures include submitting a Notice of Intent (NOI) to the Central Valley Regional Water and Quality Control Board (RWQCB) and developing the SWPPP prior to the start of construction activities.

Water used for dust control and soil compaction during construction will not result in discharge. During the construction period, sanitary waste will be collected in portable toilets (no discharge) supplied by a licensed contractor for collection and disposal at an appropriate receiving facility. Equipment wash water will be collected and disposed of offsite.

5.15.2.5 Groundwater

MEP will make no direct use of groundwater resources and will have no effect on groundwater quantity or quality.

5.15.3 Cumulative Effects

Cumulative effects to water resources could occur through the use of surface water, the contribution of sanitary wastewater, or stormwater runoff. None of these categories of water use is expected to result in significant cumulative effects to area water resources:

- **Surface Water:** There are no significant dams or levees in the vicinity. As described in Sections 5.15.2.3 and 5.15.2.4, implementation of BMPs during construction and operation will avoid the potential for adverse impacts to surface water from the project.
- **Sanitary Wastewater Disposal:** MEP sanitary wastewater will be sent to an onsite septic tank for either discharge through an onsite leach field or removal by a licensed waste hauler for offsite treatment, which will cause no adverse impacts to groundwater resources.
- **Stormwater**: Implementation of MEP will neither increase nor decrease runoff significantly on the approximately 10-acre disturbance area. The onsite stormwater detention basin has been sized to adequately retain stormwater for gradual release into the storm drain system. The cumulative effects from stormwater runoff will not be significant.

5.15.4 Mitigation Measures

This section presents mitigation measures proposed to reduce impacts to water resources in areas affected by the project.

- Implement BMPs designed to minimize soil erosion and sediment transport during construction of the plant site. Design appropriate erosion and sediment controls for slopes, catch basins, culverts, stream channels, and other areas prone to erosion.
- Conduct operations at the plant site in accordance with the EPA's Storm Water Phase I Final Rule (for construction activities disturbing 1 acre or more). Design and implement the BMPs to prevent or control pollutants potentially associated with the operation of the plant from entering stormwater sewers.
- Perform refueling and maintenance of mobile construction equipment only in designated lined and/or bermed areas located away from stream channels. Prepare and implement spill contingency plans in areas where they are appropriate.
- Prepare and submit a SWPPP to ensure quality of discharged stormwater. Obtain concurrence from the Central Valley RWQCB for the SWPPP.

The proposed mitigation measures are prescribed by stormwater and erosion control management programs mandated under the NPDES permitting system. These programs have been in place for a number of years and the prescribed measures have proven effective. Under the General NPDES Permit for Construction, for example, various specific measures are prescribed, and a program of monitoring is required. The programs are at least 90 percent effective, have been in place for a number of years, as mandated by the Clean Water Act, and have proven effective.

5.15.5 Laws, Ordinances, Regulations, and Standards

Federal, state, and local LORS applicable to water resources and anticipated compliance are discussed in this section and summarized in Table 5.15-6 (at the end of this section).

5.15.5.1 Federal LORS

In California, discharges of stormwater are regulated by the SWRCB and RWQCBs under the Clean Water Act and the Porter-Cologne Water Quality Control Act. Permit details are discussed below under state and local regulations.

5.15.5.2 State LORS

5.15.5.2.1 Construction Stormwater NPDES Permit

The federal Clean Water Act effectively prohibits discharges of stormwater from construction sites unless the discharge is in compliance with an NPDES permit. The SWRCB is the permitting authority in California and has adopted a statewide General Permit for Stormwater Discharges Associated with Construction Activity (SWRCB Water Quality Order No. 99-08-DWQ; SWRCB, 1999) that applies to projects resulting in one or more acres of soil disturbance. MEP will result in disturbance of more than one acre of soil. Therefore, the project will require the preparation of a construction SWPPP that specifies site management activities to be implemented during site development. These management activities will include construction stormwater BMPs, dewatering runoff controls, and construction equipment decontamination. Mariposa Energy will file a Notice of Intent prior to any stormwater discharge from construction activities, and will prepare and implement a SWPPP for the construction phase of activities. The Notice of Intent will be filed with the SWRCB, but the Central Valley RWQCB is responsible for inspection and enforcement.

5.15.5.3 Local LORS

5.15.5.3.1 Septic Tanks

An application for septic tank for non-residential use shall be completed and submitted to the Zone 7 Water Agency, which provides water supply and flood control services to the project area. The application will be reviewed according to Zone 7 Resolution 1165, which outlines such criteria as whether applicants have fewer than 10 employees; if hazardous materials will be used, generated or stored onsite; the size of the facility; and, whether community sewerage is available (Alameda County Flood Control and Water Conservation District Zone 7, 2007).

5.15.5.3.2 Alameda County Grading Ordinance

Grading projects within Alameda County are subject to the Alameda County Grading Ordinance (Alameda County Code [ACC] Section 15.36). Pursuant to the Grading Ordinance, the applicant is required to submit a grading plan for review and approval by the Public Work Agency. The application must include basic site information, including a conceptual plan for erosion and sediment control. ACC Section 15.36.440 states that the applicant is responsible for erosion and sediment control, as follows.

> *It shall be the responsibility of the permittee to prevent discharge of sediment from the site in quantities greater than before grading occurred, to any watercourse, drainage system, or adjacent property and to protect watercourses and adjacent properties from damage by erosion, flooding, or deposition which may result from permitted grading.*

TABLE 5.15-6
Laws, Ordinances, Regulations, and Standards for Water Resources

LORS	Applicability	How Conformance Is Achieved	Agency/Contact
Federal			
Clean Water Act/Water Pollution Control Act. P.L. 92-500, 1972; amended by Water Quality Act of 1987, P.L. 100-4 (33 USC 466 et seq.); NPDES (CWA, Section 402)	Prohibits discharge of pollutants to receiving waters unless the discharge is in compliance with an NPDES permit. Applies to all point-source discharges, including stormwater runoff from construction.	Compliance with existing statewide NPDES permit for construction activities (described below).	See below under State LORS.
State			
Federal Clean Water Act (implemented by State of California)	Implements and enforces the federal NPDES permit program.	The applicant will submit a Notice of Intent, including fee payment, to the State Water Resources Control Board prior to the start of construction activities, and will prepare and implement a construction-phase SWPPP (Section 5.15.5.2).	State Water Resources Control Board Division of Water Quality Attn. Storm Water Section P.O. Box 1977 Sacramento, CA 95812-1977 (916) 341-5537
Local			
Alameda County Grading Ordinance (Alameda County Code [ACC] Section 15.36)	No grading (as defined in ACC Section 15.36) shall occur without a permit.	The applicant will submit two copies of preliminary grading plans (conforming to the list of requirements in ACC Section 15.36.240), along with application and plan check fees, prior to construction (Section 5.15.5.3.2).	Alameda County Public Works Land Development Division 399 Elmhurst Street, Room 141 Hayward, CA 94544 (510) 670-5411
Zone 7 Water Agency Resolution No. 09-3245.	Requires payment of Drainage Fee based on area of impervious surfaces.	The applicant will submit the Drainage Fee calculation worksheet along with its application to Alameda County for a Grading Permit (Section 5.15.5.3.3).	Zone 7 Water Agency Attn. Jeff Tang 100 North Canyons Parkway Livermore, CA 94551 (925) 454-5075

Preliminary grading plans may be submitted for review to help determine precise grading permit requirements. Prior to issuing a grading permit, the County requires that the applicant submit a final grading plan signed by a civil engineer.

5.15.5.3.3 Zone 7 Water Agency Drainage Fee

The Zone 7 Water Agency provides water supply and flood protection services in the Livermore-Amador Valley area. Its service area for flood protection also covers eastern Alameda County, including the MEP site. As part of the flood protection program, the Special Drainage Area 7-1 Program provides Zone 7 with revenue for capital projects through payment of a Drainage Fee. Drainage Fees are assessed based on impervious surface area, and are paid to the local agency processing the development application (e.g., Grading Permit).

5.15.6 Permits Required, Permit Schedule, and Agency Contacts

Agency contacts and required permits are listed in Table 5.15-7.

TABLE 5.15-7
Permits and Permitting Agencies for MEP Water Resources

Permit	Schedule	Agency
Septic Tank Application for Non-Residential Use	Apply prior to operation.	Alameda County Flood Control & Water Conservation District, Zone 7 100 North Canyons Parkway Livermore, CA 94551 (925) 454-5000
Grading Permit	Occurs during the submittal phase for the design plans to Alameda County for agency review.	Alameda County Public Works Land Development Division 399 Elmhurst Street, Room 141 Hayward, CA 94544 (510) 670-5411
National Pollution Discharge Elimination System General Permit for Construction	Submit NOI to use the permit at least 30 days in advance of use, prepare SWPPP for construction.	State Water Resources Control Board Division of Water Quality Attn. Storm Water Section P.O. Box 1977 Sacramento, CA 95812-1977 (916) 341-5537

5.15.7 References

Alameda County. Alameda County General Ordinance Code, Chapter 15.36, Grading Erosion and Sediment Control. Online at: http://municipalcodes.lexisnexis.com/codes/alamedagen/. Accessed February 2, 2009.

Alameda County Flood Control and Water Conservation District Zone 7. 2007. Septic Tank Permits. Online at: http://www.zone7water.com/index.php?option=com_content&task=view&id=66&Itemid=289. Accessed: March 6, 2009.

Beckman, David. 2009. "Wasting LA's Water During a Drought." *Switchboard,* Natural Resources Defense Council. Web site: http://switchboard.nrdc.org/blogs/dbeckman/wasting_las_water_during_a_dro.html

Byron Bethany Irrigation District. 2008. Unpublished water quality analyses for Canal 45 samples collected July 1, 2008.

Department of Water Resources. 2007. Water Quality in the State Water Project, 2002 and 2003. July.

State Water Resources Control Board (SWRCB). 1999. Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity, General Permit No. CAS000002. Adopted August 19.

Western Regional Climate Center (WRCC). 2008. Tracy Pumping Plant, California-Climate Summary. Online Information: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9001. Accessed March 6, 2009.

West Yost Associates. 2004. Senate Bill 610 Water Supply Assessment for Specific Plan III. July 28.