SECTION 6.0

Alternatives

This section discusses alternatives to Mariposa Energy, LLC's proposed Mariposa Energy Project (MEP). These include the "no project" alternative, power plant site alternatives, linear facility route alternatives, technology alternatives, and water supply alternatives. This discussion focuses on alternatives that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects.

The California Environmental Quality Act (CEQA) requires consideration of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (14 California Code of Regulations [CCR] 15126.6(a)). Thus, the focus of an alternatives analysis should be on alternatives that "could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects" [14 CCR 15126.6(c)]. The CEQA Guidelines further provide that "[a]mong the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts."

The Energy Facilities Siting Regulations (Title 20, CCR, Appendix B) guidelines titled *Information Requirements for an Application* require:

> A discussion of the range of reasonable alternatives to the project, including the no project alternative… which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and an evaluation of the comparative merits of the alternatives.

The data adequacy regulations also require:

> A discussion of the applicant's site selection criteria, any alternative sites considered for the project and the reasons why the applicant chose the proposed site.

A range of reasonable alternatives are identified and evaluated in this section, including the "no project" alternative (that is, not developing a new power generation facility), alternative site locations for constructing and operating MEP, alternative project design features (including linear routes and water supply source), and various technology alternatives. This section also describes the site selection criteria used in determining the proposed location of MEP.

6.1 Project Objectives

The main objective of MEP is to provide dispatchable, operationally flexible, and efficient generation to meet Pacific Gas and Electric Company's (PG&E) need for new energy sources in Alameda County and the San Francisco Bay Area, to support and back up intermittent renewable resources (e.g., wind and solar), and to satisfy the terms of MEP's power purchase agreement with PG&E.

MEP will provide a resource to balance the variability of renewable recourses, to satisfy peak energy and capacity needs during high load events, and to support the electrical grid during outages of transmission lines and other generating facilities. PG&E has identified a near-term need for new power facilities that can be on line by or before 2015 and that can support easily dispatchable and flexible system operation. PG&E issued a Request for Offers on April 1, 2008, to obtain these energy resources from qualified bidders. MEP's objectives are consistent with this need as follows:

- Safely construct and operate a 200-megawatt (MW), natural gas-fired, simple-cycle generating facility to meet PG&E's growing peak load and the growing energy demands of customers within PG&E's service territory.
- Site the project within the Altamont Wind Resource Area in order to supply back-up generation when the local wind turbines decrease output due to decreased wind. The quick start, peaking facility will be utilized to supplement the renewable wind generation during periods of low or variable wind resource in order to maintain grid stability.
- Site the project as near as possible to a PG&E substation with available transmission capacity.
- Site the project to minimize or eliminate the length of any project linears, including gas and water supply pipelines, as well as transmission interconnections. These objectives minimize potential offsite environmental impacts and the cost of construction.
- Assist Alameda County in meeting its electrical energy needs by providing additional local dispatchable generation, decreasing the amount of imported energy and providing system/grid support at critical times, such as periods of decreasing renewable generation and peak load conditions.
- Minimize environmental and air quality impacts.
- Assist the State of California in developing increased local generation projects, thus reducing dependence on imported power.

6.2 The "No Project" Alternative

If the project were not constructed, Mariposa Energy's basic project objectives would not be met. A new natural gas-fired generating facility would not be constructed within the PG&E service territory. Instead, to meet PG&E's growing load, PG&E would need to obtain additional generation from other sources, which are potentially older and less efficient and release larger quantities of air pollutants than MEP. Moreover, grid stability would be

compromised because a highly dispatchable and flexible peaking project would not be sited near the Altamont Wind Resource Area to provide system stability and reliability during periods of low wind.

The no project alternative could result in greater fuel consumption, air pollution, and other environmental impacts in the state because older, less efficient plants with higher air emissions would continue to generate power instead of being replaced with cleaner, more efficient plants, such as MEP. Also, the no project alternative would fail to meet the objective of assisting the State of California in reducing dependence on unreliable imported power. During limited availability of in-state generated electricity, such imported electrical energy has proven to be expensive and inconsistently available. Moreover, the no project alternative would not satisfactorily meet the project objectives specified above and thus was rejected in favor of the proposed project.

6.3 Power Plant Site Alternatives

Several alternative site locations were assessed during initial screening for MEP. This initial screening identified the MEP site and two alternatives. The alternative sites are shown in Figure 6.3-1. Although each of the alternative sites could feasibly attain most of the project's basic objectives, the MEP site clearly became the preferred alternative for a variety of reasons, including minimizing the required construction of transmission, gas supply, and water supply linear features, and minimizing the project's environmental impacts.

The key screening criteria used to select the MEP site and alternative sites included:

- Location within PG&E's service territory
- Ability to gain site control
- Availability of sufficient land area
- Proximity to existing transmission and distribution lines and to an existing substation with transmission capacity
- Location near a source of water supply of sufficient quantity and quality
- Consistency and compatibility with the Alameda County East County Area Plan (ECAP), zoning ordinances, and existing land uses
- The ability to avoid or minimize potentially significant impacts on the environment

6.3.1 Proposed Project Site

The MEP site is southeast of the intersection of Bruns Road and Kelso Road in unincorporated Alameda County, California, on a 10-acre portion of a 158-acre parcel (the Lee Parcel) immediately south of the PG&E Bethany Compressor Station and 230-kilovolt (kV) Kelso Substation. The proposed power plant site is located in the southern portion of the parcel, between two small hills.

The project site is in northeastern Alameda County, in an area designated for Large Parcel Agriculture by the ECAP. Most of this site is non-irrigated grazing land. There was prior

wind turbine development on the site and surrounding area on the southern portion of the 158-acre parcel; minor debris from that development remains onsite. Additionally, an existing, unrelated power generation facility is located on the parcel. The 6.5-MW Byron Power Cogen Plant occupies 2 acres of the property north-northeast of the MEP site.

MEP will interconnect to the PG&E Kelso Substation via a new 0.7-mile, 230-kV transmission line that will run north on the property, then across Kelso Road to the existing Kelso Substation, as described in Section 3.0, Electrical Transmission. The natural gas line interconnection for the proposed power plant entails constructing approximately 580 feet of new 4-inch pipeline directly northeast from the project site to the point of interconnection with PG&E's high-pressure natural gas pipeline, located within the parcel. More information regarding the natural gas supply can be found in Section 4.0, Natural Gas Supply.

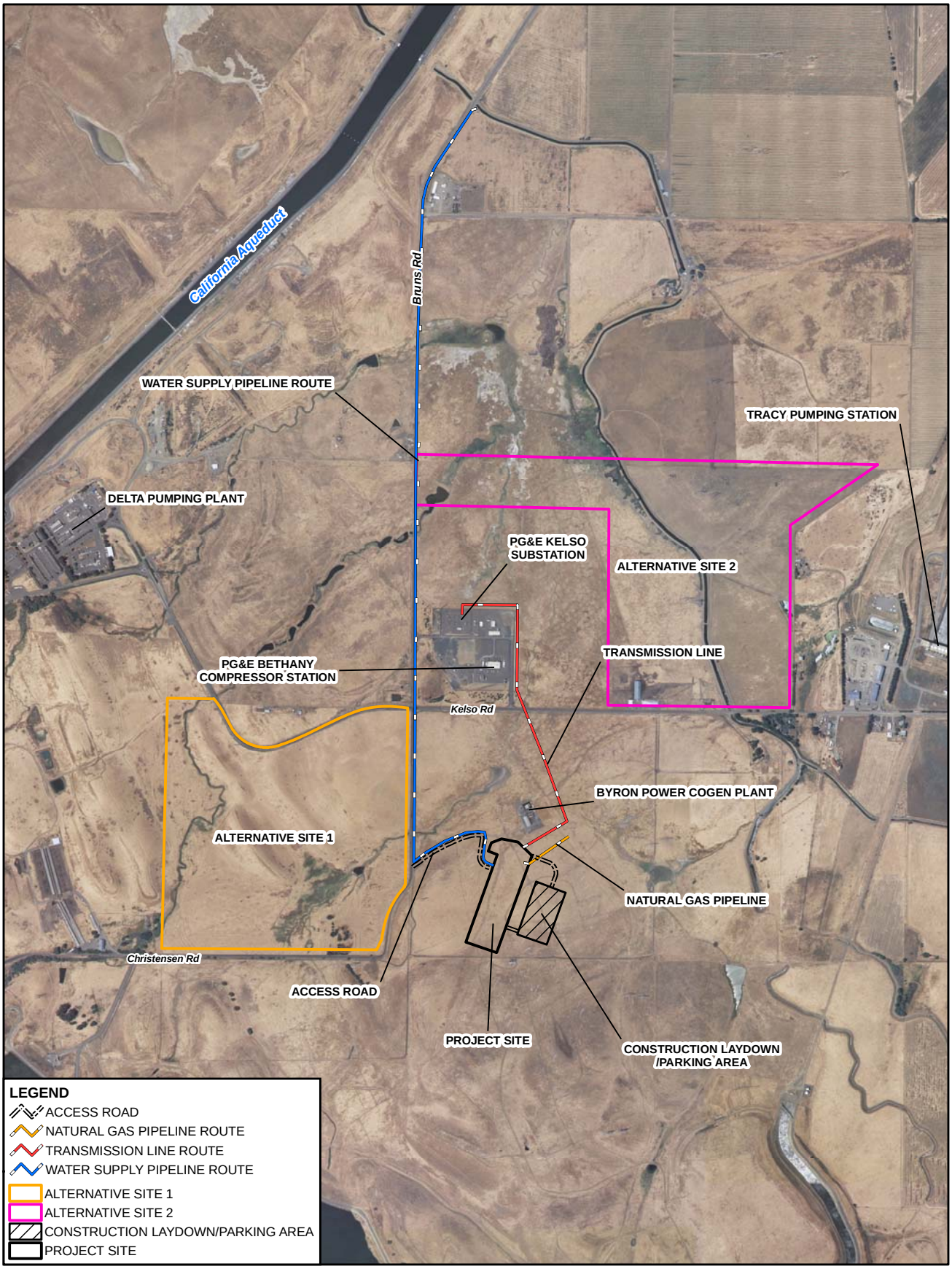
Service water will be provided from a new connection to the Byron Bethany Irrigation District (BBID) via a new pump station and 6-inch diameter, 1.8-mile pipeline placed in or along the east side of Bruns Road, from existing Canal 45 south to the plant site. Process wastewater will be either recycled in an on-site zero-liquid discharge (ZLD) system or removed for offsite disposal. An onsite septic system will be constructed for domestic wastewater disposal.

Multiple site locations on the 158-acre parcel were considered, including the northwest corner at the intersection of Bruns and Kelso Roads, south of the northeast corner, and a small north-south oriented valley on the southern portion of the parcel between two small hills. Other areas of the parcel were determined to be not suitable because of the presence of seasonal wetlands or elevated terrain. The location on the southern portion of the parcel was ultimately selected to take advantage of the natural screening provided by the small hills to minimize potential offsite noise and visual impacts, while also avoiding seasonal wetlands on the parcel.

6.3.2 Alternative 1: Costanza Site

The Costanza parcel is located immediately west of the Lee Parcel, on the western side of Bruns Road. The 143-acre parcel is vacant and is used for cattle grazing. Two drainages run through the parcel; one running north on the western portion of the property and one running northeast across the southeast corner of the property. A cattle stock pond has been developed along the drainage on the eastern portion of the parcel. The northern portion of the parcel has several small hills. The property is zoned Ag-100 (Agricultural, 100-acre minimum) and is within unincorporated eastern Alameda County. The parcel does not have a Williamson Act contract. Residential dwellings are located nearby on adjacent parcels near the northern and southwestern parcel boundaries. Based on the location of these residences, the southeast corner of the Costanza parcel was considered for a potential power plant development site.

The site would require an approximately 0.7-mile-long electrical transmission line to connect to the 230-kV Kelso Substation and an approximately 0.5-mile-long natural gas line to tie into the existing PG&E high-pressure gas main to the north. This site would require an approximately 1.7-mile-long water supply pipeline to BBID Canal 45. It is unknown whether site control is feasible at this location.



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

N

0 750 1,500
Feet

FIGURE 6.3-1
ALTERNATIVE SITE LOCATIONS
MARIPOSA ENERGY PROJECT
ALAMEDA COUNTY, CALIFORNIA

CH2MHILL

SAC\\ZION\SACGIS\PROJ\DIAMOND_376670\MAPFILES\AFC_MAPS\ALTERNATIVES.MXD MHASKELL 6/8/2009 18:02:36

6.3.3 Alternative 2: Gomes Site

The Gomes parcel is located immediately northeast of the Lee Parcel, across Kelso Road. The 150-acre parcel contains a feedlot facility adjacent to Kelso Road and is bisected by BBID Canal 70, which runs generally north/south through the parcel. The western portion of the parcel is used for cattle grazing; the eastern portion is cultivated farmland. The northern portion of the parcel has slightly elevated terrain compared to the surroundings. A western "panhandle" extends west to Bruns Road across to a topographically low-lying area with multiple drainages. The property is zoned Ag-100 (Agricultural, 100-acre minimum) and is located within unincorporated eastern Alameda County. The parcel has a Williamson Act contract. Two 500-kV transmission lines run generally north/south through the center of the parcel. Residential dwellings are located on adjacent parcels immediately south and east of the parcel boundaries. Based on the location of these residences, potential power plant development would likely be limited to the middle of the parcel (from north to south), along the western property boundary, west of the BBID Canal 70 and the 500-kV transmission lines.

The site would require an approximately 0.4-mile-long electrical transmission line to connect to the 230-kV Kelso Substation and an approximately 0.5-mile-long natural gas line to tie into the existing PG&E high-pressure gas main to the west. This site would require an approximately 2.0-mile water supply pipeline from BBID Canal 45 via Bruns Road and Kelso Road. It is unknown whether site control is feasible at this location.

6.4 Comparative Evaluation of Alternative Sites

In the discussion that follows, the sites are compared in terms of each of the 16 topic areas required in the Application for Certification (AFC), including the following:

- **Land Use Compatibility—**Is the parcel zoned appropriately for industrial use and compatible with local land use policies?
- **Routing and Length of Linear Facilities—**Can linear facilities be routed to the site along existing transmission lines, pipelines, and roads? Will linear facilities be significantly shorter for a given site?
- **Visual Resources—**Are there significant differences between the sites in their potential for impact on significant or protected viewsheds?
- **Biological Resources—**Would there be significant impacts on wetlands or threatened or endangered species?
- **Noise—**Is the site sufficiently near a sensitive receptor area such that it would be difficult to mitigate potential noise impacts below the level of significance?
- **Use of Previously Disturbed Areas—**Has the site been previously disturbed? Does the site minimize the need for clearing vegetation and otherwise present low potential for impact on biological and cultural resources?

6.4.1 Project Development Constraints

As indicated in the introductory descriptions of each of the alternative sites, the basic needs of power plant siting for land and access to electrical transmission, gas supply, and water are met at the MEP site.

The Costanza Site would require offsite linears to connect to gas, transmission, and water. The transmission interconnection and water supply connection would be approximately the same in length as MEP; however, this site would require a longer gas supply pipeline. Based on the more prominent higher terrain on the northern portion of the parcel, as well as the two creeks running through the parcel, the southeast corner of the Costanza parcel was considered for a potential power plant development site.

The Gomes Site would require offsite linears to connect to gas, transmission, and water. The transmission interconnection would be approximately 0.4-mile-long; however, it would require a longer gas supply pipeline. The site would require a 2.0-mile water supply pipeline to tie into BBID Canal 45. Although BBID Canal 70 crosses the property, this water source was rejected because it is not a year-round water source. Additionally, the site has two 500-kW transmission lines bisecting it, which essentially renders the center portion of the site unusable. Based on the more prominent higher terrain on the northern portion of the parcel and seasonal wetlands to the west, potential power plant development would likely be limited to the middle of the parcel, west of the BBID Canal 70 and the transmission lines.

6.4.2 Air Quality

The plant's configuration and operation would be essentially the same from an air quality perspective at every location. All of these sites are in the same air district (Bay Area Air Quality Management District) and offsets acquired by Mariposa Energy would be equally appropriate for every site. The type and quantity of air emissions from the alternative sites would be identical. The impacts on the human population and the environment may differ slightly because of the location of residences and other human uses in the project vicinity. The MEP site is located the farthest from the nearest residences (approximately 3,200 feet). The alternative sites would be located approximately 2,000 to 2,500 feet from the nearest residences. Local terrain is similar at all sites and not likely to change air quality impacts significantly.

6.4.3 Biological Resources

Special-status species that are recorded, or that potentially occur in the region, are generally the same for all sites. The sites are similar in their proximity and abundance of either onsite or adjacent habitat that is relatively natural or undeveloped.

As evident in Figures 5.2-3 and 5.2-4 presented in Section 5.2, the greatest impact on biological resources would be expected for development of the Costanza site because of the proximity of wetland and riparian habitat immediately to the west. The wetlands and riparian habitats border the probable site location for a plant on this parcel. Species expected in this area would include California tiger salamander and the western burrowing owl. Additionally, this location is adjacent to a known area of valley sink scrub that has the potential to provide habitat for special-status plants such as the recurved larkspur.

Additional site surveys in accordance with biological survey protocol would be essential if site development were to occur.

The Gomes Site would have similar impacts on biological resources as the MEP site and is located near areas known to have western burrowing owls. Seasonal drainages are located on the western panhandle portion of this property, which would require further surveys to determine the presence of special-status species. No natural waterways (BBID Canal 70 is present) or wetlands are located on the portion considered for project development.

6.4.4 Cultural Resources

There are no known significant cultural resources at the MEP site. Resources of the Costanza and Gomes sites are unknown. The MEP and Gomes sites have approximately the same general cultural resource sensitivity, while the Costanza site has moderate sensitivity because of its location adjacent to the seasonal creek through the parcel.

6.4.5 Geological Resources and Hazards

There are no significant differences in the geological resources present at each site. Thus, there is no significant difference in the effects of the proposed MEP site and the two alternatives on geologic resources.

6.4.6 Hazardous Materials Handling

There would be no significant difference between the site locations in terms of hazardous materials handling. The uses of hazardous materials would be the same for any of the sites.

6.4.7 Land Use and Agriculture

The three sites are all located within Alameda County. A summary of the land use status of the sites issues is provided in Table 6.4-1.

TABLE 6.4-1
Land Use Status of Sites

Site Location	FMMP Designation	East County Area Plan Zoning	Williamson Act Contract	Entitlements Required
MEP	Grazing	Large Parcel Ag	Yes	None
Alternate 1: Costanza	Grazing	Large Parcel Ag	No	None
Alternate 2: Gomes	Grazing	Large Parcel Ag	Yes	None

FMMP = Farmland Mapping and Monitoring Program

The three sites have identical FMMP, zoning, and would all be a consistent use with the ECAP.[1] The MEP site has been used for grazing and a former wind turbine facility, while the Costanza property has been used for grazing only. The Gomes property to the west is used for grazing, while the eastern side appears to be used for farming.

6.4.8 Noise

MEP is located approximately 3,200 feet from the nearest residence to the northwest. There is one residence within approximately 2,500 feet west of the Costanza site, and one residence within approximately 2,100 feet southeast of the Gomes site. Because of the lack of development in the area, the ambient noise level is relatively low during times of calm winds.

With all three sites, the power plant would add a noise source to the vicinity, in addition to several existing utility-related sources (e.g. wind farms, Bethany Compressor Station, and Byron Power Cogen Plant). The proposed MEP site is preferable based on the greater distance to residences and unique terrain shielding from the low hills present immediately to the east and west of the site. Further detailed noise analysis could result in options for mitigating noise, such as acoustical enclosures around equipment.

6.4.9 Paleontology

There would be no significant difference among the sites in terms of potential effects on paleontological resources. The probability of encountering significant fossils is approximately the same at each site.

6.4.10 Public Health

As discussed in Section 6.4.2, Air Quality, the plant's configuration and operation would be essentially the same from an air quality perspective at every location. The project and the alternative sites would not be likely to cause significant adverse long-term health impacts (either cancer or non-cancer) from exposure to toxic emissions, regardless of the site chosen.

6.4.11 Socioeconomics

All three sites are located in Alameda County. The number of workers, construction costs, payroll, and property tax revenues would be nearly the same for the project at each of the sites. Most of the workers would come from the Alameda, Contra Costa, and San Joaquin Tri-County area. Most workers would commute daily or weekly to the plant site. Some may move temporarily to the local area during construction, causing site-specific impacts on schools, utilities, and emergency services. These impacts would be temporary. As discussed in Section 6.4.2, Air Quality, and Section 6.4.10, Public Health, the project and the alternative sites would not have any potentially significant human health effects. Moreover, there are no minority and low-income populations as defined by U.S. Census data in the

[1] The ECAP Land Use Diagram designates each of the project sites as "Large Parcel Agriculture." This Land Use Designation requires a minimum parcel size of 100 acres and allows public and quasi-public uses such as MEP. The ECAP's Open Space Diagram indicates that the three sites are also located within its Wind Resource Area, which covers the northeastern section of the County, and which encourages development of wind energy operations. Below the ECAP in the County's land use hierarchy is its Zoning Code, which divides the County into various Zoning Districts. The sites are located within the Agricultural Zoning District, and the County considers a power plant to be a conditionally permitted use within that Zoning District. The passage of Measure D in 2002 did not alter Section 17 of the Zoning Code regarding public utility uses or the inclusion of public uses, quasi-public uses, and utility corridors as allowable uses in Large Parcel Agricultural.

vicinity. There would be no disproportionately high and adverse effects on any populations, let alone any such effects on low-income of minority populations. Accordingly, the project and the alternative sites would comply with environmental justice requirements by avoiding disproportionately high and adverse impacts on the minority and low-income populations.

6.4.12 Soils

Use of the proposed MEP, Costanza, and Gomes sites would involve the conversion of non-irrigated grazing land to utility uses. The MEP and Costanza sites are currently used for grazing, while approximately half of the Gomes parcel appears to be farmed. Due to the large size of the Gomes parcel, the plant could be sited within the portion that is used for grazing. Differences in soil erosion would be inconsequential, given proper use of best management practices during construction and operation.

6.4.13 Traffic and Transportation

All three of the sites considered are in the same vicinity and would be accessed via the same local roadways. Therefore, the construction and operations traffic and transportation considerations are not a major consideration in evaluating or comparing the sites.

6.4.14 Visual Resources

The potential for visual resource impacts associated with each of the sites varies depending on the relative visibility of the sites from roads and residences and the length and potential visibility of any new transmission lines that the power plant would require. Visual impacts are also a function of the surrounding facilities.

The MEP site is visible in unobstructed views from points near the intersection of Kelso Road and Bruns Road. Views of the project site from locations throughout the surrounding area are intermittent because of the topography of the site itself and the nearby land, which forms a bowl-like setting within which the project would be located. The project site is screened to some degree from many parts of the nearby area by this land form, as well as by the presence of mature vegetation and existing structures, which limit the areas from which there is a potential for sustained, unobstructed views of the project site. A 0.7-mile transmission line will be needed at this site to connect with the Kelso Substation to the north.

The Costanza site is located within a slightly depressed area with some small hills located to the south and the east. The area is predominantly used for grazing and some agricultural farming uses. The hills to the south and east would provide some screening to motorists heading south along Bruns Road, as well as recreationists at the Bethany Reservoir. The project would be visible to residents and motorists to the north, as there is limited screening provided by the natural terrain. The plant would be highly visible to the residence located west of the site. Motorists traveling east and west along Christensen Road would have an unobstructed view of the plant site at this location. A 0.7-mile transmission line would be needed at this site to connect with the Kelso Substation to the northeast.

The Gomes site is located to the west of BBID Canal 70 and is used for grazing. Immediately east of Canal 70, the land is slightly elevated, and would provide limited screening for viewers to the east. Motorists along both Bruns Road (heading north and south) and Kelso

Road (heading east or west) would have an unobstructed view of a plant at this site. The nearest residents to the southeast would have minimal screening by the terrain on the east side of Canal 70, and by the trees immediately surrounding the homes; however, the plant would be highly visible. Recreationists at the Bethany Reservoir would have limited views of the site due to the hillier terrain farther south, near the reservoir, but the plant would be still visible at this location. A 0.4-mile transmission line would be needed at this site to connect with the Kelso Substation to the west.

6.4.15 Water Resources

Similar to the proposed MEP site, each alternative site would require the same amount of water for process use, fire protection, and potable water uses (drinking water, safety showers, etc.). Since BBID Canal 45 has been identified as a year-round reliable water-supply source, all three locations would tie into BBID Canal 45 at the intersection of Bruns Road and Canal 45. Since the MEP site and the Costanza site are located near each other, the required water supply pipeline length would be approximately equal in length (1.8 miles and 1.7 miles, respectively) long from these sites. The Gomes site would require a slightly longer pipeline, approximately 2.0 miles in length.

6.4.16 Waste Management

The same quantity of waste will be generated at the proposed site as at all alternative sites. The environmental impact of waste disposal would not differ significantly between the alternative sites.

6.4.17 Summary and Comparison

Although each of the alternative sites is feasible and could likely meet most of the basic project objectives, the MEP site is the preferred alternative for a variety of reasons.

The Costanza site was rejected because this site has the potential for the greatest impact on biological resources due to its proximity to a creek and wetland habitat to the west. The California tiger salamander (federally threatened, California Species of Special Concern), the western burrowing owl (California Species of Special Concern), and valley sink scrub have been recorded in this area. Additionally, because of the proximity of the site to the creek, this site has a greater potential for impacts on cultural resources. This alternative is located approximately 2,500 feet from the nearest residence and limited screening is available to mitigate noise and visual impacts for the residence, motorists traveling along Christensen Road, and motorists traveling along portions of Bruns Road.

The Gomes site was rejected because of the high visibility to residents, motorists, and recreationists in the area. The site has little in the way of screening (industrial facilities, trees, large buildings), and due to the terrain of the area, minimal screening by hills is available. Additionally, this site is located closest to residents at approximately 2,100 feet to the southeast. While it is possible that the potential visual impacts on these nearby receptors could be mitigated to a level of insignificance, this mitigation would add significant costs to the project in comparison to the MEP site.

The MEP site will result in the fewest potential environmental impacts compared to the Costanza and Gomes sites. When compared to these alternatives, the MEP site fulfills the

project objectives most cost effectively and with the fewest impacts because the MEP site is located the farthest from a residence, has natural screening provided by the terrain, and is not located immediately adjacent to sensitive biological resource areas, as compared to the Costanza site.

Taken all together, the MEP site best meets the basic project objectives without resulting in any adverse environmental impacts as compared to the Costanza and Gomes sites. As a result, the Costanza and Gomes sites were rejected in favor of the MEP site. Table 6.4-2 compares the MEP and alternative sites in light of the key project objectives and environmental factors.

TABLE 6.4-2
Comparison of the Proposed Site and Alternative Site Locations

Characteristic	MEP	Alternative 1 Costanza	Alternative 2 Gomes
Ability to gain site control	Yes	Unknown	Unknown
Availability of sufficient land area	Yes	Yes	Yes
Proximity to existing transmission, distribution lines and an existing substation	0.7 miles	0.7 miles	0.4 miles
Distance to water supply source of appropriate quality and quantity	1.8 miles	1.7 miles	2.0 miles
Land use consistent with County General Plans	Yes	Yes	Yes
Proximity to nearest residence	3,200 feet	2,500 feet	2,100 feet
Potential Presence of Threatened and Endangered Species and Habitat	Low	Moderate	Low
Cultural/ Archaeological Sensitivity	Low	Moderate	Low
Potential noise impacts	Low	Moderate	Moderate
Potential visual impacts	Low	Moderate	Moderate
Potential soils impacts	Low	Low	Low

6.5 Alternative Project Design Features

This section addresses alternatives to some of the MEP design features, such as the linear facility routing, interconnection location, and water supply source.

6.5.1 Alternative Linear Facility Routing

This section addresses alternative linear facility routing for the proposed natural gas supply pipeline, electrical transmission line, and water supply pipeline.

6.5.1.1 Natural Gas Supply Pipeline Route Alternatives

The facility will connect to PG&E's existing high-pressure natural gas pipeline (Line 2), which is located within the Lee Parcel and is approximately 580 feet northeast of the project site. Because of the short distance, direct route, and the lack of potentially significant impacts associated with this interconnection, no other alternatives would avoid or minimize potentially significant effects compared to the chosen route.

6.5.1.2 Electrical Transmission Line Route Alternatives

The facility will connect to PG&E's 230-kV Kelso Substation via a new approximately 0.7-mile-long transmission line. Because of the short distance, direct route, the preference to avoid existing transmission lines located to the east and west, and the lack of potentially significant impacts associated with this interconnection, no other alternatives would avoid or minimize potentially significant effects compared to the chosen route. Section 6.5.2 addresses additional transmission interconnection points that were analyzed as possible alternatives to the PG&E 230-kV Kelso Substation.

6.5.1.3 Water Supply Pipeline Route Alternatives

The facility will connect via a new 6-inch-diameter, 1.8-mile water supply line from BBID Canal 45. Due to the existence of a direct route along existing roadway corridor and the lack of potentially significant impacts associated with this interconnection, no other alternatives would avoid or minimize potentially significant effects compared to the chosen route. Section 6.5.3 addresses additional water supply sources that were analyzed as possible alternatives to Canal 45.

6.5.2 Interconnection Alternatives

Three interconnection options near the MEP site were considered. The proposed interconnection location is PG&E's 230-kV Kelso Substation, located approximately 0.5 miles north of the MEP site. Alternate interconnection options in the vicinity include (1) the Western Area Power Authority (WAPA) Tracy Substation located on the north side of Kelso Road just west of Mountain House Road (approximately 1.0 mile from MEP) within the WAPA Balancing Authority, and (2) the California Department of Water Resources Delta Substation located at the Harvey O. Banks Delta Pumping Plant at the western terminus of Kelso Road (approximately 1.1 miles from MEP). Each of the two alternate interconnection alternatives would require construction of significantly longer tie-in transmission lines, with greater potential environmental impacts based on greater length and additional terrain crossed. Additionally, PG&E is the counterparty for the project's output and neither of the alternatives provides direct access to PG&E's transmission system, necessitating a contractual agreement with an intermediate party. Interconnection to the WAPA system would also require additional interconnection studies and may result in environmental impacts associated with safe and reliable interconnection to the WAPA Balancing Authority. Therefore, the proposed interconnection at Kelso Substation is preferred to minimize potential environmental impacts and achieve the basic project objectives set forth in Mariposa Energy's contract with PG&E.

6.5.3 Water Supply Source Alternatives

Mariposa Energy has incorporated all cost-effective water conservation features into the project design to minimize the use of water. As discussed in Section 6.6.4, MEP will not include evaporative (wet) cooling. Notwithstanding these significant measures to minimize water use, tertiary-treated recycled water supply sources were evaluated as an alternative to the BBID Canal 45 water supply. The nearest potential source of recycled water is Mountain House Community Services District (MHCSD) Wastewater Treatment Plant (WWTP), at a distance of approximately 5.5 miles from the MEP. Recycled water is also potentially available from the City of Tracy WWTP at a distance of approximately 11.5 miles from MEP.

Total water use is expected to average 34.8 acre-feet per year based on an expected operating scenario of 600 hours per year and 200 start and stop cycles. The estimated annual usage associated with the maximum-permitted operating scenario of 4,000 hours per year and 300 start and stop cycles is approximately 187 acre-feet per year.

6.5.3.1 Description of Sources

Proposed Water Supply: BBID has available untreated service water in its Canal 45 to serve MEP in excess of project needs, as indicated in Appendix 2B. Service water will be provided from a new connection to Canal 45 via a new pump station and a 6-inch-diameter, 1.8-mile-long pipeline placed in or along the east side of Bruns Road, from existing Canal 45 south to the MEP 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 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.

Alternate Water Supply –MHCSD WWTP: MHCSD has developed its WWTP in a phased approach to meet the needs of its growing community. The second phase of development included tertiary treatment of WWTP effluent, allowing for recycled water use. As of March 13, 2007, the MHCSD WWTP began to discharge tertiary-treated waste water to the Old River consistent with Phase II requirements specified in the California Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements (Order No. R5-2007-0039/National Pollutant Discharge Elimination System (NPDES No. CA0084271).
The MHCSD priority use for recycled wastewater will be for uses within the Mountain House community. The initial community priority is to supply irrigation water for a planned (but not yet constructed) community golf course (Shreghi, 2009). The golf course will use approximately 1 million gallons per day (mgd) of water (during the irrigation season). Additionally, the California Energy Commission (CEC) has required in its license of the proposed East Altamont Energy Center (CEC, 2003), that prior to operation of that facility: (1) a pipeline capable of conveying 5,900 gallons per minute (8.5 mgd) of recycled water from the Mountain House WWTP be constructed, and (2) a formal request be submitted for recycled water to satisfy cooling needs for the project. Subsequently, this facility would be required to use all available recycled water to meet its cooling needs.

The current Phase II WWTP is designed to process a daily flow of 3.0 mgd, and includes tertiary filtration and ultraviolet disinfection. The average 2008 annual effluent flows (based on monthly averages reported in discharger self-monitoring reports) were approximately 0.483 mgd; the 2008 annual total was 560 acre-feet[2]. This quantity is sufficient to meet neither the planned Mountain House golf course irrigation needs nor the needs of the East Altamont Energy Center when built. Significant additional development in the Mountain House community will be required before sufficient supply is available to meet the needs of the planned golf course and additional potential recycled water uses. Based on the current uncertainty in growth of the housing market, it is difficult to predict the timing of future capacity increases. Therefore, the MHCSD WWTP is not expected to have recycled water supply available for use at MEP.

If supply capacity from the MHCSD WWTP were to become available in the future, construction of a conveyance system for the recycled water would be required. This pipeline would be in addition to the BBID Canal 45 water supply pipeline that will be required regardless of potential recycled water supply to ensure water supply reliability and to meet MEP potable water needs, as recycled water cannot be used for potable uses per the California Code of Regulations, Title 22, Division 4. An approximately 5.5-mile pipeline would be required to use this source of recycled water at MEP. The conceptual recycled water supply pipeline route with the least environmental impacts would be northeast from MEP to Kelso Road; along the south side of Kelso Road to North Great Valley Parkway; along the north side of North Great Valley Parkway and crossing underneath Byron Bethany Road; within the existing utility corridor between the Union Pacific Railroad right-of-way and Byron Bethany Road southeast to West Bethany Road; along north side of West Bethany Road to the MHCSD WWTP site, and north into the WWTP facility. Future Mountain House commercial development plans near the WWTP facility would need to be considered in finalizing this route.

Alternate Water Supply – City of Tracy WWTP: The City of Tracy plans to provide recycled water to several proposed power generation projects, including the Midway Power (a.k.a. Tesla) Project, Mulqueeney Ranch Pumped Storage Project, and Stockton Generation LLC Roberts Island Project (City of Tracy, 2009). Each of these proposed projects would generate significant evaporative losses (500 acre-feet per year or greater). Based on the significant conveyance distance with proportionally greater potential environmental impacts, and MEP's relatively low expected water usage, the City of Tracy WWTP is not likely to be a viable water supply source for MEP. Therefore, the remainder of this analysis focuses on the MHCSD WWTP alternative. Potential impacts and costs of this alternative can generally be extrapolated from the Mountain House WWTP evaluation based on the required pipeline length being approximately two times greater.

6.5.3.2 Environmental Factors

The paragraphs below provide a brief environmental analysis comparing the proposed BBID Canal 45 water supply source with the MHCSD WWTP recycled water supply alternate option. It should be noted that in either alternative, a 1.8-mile pipeline from BBID to MEP would be needed to ensure water supply reliability and to bring potable water to the site. Therefore, the alternative of using recycled water from MHCSD would have

[2] From CSD Monthly Average Data RWQCB Permit Order No. R5-2007-0039 Status: Phase II NPDES CA0084271

environmental impacts in excess of those for the selected option of building a single water pipeline from BBID.

Air Quality and Public Health. Impacts would occur as a result of emissions from construction equipment. Since construction techniques would be similar for either option, potential impacts will be proportional to pipeline length. Therefore, the BBID Canal 45 option will have a significant lower impact due to the shorter pipeline route (1.8 miles versus 7.3 miles total of pipeline between the BBID line and the MHCSD line). Because the MHCSD option is significantly longer, additional soil would be disturbed resulting in additional fugitive dust impacts and construction vehicle emissions.

Biological Resources. The proposed and alternate water supply pipeline routes generally follow roads and rights-of-way that are partly disturbed and would be buried upon completion of construction. The potential for rare plants along both routes is considered very low because of the disturbed nature of these road shoulders. The project area is dominated by invasive plant species. The disturbed nature of the road corridors generally precludes habitat for state and federally listed species, including California tiger salamander, California red-legged frog, San Joaquin kit fox, and vernal pool fairy shrimp. Features of biological interest along the alternate water supply pipeline route are discussed below.

Tall trees including eucalyptus growing along Kelso Road provide potential nest sites for avian species, including state-threatened Swainson's hawk. Mountain House Creek, located along Byron Bethany Road, provides potential habitat for sensitive wildlife. Mountain House Creek would likely be regulated by the California Department of Fish and Game, U.S. Army Corps of Engineers, and RWQCB. It is uncertain whether adequate clearance exists above the box culvert at this crossing for the new pipeline or whether alternate construction techniques may be required. The ephemeral drainages located along Kelso Road are likely not jurisdictional by the agencies. There is one isolated wetland area (supporting cattails) along Kelso Road which is associated with an irrigation ditch. This ditch is adjacent to the road shoulder and could be avoided by the pipeline. Near Wicklund Road, adjacent to the WWTP, is a slough tributary to Old River, a delta water body that is jurisdictional at the state and federal level.

Each of the features discussed above would require a detailed evaluation to assess potential impacts to biological resources. As discussed in Section 5.2, potential impacts associated with the proposed BBID water supply pipeline route are limited to small drainage crossings along that route. Therefore, it appears that potential biological impacts will be minimized by construction of the proposed BBID water supply pipeline.

Cultural Resources. Cultural resource sensitivity, which is low, would not differ significantly throughout the area covered by the proposed and alternative routes. The greater trenching length required for the alternate Mountain House WWTP water supply pipeline increases the likelihood of cultural resource impacts. The proposed BBID water supply pipeline route is preferred from a cultural resource perspective.

Noise. Construction noise impacts associated with the proposed water supply pipeline will be negligible; no noise-sensitive receptors are located along this route. Several residences are located along the alternate water supply pipeline route, including several residences along

Kelso Road and the Mountain House community residential development at the intersection of Kelso Road and North Great Valley Parkway. Therefore potential construction noise impacts would be greater for the alternate water supply pipeline route.

Traffic and Transportation. Traffic impacts associated with the proposed BBID route will be minor due to the low traffic volume on Bruns Road. The alternate Mountain House WWTP route would impact somewhat higher traffic levels on Kelso Road. Any encroachment on Byron Bethany Road for pipeline construction would potentially create significant traffic disruption due to the high traffic volumes. Trenchless construction would likely be required for the Byron Bethany Road and Union Pacific Railroad crossings. Potential traffic impacts and required traffic control measures would be significantly greater for the Mountain House WWTP water supply pipeline route, due to its greater length and location. The proposed BBID water supply pipeline route is preferable from a traffic impact perspective.

Water Resources. Mariposa Energy has incorporated water conservation measures directly into the project design and operation to minimize the use of water. The MEP design incorporates mechanical chillers rather than evaporative cooling or fogging for turbine inlet air cooling. Additionally, MEP will recycle process wastewater discharge and collect condensate for reuse at the facility. Based on these measures, the additional water resource conservation benefit of using a recycled water supply source would be greatly reduced, in comparison with an evaporative cooling facility. At typical summer operation conditions (93 degrees Fahrenheit), MEP's water usage would be approximately 42 percent greater if the project used evaporative inlet air cooling rather than a mechanical chiller with air-cooled condenser.

Additionally, MEP requires a source for facility potable water needs. As discussed in Sections 2.0 and 5.15, BBID water will be treated onsite for potable uses. Mountain House WWTP recycled water cannot be treated for potable needs; therefore, BBID water supply would be required in addition to the alternate source, if recycled water were used.

6.5.3.3 Institutional Factors

Both the proposed and alternate water supply source pipelines follow the alignment of rural public roads. Both routes would require coordination with local jurisdictions for roadway encroachment and traffic control, and additionally would cross two high-pressure natural gas pipelines operated by PG&E.

The Mountain House WWTP alternative would require significant additional encroachment coordination and approvals due to several utility, water conveyance, and transportation crossings along this route. Crossings along the Kelso Road portion of this route include a petroleum pipeline, BBID Canal 70, and the Delta-Mendota Canal. At this location, the Delta-Mendota Canal is routed underground through three approximately 6-foot-diameter pipes. High traffic volumes on Byron Bethany Road would likely necessitate trenchless construction for this crossing to minimize traffic disturbance. Additionally, coordination and access agreements would be required with Union Pacific Railroad for encroachment in right-of-ways and crossings. Based on the anticipated significant access agreement coordination required for this alternative route, the proposed BBID water supply source is favored for institutional factor considerations.

6.5.3.4 Engineering/Construction Feasibility

Either the proposed or alternative source conveyance pipeline would generally be buried in the shoulders of the roadways using open trench construction. For the Mountain House recycled water pipeline route, trenchless construction would likely be required for at least BBID Canal 70, Union Pacific Railroad, and Byron Bethany Road crossings. As discussed in Section 6.5.3.3, several additional large pipeline crossings exist along this route and may require consideration of alternate construction techniques. Traffic control would be required for both the proposed and alternative source routes; however, much higher traffic volumes are present along the Mountain House recycled water route (most notable Byron Bethany Road). Pavement restoration would be required for both routes.

Conceptual design engineering cost estimates were prepared for both the proposed and alternate water supply conveyance systems. The estimates for the proposed 1.8-mile BBID Canal 45 and Mountain House WWTP conveyance systems are $891,000 and $2.63 million, respectively.

6.5.3.5 Conclusion

Mariposa Energy has designed MEP with water-conserving measures such as replacing evaporative cooling with air-cooled condensers to minimize water use to an expected annual usage of 34.8 acre-feet per year and estimated usage at maximum-permitted operation of 187 acre-feet per year. A local reliable source of recycled water is not available, as the MHCSD does not currently discharge quantities sufficient to meet planned recycled water demand in the community. Additionally, the potential environmental impacts associated with construction of the approximately 5.5-mile recycled water supply pipeline from the Mountain House WWTP would be much greater than with the proposed 1.8-mile BBID water supply pipeline. Finally, even if the use of recycled water from Mountain House were feasible, the 1.8 mile water pipeline from BBID to the project site would need to be constructed to ensure water supply reliability and to provide potable water to MEP. Based on the limited water usage quantities required for MEP, the use of recycled water is not economically feasible for this project.

6.6 Technology Alternatives

6.6.1 Generation Technology Alternatives

Selection of the power generation technology focused on those technologies that can utilize the natural gas readily available from the existing distribution system. The following is a discussion of the suitability of such technologies for application to MEP.

6.6.1.1 Conventional Boiler and Steam Turbine

This technology burns fuel in the furnace of a conventional boiler to create steam. The steam is used to drive a steam turbine-generator, and the steam is then condensed and returned to the boiler. This is a dated technology that is able to achieve thermal efficiencies up to approximately 36 percent when utilizing natural gas, although efficiencies are somewhat higher when utilizing oil or coal. Because of this low efficiency and large space requirement, the conventional boiler and steam turbine technology was eliminated from consideration.

6.6.1.2 Conventional Combined-Cycle Combustion Turbine

This technology integrates combustion turbines and steam turbines to achieve higher efficiencies. The combustion turbine's hot exhaust is passed through a heat recovery system generator to create steam used to drive a steam turbine-generator. This technology is able to achieve high thermal efficiencies. The combined-cycle alternative, however, requires very large capital cost more appropriate for a baseload facility, a large site, and very large quantities of water for cooling. Additionally, conventional combined-cycle technology cannot match the General Electric (GE) LM6000 technology for rapid startup, efficient cycling, high part-load efficiency, and load following capability, all of which are critical basic project objectives of MEP.

6.6.1.3 Kalina Combined-Cycle

This technology is similar to the conventional combined-cycle, except a mixture of ammonia and water is used in place of pure water in the steam cycle. The Kalina cycle could potentially increase combined-cycle thermal efficiencies by several percentage points. This technology is still in the development phase and has not been commercially demonstrated; therefore, it was eliminated from consideration.

6.6.1.4 Internal Combustion Engines

Reciprocating internal combustion engine designs are also available for small peaking power plant configurations. These are based on the design for large marine diesel engines, fitted to burn natural gas. Advantages of internal combustion engines are that they: (1) use very little water for cooling, because they use a closed-loop coolant system with radiators and fans; (2) provide quick-start capability (on-line at full power in 10 minutes); (3) have more efficient heat rates at both partial and full loads; and (4) are responsive to load-following needs because they are deployed in small units (8 megawatts [MW] per unit with 10 to 14 engines in one power plant), that can be started up and shut down at will. Disadvantages of this design include higher emissions than comparable combustion turbine technology and much higher capital costs. Mariposa Energy proposed the use of internal combustion engines to PG&E and PG&E rejected that configuration as not meeting the basic project objectives as efficiently and effectively as the MEP configuration.

6.6.1.5 Conventional Simple-Cycle Combustion Turbine

The GE LM6000 PC Sprint combustion turbine technology was selected primarily because it is proven, reliable equipment that also provides operational flexibility. The configuration of four LM6000 PC Sprint units provides a well proven technology that is flexible in operation, efficient, cost effective, and easily dispatchable. The factors Mariposa Energy considered in selecting four LM6000 units included the following:

- High reliability/availability – The LM6000 gas generator has an overall reliability of 99.42 percent and package availability of 98.36 percent based on GE data compiled from November 2004 to July 2007.
- Low equivalent forced outage rate – The LM6000 had an equivalent forced outage rate of 1.43 percent from November 2004 to July 2007.

- Mariposa Energy's parent company, Diamond Generating Corporation, owns and operates five LM 6000 Sprint units in peaking service in California.

6.6.2 Fuel Technology Alternatives

Technologies based on fuels other than natural gas were eliminated from consideration because they do not meet the project objective of providing operationally flexible, dispatchable, quick start, and reliable power. Some of these alternative fuels have potential for additional air quality and public health impacts. Others, like certain biofuels, are not available in commercial quantities or are not available via pipeline or other reliable delivery system. Additional factors rendering alternative fuel technologies unsuitable for the proposed project are as follows:

- No new geothermal or new hydroelectric resources of sufficient size and sufficient operational profile exist in the PG&E service territory or adjacent territories that can meet the contractually obligated online date of July 1, 2012.
- Biomass fuel facilities do not provide quick start capabilities and have additional environmental impacts related to air emissions and solid waste generation. Additionally, biomass facilities would require additional acreage, taller structures, and larger quantities of water.
- Solar and wind technologies are generally not dispatchable and, therefore, are not capable of providing fast-starting, flexible generating capacity and are not capable of producing ancillary services other than reactive power.
- Coal, fuel oil, and other similar fuels emit more air pollutants and greenhouse gases than technologies utilizing natural gas.

The availability of the natural gas resource provided by PG&E, as well as the environmental and operational advantages of natural gas technologies, makes natural gas the logical choice for the proposed project.

6.6.3 Cooling Alternatives

MEP is a simple cycle power plant that does not generate steam that would require a cooling tower or air cooled condenser. Therefore, cooling requirements are limited to combustion turbine generator (CTG) lubricating oil systems and inlet air cooling. The inlet cooling system and cooling material is discussed in detail in the following subsections. The remainder of this subsection will address the lubricating oil system cooling technology.

The lubricating oil system uses a fin-fan cooler to reduce the temperature of the lubricating oil. This system functions similar to an automobile radiator where the oil is passed through a "radiator" as air is passed through the cooling fins. Heat is removed from the oil and is released to the atmosphere. None of the oil is entrained in the air and no contaminants are released from a fin-fan cooler. Additionally, this type of cooling system does not use water.

6.6.4 Inlet Cooling Alternatives

The CTG inlet air cooling can be accomplished using evaporative coolers, foggers, or mechanical chillers. The evaporative cooling system and foggers use water to decrease the

inlet air temperature and increase CTG efficiency and electrical generation during warm ambient conditions. An evaporative cooling system uses evaporation of water to cool the inlet CTG air. Water is applied to a porous media in the CTG air inlet and as the air passes through the media, water is evaporated, which results in cooling of the air. This system is similar to a residential evaporative (swamp) cooler.

A fogger system is similar in principle to the evaporative cooling system but this system sprays a fine mist of water into the CTG air inlet to result in cooling.

Mechanical chillers use a refrigerant in cooling coils located in the CTG air inlet to cool the air. This system is similar in principle to a residential or commercial comfort cooling system. The refrigerant is reused in the system and advances in refrigerant technology result in very low leak rates for refrigerant systems. Furthermore, most refrigerants are not considered air pollutants. The refrigerant selected is discussed further in the following subsection.

Based on the available alternatives of inlet air cooling, the water-based systems will result in the consumption of a valuable California resource (water), while the mechanical chiller system will not. Water cooling uses less parasitic load and therefore would slightly increase the cycle efficiency. Mechanical chillers provide lower inlet temperatures and therefore provide greater power output at a slightly higher heat rate (efficiency) at higher ambient temperatures when peaking power is needed, given the large air conditioning loads in the region. Despite the slight decrease in plant output, the mechanical chiller system was selected based on its having a lower environmental impact over the water-based cooling systems due to their use of water.

6.6.5 Chiller Refrigerant Alternatives

MEP's CTG inlet air cooling system is a mechanical chiller system that uses a refrigerant to reduce the CTG inlet air temperature during warm ambient conditions to increase CTG efficiency and electrical output. Several options exist for the refrigerant, including anhydrous ammonia and R134A. Anhydrous ammonia-based mechanical chillers have a slightly higher cooling efficiency, requiring a smaller sized unit and lower parasitic electrical demand. The additional parasitic electrical demand associated with using R134A will be approximately 1.75 MW. Over the course of a year, the electrical generation loss compared to using ammonia will be over 1,000 MW-hours per year based on the expected operating scenario of 600 hours annually. However, anhydrous ammonia, if released, can pose a public health concern and is considered a toxic material in sufficiently high concentrations. The R134A-based mechanical chiller units use the same refrigerant that is almost exclusively used in modern automobile air conditioning systems and is not considered a toxic material. The potential drawback is that R134A, if released, can potentially impact the atmospheric ozone layer that protects the earth from solar radiation.

The Clean Air Act amendments of 1990 regulate both ammonia and R134A. Ammonia is regulated through the Risk Management requirements (Title 40, Code of Federal Regulations [CFR] Part 68), requiring the preparation of a Risk Management Plan (RMP) for facilities using or storing covered substances above a threshold value. In the case of ammonia, the threshold value is 10,000 pounds. MEP's mechanical chiller unit would require the storage of more than 10,000 pounds of ammonia and would require preparation

of an RMP that describes the design of the system and potential public health impacts of a catastrophic release of ammonia.

Refrigerants with a potential to impact the atmospheric ozone layer are regulated by the Stratospheric Ozone regulations contained in Title 40, CFR, Part 82. This regulation prohibits the use of some refrigerants after certain dates and regulates the use of other refrigerants. The R134A system proposed by Mariposa Energy would require that only U.S. Environmental Protection Agency-certified technicians perform maintenance work on the unit and that intentional release of the refrigerant during maintenance is prohibited. The refrigerant is recycled during maintenance to reduce the release of refrigerant.

Mariposa Energy has elected to use R134A as the chiller refrigerant working fluid, despite an increased capital cost of approximately $2.5 million and decreased plant generation output of approximately 1.75 MW. While this refrigerant has a reduced operating efficiency and increased costs compared with anhydrous ammonia, it was selected to minimize the transportation, storage, and use of hazardous materials in association with the project.

6.7 References

California Energy Commission (CEC). 2003. East Altamont Energy Center Final Commission Decision. August.

City of Tracy. 2009. Tracy City Council Regular Meeting Minutes. February 17.

Shareghi, Nader. 2009. Personal communication with Peggie King of CH2M HILL. April 27.