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| 06-AFC-5C |
| DATE 9/21/2009 |
| RECD. 9/21/2009 |

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September 21, 2009

**VIA HAND DELIVERY**

Mr. Dale Rundquist
Compliance Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

**Re: Panoche Energy Center Project (06-AFC-5C)**
**Petition to Amend – Urgent Action Requested**

Dear Mr. Rundquist:

On behalf of Panoche Energy Center, LLC, please find the accompanying Petition to Amend ("Petition") requesting the California Energy Commission approve an amendment to the December 19, 2007 Final Decision, as well as the subsequent first petition to amend (collectively, "Final Decision"), for the Panoche Energy Center ("PEC"). Specifically, the instant Petition requests several urgent and necessary modifications to the project. These changes are referred to within the Petition as the "Wastewater Disposal Changes."

The Final Decision concluded that PEC complied with all applicable laws, ordinances, regulations and standards ("LORS"). As discussed in detail throughout Section 5.0 of the accompanying Petition (see *Environmental Information*), the proposed Wastewater Disposal Changes will comply with all applicable LORS and will not adversely affect PEC's ability to comply with all applicable LORS. In addition, the Petition evaluates the environmental effects of PEC to the extent the proposed modifications expand such effects beyond the existing, approved project.

We look forward to Staff's review of this Petition. In the meantime, if you have any questions, please do not hesitate to contact me directly at (916) 447-0700.

Respectfully submitted,

Melissa A. Foster

MAF:kjh
Enclosure
cc: Panoche Energy Center, LLC
Maggie Fitzgerald, URS Corporation

# PETITION TO AMEND FINAL COMMISSION DECISION

## PANOCHE ENERGY CENTER

06-AFC-5C

Submitted to

California Energy Commission

Submitted by

Panoche Energy Center, LLC

September 2009

Prepared by

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APPENDIX B BIOLOGICAL RESOURCES
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# 1.0 SUMMARY OF AMENDMENT

Panoche Energy Center, LLC (PECL) files this Petition to Amend (Petition) the California Energy Commission's (CEC) December 19, 2007 Final Decision approving the Application for Certification (AFC) for the Panoche Energy Center (PEC). The PEC Final Decision was recently modified through PECL's first petition to amend dated October 2008. Here, in this Petition, PECL requests several urgent and necessary modifications to the project description which will resolve wastewater disposal difficulties encountered in the project. These proposed changes are hereinafter referred to as the "Wastewater Disposal Changes". This Petition sets forth an environmental analysis of the proposed Wastewater Disposal Changes, to the extent they extend the environmental effects of PEC beyond the existing approved project. The Petition also evaluates compliance with laws, ordinances, regulations and standards (LORS) and the cumulative environmental effects of PEC with the proposed changes. As part of this evaluation, PEC Conditions of Certification (COCs) were reviewed and, where necessary, proposed changes to affected COCs are also included.

## 1.1 PROPOSED CHANGES

### 1.1.1 Existing Conditions

The 400 megawatt (MW) simple-cycle PEC attained full commercial status on July 1, 2009. PECL was permitted to design, construct and operate four wastewater injection wells. PEC operators encountered difficulties with the injection wells' wastewater discharge capacity at peak summer load, however. Specifically, none of the four operating injection wells have the capacity to accept full load wastewater flow rates as they were designed, permitted, and built.

In an effort to remediate the problem with the injection wells, PECL has implemented a temporary treatment system to ensure that wastewater volumes will not exceed the capacity of the wells. Wastewater from the cooling tower blowdown and the reverse osmosis system that would normally go to the wastewater injection tank is being diverted to a temporary water treatment system. The diverted wastewater first goes through a coarse filter to remove the dirt and large particles that the cooling tower collects. The water then goes through an ultra filter which cleans the water further, lowers the total suspended solids (TSS) and lowers the conductivity. After the ultra filter, the diverted wastewater is sent through a mixed bed polisher. The mixed bed polisher removes silica and other minerals through an ion exchange process. The mixed bed polishers are being provided under contract and are regenerated offsite by the company providing that service. After passing through the mixed bed polishers, the water quality is high enough to allow the water to be returned to the cooling tower for use. The process has reduced the highest flows experienced so far, 400 gpm of blowdown and reverse osmosis water, to about 100 gpm of wastewater. Thus, it can be generalized as capable of reducing the blowdown and reverse osmosis wastewater sent through the system by 75%. The other 25% (rejects from the ultra filters) is sent to the wastewater injection tank for injection. Currently, the injection wells are handling approximately 70 to 90 gpm in total. During operational times where the net wastewater production exceeds injection well capacity, the excess wastewater is being stored onsite for later injection when wastewater production levels decline.

While it is not clear why the injection wells have not achieved their predicted and designed functionality, their condition cannot be assured and they must be presumed to be unreliable in the future. Further, the current process is only a temporary measure to assure plant availability. The purpose of this Petition is to obtain changes to the project to allow a better, permanent means of disposing of wastewater. Due to the above circumstances, PECL conducted a careful evaluation of alternatives and now urgently seeks approval for modifications to its operational effluent system. Specifically, PECL proposes to construct and operate wastewater surface impoundments to dispose of wastewater by percolating it into an underlying highly degraded and unusable aquifer.

### 1.1.2 Proposed Changes

As explained in detail in Section 3.0 *Overview of Changes*, PECL proposes to construct and operate wastewater surface impoundments to percolate wastewater into an underlying, degraded and unusable aquifer. As explained in Section 3.0 *Overview of Changes* and analyzed in Section 5.0 *Environmental Information*, the proposed changes will have no significant adverse effect on the environment. PEC, as modified, will operate in full compliance with all applicable LORS. A summary of the changes and their effects follows:

- The wastewater surface impoundments will be constructed almost entirely within the 7.18-acre laydown and staging area used for construction of PEC. An additional 2.0 acres of existing pomegranate orchard will be cleared and used.
- The underlying aquifer is highly degraded and the relative effect of the discharge by PEC will be negligible and will not affect usable water supplies.
- The proposed changes will not adversely affect visual, water supply, or other resource issue areas. Most issue areas remain unchanged.
- Cultural, biological and agricultural issues were fully analyzed and mitigated in the original AFC process and mitigation systems put in place in the COCs fit perfectly with the proposed changes.
- Reliability will be greatly improved by resolving the wastewater discharge issue.

Two other minor changes are also proposed. First, an ultrafiltration skid will provide removal of oxidized metals and total suspended solids prior to reverse osmosis (RO) filters. Second, evaporative cooler blowdown and intercooler condensate will be redirected from the wastewater storage tank to the cooling tower. These changes are enhancements to the design and operation of PEC.

## 1.2 CUMULATIVE IMPACTS

Section 5.0 *Environmental Information* of this Petition addresses each environmental area that may have potential impacts due to the proposed modifications. A cumulative impacts assessment is included within each issue area. The modifications discussed herein, however, will not result in significant, unmitigated cumulative impacts. Furthermore, the modifications discussed herein will not change the assumptions or conclusions made in the CEC's Final Decision.

## 1.3 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The December 2007 Final Decision (and the October 2008 First Amendment) concluded that PEC complied with all applicable LORS. As discussed in detail throughout Section 5.0 *Environmental Information*, the proposed modifications will not affect PEC's ability to comply with all applicable LORS.

# 2.0 CONSISTENCY WITH SECTION 1769

Title 20 of the California Code of Regulations, section 1769 (Section 1769) requires a discussion of a requested amendment's consistencies with requisite LORS and whether the requested modifications are based upon new information that changes or undermines the assumptions, rationale, findings, or other bases of a Final Decision. In addition, if a project is no longer consistent with its license, Section 1769 requires the applicant to provide an explanation as to why the modification should be permitted.

Pursuant to and consistent with Section 1769, this Petition provides a complete description of, and an explanation for, the proposed modifications, rationale for the proposed modifications, LORS compliance analysis, and any proposed changes to the COCs set forth in the Final Decision for PEC. Further, the analysis herein contains a discussion of the potential effect of the proposed modifications on nearby property owners, the public, and parties to this proceeding.

## 2.1 NECESSITY OF PROPOSED CHANGE

Sections 1769(a)(1)(B) and 1769(a)(1)(C) require a discussion of the necessity for the proposed modifications and whether such modifications are based on information known by PECL during the AFC proceeding. PECL's Petition is based upon new information, which was unknown to PECL during the AFC proceeding. Specifically, the proposed unlined wastewater surface impoundments are required to mitigate the inability of the underlying site geology to accommodate PEC's wastewater discharge via four operating injection wells. While reasonable surveillance and design efforts indicated that these wells and their geologic setting would receive all of PEC's wastewater - even under full load conditions - these wells are not capable of meeting the design and permitted discharge volumes at higher loads. The other changes are enhancements found appropriate and necessary in the commissioning of PEC.

## 2.2 URGENCY AND NEED FOR PROMPT ACTION

While PEC has been able to meet operational obligations to date, the temporary solution in place is not reliable enough, nor economical enough to suffice as a long term solution. Further, as this Petition demonstrates, the best alternative is to use surface impoundments. PECL requests that this Petition be treated as not only necessary but urgent. A permanent solution should be approved and implemented as soon as possible, ideally such that these changes can be in place before the peak demand season of 2010.

# 3.0 OVERVIEW OF CHANGES

## 3.1 INTRODUCTION

The proposed Wastewater Disposal Changes are necessary to provide for reliable disposal of PEC wastewater. This Petition seeks a solution to the inadequate performance of the four onsite wastewater injection wells. PEC is a 400 MW simple-cycle power plant that became fully commercial on July 1, 2009. Originally, only two injection wells were believed to be necessary to accommodate all of PEC's wastewater. As the original two injection wells were placed into service, they were deemed to be under-performing on a flow rate basis. Two additional injection wells were subsequently constructed and also placed into service. The latter two injection wells also failed to meet design injection capacity. While the CEC Final Decision allows for up to six injection wells, it is clearly evident that the underlying geology will not accommodate the required wastewater flow rates. Therefore, alternatives to additional injection wells were evaluated and these proposed Wastewater Disposal Changes were selected as the best alternative for PEC wastewater discharge.

Two other minor changes are also proposed. First, an ultrafiltration skid will provide removal of oxidized metals and total suspended solids prior to RO filters. Second, evaporative cooler blowdown and intercooler condensate will be redirected from the wastewater storage tank to the cooling tower.

These changes to the PEC Final Decision will include the use of the 7.18-acre PEC laydown area and also 2.0 acres adjacent to the laydown area to increase the project site's permanent footprint to 22 acres. The existing 12.82-acre project site cannot accommodate the two unlined wastewater surface impoundments (UWSI) required for these changes, however, of the additional 9.18 acres, most all has already been cleared of vegetation and was used as temporary laydown. The proposed changes will accommodate 100% of the hourly, daily, and annual wastewater discharges, while promoting an element of redundancy and maintenance capability. This will ensure full capacity and reliability of PEC's 400 MW rating. The existing, degraded injection wells will be retained as an alternative wastewater disposal method to the extent they remain functional.

## 3.2 WASTEWATER DISPOSAL CHANGES LOCATION

The proposed changes will use two UWSI located adjacent and south of the existing PEC plant footprint, mostly within the existing PEC construction laydown area, in a rural area of Fresno County, California, generally southeast of the intersection of West Panoche Road and Davidson Avenue (Site). The nearest city is Mendota, approximately 16 miles to the northeast. Interstate 5 (I-5) is approximately 1.5 miles west and the California Aqueduct is approximately three miles to the east. Agricultural uses are prevalent throughout the vicinity of the site, including the cultivation of pomegranates, almonds, grapes, and field crops. Several rural residences are also located in the vicinity. Industrial uses in the vicinity include the existing PG&E Substation, the Starwood Power Generation Station, the Calpeak Plan Check Power Generation Facility, and the Wellhead Power Generation Facility. Specifically, the Site is located in Township 15 South, Range 13 East (Mount Diablo Baseline Meridian). The Assessor Parcel Number is 027-060-81S.

Alternatives and respective locations are further discussed in Section 4.0 *Alternatives*. In brief, the use of the Site primarily consists of the existing PEC laydown area, which currently is mostly disturbed and would result in the lowest overall environmental impacts. The next-best land option would have been a triangular parcel north of PEC and bordering Panoche Road. This parcel is encumbered by existing transmission lines, towers and easements. The surrounding area is currently used for agriculture (pomegranate trees) and provides a buffer between the road and the power plant.

## 3.3 SITE DESCRIPTION

The Site is located in an agricultural area surrounded by pomegranate trees. Power line easements are located along the northern and western boundary (refer to Figure 1.3-1 *Project Architectural Rendering*). The surface is composed of sands, silts, and clays common to alluvial fan deposits in the area with generally loose and dry soils.

### 3.3.1 Topography

The Site is essentially flat with a slight slope downward toward the northeast. The elevation of the Site vicinity is approximately 420-feet above mean sea level and slopes gently down to the northeast at approximately one percent grade (refer to Figure 3.2-1 *General Project Vicinity*).

### 3.3.2 Geologic Setting and Seismology

The Site is located in the western San Joaquin Valley within the Central Valley, also known as the Great Valley geomorphic province. More specifically, the Site is located southeast of Panoche Creek on the Panoche Creek alluvial fan. The fan is one of a belt of coalescing alluvial fans 12 to 19 miles wide, and located in the east flank of the Coast Ranges between the flood plains of the San Joaquin River and Fresno Slough in the trough of the valley to the northeast and the foothills of the Coast Range to the southwest. The geologic setting and seismology would not differ from that of the adjacent approved PEC. Section 5.3 *Geologic Hazards and Resources* of this Petition discusses geology and seismology in greater detail. Refer to Figures 5.3-2A and 5.3-2B *Site Geologic Map*.

### 3.3.3 Hydrological Setting

The western San Joaquin Valley can be characterized as semi-arid. The valley experiences long, hot, dry summers and relatively mild winters. The average annual temperature is 63.2 degrees Fahrenheit and average annual precipitation is 11.23 inches. The hydrological setting is the same as the approved PEC site.

## 3.4 DESCRIPTION OF PROPOSED CHANGES

Two new UWSI would provide a new method of disposing of wastewater by percolating it into the underlying highly degraded and unusable aquifer. The existing wastewater injections wells would remain as an alternative means of disposing of some or all of PEC's wastewater. The Site for the UWSI is south and adjacent to the PEC project site. Additionally, two other minor changes are proposed.

### 3.4.1 Overview

PEC is proposing the installation of two UWSI, which will serve PEC's wastewater disposal needs. The UWSI will be located on 9.18 acres adjacent and south of the existing plant footprint. As previously discussed, most of this 9.18 acres is currently serving as the PEC construction laydown area. Specifically, this Petition involves expanding the permanent PEC site and adding two UWSI (UWSI-1 and UWSI-2) as illustrated in Figure 3.4-1 *Project Site Plan*.

UWSI-1 is designed to have a bottom surface area of 2.90 acres and UWSI-2 is designed to have a bottom surface area of 2.93 acres. Both UWSI will be built to a six-foot depth and allow for a two-foot freeboard. The UWSI also will have a 20-foot wide surrounding berm. The berm width will allow for maintenance vehicle access. Berm heights will measure six feet from the top of the berm to existing ground elevation. The southern edge of the south berm (the bottom edge of the outer slope) is along the edge of the property boundary.

Wastewater will be transferred from the storage tank to the UWSI. Conveyance will consist of 6" carbon steel piping aboveground and 6" HDPE underground. A new injection well pH control tank will be installed to allow separate acid treatment of water bound for injection wells.

The UWSI will have security fencing that will be consistent with and integrated into the existing PEC site security fence.

Two other minor changes are also proposed. First, an ultrafiltration skid will provide removal of oxidized metals and total suspended solids prior to RO filters. Second, evaporative cooler blowdown and intercooler condensate will be redirected from the wastewater tank to the cooling tower. This change results in an increase in water efficiency and decreased source water consumption.

### 3.4.2 Site Access

Access to the UWSI area would remain the same as access to PEC. The main corridor of travel to access the site would continue to be along I-5 and West Panoche Road, with the existing site entrance gate located on Davidson Road.

### 3.4.3 Site Layout

Implementation of the changes discussed in this Petition will be situated on 9.18 acres of land adjacent to and directly south of the PEC project site (refer to Figure 3.4-1 *Project Site Plan*). The combined 12.82-acre previously approved PEC project site and 9.18-acre expanded Site will constitute a rectangular 22.0-acre parcel. The parcel is described in detail in Section 5.9 *Land Use*.

### 3.4.4 Power Plant Cycle

The changes discussed in this Petition would not affect the previously approved PEC power plant cycle.

### 3.4.5 Major Electrical Equipment and Systems

The Wastewater Disposal Changes would not affect major electrical equipment and systems of the previously approved PEC.

### 3.4.6 Fuel Gas System

The Wastewater Disposal Changes would not affect fuel gas systems as compared with the previously approved PEC project.

### 3.4.7 Water Supply and Treatment

The installation of the ultrafiltration skid will add a water treatment step before the RO filters.

### 3.4.8 Wastewater Management

The principal wastewater management change sought in this Petition involves routing the wastewater, either in part or in total, away from the injection wells and into the UWSI. The redirection of the evaporative cooler blowdown and intercooler condensate from the wastewater tank to the cooling tower results in increased water efficiency and less wastewater discharge. The ultrafiltration skid produces a backwash stream that is directed to the wastewater storage tank.

### 3.4.9 Solid Waste Management

Operationally, the Wastewater Disposal Changes would not result in changes to the PEC Final Decision assumptions and COCs, except for the periodic dredging of the surface impoundments to remove sediments. These sediments are described in Section 5.14 *Waste Management*.

Building the UWSI would result in construction waste including packing materials; excess construction materials including paper, wood, metal, wires, or other basic building materials; temporary weather covers; consumable abrasives; cutting tools; broken tools; parts and electrical and electronic components; construction equipment maintenance materials; empty containers; and other solid waste and typical refuse generated by construction crews.

Solid waste will be segregated and recycled where practical. Non-recyclable waste will be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III landfill. Some hazardous wastes, such as welding materials and dried paint, may be generated during construction. Hazardous materials would be handled and disposed of in accordance with applicable LORS. Hazardous wastes will be recycled or disposed of in a licensed Class I disposal facility, as appropriate.

### 3.4.10 Management and Disposal of Hazardous Material and Hazardous Waste

The Wastewater Disposal Changes would not result in any affective changes on the generation, management and disposal of hazardous materials and hazardous wastes as compared to the previously approved PEC project.

### 3.4.11 Emissions Control and Monitoring Equipment

In the operations phase, the Wastewater Disposal Changes would not affect PEC emissions generation or control, nor would it require additional monitoring equipment.

### 3.4.12 Fire Protection System

The Wastewater Disposal Changes would not affect PEC fire protection systems.

### 3.4.13 Plant Auxiliaries

The Wastewater Disposal Changes would not affect PEC plant auxiliaries.

### 3.4.14 Heating, Ventilation, and Air Conditioning

The Wastewater Disposal Changes would not affect heating, ventilation, or air conditioning as addressed for the previously approved PEC project.

### 3.4.15 Plumbing

The Wastewater Disposal Changes would not affect plumbing as addressed for the previously approved PEC project.

## 3.5 CIVIL STRUCTURAL FEATURES

The following section describes the buildings, structures, and other civil/structural features that will be constructed as part of the Wastewater Disposal Changes.

### 3.5.1 Overview

Construction would begin with removal of PEC construction-related structures and appertenances on the 7.18-acre laydown area. The 2.0 acres of orchard would be cleared. A Drainage, Erosion and Sediment Control Plan would be implemented to establish proper drainage and sediment control of the 9.18-acre Site. Some integration with the existing Drainage, Erosion and Sediment Control Plan will be sought. A security fence will be installed around the area and integrated into the current PEC site fence. The UWSI will be constructed in a manner that minimizes the amount of soil to be moved offsite. To optimize size and performance and minimize environmental impacts, construction of the UWSI will result in 3,000 cubic yards of soil removal to be hauled offsite. The temporary laydown area for this work will be located within the PEC site footprint. No additional land offsite will be required.

Operationally, periodic dredging of UWSI sediment will be necessary to promote percolation. This maintenance activity is anticipated to be required once a year. Solids from this maintenance activity will be hauled offsite to a waste disposal facility/landfill identified in Table 5.14-1, Waste Recycling/Disposal Facilities, of the previously approved PEC AFC. Section 3.9 *Operations and Maintenance,* provides further details on operational maintenance activities.

### 3.5.2 Stacks

The Wastewater Disposal Changes would not result in the construction of additional stacks.

### 3.5.3 Buildings

The Wastewater Disposal Changes would not result in the construction of additional buildings.

### 3.5.4 Transformer Foundations and Fire Walls

The Wastewater Disposal Changes would not result in the construction or installation of additional transformer foundations or fire walls.

### 3.5.5 Yard Tanks

An injection well pH control tank will be installed upstream of the injection well charge pumps and downstream of the existing wastewater storage tank.

### 3.5.6 Roads

The Wastewater Disposal Changes would not result in the construction of additional roads or result in the improvement of any existing roads from those identified and previously approved for PEC.

### 3.5.7 Site Security Fencing

During construction and following initial excavation, a security fence would be erected around the perimeter of the surface impoundment area. The security fencing will be integrated into the existing PEC fence to form one continuous fence line and secured area.

### 3.5.8 Site Grading and Drainage

Site grading and drainage will be in accordance with the modified Site Drainage, Erosion and Sediment Control Plan (per condition SOIL&WATER-2).

### 3.5.9 Site Flood Issues

The Site is located in the Westside Sub-Basin of the San Joaquin Valley Groundwater Basin. Aquifers underlying the site include a lower confined zone and an upper semi-confined zone that is separated by the Corcoran Clay of the Tulare Formation. Due to this low groundwater table and nature of the alluvial deposits, the potential for liquefaction to occur is considered remote. A shallow unlined ditch north of the site is included within the special flood hazard area inundated by the 100-year flood with no base flood elevation determined by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map. Furthermore, the Site is generally located within areas determined to be outside the 500-year floodplain.

### 3.5.10 Sanitary System

The Wastewater Disposal Changes would not result in the construction or installation of a new sanitary system or modification of the PEC septic system.

### 3.5.11 Earthwork

The Site consists of 7.18 acres of land currently the previously approved PEC laydown area and 2.0 acres of land currently being used for agriculture (pomegranate trees). Excavation will consist of the removal and disposal of vegetation and grading to establish proper drainage. The two UWSI will be constructed as shown in Figure 3.4-3 *Grading and Drainages Plan*. A new or

modified SWPPP would be used during construction of the UWSI. Upon construction completion, there will be approximately 3,000 cubic yards of excess soil that will be disposed or utilized offsite.

## 3.6 ELECTRICAL INTERCONNECTION

No changes to the PEC interconnection with PG&E's Panoche Substation are sought via this Petition.

## 3.7 PIPELINE

The Wastewater Disposal Changes would result in the installation of pipelines to convey wastewater from the wastewater storage tank to the UWSI.

### 3.7.1 Natural Gas Supply Line

The Wastewater Disposal Changes would not result in the construction of or installation of natural gas supply lines.

## 3.8 CONSTRUCTION

The Wastewater Disposal Changes would not affect construction of the previously approved PEC. Construction of the UWSI would occur after construction of PEC is completed. PEC went fully commercial on July 1, 2009. From August through September 2009, the clean-up phase for PEC construction would occur. Construction of the UWSI is projected to begin in the Spring 2010 and last for about 10 weeks.

The workforce will vary depending on the month of construction and weather conditions. Grading activities would require approximately seven laborers for five weeks.

### 3.8.1 Power Plant Facility

The Wastewater Disposal Changes would not affect the previously approved PEC power plant facility.

## 3.9 OPERATIONS AND MAINTENANCE

### 3.9.1 Introduction

This section discusses the operation and maintenance procedures that will be followed to ensure safe, reliable, and environmentally acceptable operation of the UWSI.

### 3.9.2 Power Plant Facility

The Wastewater Disposal Changes would not affect the previously approved PEC facility operations or maintenance activities.

### 3.9.3 Transmission System Operation and Maintenance

The Wastewater Disposal Changes would not affect the previously approved PEC transmission system operations or maintenance activities.

### 3.9.4 Pipelines

The Wastewater Disposal Changes would result in the installation of pipelines that connect existing wastewater pump discharge headers to the two new UWSI. The majority of the pipeline will be installed underground to convey the wastewater from the injection well charge pumps to the UWSI. This underground portion is expected to be approximately 400 feet. The remainder of the pipe will be 6" carbon steel piping located aboveground, with an estimated 50 feet of piping. This aboveground carbon steel piping will connect to the underground HDPE pipeline to facilitate conveying the wastewater to the UWSI, and will maintain the flexibility in the system to allow for deep well injection as necessary.

## 3.10 FACILITY CLOSURE

The Wastewater Disposal Changes would not be adversely affected by the temporary or permanent closure of the previously approved PEC facility.

### 3.10.1 Temporary Closure

The Wastewater Disposal Changes would not be adversely affected by the temporary or permanent closure of the previously approved PEC facility.

### 3.10.2 Permanent Closure

The Wastewater Disposal Changes would not be adversely affected by the permanent closure of the previously approved PEC facility.

### 3.10.3 Closure Mitigation

The Wastewater Disposal Changes would not affect closure mitigation of the previously approved PEC.

## 3.11 SAFETY, AVAILABILITY, AND RELIABILITY

The Wastewater Disposal Changes would not negatively affect the safety or availability of the previously approved PEC project. Rather, construction and use of the Wastewater Disposal Changes would increase electrical reliability and capacity by ensuring proper disposal of project wastewater.

### 3.11.1 Safety Precautions and Emergency Systems

The Wastewater Disposal Changes would not affect the safety precautions or emergency systems being implemented as part of the design and construction of the previously approved PEC.

### 3.11.2 Aviation Safety

The Wastewater Disposal Changes would not affect aviation safety of the previously approved PEC.

### 3.11.3 Transmission Line Safety and Nuisance

The Wastewater Disposal Changes would not adversely affect transmission line safety or create nuisance beyond those currently experienced in the area.

### 3.11.4 Facility Availability

The Wastewater Disposal Changes would not negatively affect the availability, operating life, or service factor of the previously approved PEC facility.

### 3.11.5 Equipment Reliability and Redundancy

The Wastewater Disposal Changes would have a positive affect on power generation reliability and availability by ensuring wastewater disposal capacity.

### 3.11.6 Power Plant Performance Efficiency

The Wastewater Disposal Changes would not affect the performance or efficiency of the previously approved PEC.

### 3.11.7 Fuel Water Availability

The Wastewater Disposal Changes would not change the fuel or water use for the previously approved PEC.

### 3.11.8 Quality and Control

The general contractor, the design-engineer contractor, and all significant vendors, suppliers, and subcontractors for the Wastewater Disposal Changes would be required to develop a specific quality program prior to beginning work. Each program would define quality goals, processes to measure events, and incentive programs. Quality standards would include safety and environmental compliance objectives.

## 3.12 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicable LORS are included for each technical discipline in their respective sections within this Petition.

# 4.0 ALTERNATIVES

Title 20 California Code of Regulations requires an applicant to discuss "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 proposed Wastewater Disposal Changes consist of the development and use of two onsite UWSI, designed to accommodate PEC's process wastewater. The UWSI would be built in the already cleared laydown area and a small portion of the adjacent pomegranate orchard. Alternative (or additional) water sources were evaluated as part of the overall wastewater alternative screening process, but none of the wastewater options that involved changes to the water supply were deemed "reasonable." As proposed herein, the proposed changes will not cause PEC to increase its maximum annual source water use. Given this, each of the "reasonable" alternatives discussed herein assumes a baseline condition that PEC will continue to rely on its onsite production wells as its source of water.

Before describing individual Alternatives, below is a list of the basic conditions and notions from which PECL based their consideration of whether an alternative is "reasonable":

1. Annual withdrawal volume from PEC's production wells should not increase beyond that of the original AFC.

2. Use of land that includes the existing laydown area is preferred, as this will minimize environmental impacts compared to using non-adjacent land resources, including agricultural land.

3. Any load-consuming increases should not be beyond those specified in the Power Purchase Agreement. This supports the overall relatively high energy efficiency and availability the facility affords, and ensures that power plant efficiency is not adversely affected.

4. Minimize new linear components such as pipelines that entangle need for easements, land use rights, and that would increase the disturbance of agricultural land and environmental effects.

5. Continue use of PEC's current water source (onsite wells).

6. Support implementation before the next load demand season begins in May of 2010.

## 4.1 NO PROJECT ALTERNATIVE

If these changes are not made, the goals and objectives expressed and authorized under the Final Decision would not be met. Without a wastewater alternative to the injection wells, PEC would not be able to reliably produce electricity according to its Power Purchase Agreement with PG&E. Moreover, the project could cease to provide much-needed power and other benefits, both locally and regionally.

## 4.2 ALTERNATIVE SITE LOCATIONS

PECL considered the environmental impacts of various site locations associated with the reasonable wastewater disposal alternatives set forth herein. Aside from the "no project alternative." all of the reasonable wastewater disposal alternatives would require additional land to that originally permitted for the operation of PEC. Generally, adjacent or nearby sites offer clear advantages over remote sites. The 7.18-acre existing PEC laydown area offers the best, or baseline, site due to its proximity to the wastewater source and because this area has already been disturbed and mitigated for environmental impacts.

## 4.3 ALTERNATE PROJECT CONFIGURATIONS

PEC consists of four General Electric LMS100 combustion turbines that supply power to meet the requirements of a power purchase agreement between PEC and PG&E. This agreement binds PECL to certain energy conversion standards of efficiency, reliability and availability. Configurations to the wastewater process cannot conflict with this contractual obligation.

## 4.4 ALTERNATE LINEAR ROUTES

Linears introduce the potential for additional environmental impacts, costs and energy consumption. In solving its wastewater disposal issues, PECL was hopeful to not introduce any new linears. The changes, as proposed, do not have any new or expanded linears.

## 4.5 ALTERNATE TECHNOLOGIES

PECL considered all available and practical water treatment and wastewater technologies, ranging from energy-intensive zero liquid discharge (ZLD) to low energy evaporation ponds.

## 4.6 WASTEWATER DISPOSAL ALTERNATIVES

### 4.6.1 Unreasonable or Unavailable Alternatives

PEC has investigated numerous wastewater disposal alternatives. Many were dismissed as being unreasonable or unavailable. These include:

- Pumping or trucking wastewater to a wastewater treatment plant (WWTP)
- Discharging wastewater to a brine line to Pacific Ocean
- Adding injection wells
- Changing the production water source – (i.e., WWTP effluent, aqueduct water, agricultural irrigation tail water)
- Discharging to a nearby water body
- Regenerating deionizer systems offsite
- Zero liquid discharge (ZLD)

### 4.6.2 Pumping or Trucking Wastewater to a WWTP

Sending PEC's wastewater to a local WWTP is unreasonable mainly because of prohibitive water quality issues. WWTP discharge permits do not allow for increases in electrical conductivity (eC) of the facility's discharge that is greater than 500 umhos/cm above incoming

WWTP water quality. Incoming water to Westside Central Valley WWTPs is typically near their regulatory eC limit, so taking large volumes of higher eC PEC wastewater would put these plants over their permitted discharge limit.

### 4.6.3 Discharging Wastewater to a Brine Line to Pacific Ocean

There is no existing or planned brine line (to the Pacific Ocean) in close proximity to the PEC facility. Building and using such a dedicated brine line is economically prohibitive, and would take several years to permit and construct.

### 4.6.4 Adding Injection Wells

PEC originally thought that two injection wells would be sufficient to handle the maximum permitted wastewater volumes. The construction and commissioning of an additional two wells has provided PEC with further evidence that this technology is not suited for its wastewater disposal needs due to unfavorable geological conditions.

#### Changing the Production Water Source

As noted above, reliance on water cooling is essential in maximizing the project's electrical output and efficiency. To meet energy requirements of its power sales agreement, PEC must continue to rely on water for cooling the gas turbines. Alternative water sources were considered in an effort to improve the wastewater quality beyond what is presently permitted and produced. Beyond the groundwater currently used, there are two types of water sources near PEC: (1) WWTP effluent, and (2) state and federal aqueduct water. State Water Policy 75-58 effectively prohibits the use of aqueduct water for power plant cooling, so this water option was dismissed. Several WWTPs within a 45 mile radius of PEC were evaluated. Aside from the prohibitive costs associated with constructing and operating a long water pipeline, the limiting factor for dismissing this water source was the relatively high total dissolved solids (TDS), silica, and other constituents found in the WWTP effluent. These high concentrations did not provide significant improvements to projected wastewater quality when compared to the existing onsite wells. As a result of this lack of suitable water source alternatives, none of the "reasonable" wastewater alternatives (as described below) involved changes to the existing water source.

#### Discharging to a Nearby Water Body

When considering the potential to discharge to a water body, i.e., "waters of the U.S.," regulations effectively require that the receiving stream is sufficiently voluminous and the wastewater is sufficiently low in solids to ensure that there are no significant "loading" impacts to the receiving water body. In PEC's case, there are no receiving water bodies in close proximity to the facility that would promote this opportunity.

#### Regenerating Deionizer Systems Offsite

This is a technically available option, but it is too costly, both economically and environmentally. At full load, the project would require up to ten demineralizer trailer rigs be moved in and out of service per day. PEC is presently and temporarily relying on an offsite regeneration process to reduce the amount of wastewater generated onsite (due to the under-performing injection wells inability to accommodate the full designed wastewater flow rate). While implemented on a temporary basis, this offsite regeneration process would be

prohibitively expensive at full capacity. In addition, an offsite regeneration process of PEC's scale would impose environmental impacts associated with truck fuel use. Further, the injection wells cannot be relied on in the long term so this alternative does not meet reliability standards.

### Zero Liquid Discharge

A ZLD system would require a parasitic electrical load that would consume roughly about 8% of the plant's gross power production due to the nature of forcing wastewater through membranes and then evaporating the membrane reject stream. ZLD processes require continuous, steady-state operation to prevent equipment fouling and to minimize power consumption. Thus, ZLD processes will not work reliably in a batch mode, as would be presented by PEC's "peaking" operations. If a ZLD system was used, PEC would not be able to reliably and efficiently produce electricity according to its power purchase agreement with PG&E. Further, a ZLD system would result in extremely high capital and O&M costs. In addition to reliability and costs prohibitions, and as a direct result of lowered energy conversion efficiency, more greenhouse gases (GHG or $CO_2$) would be generated on an electrical output basis. Under its current configuration, PEC produces about 1,100 pounds of $CO_2$ for each megawatt-hour of electricity. A ZLD system would increase $CO_2$ production for each megawatt-hour to 1,190 pounds, which at maximum operation would result in an additional 90,000 tons of $CO_2$ per year. . Therefore, a ZLD system is considered an unviable option for treating PEC's wastewater.

## 4.6.5 Reasonable Alternatives

PEC considers the following Project Alternatives to be "reasonable:"

- Double-lined evaporation pond(s)
- Onsite unlined wastewater surface impoundment(s)

### Double-Lined Evaporation Pond(s)

Discharge to a double-lined evaporation pond in accordance with Title 27 of the California Code of Regulations would require a total pond area of approximately 80 to 100 acres for the amount of wastewater PEC generates. The pond(s) would require periodic sediment cleaning and offsite disposal (likely as Class 1 or 2 waste). This would increase environmental impacts due to dust, traffic, greenhouse gas emissions, and use of landfill space. In addition, evaporation increases the concentration of selenium in the pond water, which could create a potential threat to waterfowl. Lastly, preventing leakage over the 20-year projected lifespan of PEC would be extremely difficult for a double-lined pond of this size. At the end of the project life, the pond would need to be closed in accordance with Title 27 of the California Code of Regulations. A double-lined pond of this size would also have an extremely high capital cost (estimated to be $40 million). All of these factors make an 80 to 100-acre double-lined evaporation pond a highly impractical discharge alternative.

### Onsite Unlined Wastewater Surface Impoundment(s)

There are no nearby surface receiving waters suitable for wastewater disposal, so discharge to a UWSI is the only practical surface discharge option. Reliance on UWSI would require fewer resources while promoting higher energy production efficiencies than any of the other alternatives. PECL has proposed to use two smaller ponds rather than a single large pond to

afford good maintenance practices. The ponds will allow wastewater to percolate into the unusable upper semi-confined aquifer, which is of low water quality and is generally worse quality than the PEC wastewater. As evaluated in Section 5.5 *Water Resources* this discharge will be compliant with LORS and not produce any significant adverse environmental impacts.

In summary, the PECL has chosen the onsite unlined wastewater surface impoundments alternative because it affords the best balance between minimizing environmental impacts and optimizing energy efficiency, reliability, and availability.

# 5.0 ENVIRONMENTAL INFORMATION

## 5.1 INTRODUCTION

This section presents a description of the affected environment, potential environmental consequences and potential cumulative impacts that are associated with the Wastewater Disposal Changes, along with measures to mitigate or avoid adverse impacts as appropriate. Supporting information to determine compliance with applicable LORS is included within the discussion in each applicable section. A discussion of any changes or additions to the approved COCs is also included within each environmental resource section.

The environmental assessments presented in this section are meant to comply with CEC requirements, including those of the California Environmental Quality Act (CEQA). In general, each section follows the same format of presenting the affected environment and existing Site conditions, followed by the environmental consequences of the changes with measures to mitigate significant adverse impacts.

Information regarding the Wastewater Disposal Changes location, site description, and a description of their changes are discussed in Sections 3.2 *Wastewater Disposal Changes Location*, 3.3 *Site Description*, and 3.4 *Description of Proposed Changes* of this Petition.

## 5.2 AIR QUALITY

This Petition evaluates the effects on air quality due to the Wastewater Disposal Changes construction.

### 5.2.1 Affected Environment

Please see the Air Quality section of the previously approved PEC AFC for a discussion of existing conditions in the vicinity of the PEC project site, which are identical for the Wastewater Disposal Changes, except that construction of the PEC is now complete.

### 5.2.2 Environmental Consequences

In general, impacts associated with air quality due to the construction of the Wastewater Disposal Changes are anticipated to be minor and short-term in nature. Emissions of $PM_{10}$ and $PM_{2.5}$ would likely occur as a result of soil disturbance associated with construction activities, and movement of construction equipment. However, the use of water as a dust suppressant during construction activities and the subsequent application of acceptable soil stabilizing techniques would ensure that potential emissions are less than significant.

A small short-term increase in emissions of equipment and vehicle fuel combustion pollutants, including oxides of nitrogen ($NO_x$), carbon monoxide (CO), sulfur dioxide ($SO_2$), volatile organic compounds (VOC) and particulate matter, both $PM_{10}$ and $PM_{2.5}$, would occur during construction. Implementing reduced idling times for construction equipment and using ultra-low sulfur diesel fuel and properly tuned and maintained equipment will reduce fuel combustion emission from these sources. As shown below, total construction emissions will be significantly less than the emissions from the construction of the currently operating PEC facility.

Once construction of the Wastewater Disposal Changes are complete and the UWSI go into service, there would be minimal increases in emissions and air quality impacts compared to current operations. These incidental increases will result from a small number of vehicles and other mobile equipment that may be used for the operation and from periodic maintenance dredging to remove sediments from the bottom of the ponds. The operational phase will coincide with the plant operational phase. There will not be any significant increases in emissions during construction or over the life of the project.

The Wastewater Disposal Changes construction would not change the existing air quality, meteorology, or topography beyond what was identified for the previously approved PEC. Hence, re-analyzing the existing plant's air quality and heath risks as a result of construction and use of these changes is not necessary.

Projected emissions from the construction of the Wastewater Disposal Changes were calculated based on the following approximate 10-week construction schedule:

**Table 5.2.1 Approximate Construction Schedule**

| Week Nos. | Phase | Activity |
|---|---|---|
| 1-5 | Civil | Digging the impoundments and constructing berms |
| 4-9 | Mechanical | Installation of an underground pipe and tie-in to the existing plant |
| 6-9 | Electrical | Installation of an underground conduit and monitoring devices |
| 6-9 | Monitoring Wells | Installation, development, water sampling and analysis |
| 10 | Start-up & Testing | Per operating and compliance procedures |

Typical construction equipment for the level of effort needed to construct the Wastewater Disposal Changes is summarized in Table 5.2-2.

**Table 5.2-2 Equipment Required For Construction**

| Equipment | Use |
|---|---|
| Loader | Excavate impoundments |
| Scrapers | Excavate impoundments |
| Water truck | Dust and fire control |
| Dump trucks | Haul cut soils |
| Pickup trucks | Transport laborers |
| Welders | Welding |
| Fusion machine | Pipe fusing |
| Well rig | Monitoring well installation |

Detailed information on equipment usage for the construction of the Wastewater Disposal Changes and associated pollutant emissions is provided in Appendix A.

Emission information for the Wastewater Disposal Changes construction was calculated based on the expected equipment use for each phase of construction. It was assumed that the civil, mechanical, and electrical component phases occurred simultaneously to calculate the worst-case short-term and long-term emissions.

Tables 5.2-3 to 5.2-6 present the estimated worst-case equipment exhaust and fugitive dust emission rates during construction for onsite and offsite activities associated with Wastewater Disposal Changes construction. The onsite emissions include exhaust and travel dust from the construction equipment, dust from earthmoving activities and travel dust from worker vehicles. The offsite emissions include dust and exhaust from the construction worker vehicles and dump trucks removing soil from the site.

**Table 5.2-3 Maximum Equipment Onsite Daily Emission Rates Due to Construction**

| | | Daily Emissions Onsite (lb/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Activity** | **Emission Type** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** | **VOC** | **NOx** | **SOx** | **$CO_2$** | **$N_20$** | **$CH_4$** | **$CO_2e$** |
| Wastewater Disposal Changes Construction | Combustion exhaust | 3.59 | 3.30 | 44.79 | 10.08 | 84.03 | 0.08 | 7,797 | 0.002 | 1.07 | 7,820 |
| | Fugitive dust | 25.81 | 3.74 | | | | | | | | |
| | **Total Onsite** | **33.66** | **7.47** | **44.79** | **10.08** | **84.03** | **0.08** | **7,797** | **0.002** | **1.07** | **7,820** |

**Table 5.2-4 Maximum Equipment Onsite Annual Emission Rates Due to Construction**

| | | Annual Emissions Onsite (tons/year) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Activity** | **Emission Type** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** | **VOC** | **NOx** | **SOx** | **$CO_2$** | **$N_20$** | **$CH_4$** | **$CO_2e$** |
| Wastewater Disposal Changes Construction | Combustion exhaust | 0.05 | 0.04 | 0.61 | 0.13 | 1.15 | 0.001 | 106.81 | 4.0E-05 | 0.01 | 107.13 |
| | Fugitive dust | 0.50 | 0.07 | | | | | | | | |
| | **Total Onsite** | **0.54** | **0.11** | **0.61** | **0.13** | **1.15** | **0.001** | **106.81** | **4.0E-05** | **0.01** | **107.13** |

**Table 5.2-5 Maximum Equipment Offsite Daily Emission Rates Due to Construction**

| | | Daily Emissions Offsite (lb/day) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Activity** | **Emission Type** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** | **VOC** | **NOx** | **SOx** | **$CO_2$** | **$N_20$** | **$CH_4$** | **$CO_2e$** |
| Wastewater Disposal Changes Construction | Combustion exhaust | 0.86 | 0.74 | 26.35 | 4.29 | 11.07 | 0.03 | 3,733 | 0.11 | 0.19 | 3,769 |
| | Fugitive dust | 9.49 | 1.42 | | | | | | | | |
| | **Total Offsite** | **10.35** | **2.17** | **26.35** | **4.29** | **11.07** | **0.03** | **3,733** | **0.11** | **0.19** | **3,769** |

**Table 5.2-6 Maximum Equipment Offsite Annual Emission Rates Due to Construction**

| | | Annual Emissions Offsite (tons/year) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Activity** | **Emission Type** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** | **VOC** | **NOx** | **SOx** | **$CO_2$** | **$N_20$** | **$CH_4$** | **$CO_2e$** |
| Wastewater Disposal Changes Construction | Combustion exhaust | 0.01 | 0.01 | 0.66 | 0.08 | 0.17 | 0.001 | 87.28 | 2.9E-03 | 0.01 | 88.29 |
| | Fugitive dust | 0.15 | 0.02 | | | | | | | | |
| | **Total Offsite** | **0.16** | **0.03** | **0.66** | **0.08** | **0.17** | **0.001** | **87.28** | **2.90E-03** | **0.01** | **88.29** |

The maximum emission rates in Tables 5.2-2 to 5.2-5 for construction of the Wastewater Disposal Changes are well below the corresponding maximum values for all pollutants that were approved for the substantially larger PEC construction effort. Thus, it is justifiable to assume that the worst-case construction scenario (the phase that creates the most pollutant emissions) remains the site grading activities associated with the approved PEC. Additional dispersion modeling to evaluate the Wastewater Disposal Changes impacts would result in significantly lower predicted impacts than those already found to be acceptable in the previously approved PEC AFC.

### 5.2.3 Cumulative Impacts

There are no additional cumulative impacts caused by operation of the Wastewater Disposal Changes because the operational UWSI will have negligibly small emissions of air pollutants.

### 5.2.4 Mitigation Measures □ Emissions Offsets

The same construction mitigation measures described in the AFC Section 5.2 - Air Quality of the the previously approved PEC would apply to construction of the Wastewater Disposal Changes. Emission Reduction Credits are not required by the San Joaquin Valley Air Pollution Control District (SJVAPCD) to mitigate the construction phase emissions. No air quality mitigation measures are required for the operational phase of the Wastewater Disposal Changes, as there will be no stationary sources of emissions associated with their operation.

### 5.2.5 LORS Compliance

There are no additional LORS applicable to the Wastewater Disposal Changes construction and operations beyond the LORS identified for the previously approved PEC AFC. The Wastewater Disposal Changes will comply with all applicable LORS.

### 5.2.6 Involved Agencies and Agency Contacts

The contacts at air quality regulatory agencies for the Wastewater Disposal Changes would be the same as those listed in the previously approved PEC AFC.

### 5.2.7 Permits and Permitting Schedule

The operational phase of the Wastewater Disposal Changes will not require additional permits from SJVAPCD because there will be no associated stationary sources of air pollutants. However, the air quality construction mitigation plan and SJVAPCD dust control plan submitted for the previously approved PEC construction effort will be expanded to include the

Wastewater Disposal Changes or new plans specific to the Wastewater Disposal Changes will be prepared.

### 5.2.8 References

There are no additional references.

### 5.2.9 Conditions of Certification

The COCs issued by the CEC as part of the previously approved PEC are applicable and sufficient to ensure that emissions from the Wastewater Disposal Changes will remain below relevant significance levels. No new COCs pertaining to air quality are required for the Wastewater Disposal Changes.

## 5.3 GEOLOGIC HAZARDS AND RESOURCES

### 5.3.1 Affected Environment

As discussed in Sections 3.2 *Wastewater Disposal Changes Location* and 3.3 *Site Description* , the Wastewater Disposal Changes are located southeast of Panoche Creek on the Panoche Creek alluvial fan. See Figures 5.3-2A and 5.3-2B *Site Geologic Map*. The fan is one of a belt of coalescing alluvial fans 12 to 19 miles wide and located on the east flank of the Coast Ranges between the flood plains of the San Joaquin River and Fresno Slough. The Site is located near the head of the largest fans in the region, near its intersection with the smaller Tumey Gulch alluvial fan to the south. Elevations of the alluvial fans range from approximately 130 feet above mean sea level at the base to 900 feet above mean sea level at the apexes. The Site elevation is approximately 407 feet above mean sea level and the site is composed of older alluvium underlain by tertiary sediments, cretaceous marine deposits, and pre-tertiary basement rocks.

### 5.3.2 Environmental Consequences

No adverse effect on geological resources is expected from the Wastewater Disposal Changes.

### 5.3.3 LORS Compliance

This section addresses LORS applicable to Wastewater Disposal Changes geologic hazards and resources. All applicable elements of the California Building Code, Chapters 16 and 33, are addressed in the approved PEC AFC. The Wastewater Disposal Changes will comply with applicable geological hazards and resources LORS described in the previously approved PEC AFC.

### 5.3.4 References

There are no additional references.

### 5.3.5 Cumulative Impacts

Because the various projects in the cumulative impact evaluation will be responsible for complying individually with applicable geologic hazards and resources LORS, no cumulative impacts on geologic hazards and resources are expected as a result of the Wastewater Disposal Changes.

### 5.3.6 Conditions of Certification

No new COCs pertaining to geologic hazards and resources are required for the Wastewater Disposal Changes.

## 5.4 AGRICULTURE AND SOILS

This section describes the affected environment and the environmental effects of the Wastewater Disposal Changes on agriculture and soils in accordance with CEC requirements. As appropriate, agriculture and soils-related mitigation measures are also included in this section. The Wastewater Disposal Changes will comply with applicable agriculture and soils LORS described in the AFC for the previously approved PEC.

### 5.4.1 Affected Environment

As discussed in Sections 3.2 *Wastewater Disposal Changes Location* and 3.3 *Site Description*, the Wastewater Disposal Changes will be located in a rural area of Fresno County, California, generally southeast of the intersection of West Panoche Road and Davidson Avenue. Agricultural uses are prevalent throughout the vicinity including the cultivation of pomegranates, almonds, grapes, and field crops. Few rural residences are also located in the vicinity. Industrial uses in the vicinity include the PG&E Panoche Substation, Starwood Power Generation Facility, the Calpeak Plan Check Power Generation Facility, and the Wellhead Power Generation Facility.

The Site is located mostly on the existing PEC laydown area in an agricultural area surrounded by pomegranate trees. The Site is essentially flat with a slight slope downward towards the northeast. The elevation of the vicinity is approximately 420-feet above mean sea level and slopes gently down to the southeast at approximately one percent grade. The surface is composed of sands, silts, and clays common to alluvial fan deposits in the area with generally loose and dry soils.

**Soil Resources**

The soil resources of the Wastewater Disposal Changes are the same as those described in the previously approved AFC.

Soils are mapped and described as “soil series.” The locations and properties of the soil series were identified from data and maps prepared by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS). A list of soil types is included in Table 5.4-1 below and mapped in Figure 5.4-1 *Agricultural Soils Surrounding Project Site*. The WSS Database contains official USDA soil survey information as viewable maps and tables for more than 2,300 soil surveys in the United States and its territories. The Site has been disturbed through agricultural production and current use as the PEC laydown area. Refer to 5.3 *Geological Hazards and Resources* for the characteristics of the subsurface soils.

**Table 5.4-1 Soil Types in the Western Part of Fresno County**

(in Proximity to Project Site)

| Map Unit Symbol | Map Unit Name |
|---|---|
| 406 | Guijarral Sandy Loam, 2 to 5 Percent Slopes |
| 442 | Panoche Clay Loam, 0 to 2 Percent Slopes |
| 445 | Excelsior Sandy Loam, 0 to 2 Percent Slopes |
| 447 | Excelsior Sandy Loam, Sandy Substratum, 0 to 2 Percent Slopes |
| 477 | Westhaven Clay Loam, 0 to 2 Percent Slopes |
| 478 | Cerini Sandy Loam, 0 to 2 Percent Slopes |
| 479 | Cerini Clay Loam, 0 to 2 Percent Slopes |
| 491 | Cerini Clay Loam, Subsided, 0 to 5 Percent Slopes |
| 492 | Panoche Loam, Subsided, 0 to 5 Percent Slopes |
| 493 | Panoche Clay Loam, Subsided, 0 to 5 Percent Slopes |
| 590 | Cerini-Anela-Fluvaquents, Saline-Sodic, Association, 0 to 2 Percent Slopes |
| 960 | Excelsior, Sandy Substratum-Westhaven Association, Flooded, 0 to 2 Percent Slopes |
| 982 | Water |

The Site is located close to or within areas adjacent to the Diablo Range susceptible to near-surface subsidence due to hydrocompaction of soils. Near-surface subsidence produced by initial wetting of these soils has destroyed or damaged ditches, canals, roads, wells, pipelines, electric transmission towers, and buildings and has made the irrigation of crops difficult. The Site has been irrigated for agricultural use for many years which lessens the likelihood of near-surface subsidence following the installation of the UWSI.

Settlement can occur in poorly consolidated soils during ground shaking. Earthquake induced settlement can cause distress to structures supported on shallow foundations, damage to utilities that serve pile-supported structures, and damage to lifelines that are commonly buried at shallow depths. The presence of loose, unsaturated granular soil layers at the Site could result in some seismic-induced settlement that was taken into account during design.

The native soils present at the site consist of the Panoche Series (refer to Figure 5.4-1 *Agricultural Soils Surrounding Project Site*). The Panoche Series soils typically slope at zero (0) to two (2) percent, with medium runoff. The Panoche Series soil in the Site is the Panoche clay loam, 0 to 2 percent slopes.

Panoche clay loam soils are categorized as Capability Unit Classification I, with Capability Subclass VIIc. There are no major limitations and few minor limitations for this soil. Permeability of this Panoche soil is moderate, with an available water capacity that is high or very high. Effective rooting depth is 60 inches or more. As stated, runoff is medium, and the hazard of water erosion is slight.

The surface layer is light brownish gray clay loam about seven inches thick. The upper nine inches of the subsoil is light brownish gray loam. The next 27 inches is light gray loam over 14 inches of light brownish gray loam. The lower part to a depth of 72 inches is light brownish gray sandy loam. The soil is calcareous throughout. In some areas the surface layer is clay, sandy clay loam, or loam.

As stated above, 7.18 acres of the 9.18-acre Site have been cleared of pomegranate trees, and used as the PEC laydown area. Pomegranate trees are presently grown on 2.0 acres of the Site. The Panoche Series soil identified and discussed above represents the soil conditions in the construction zone.

The Site is relatively flat, unpaved, and does not have existing unnatural runoff drainage (refer to Figure 5.4-2 *Existing Land Use Surrounding Project Site*).

Transmission Lines. No transmission lines will be associated with the Wastewater Disposal Changes.

Offsite Pipelines. No offsite pipelines are associated with the Wastewater Disposal Changes.

Worker Parking and Equipment Staging Sites. There will not be any offsite locations for worker parking and equipment staging. Worker parking and equipment staging will be located within the existing PEC and Wastewater Disposal Changes footprint. The soil series for the parking and equipment staging are identical to the construction area.

## Agriculture and Prime Farmland

The agricultural resources and presence of prime farmland for the Wastewater Disposal Changes are the same as those described in the previously approved AFC.

The Site and adjacent land are designated by the California Department of Conservation (CDC) as prime farmland. Prime farmland, as defined by the USDA and CDC, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses. The impact on prime agricultural lands related to the Wastewater Disposal Changes is described in Section 5.9 *Land Use*.

### Williamson Act

The additional 9.18 acres that comprise the Site are subject to the Williamson Act, as was the 12.82-arce PEC project parcel. By resolution of the Fresno County Board of Supervisors on April 28, 2007, the 12.82-acre parcel that comprises the previously approved PEC project site was no longer subject to the Williamson Act. The Site is undergoing review and approval of a Williamson Act cancellation application filed to Fresno County on February 24, 2009. Favorable CDC comments were received by the County on June 24, 2009. On September 2, 2009 the Agricultural Land Conservation Committee filed its recommendation to the County in favor of the Williamson Act cancellation (provided in Appendix D). A resolution by the Board of Supervisors to cancel Williamson Act obligations on the 9.18 acres is anticipated in October 2009.

### 5.4.2 Environmental Consequences

**Construction-Related Impacts**

Significance criteria have been selected based on the CEQA Guidelines as well as performance standards adopted by responsible agencies. An impact may be considered significant from an agriculture and soil standpoint if the Wastewater Disposal Changes results in:

- Substantial soil erosion or loss of topsoil;
- Degradation or loss of available agricultural land, agricultural activities, or agricultural land productivity in the project area;
- Alteration of agricultural land characteristics due to air emissions; or
- Conversion of Prime or Unique Farmland, or Farmland of Statewide Importance, to non-agricultural use.

Construction impacts on soil resources can include increased soil erosion and soil compaction. Soil erosion causes the loss of topsoil and can increase the sediment load in the surface receiving waters downstream of the construction Site. The magnitude, extent, and duration of this construction-related impact depends on the erodibility of the soil (slight, as discussed above), the proximity of the construction activity to a receiving water body, the degree of contamination of the excavated soil stockpiles, and the construction methodologies, duration, and the season.

**Wastewater Disposal Changes Site**

Construction activities for the 9.18-acre Site will include tree removal and grubbing, grading, digging the UWSI, and constructing the berms (civil component); installation of underground pipe and tie-in to existing plant (mechanical component); installation of underground conduit and monitoring devices (electrical component); and clean-up and final site grading. A construction staging area will be located within the existing PEC and 9.18-acre Wastewater Disposal Changes footprint.

Excavation work will consist of the removal, storage, and/or disposal of soil, vegetation, organic matter, loose rock, tree irrigation, and debris to establish the lines and grades necessary for construction. Material suitable for backfill will be stored in stockpiles at designated locations using proper erosion protection methods. Excess material will be removed from the Site and disposed of at an acceptable location. During the construction phase, temporary erosion and sediment control measures, such as mulching, jute netting, culverts, sediment detention basins, etc., will be installed.

Areas to be backfilled will be prepared by removing unsuitable material and rocks. The bottom of an excavation will be examined for loose or soft areas. Such areas will be excavated fully and will be backfilled with compacted fill.

Backfilling will be done in layers of uniform, specified thickness. Soil in each layer will be properly moistened to facilitate compaction to achieve specified density. To verify compaction, representative field density and moisture-content tests will be made during compaction. Embankment, dikes, bedding for buried piping, and backfill will be compacted to at least 95 percent of the maximum dry density. General backfill placed in remote and/or unsurfaced areas will be compacted to at least 90 percent of the maximum dry density.

Short-term increases in soil erosion are expected to occur during the construction phase. The erosion characteristics of the Panoche Series mapped at the location of the Site are slight.

Project-related soil erosion will be minimized through implementation of erosion control measures described in Section 5.4.3 *Mitigation Measures* including stabilizing the side slopes for the permanent condition to reduce erosion problems. Therefore, impacts from soil erosion are expected to be insignificant.

The Wastewater Disposal Changes will result in soil compaction due to site grading. Compaction increases soil density by reducing pore space and impeding water and gas movement through this medium. This can result in an overall decrease in sedimentation. The incorporation of erosion control measures described in Section 5.4.3 *Mitigation Measures* during construction of the Wastewater Disposal Changes will result in less than significant impacts from soil compaction.

Site preparation and construction of the Wastewater Disposal Changes may potentially involve excavation of contaminated soils. Contaminated excavated soils, if encountered, will be stored temporarily in construction zones and removed for disposal or treatment and recycling. Management of contaminated excavated materials will be conducted in accordance with applicable federal, state, and local regulations, as described in Section 5.14 *Waste Management*. Therefore, the impact to the potential receiving waters will be less than significant. If applicable, the engineering fill will be imported to replace excavated materials that are not suitable for replacement.

Following construction, wind and water erosion on developed portions of the Site will be reduced because the Site will be compacted, and drainage will be controlled. Implementation of the erosion control measures discussed in Section 5.4.3 *Mitigation Measures* is expected to limit impacts to the soils resource at the Site to acceptable levels.

Williamson Act Compliance

As described above, a resolution from the County Board of Supervisors is expected in October 2009 that will relinquish all Williamson Act obligations. Therefore, under the Williamson Act, the contract on the 9.18-acre Site will be deemed null and void and no findings need be made under Government Code section 51292 regarding the location of the Wastewater Disposal Changes within an agricultural preserve (See also Gov't. Code § 51292(c)).

Transmission Lines

No transmission lines will be associated with the Wastewater Disposal Changes.

Offsite Pipelines

The Wastewater Disposal Changes will not include alteration of existing offsite pipelines.

Worker Parking and Equipment Staging Site

The worker parking and equipment staging sites will not be paved. Exposed soils in parking areas will be covered with gravel to minimize dust and erosion. Additional erosion control measures (more fully described in Section 5.4.3 *Mitigation Measures*) will be implemented during grading to help maintain water quality and to prevent accelerated soil erosion or dust

generation. No significant impacts to native soils, receiving waters, or area agricultural lands are anticipated at or near the Site.

### 5.4.3 Mitigation Measures

Anticipated impacts to the surrounding area from the construction of the Wastewater Disposal Changes will be minimized by the implementation of erosion control plans and storm water pollution prevention plans. No mitigation is required because impacts to soils during construction and operation are minimal.

**Temporary Erosion Control Measures**

Typically, temporary erosion control measures include revegetation, slope stabilizers, dust suppression, construction of berms and ditches, and sediment barriers. During construction of the UWSI, employment of control measures will minimize wind-blown erosion. Spraying clean water on the soil in construction areas will help to suppress dust.

Sediment barriers, such as straw bales or silt fences, slow runoff, and trap sediment. Generally, placement of barriers will occur at the base of exposed slopes below disturbed areas. Placing barriers around the Site and the property boundary serves as prevention against sediment leaving the Site. Because the Site is relatively level, standard surface erosion control techniques should be effective. Soil stockpiles generated during construction will be covered and protected from rainfall if left onsite for extended periods of time.

**Permanent Erosion Control Measures**

Due to the Site's flatness, runoff collection, and drainage system, additional long-term measures are neither warranted nor necessary.

### 5.4.4 LORS Compliance

The Wastewater Disposal Changes will comply with applicable agriculture and soils LORS evaluated for the previously approved PEC AFC.

### 5.4.5 References

There are no additional references.

### 5.4.6 Cumulative Impacts

Soil erosion and sedimentation impacts associated with the Wastewater Disposal Changes will not be significant and will not be cumulatively considerable in combination with negligible impacts from the previously approved PEC. The Wastewater Disposal Changes are going to be constructed on previously disturbed land, the PEC laydown area and pomegranate orchard. Therefore, the location is not expected to have an effect on revegetation potential. Agricultural impacts are described in Section 5.9 *Land Use*. Impacts related to the potential excavation of contaminated soils will not be significant because all excavated materials will be handled in accordance with the procedures described in Section 5.14 *Waste Management.*

### 5.4.7 Conditions of Certification

The Wastewater Disposal Changes generally pose the same effect to agriculture and soils as the previously approved PEC. Any incremental effect caused by the changes does not raise the impact of PEC as a whole above the present level of significance. No modifications to existing agriculture and soils COCs are necessary.

## 5.5 WATER RESOURCES

This section describes the affected environment and the environmental effects of the Wastewater Disposal Changes on water resources. PECL proposes to construct and operate UWSI to receive and dispose of project wastewater through percolation into the unusable semi-confined aquifer below the Site. These changes will not affect the use of water resources and will resolve a critical and urgent issue the project faces regarding wastewater disposal. The discharge will be permitted by the Regional Water Quality Control Board (RWQCB). Further, the groundwater beneath the UWSI is not "high quality" water under State Water Resources Control Board (SWRCB) Resolution No. 68-16. Moreover, the discharge of the plant wastewater is unlikely to have more than a minimal impact on the potential usability of the groundwater in the semi-confined aquifer. For these reasons these proposed changes will comply with applicable water resources LORS while ensuring that PEC is able to reliably and efficiently provide electricity.

### 5.5.1 Existing Site Conditions

The issues with the performance of the injection wells and the temporary measures taken to ensure power plant operation and reliability are fully described in Section 3.0 *Overview of Changes*. Because of these issues, PECL has studied alternatives and proposes to construct UWSI to accept discharge of wastewater.

To further this proposal, an onsite groundwater monitoring well (MW-4) was completed in the semi-confined aquifer with a screened interval extending from about 150 to 210 feet below ground surface (bgs). First-encountered groundwater was present at approximately 170 feet bgs. Four groundwater samples were collected from the well in July and August 2009 and analyzed for metals and minerals. The results are tabulated in Appendix E, along with applicable water quality objectives (WQOs) found in the California RWQCB Water Quality Control Plan for the Tulare Lake Basin (Basin Plan) and state maximum contaminant levels (MCLs), when applicable. The analytical results for the first-encountered groundwater indicate that many of the semi-confined aquifer background groundwater concentrations substantially exceed the municipal and/or agricultural WQOs in the Basin Plan.

For example, regarding municipal WQOs, the first-encountered groundwater contains:

- Nitrate concentration of about 393 milligrams per liter (mg/l), which is more than eight times the primary MCL of 45 mg/l.
- Arsenic concentration of about 24 micrograms per liter (ug/l), which is more than twice the primary MCL of 10 ug/l.
- Selenium concentration of about 495 ug/l, which is more than nine times the primary MCL of 50 ug/l.

- TDS concentration of about 4,500 mg/l, which is more than four times the upper secondary MCL of 1,000 mg/l.
- Sulfate concentration of about 2,200 mg/l, which is more than four times the upper secondary MCL of 500 mg/l.

Regarding agricultural WQOs, the first encountered groundwater contains:

- TDS concentration of about 4,500 mg/l, which is more than twice the level of 2,000 mg/l, which is considered to be severely restricted for irrigation use (FAO Publication 29).
- Chloride concentration of about 403 mg/l, whereas the most sensitive crops show chloride impacts at a concentration of about 100 mg/l, and many crops, including grapes which are grown in the PEC vicinity, show impacts at a concentration of 250 mg/l.
- Boron concentration of about 3,230 ug/l, whereas the most sensitive crops, including grapes which are grown in the PEC vicinity, show boron impacts at concentrations of about 500 ug/l, and many crops show impacts at concentrations of 2,000 ug/l.
- Selenium concentration of about 495 ug/l, which is more than 24 times the FAO-recommended maximum irrigation-water concentration of 20 ug/l.

Thus, multiple constituents in the existing groundwater render the semi-confined aquifer unusable for municipal and agricultural purposes, unless the water is first treated to remove these constituents.

A few widely spaced irrigation wells are present in the general vicinity of PEC. Newer irrigation wells are supposed to be screened exclusively in the confined aquifer; older wells may be screened and/or filter-packed across both aquifers. Local farmers use these wells when they are unable to obtain surface water for irrigation. The local farmers purposely do not have wells screened exclusively in the semi-confined aquifer, because groundwater from the semi-confined aquifer is detrimental to their crops.

Only two supply wells in the plant vicinity are known to be screened within the semi-confined aquifer. These are emergency backup supply wells for the Calpeak-Panoche and Starwood-Midway peaker power plants, located about 1,000 and 1,500 feet, respectively, northeast of PEC. The Starwood-Midway well is known to be screened from 400 to 500 feet bgs. The Calpeak-Panoche well is known to be 500 feet deep, and the top of the screen is assumed to be at a similar depth as the Starwood-Midway well, based on reported analytical results. Both of these plants have demineralizing water-treatment systems that would be used to treat the groundwater before use. The Calpeak-Panoche plant normally gets its source water by truck provided by a local farmer from either his surface water supply or his irrigation wells. The Starwood-Midway plant normally gets its source water by pipeline from a local farmer's surface water supply (sediment-filter backwash water).

## 5.5.2 Project Water and Wastewater Needs

### 5.5.2.1 Water Supply

There will be no increased use of water caused by the Wastewater Disposal Changes. Water will continue to be supplied by onsite wells completed in the confined aquifer.

**Wastewater Disposal Alternatives**

Following is a summary of the wastewater disposal alternatives that are analyzed in greater detail in Section 4.0 *Alternatives* of this document:

- Pumping or trucking wastewater to a WWTP
- Discharging wastewater to a brine line to Pacific Ocean
- Adding injection wells
- Changing the production water source (i.e., WWTP effluent, aqueduct water, agricultural irrigation tail water)
- Discharging to a nearby water body
- Regenerating deionizer systems offsite
- Zero liquid discharge (ZLD)
- Double-lined evaporation pond(s)
- Onsite unlined wastewater surface impoundment(s)

Of these alternatives, the use of onsite unlined wastewater surface impoundments was found to be feasible and the environmentally superior choice.

## 5.5.3 Water Resources and Wastewater Management

### 5.5.3.1 Project Water Resources Plan

**5.5.3.1.1 Source of Project Water Supply.** Water will continue to be supplied from the confined aquifer.

**5.5.3.1.2 Process Water Uses.** Uses of the process well water will not be changed by the Wastewater Disposal Changes.

**5.5.3.1.3 Project Water Supply Facilities.** Process and other onsite-use water will continue to be supplied via two onsite production wells connected to the confined aquifer.

**5.5.3.1.4 Project Water Treatment.**

Project water treatment will not be changed, except that an ultrafiltration skid will be added to remove total suspended solids from the source water. The ultrafiltration skid will remove suspended solids from the water before it enters the RO system. Backwash water used to periodically clean the ultrafiltration skid will be sent to the oil/water separator. Refer to Figure 5.5-3 *Water Balance Flow Diagram*.

### 5.5.3.2 Project Wastewater Management Plan

**5.5.3.2.1 Selected Wastewater Disposal Alternative.** Based on the evaluation described in Section 4.0 *Alternatives* and Section 5.5.2.1 *Water Supply*, use of UWSI was identified as the superior alternative for disposal of plant wastewater. The surface impoundments are superior in terms of providing the best balance between minimizing environmental impacts and optimizing energy efficiency, reliability and availability. Under this alternative, wastewater collected in the plant's wastewater storage tank can be conveyed by a pipeline to the surface impoundments for evaporation and percolation.

**5.5.3.2.2 Project Wastewater Streams.** Evaporative cooler blowdown and intercooler condensation will be redirected to the cooling tower, rather than going to the wastewater storage tank. This change will improve water efficiency and decrease the use of source water. Refer to Figure 5.5-3 *Water Balance Flow Diagram*.

**5.5.3.2.3 Storm Water Runoff.** According to the Federal Emergency Management Agency (FEMA), the site is outside the 500-year flood plain. The UWSI will be designed, operated, and maintained in conformance with Fresno County ordinance Title 15, Flood Hazard Areas to ensure that in the event of a 100-year storm, the UWSI are not subjected to any flood damage, inundation, or washout.

A Storm Water Pollution Prevention Plan (SWPPP) will be prepared prior to construction of the surface impoundments. This plan will be implemented to control and minimize contamination of storm water during the construction of the surface impoundments. The plan will employ best management practices such as stabilized construction entrances, silt fencing, berms, hay bales, and detention basins to control runoff from all construction areas.

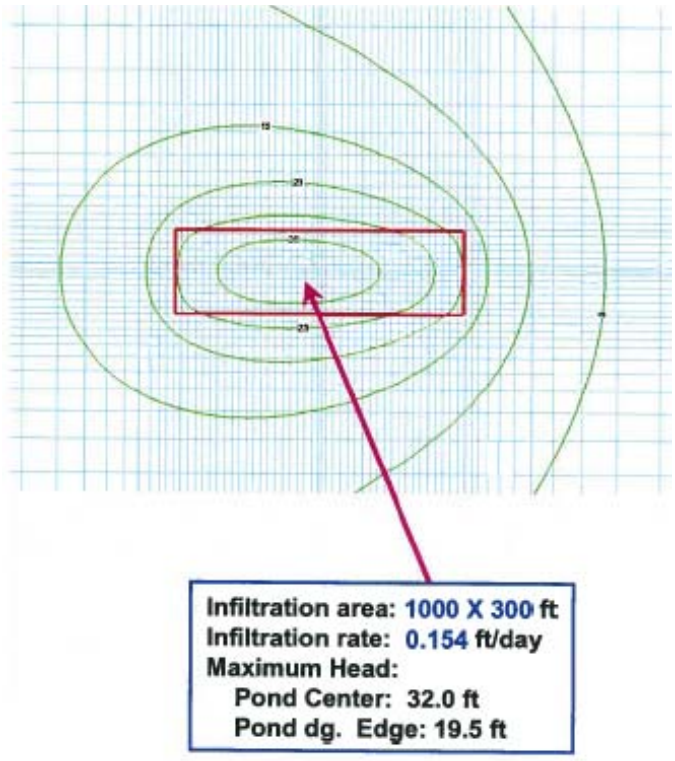
## 5.5.4 Effect of Proposed Project on Water Resources

### 5.5.4.1 Effect on Sub-Basin Water Balance

The Wastewater Disposal Changes will return up to approximately 380 acre-feet per year of water to groundwater storage in the Westside Sub-Basin in the semi-confined aquifer. The volume of wastewater discharged to the surface impoundments for potential percolation into the semi-confined aquifer will amount to roughly 1/3 of the volume extracted from the confined aquifer to supply the plant. The total volume of groundwater storage in the semi-confined aquifer is estimated at 36.5 million acre-feet, so the annual volume of percolated wastewater would amount to less than 0.001 percent of this total volume.

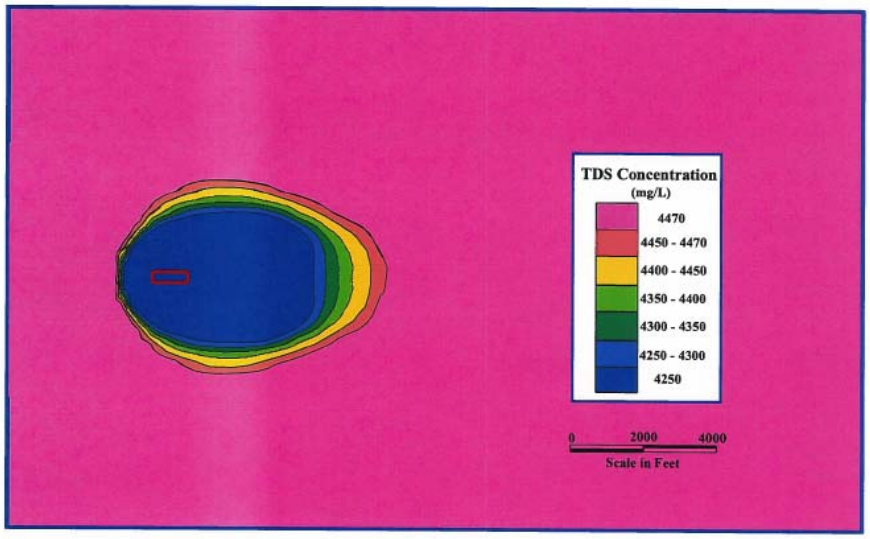
### 5.5.4.2 Water Level Effects

Computer groundwater modeling results presented in Appendix E indicate that the groundwater level will increase at maximum by roughly 32 feet beneath the center of the UWSI and roughly 20 feet at the edge of the impoundments. The edge of the groundwater mound will extend roughly 1,000 feet downgradient and crossgradient from the UWSI as shown below.




### 5.5.4.3 Water Quality Effects

As discussed in Appendix E, the volume of groundwater affected by the Wastewater Disposal Changes at the end of the 20-year projected life of PEC is predicted to extend roughly 5,800 feet laterally downgradient and 240 feet vertically below the water table. This prediction is highly conservative in that it assumes that the plant would operate for 5,000 hours at maximum load per year for 20 years. Within this volume of groundwater, the estimated TDS concentration will improve from about 4,500 mg/l to 4,250 mg/l.




Plan view contour map of simulated TDS concentration along the pond centerline (T=20 years)
(Contour level = 4250, 4300, 4350, 4400, 4450, and 4470 mg/L)

Similarly, improvements are predicted in concentrations of other constituents such as calcium, magnesium, chloride, and nitrate. There are seven constituents, however, for which the predicted maximum concentrations within the volume of affected groundwater are greater than the baseline groundwater concentration and are also greater than the municipal and/or agricultural WQOs. These constituents are discussed in turn below:

- **Arsenic.** The background arsenic concentration is approximately 24 ug/l. The municipal WQO is 10 ug/l. The agricultural WQO is 100 ug/l. The predicted maximum groundwater concentration after PEC's proposed discharge is 94 ug/l. Since the background concentration is already greater than the municipal WQO, and since the discharge is not predicted to cause the groundwater concentration to exceed the agricultural WQO, the discharge will cause no further WQO exceedances. In terms of potential municipal uses, arsenic removal would be required even for the background groundwater. If the discharge occurred as proposed, the overall level of required water treatment would very likely decrease due to the substantial concentration decreases in other constituents such as nitrate and selenium.
- **Boron.** The background groundwater boron concentration is approximately 3,225 ug/l. There is no municipal WQO for boron, and the agricultural WQO based on actual crops in the PEC vicinity is 500 ug/l. The predicted maximum groundwater concentration of boron after PEC's proposed discharge is 10,600 ug/l. In terms of potential agricultural uses, boron removal would be required even for the background groundwater, because the background concentration of 3,225 ug/l is substantially greater than agricultural WQO of 500 ug/l. If the discharge occurred, the overall level of required water treatment would likely change very little because selenium is present in the background groundwater at a greater multiple of its agricultural WQO than would be the case for boron after discharge.
- **Fluoride.** The background fluoride concentration is approximately 0.07 mg/l. The municipal WQO is 2.0 mg/l. The agricultural WQO is 1.0 mg/l. The predicted maximum groundwater concentration after discharge is 1.24 mg/l. In terms of potential agricultural uses, if the discharge occurred, the overall level of required water treatment would likely change very little because another constituent, selenium, is present in the background groundwater at a greater multiple of its agricultural WQO than would be the case for fluoride after discharge.
- **Manganese.** The background manganese concentration is less than 10 ug/l. The municipal WQO is 50 ug/l, based on a secondary MCL due to taste and odor concerns, not on a primary MCL. The agricultural WQO is 200 ug/l. The predicted maximum groundwater concentration after discharge is 160 ug/l. In terms of potential municipal uses, if the discharge occurred, the overall level of required water treatment prior to municipal use would very likely decrease due to the substantial concentration decreases in other constituents such as nitrate and selenium.
- **Molybdenum.** The background molybdenum concentration is less than 10 ug/l. There is no municipal WQO. The agricultural WQO is 10 ug/l. The predicted maximum groundwater concentration after discharge is 154 ug/l in the affected portion of the semi-confined aquifer. In terms of potential agricultural uses, if the discharge occurred, the overall level of required water treatment would likely change very little because another constituent, selenium, is present in the background groundwater at a greater multiple of its agricultural WQO than would be the case for molybdenum after discharge.

- **Sodium.** The background sodium concentration is approximately 528 mg/l. There is no municipal WQO. The agricultural WQO is nominally 69 mg/l. The predicted maximum groundwater concentration after discharge is 1,330 mg/l. In terms of potential agricultural uses, if the discharge occurred, the overall level of required water treatment would likely change very little because another constituent, selenium, is present in the background groundwater at a greater multiple of its agricultural WQO than would be the case for sodium after discharge.
- **Sulfate**. The background sulfate concentration is approximately 2,200 mg/l. The municipal WQO is 500 mg/l. There is no agricultural WQO. The predicted maximum groundwater concentration after discharge is 2,380 mg/l. Since the background concentration is already greater than the municipal WQO, and since there is no agricultural WQO, the discharge will not cause further WQO exceedances. In terms of potential municipal uses, sulfate removal would be required even for the background groundwater. If the proposed discharge occurred, the overall level of required water treatment would very likely decrease due to the substantial concentration decreases in other constituents such as nitrate and selenium.

In summary, the discharge is predicted to cause only one new exceedance of a municipal WQO (for manganese, and that WQO is based only on a secondary MCL) and only two new exceedances of agricultural WQOs (for fluoride and molybdenum). The discharge is predicted to cause four other constituents (arsenic, boron, sodium, and sulfate) to exceed municipal or agricultural WQOs by a somewhat greater margin than the background groundwater already exceeds the WQOs. In terms of both potential municipal or agricultural uses, however, water treatment would be required even for the background groundwater. If the Wastewater Disposal Changes occurred, the overall level of required water treatment would likely change very little or actually decrease due to the substantial concentration decreases in other constituents such as TDS, chloride, nitrate, selenium, and strontium. Further, the scope of effect on new treatment requirements is limited by the fact that only a small portion of the aquifer is so affected. The antidegradation analysis provided in Appendix E contains additional evaluation of the effects of the proposed discharge.

The groundwater in the semi-confined aquifer in its existing state (i.e., without treatment) has very limited beneficial uses. Due to the fact that the upper semi-confined aquifer is of far lower quality than that quality established in adopted SWRCB policies (including the Basin Plan), the groundwater beneath the two proposed surface impoundments does not meet the requirements of "high quality" water that is to be maintained under SWRCB Resolution No. 68-16. Moreover, the discharge of the plant wastewater is unlikely to have a noticeable effect on the potential usability of the groundwater.

#### 5.5.4.4 Cumulative Effects

As the various projects in the cumulative impact evaluation will be responsible for complying individually with applicable water resources LORS, no cumulative impacts on water resources are expected as a result of the Wastewater Disposal Changes.

### 5.5.5 Available Documents and Information

Section 5.5.5 of the previously approved PEC AFC summarizes the available water resources documents and information. No additional information is needed.

### 5.5.6 Stipulated Conditions

The analysis of the effect of the Wastewater Disposal Changes on water resources indicates that the Wastewater Disposal Changes will not have a significant effect on the water resources in the Westside Sub-Basin. Implementation of the following Conditions of Certification (COC) will help ensure that the project complies with the applicable LORS as identified in Section 5.5.8 of the AFC and in Section 5.5.8 *LORS Compliance* of this PTA. Because the Wastewater Disposal Changes will require waste discharge requirements (WDR) issued by the RWQCB, a standard COC governing WDR permits should be added. Below, proposed new COC Soil & Water-10 is provided.

**Soil & Water-10: Waste Discharge Requirements**

The project owner will comply with all waste discharge requirements set forth in California Water Code (CWC) Section 13260 et seq, including submitting a Report of Waste Discharge (ROWD) and complying with Waste Discharge Requirements (WDRs) to be established for operation of the surface impoundments.

**Verification.** The project owner shall submit copies to the CPM of all correspondence between the project owner and the RWQCB regarding wastewater discharge to the unlined wastewater surface impoundments within 10 days of its receipt (when the project owner receives correspondence from the RWQCB) or within 10 days of its mailing (when the project owner sends correspondence to the RWQCB). This information shall include copies of the ROWD and the WDRs for the project.

### 5.5.7 Mitigation Measures

In relation to water resources, mitigation measures for the Wastewater Disposal Changes would be applied in situations where the proposed changes have or would have an unmitigated significant impact. As discussed above, the evaluation of water resources impacts considered both the quantity and the quality of water in the area. Regarding groundwater availability in the area, the project will not have a significant impact on the depth to water in the semi-confined aquifer. Furthermore, the groundwater in the semi-confined aquifer in its existing state has very limited beneficial uses. Due to the fact that the upper semi-confined aquifer is of far lower quality than that quality established in adopted SWCRB policies (including the Basin Plan), the groundwater beneath the two proposed surface impoundments does not meet the requirements of "high quality" water under SWRCB Resolution No. 68-16. Moreover, the Wastewater Disposal Changes are unlikely to have more than a minimal impact on the potential usability of the groundwater. Because the project will not have a substantial effect on the quality of groundwater in the area, no new water resources mitigation is required for the Wastewater Disposal Changes.

### 5.5.8 LORS Compliance

The construction and operation of the UWSI will be in accordance with all federal, state, county and local LORS applicable to water resources. Applicable LORS were presented in the AFC.

The Wastewater Disposal Changes must comply with SWRCB policies, including SWRCB Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California (Resolution). The Resolution directs that "existing high quality [water] will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in [State] policies" (emphasis added). The Resolution also directs that any activities that result in discharges to "existing high quality waters" are required to use "the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained." As discussed in Sections 5.5.4.3 *Water Quality Effects* and 5.5.7 *Mitigation Measures*, the upper semi-confined aquifer is of far lower quality than that established in adopted SWCRB policies (including the Basin Plan) and, therefore, the existing groundwater beneath the two proposed surface impoundments does not meet the requirements of "high quality" water under SWRCB Resolution No. 68-16. Moreover, the Wastewater Disposal Changes are unlikely to have more than a minimal impact on the potential usability of the groundwater. Because the project will not have a substantial effect on the quality of groundwater in the area and since the existing groundwater beneath the two proposed surface impoundments does not meet the requirements of "high quality" water under SWRCB Resolution No. 68-16, the Wastewater Disposal Changes comply with applicable federal, state, county, and local LORS applicable to water resources.

### 5.5.9 Involved Agencies and Agency Contacts

PEC has already begun discussions regarding WDRs with Lonnie Wass, Supervising Water Resource Control Engineer, of the RWQCB regarding the UWSI. Mr. Wass's telephone number is 559-445-5116.

### 5.5.10 References

No additional references beyond those presented in the AFC were consulted.

## 5.6 BIOLOGICAL RESOURCES

For the purposes of this Petition, the "biological survey area" or "survey area" was defined as the 9.18-acre physical ground disturbance footprint, plus an approximate one (1) mile buffer (see Figure 5.6-1 *Biological Survey Area*). This section evaluates the existing habitat conditions with the survey area and determines the potential for occurrence of biological resources[1], common and special-status species[2], their habitats[3], and other special aquatic resource areas[4] within the physical ground disturbance footprint.

[1] For the purposes of this Petition, biological resources include plants, wildlife, and habitats that occur, or have the potential to occur, within the Project's survey area.

[2] For the purposes of this analysis, "special-status species" include any species that has been afforded special recognition by federal, state, or local resources agencies [e.g., U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG)) and/or resource conservation organizations (e.g., California Native Plant Society (CNPS)]. The term "special-status species" excludes those avian species solely identified under Section 10 of the Migratory Bird Treaty Act (MBTA) for federal protection. Nonetheless, MBTA Section 10 protected species are afforded avoidance and minimization measures per state and federal requirements.

### 5.6.1 Affected Environment

The location of the Site, as a result of heavy agricultural and industrial uses, does not include native vegetation (JRP Historical Consulting, 2006). Existing conditions at the Site include the existing construction laydown area and 2.0 acres of orchard. The adjacent lands include Panoche Road and agricultural uses, primarily pomegranate trees.

**Survey Methods**

Biological field surveys were conducted within the survey area by URS biologists Ken McDonald and Dennis Miller (resumes included in Appendix B) in July 2008 according to the CEC regulations (CEC, 2000). Additionally, on-going biological monitoring has also been occurring within the survey area for the last sixteen (16) consecutive months.

In preparation of this document, available information was reviewed from resource management plans, monthly and annual monitoring reports from the CEC, and other relevant documents to determine locations and types of biological resources that have the potential to exist within and adjacent to the survey area. The June 2009 California Natural Diversity Database (CNDDB) and California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Plants of California were also queried for records of occurrence of common and special-status species, and their habitats within the following USGS 7.5-minute quadrangles: Hammonds Ranch, Broadview Farms, Firebaugh, Chounet Ranch, Chaney Ranch, Coit Ranch, Tumey Hills, Monocline Ridge, and Levis quadrangles.

The pedestrian-based July 2008 field evaluation of the survey area was performed to assess general and dominant vegetation types, community[5] sizes, habitat types and species present within communities. Community types were based on observed dominant vegetation composition and density. Vegetation classifications of plant communities in the survey area were derived from the criteria and definitions of Holland (1986) and Sawyer and Keeler-Wolf (1995). Plants were identified to the lowest taxonomic level sufficient to determine whether plant species observed were non-native, native or special-status. Scientific and common species names were recorded according to Hickman (1993).

Accordingly, meandering transects were utilized in order to provide adequate visual coverage of the survey area. Field adjustments were made to account for differences in terrain, vegetation density and so forth to ensure satisfactory visual coverage of the survey area. Where access to the entire survey area was not possible as a result of private property or other physical barriers, observations were made from nearest appropriate vantage points with binoculars or via aerial photographs to document and verify the presence or absence of biological resources.

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[3] A "habitat" is defined as the place, or type of locale where a plant or animal naturally or normally lives and grows.

[4] For the purposes of this analysis, special aquatic resource areas are being defined as the **potential** limits of: U.S. Army Corps of Engineers (USACE) jurisdiction pursuant to Section 404 of the Clean Water Act (CWA); the Regional Water Quality Control Board (RWQCB) legal authority in accordance with Section 401 of the CWA and Porter-Cologne; and CDFG's jurisdiction pursuant to Section 1600 (et seq.) of the California Fish and Game Code (CFGC).

[5] A community is an assemblage of populations of plants, animals, bacteria, and fungi that live in an environment and interact with one another, forming a distinctive living system with its own composition, structure, environmental relationships, development, and functions (Whittaker 1975).

Wildlife presence/absence assessments were performed for birds, mammals, amphibians, and reptiles within the survey area. The presence of a wildlife species was based on direct observation, wildlife sign (e.g., tracks, burrows, nests, scat), or vocalization. Field data compiled for wildlife included the species scientific name, common name, habitat, and evidence of sign when no direct observations were made. Scientific and common species names are recorded based on specialized field guides and related literature (Burt & Grossenheider, 1980; Elbroch, 2003; Halfpenny Ph.D., 2000, Sibley, 2000; Stebbins, 2003).

Furthermore, potential for occurrence of special-status species were determined for the physical ground disturbance footprint. These lands were assessed in the field for their potential to support both common and special-status plant and animal species based on habitat suitability comparisons with reported occupied habitats (CDFG; Hickman, 1993; Holland, 1986; Sawyer & Keeler-Wolf, 1995). The following potential for occurrence definitions were utilized:

> **Absent:** Species distribution is restricted by substantive habitat requirements, which do not occur within the physical ground disturbance footprint, and no further survey or study is obligatory to determine likely presence or absence of this species.
>
> **High:** Species distribution is restricted by substantive habitat requirements, which occur within the physical ground disturbance footprint, and further survey or study is necessary to determine likely presence or absence of species.
>
> **Present:** Species or species sign were observed to be present.

In summation, where there was no suitable habitat present for a particular special status species within the physical ground disturbance footprint, or only negligible suitable habitat was present, the species was considered to be "Absent." The "High" category corresponds to a recommendation of conducting a focused survey within the physical ground disturbance footprint to determine if the species is present or absent. The "High" and "Present" categorizes may, in certain circumstances, obligate subsequent focused surveys or implementation of specific programs to avoid, minimize, or compensate for adverse impacts.

Additionally, USGS topographic maps were examined to determine the locations of potential special aquatic resource areas within the survey area. Those portions of the physical ground disturbance footprint suspected of containing special aquatic resource areas (e.g., Waters of the United States, wetlands, Waters of the State) were also assessed by visual observation in the field. Potential special aquatic resource areas were evaluated by determining the presence of definable channels and/or hydrophytic vegetation, riparian habitat, and hydrologic regime within and adjacent to the physical ground disturbance footprint.

## Results

Plant Communities

The physical ground disturbance footprint is collocated within the existing PEC construction lay down area and provides limited habitat for plant species due to its developed/disturbed habitat. No native vegetation is present within the physical ground disturbance footprint. Table 5.6.2 of the CEC approved PEC AFC includes a plant species list.

Wetlands

Section 5.6.1.3 of the CEC approved PEC AFC adequately summarizes the limits of Clean Water Act and California Fish and Game Code (CFGC) Section 1600 (et. seq.) jurisdiction within the physical ground disturbance footprint. No special aquatic resource areas (e.g., Waters of the United States, wetlands, Waters of the State, sensitive riparian or riverine habitats) were detected within these lands.

Wildlife

The physical ground disturbance footprint is collocated within the existing PEC construction lay down area and provides limited habitat for wildlife species due to its developed/disturbed habitat. Table 5.6.2 of the CEC approved PEC AFC includes a wildlife species list.

Special-Status Species

**Plants.** No special-status plant species were observed during the 2008 field survey and the 2009 biological monitoring. There are also no records of special status species within the physical ground disturbance footprint.

**Wildlife.** No special-status wildlife species were observed during the 2008 field survey and the 2009 biological monitoring. There are also no records of special status species within the physical ground disturbance footprint.

Please refer to Figure 5.6-2 *Biological Resources within 1 Mile of the Project Site* for a map of the survey area and vicinity with identification of any biological resources within a 1-mile radius of the physical ground disturbance footprint.

**Special Environmental Areas in the Project Vicinity**

Section 5.6.1.6 of the CEC approved PEC AFC summarizes the Special Environmental Areas (SEA) within the survey area. There are no records of SEA's located within the physical ground disturbance footprint.

## 5.6.2 Environmental Consequences

Expected direct and indirect impacts to biological resources within the physical ground disturbance footprint are discussed below. Significant impacts are those that would involve the loss of a special status plant or wildlife species, or degradation of their habitat. The physical ground disturbance footprint would have significant impacts to vegetation and wildlife if it would:

- Cause a fish or wildlife population to drop below self-sustaining levels [California Environmental Quality Act (CEQA) Guidelines, Section 15065 (a)];
- Threaten to eliminate a plant or animal community [CEQA Guidelines, Section 15065 (a)];
- Substantially affect, reduce the number, or restrict the range of the unique, rare, or endangered species of animal or plant, or the habitat of the species [CEQA Guidelines, Section 15065 (a), Appendix G (c), Appendix I (II.4.b) and (II.5.b)];

- Substantially diminish or reduce habitat for fish, wildlife, or plants [CEQA Guidelines, Section 15065 (a), Appendix G (t)];
- Interfere substantially with the movement of resident or migratory fish or wildlife species [CEQA Guidelines, Appendix G (d)];
- Change the diversity of species, or number of any species of plants (including trees, shrubs, grass crops, and aquatic plants) or animals (bird, land animals including reptiles, fish and shellfish, benthic organisms, or insects) [CEQA Guidelines, Appendix I (II.4.1) and (II.5.a)];
- Introduce new species of plants or animals into an area, or act as a barrier to the normal replenishment of existing species [CEQA Guidelines, Appendix I (II.4.c) and (II.5.c)];
- Deteriorate existing fish or wildlife habitat [CEQA Guidelines, Appendix I (II.5.d)]; or
- Conflict with any regional Habitat Conservation Plans (HCPs).

The above criteria are used to evaluate the physical ground disturbance footprint impacts to plant communities and wildlife. The potential impacts associated with the construction and operation of the Wastewater Disposal Changes are discussed on the following page.

**Potential Impacts of the Wastewater Disposal Changes**

The physical ground disturbance footprint would not result in significant impacts to biological resources because it would not:

- Cause a fish or wildlife population to drop below self-sustaining levels;
- Threaten to eliminate a plant or animal community;
- Substantially affect, reduce the number, or restrict the range of the unique, rare, or endangered species of animal or plant, or the habitat of the species;
- Substantially diminish or reduce habitat for fish, wildlife, or plants;
- Interfere substantially with the movement of resident or migratory fish or wildlife species;
- Change the diversity of species, or number of any species of plants (including trees, shrubs, grass crops, and aquatic plants) or animals (bird, land animals including reptiles, fish and shellfish, benthic organisms, or insects);
- Introduce new species of plants or animals into an area, or act as a barrier to the normal replenishment of existing species;
- Deteriorate existing fish or wildlife habitat; or
- Conflict with any regional HCPs.

Less-than-significant impacts associated with construction and operations of the physical ground disturbance footprint are discussed further below.

Construction, Operation and Maintenance Impacts

The physical ground disturbance footprint involves the construction of UWSI located directly south of the PEC site. The total footprint includes 9.18 acres. UWSI-1 has a bottom surface area of 2.90 acres, and UWSI-2 has a bottom surface area of 2.93 acres. The existing injection well charge pumps will be used to pump the wastewater from the wastewater storage tank to the UWSI. The piping will be 6” carbon steel piping aboveground and 6” HDPE underground.

Accordingly, the physical ground disturbance footprint impacts are not anticipated to extend beyond the anthropogenically-disturbed area. To that end, any biological resource present in the physical ground disturbance footprint are assumed to have acclimated and developed tolerance to substantial noise, light, and other influences resulting from the presence of an active orchard (e.g., vehicular traffic, noise, light, dust, vehicle emissions, maintenance, and harvesting activities).

There is a potential for impacts to nesting and migratory birds, and raptors within the physical ground disturbance footprint; as a result of the construction of the impoundment features that may provide suitable foraging, and refuge habitats. Therefore, compliance implementation guidance is provided as a means of avoiding, minimizing, and compensating for adverse impacts to biological resources.

The Wastewater Disposal Changes' construction, operation, and maintenance activities may also temporarily deter wildlife from foraging in the vicinity and in surrounding lands. However, impacts would occur only during active construction and within a relatively small portion of the survey area. Short-term adverse impacts of the physical ground disturbance footprint may change foraging in the surrounding lands adjacent to the activity as well, but are considered to be insignificant, because animals that currently forage within these lands are assumed to be acclimated to this human-influenced environment. Thus, common species occur throughout the region in large numbers. It is not anticipated that the actions will change activities within the area, which would result in a trend toward state or federal listing, additional protection, apparent changes in habitat availability, or loss of viability for any of these species. Furthermore, the actions will not likely adversely affect any special-status plant or animal species, adversely affect annual production, or substantially change migration or foraging patterns.

Air Emissions and Noise

Increases in air emissions (Section 5.2 *Air Quality*) and noise (Section 5.12 *Noise*) as a result of the construction, operation, and maintenance of the Wastewater Disposal Changes are not expected to cause significant impacts to wildlife. The project area provides limited habitat for wildlife due to high agricultural use. Most of the wildlife species observed within the area are species that are often found in disturbed or developed areas and are expected to adapt to the new noise levels and air emissions.

### Impacts on Special-Status Species

No federally-listed or state-listed threatened or endangered species are expected to occur in the physical ground disturbance footprint due to lack of suitable habitat. No adverse impacts are expected to result as the majority of the special-status species reported are located near the Tumey Hills at least 4.2 miles from the Site.

### Impacts to Wildlife Corridors

The survey area does not include recognized wildlife linkages or movement corridors. The survey area has not been identified as an important landscape linkage as it doesn't connect two large blocks of natural open space essential for the long-term wildlife viability. No significant impacts to wildlife movement are expected.

### Parking, Laydown, and Access Road

Parking, laydown and access road are all within the physical ground disturbance footprint. No impacts associated with construction and operations of the Wastewater Disposal Changes are expected.

## 5.6.3 Avoidance and Minimization Measures

Refer to the previously approved PEC AFC section for stipulations that must be implemented to avoid and minimize impacts to common wildlife and any potential wildlife species.

## 5.6.4 Mitigation Measures

The Wastewater Disposal Changes will require the following mitigation measures:

- Purchase of additional mitigation credits at the Krayenhagen Hills Conservation Bank to offset potential impacts to the San Joaquin Kit Fox (SJKF). The purchase of such credits was addressed by the USFWS in the August 21, 2007 Biological Opinion issued for PEC and specifies actions that are required to avoid, minimize, or compensate for any potentially significant impacts to the SJKF and their habitat. USFWS identified the Krayenhagen Hills Conservation Bank as a preferred location to purchase mitigation credits at 1.1:1 acres for permanent disturbance and 0.3:1 for temporary disturbance. The PEC existing condition of certification BIO-10 covers this additional mitigation credit requirement and therefore no changes are proposed to existing condition of certification BIO-10.
- Prior to the start of operations, the project owner shall develop a UWSI monitoring plan. The plan shall include wildlife survey and water quality testing methods. Additionally, it shall denote specific remedial actions in the event that wildlife are adversely impacted from impound feature. Furthermore, the plan shall define wildlife usage thresholds in coordination with USFWS and CDFG.

## 5.6.5 LORS Compliance

The Wastewater Disposal Changes will comply with all LORS applicable to biological resources described in the AFC for the approved PEC.

## 5.6.6 References

Burt, W.H. and Grossenheider, R.P. 1980. *A Field Guide To Mammals: North America; north of Mexico*. New York, NY: Houghton Mifflin Company.

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Elbroch, M. 2003. *Mammal Tracks & Sign, A Guide to North American Species*. Mechanicsburg, PA: Stackpole Books.

Halfpenny, J.C. 2000. Scats and Tracks of the Desert Southwest, A Field Guide to the Signs of 70 Wildlife Species. Helena, MT: Falcon Publishing, Inc.

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Sawyer and Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento, CA: California Native Plant Society.

Stebbins, R.C. 1985. A field guide of western reptiles and amphibians. Second edition, revised. Houghton Mifflin Company, Boston, Massachusetts.

### 5.6.7 Cumulative Impacts

Section 5.6.2.3 of the previously approved PEC AFC summarizes the projects within a five-mile radius of PEC (including the existing Wastewater Disposal Changes area) that could potentially contribute to cumulative impacts. No additional cumulative impacts of significance are anticipated.

### 5.6.8 Conditions of Certification

This Petition does not require changes to any of the conditions identified in the Biological Resources section of Final Decision. However, the adoption of a new condition, BIO-11, is proposed to reduce impacts to Biological Resources from the Wastewater Disposal Changes to an insignificant level.

> **BIO-11** Prior to the start of operations, the project owner shall develop a UWSI monitoring plan that shall include wildlife survey and surface water quality testing methods and specific remedial actions in the case that wildlife usage thresholds are exceeded. The wildlife usage thresholds shall also be defined in coordination with USFWS and CDFG and included in the plan. All wildlife use and water quality indices, thresholds, and remedial actions to be taken must be approved by the CPM, in consultation with USFWS and CDFG.

## 5.7 CULTURAL RESOURCES

This section discusses the cultural resources environment and potential effects of the modifications to the approved PEC.

### 5.7.1 Affected Environment

The affected environment for the Wastewater Disposal Changes is the same as that described and evaluated for the approved PEC. As with the approved PEC, the modifications are located in a region characterized primarily by agricultural development situated near reclaimed land upon what was once marshland connected to the Tulare Lake. Agricultural development characterizes the vicinity immediately surrounding the modifications. Natural habitats for the most part have been displaced by development associated with the various agricultural activities, primarily orchards. Prior to development, Tulare Lake and the marsh setting of the general area would have supported diverse fauna and flora.

### 5.7.2 Environment Consequences

The Wastewater Disposal Changes will require excavation and grading of 9.18 acres in an area most recently used as the construction laydown area for the PEC project. Approximately 2.0 acres of the Site is currently being used for agriculture (pomegranate trees). Prior to the construction of the PEC, the Site was an active pomegranate orchard. A record search for the approved PEC project area including a ½-mile buffer was conducted on September 4, 2008. No previously recorded resources were identified; four previous surveys were conducted within ¼-mile of the modifications (refer to Figure 5.7-2 *Area of Potential Effects & Previous Cultural Surveys*). The Native American Heritage Commission (NAHC) was contacted on August 25, 2008. Informational letters were sent to eight contacts identified by the NAHC on September 2, 2008. Follow-up telephone calls were made to all individuals who did not respond to the letter. None of the contacts expressed concerns regarding the project area. The entire 9.18-acre area was subject to pedestrian survey on July 24, 2008. No archaeological resources were identified. A survey for built environment resources within ½ mile of the project area was conducted by JRP Historical in 2006. All built environment resources were evaluated and none were found to be eligible for listing on federal, state, or local registers. Throughout 2008 and 2009, the PEC plant site and appurtenant facilities were subject to full-time cultural resources monitoring for all excavation. This long-term monitoring program, carried out in the same geomorphic setting immediately adjacent to the modifications, was completely negative for cultural resources. The attached Cultural Resources Technical Report, provided in Appendix C, Figures 1 and 2, includes more information regarding cultural resources activities.

### 5.7.3 Mitigation

No known cultural resources will be impacted by the changes; however, ground-disturbing activity may result in impacts to unknown cultural resources. Existing mitigation measures set forth in the Cultural Resources Mitigation and Monitoring Plan (CRMMP) will be implemented for the Wastewater Disposal Changes and a Cultural Resources Monitor (CRM) will be onsite for all ground-disturbing activities.

### 5.7.4 LORS Compliance

The Wastewater Disposal Changes will comply with applicable cultural resources LORS described in the AFC for the approved PEC.

### 5.7.5 References

Please see the Cultural Resources Technical Report provided as Appendix C to this Petition for a complete list of references.

### 5.7.6 Cumulative Impacts

The Wastewater Disposal Changes pose the same effect to cultural resources as the previously approved PEC.

### 5.7.7 Conditions of Certification

No modifications to the Cultural Resources COCs or mitigation measures are recommended.

## 5.8 PALEONTOLOGICAL RESOURCES

### 5.8.1 Introduction

This section of the PTA summarizes the potential environmental impacts on paleontological resources that may result from the construction of UWSI.

The data for this assessment is largely based upon the results of the Paleontological Resource Impact Assessment (PRIA) completed for PEC (Fisk 2006) as well as the Final Report on the Results of the Paleontological Resources Monitoring and Mitigation Program (Fisk and Haasl 2009). The mitigation measures recommended in this report follow the mitigation measures in the PEC Paleontological Resources Monitoring and Mitigation Plan (PRMMP) for PEC (Fisk 2007).

Paleontological impacts for the Project are likely to be identical to that of the recently constructed PEC. Excavations up to six (6) feet (1.8 meters) in depth will likely impact both the late Pleistocene to early Holocene age “San Luis Ranch alluvium” and the younger Holocene age “Patterson alluvium”. Of these units, the “San Luis Ranch alluvium” has been rated as being highly sensitive with respect to paleontological resources (Fisk 2006). Abundant, scientifically important microvertebrates and plant microfossils (pollen, spores, and dinoflagellates) were salvaged during the implementation of the PEC PRMMP in the area immediately adjacent to the Site. The PEC Final Paleontological Resources Report (per COC PAL-7) provides a detailed list of fossils salvaged from the “San Luis Ranch alluvium” from the PEC site.

### 5.8.2 Affected Environment

The affected environment is the same as that evaluated for the previously approved PEC.

**Geographic Location:** The Site is located in rural western Fresno County at approximately latitude 36°39'06"N, longitude 120°35'05"W, in the SW ¼ of Section 5, Township 15S, Range 13E, in the west-central portion of the San Joaquin Valley, near the geographic center of the State of California. The general area is bounded on the west by the upper portion of the gently

inclined alluvial fan known as the Panoche Fan (Jennings and Strand 1958; Miller *et al*. 1971) or Panoche Creek Fan (Bull 1964a, 1964b; Lettis 1982a, 1982b), which lies at the base of low-lying foothills of the Diablo Range, the easternmost ridge of the Coast Ranges. To the east of the Site is the continuation of the gently inclined alluvial fan built by both Panoche Creek and adjacent smaller streams, all of which originate in the Diablo Range. The area in the immediate vicinity of the Site is irrigated farmland with the primary crop being pomegranates.

**Regional Geologic Setting:** The general geology of the Site was summarized in the PRIA (Fisk 2006), prepared and approved for PEC. The western margin of the San Joaquin Valley, where the PEC and Wastewater Disposal Changes are located, is a discontinuous series of individual and coalescing alluvial fans, with their apices located where streams drain the eastern foothills of the Coast Ranges. These low relief alluvial fans form a nearly continuous belt between the dissected uplands of the Coast Ranges and the nearly flat basin plain of the San Joaquin Valley. They are composed of undeformed to only slightly deformed alluvial deposits laid down primarily during Pleistocene time. Each alluvial fan consists of a mass of coarse to fine rock debris that splays outward from the mouth of its primary stream channel onto the valley floor as a fan-like deposit of well-sorted sand and gravel encased in a matrix of finer sediments, chiefly poorly sorted fine sand and silt deposited away from the stream channels on the alluvial plain. The alluvial deposits underlying the Site consists of coarse- to fine-grained sediment eroded from Tertiary and older volcanic, plutonic, and metamorphic rocks in the Diablo Range to the west (Bull 1964a; Lettis 1982a, 1982b), grading east- or slightly northeast-ward through gradually decreasing grain sizes from coarse gravel at the Coast Range foothills to clay-rich silt on the San Joaquin Valley basin plain. The gravel, sand, silt, and clay that compose these alluvial fans have in the past produced significant fossils, primarily large land mammals such as mammoths, mastodons, camels, bison, and horses but also the remains of small vertebrates, invertebrates, and the pollen and spores of plants (Fisk and Haasl 2009).

**Resource Inventory Methods:** This baseline paleontological resource inventory of the Site is based largely on the PRIA of the previously approved PEC (Fisk 2006). Fisk (2006) relied on a review of the available geological and paleontological literature, an archival search conducted at the University of California, Museum of Paleontology (UCMP), and a field survey of the PEC vicinity to assess potential impacts to paleontological resources stemming from its construction. These methods were consistent with CEC (2007) and SVP (1995) guidelines. In addition, valuable information on the stratigraphy and subsurface geology likely to be present under the Project was obtained during paleontological monitoring of earth moving activities for PEC and its associated linear features from January through July 2008, and from January to February 2009. During PEC construction, excavations exposed up to 30 feet (approximately nine meters) of subsurface stratigraphy. In addition, paleontological monitoring of percolation tests on the Site in June 2009 confirmed that the subsurface stratigraphy of the Site is identical to that encountered at PEC. In short, we have an accurate picture of the potential paleontological resources of the Site because PRC performed the monitoring for PEC in compliance with the original AFC, both on and adjacent to the Site.

**Stratigraphic Inventory:** The unconsolidated and semi-consolidated sediments composing the Panoche Creek alluvial fan, that encompasses both PEC and the Site, can be divided into three informally named stratigraphic units (Lettis, 1982a, 1982b). They are, from oldest to youngest: the middle to late Pleistocene “Los Banos alluvium”, the late Pleistocene to early Holocene “San

Luis Ranch alluvium", and a thin veneer of the younger, Holocene "Patterson alluvium". The PRIA prepared for the recently constructed PEC (Fisk 2006) provided a more detailed description of each stratigraphic unit. Of these, only the "San Luis Ranch" and the "Patterson alluvium" will be impacted by the Wastewater Disposal Changes. The "San Luis Ranch alluvium" has yielded fossil remains at previously recorded localities within the Central Valley (Bull 1964; Lettis 1982a, 1982b; Beard and Landon 1988) as well as at the immediately adjacent PEC site (Fisk and Haasl 2009).

**Paleontological Resource Inventory:** An inventory of the paleontological resources of each stratigraphic unit likely to be impacted at the Site is presented below and the paleontological importance of these resources is assessed. Fisk (2006) concluded that the "San Luis Ranch alluvium" has high sensitivity because this stratigraphic unit has previously yielded vertebrate and plant fossils. The "Patterson alluvium" was considered to have low sensitivity because it has not been known to produce significant fossils. The Final Paleontological Resources Report on the Results of the Paleontological Resources Monitoring and Mitigation Program (Fisk and Haasl 2009) supports these conclusions. Abundant fossils, including rodent teeth and bones, reptile jaws, freshwater gastropods, and palynomorphs (pollen, spores, and dinoflagellates), were salvaged at several stratigraphic intervals from sediments interpreted to belong to the "San Luis Ranch alluvium". The paleontological sensitivity of the stratigraphic units beneath the Site remains the same as determined in the PRIA for the previously approved PEC (Fisk 2006).

### 5.8.3 Environmental Consequences

Potential impacts on paleontological resources resulting from the Wastewater Disposal Changes can be divided into construction-related impacts and operation-related impacts. Construction-related impacts to paleontological resources primarily involve terrain modification (excavations and drainage diversion measures). Paleontological resources, including an undetermined number of fossil remains and unrecorded fossil sites; associated specimen data and corresponding geologic and geographic locality data; and the fossil-bearing strata, could be adversely affected by (i.e., would be sensitive to) ground disturbance and earth moving associated with construction of the Project. Direct impacts would result from the six (6) feet (1.8 meters) of excavation required to construct the UWSI but includes any other earth moving activity that disturbs or buries previously undisturbed fossiliferous sediments, making those sediments and their paleontological resources unavailable for future scientific investigation. The potential environmental effects from construction and operation of the Wastewater Disposal Changes on paleontological resources are presented below.

**Potential Impacts from Project Construction:** The Site is located on fossiliferous Pleistocene and Holocene-age alluvial deposits informally named the "Los Banos alluvium", and "Patterson alluvium." Excavations deeper than four (4) feet (1.2 meters), such as those needed to construct the UWSI have the potential to result in adverse impacts to significant paleontological resources. However, the construction of supporting facilities, such as fencing, laydown areas, clearing vegetation, irrigation ditch realignment, and parking areas, have very low potential to cause adverse impacts to significant paleontological resources, as they will involve ground disturbance only to the "Patterson alluvium."

**Potential Impacts from Project Operation:** No impacts on paleontological resources are expected to occur from the operation of the UWSI.

### 5.8.4 Cumulative Impacts

The potential for cumulative impacts to paleontological resources stemming from Wastewater Disposal Changes construction is low, provided that the mitigation measures established for PEC and outlined below are implemented.

### 5.8.5 Mitigation Measures

Existing mitigation measures set forth in the PRMMP prepared and adopted for the previously approved PEC (Fisk 2007) will be implemented for the Wastewater Disposal Changes. In short this means that a Paleontological Resource Monitor (PRM) will be onsite whenever ground disturbing activities have the potential of impacting the "San Luis Ranch alluvium" (i.e., at depths greater than four feet). The implementation of these mitigation measures, already established for the completed PEC, will reduce the potentially significant adverse environmental impact of ground disturbance and earth moving on paleontological resources of the Wastewater Disposal Changes to an insignificant level by allowing for the recovery of fossil remains and associated specimen data and corresponding geologic and geographic locality data that otherwise might be lost to earth moving and to unauthorized fossil collecting.

### 5.8.6 Involved Agencies and Agency Contacts

There is no state or local agencies having specific jurisdiction over paleontological resources.

### 5.8.7 LORS Compliance

The Project will comply with applicable paleontological resource LORS evaluated for the approved PEC AFC.

### 5.8.8 Permits Required and Permit Schedule

No state or county agency requires a paleontological collecting permit to allow for the recovery of fossil remains discovered as a result of construction-related earth moving on state or private land in a project site.

### 5.8.9 References

Beard, S., and Laudon, J., 1988, Data for ground-water test holes in Fresno County, western San Joaquin Valley, California, June to August 1985: U. S. Geological Survey Open File Report OF-88-78, 39 p.

Bull, W. B., 1964a, Alluvial fans and near-surface subsidence in western Fresno County, California: U. S. Geological Survey Professional Paper 437-A, 71 p.

Bull, W. B., 1964b, Geomorphology of segmented alluvial fans in western Fresno County, California: U. S. Geological Survey Professional Paper 352-E, p. 89-129.

California Energy Commission (CEC), 2007, Rules of practice and procedure and power plant site certification regulations, April 2007: California Energy Commission, Sacramento, CA, 128 p.

Fisk, L. H., 2006, Panoche Energy Center application for certification paleontological resources section: unpublished report prepared for California Energy Commission and URS Corporation by PaleoResource Consultants, Sacramento, CA, 37 p.

Fisk, L. H., 2007, Panoche Energy Center paleontological resources monitoring and mitigation plan: unpublished report prepared for California Energy Commission and URS Corporation by PaleoResource Consultants, Auburn, CA, 41 p.

Fisk, L. H., and Haasl, D. M., 2009, Final report on the results of the paleontological resources monitoring and mitigation program: unpublished report prepared for the California Energy Commission and URS Corporation by PaleoResource Consultants, Auburn, CA, 61 p.

Jennings, C. W., and Strand, R. G., 1958, Geologic map of California, Santa Cruz Sheet: California Division of Mines and Geology, Sacramento, CA, scale 1:250,000.

Lettis, W. R., 1982a, Late Cenozoic stratigraphy and structure of the western margin of the central San Joaquin Valley, California: unpublished PhD dissertation, University of California, Berkeley, CA, 316 p.

Lettis, W. R., 1982b, Late Cenozoic stratigraphy and structure of the western margin of the central San Joaquin Valley, California: U. S. Geological Survey Open File Report OF-82-526, 203 p.

Miller, R. E., Green, J. H., and Davis, G. H., 1971, Geology of the compacting deposits in the Los Banos-Kettleman City subsidence area, California: U. S. Geological Survey Professional Paper 497-E, 46 p., scale 1:250,000.

Society of Vertebrate Paleontology (SVP), 1995, Assessment and mitigation of adverse impacts to nonrenewable paleontological resources -- standard guidelines: Society of Vertebrate Paleontology News Bulletin, vol. 163, p. 22-27.

Society of Vertebrate Paleontology (SVP), 1996, Conditions of receivership for paleontological salvage collections: Society of Vertebrate Paleontology News Bulletin, vol. 166, p. 31-32.

### 5.8.10 Conditions of Certification

The Wastewater Disposal Changes will result in the same type and level of impacts to paleontological resources as the previously approved PEC, and therefore no modifications to existing COCs are necessary.

## 5.9 LAND USE

This section describes potential affects that the Wastewater Disposal Changes may have on land use, and evaluates their potential impacts from environmental consequences, mitigation measures and LORS perspectives.

### 5.9.1 Affected Environment

As described in Section 3.0 *Overview of Changes* of this Petition, the Wastewater Disposal Changes utilizes 9.18 acres adjacent and south of the previously approved PEC facility. The affected environment of the Wastewater Disposal Changes is effectively that of the approved PEC project with the addition of two land areas: (1) the existing PEC construction laydown area (7.18 acres) and (2) an adjacent two acres currently growing pomegranates (see Figure 3.2-1 *General Project Vicinity*). The Site is within the same assessors parcel number as the approved PEC (027-060-81S). Figure 5.9-1 *Current Land Use and Wastewater Disposal Changes Map,* shows the existing project laydown and orchard boundaries.

#### General Plan and Zoning Designations

The general plan and zoning designations for the previously approved PEC project and the Wastewater Disposal Changes are the same as that described in the approved PEC AFC. As with the approved PEC, the Wastewater Disposal Changes area is consistent with the Fresno County General Plan and zoning designation. The Site area is designated as Agriculture by the Land Use Element of the Fresno County General Plan. It has a zoning designation of AE-20, Exclusive Agriculture District (please see Figure 5.9-2 *Zoning Designations Surrounding Project Site* and Figure 5.9-3 *Existing Land Use Surrounding Project Site*). As with the approved PEC, this land use has an unclassified conditional use for energy production in the AE Zone district.

#### Subdivision Map Act and Williamson Act

The applicability of the Subdivision Map Act is consequential to the PEC agreement with the landowner for exclusive rights to purchase the Site. Per the Subdivision Map Act, newly created parcels, as would result from the sale of the Site, shall be no smaller than 20 acres. As such, the sale depended on at least a 20-acre parcel. PEC sought the additional two acres to accommodate unknown future project needs, thereby making the total PEC site 22 acres. Figure 5.9-1 *Current Land Use and Wastewater Disposal Changes Map* shows the present PEC facility, PEC laydown and two-acre orchard area.

The additional 9.18 acres that comprises the Site is subject to the Williamson Act, as was the 12.82-acre PEC project parcel. By resolution of the Fresno County Board of Supervisors on April 28, 2007, the 12.82-acre parcel that comprises the previously approved PEC project site was no longer subject to the Williamson Act. The 7.18-acre laydown area was not part of that cancellation proceeding, nor was the 2.0-acre area adjacent to the laydown area. The Wastewater Disposal Changes Site is undergoing review and approval of a Williamson Act cancellation application filed with Fresno County on February 24, 2009. Favorable California Department of Conservation (CDC) comments were received by the County on June 24, 2009. On September 2, 2009, the Agricultural Land Conservation Committee filed its recommendation to the County in favor of Williamson Act cancellation for the entire 9.18 acres (provided in Appendix D). A resolution by the Fresno County Board of Supervisors to cancel Williamson Act obligations on the 9.18 acres is anticipated in October 2009.

## 5.9.2 Environmental Consequences

### General Plan and Zoning

As stated in the Final Decision for the approved PEC, Fresno County's Department of Public Works and Planning determined that the approved PEC power generating facility is consistent with the County General Plan and zoning ordinance. General Plan policy LU-A.3 allows certain non-agricultural uses in areas designated Agriculture. Energy production is an unclassified conditional use in the AE Zone district. The County of Fresno provided a notice of determination of General Plan Conformity of the approved PEC on August 8, 2007. The Wastewater Disposal Changes are consistent with this determination. In addition, the Wastewater Disposal Changes would not preclude or unduly restrict existing or planned land uses.

Also, akin to the approved PEC, the Wastewater Disposal Changes would not disrupt or divide the physical arrangement of an established community.

### Subdivision Map Act and Williamson Act Compliance

As described above, a resolution from the Fresno County Board of Supervisors is expected in or about October 2009 that will relinquish all Williamson Act obligations associated with the 9.18 acres at issue herein. Therefore, under the Williamson Act, the contract on the 9.18-acre Site will be deemed null and void and no findings need be made under Government Code section 51292 regarding the location of the Wastewater Disposal Changes within an agricultural preserve. (*See also* Gov't Code § 51292(c).)

### Loss of Agricultural Lands

Construction of the Wastewater Disposal Changes will permanently convert 9.18 acres of prime farmland to a non-agricultural use. To mitigate for the loss of an additional 9.18 acres of farmland associated with the Wastewater Disposal Changes, the project owner will pay an additional fee to a land trust in compliance with the CEC's existing Condition of Certification LAND-1. With this mitigation, the potential impact is reduced to an insignificant level.

There are no other potential environmental impacts to land use identified for the Wastewater Disposal Changes. The changes will not disrupt or divide an existing community or interfere with current or potential future neighboring land uses and is consistent with County land use policies and regulations.

## 5.9.3 Mitigation Measures

The Wastewater Disposal Changes will not cause significant adverse land use impacts and will not conflict with existing land use activities in the area. However, since the Wastewater Disposal Changes will convert an additional 9.18 acres of prime farmland to a non-agricultural use, the project owner will contribute funds to a land trust for the preservation of agricultural lands to mitigate for the loss of the additional 9.18 acres of agricultural land.

## 5.9.4 LORS Compliance

The Wastewater Disposal Changes will comply with all applicable Land Use LORS described for the approved PEC AFC.

### 5.9.5 References

There are no additional references.

### 5.9.6 Cumulative Impacts

The Wastewater Disposal Changes will not result in any significant cumulative impacts to land use beyond those addressed for the approved PEC. The only incremental impacts related to land use that could occur would be the loss of an additional 9.18 acres of agricultural lands. However, through continued compliance with the CEC's existing Land Use COCs and the payment of an additional fee to a land trust for the conversion of 9.18-acres of agricultural land to a non-agricultural use, any potential impact would be reduced to an insignificant level.

### 5.9.7 Conditions of Certification

This Petition does not require the addition of new Conditions of Certification nor changes to any of the conditions identified in the Land Use section of the PEC Conditions of Certification. However, in accordance with LAND-1, the project owner shall mitigate for the loss of the additional 9.18 acres of prime farmland at a one-to-one ratio to reduce the impact to agricultural lands from the Wastewater Disposal Changes to an insignificant level.

## 5.10 SOCIOECONOMICS

This section describes the potential impact to the social and economic structure within the Wastewater Disposal Changes vicinity and region. This discussion considers potential impacts to population, housing, public services and utilities, fiscal resources, and indirect and induced economic impacts. Additionally, this section considers environmental justice analysis, applicable LORS, cumulative impact analysis, and conditions of certification.

The criteria used in determining whether project-related socioeconomic impacts would be significant are found in Appendix G of the CEQA Guidelines. The criteria are the same as that presented in the approved PEC AFC (2006).

As with the approved PEC, the methodology used to analyze environmental justice aspects of the Wastewater Disposal Changes follow the United States Environmental Protection Act's (EPA's) *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses* (1998).

### 5.10.1 Affected Environment

The Wastewater Disposal Changes would be located directly south of the PEC site. As with the previously approved PEC, the Wastewater Disposal Changes area is located in a rural unincorporated area of Fresno County, California. The Project area is generally south of the southwest-northeast trending West Panoche Road, and approximately two miles east of Interstate-5. The nearest city is Mendota, which is roughly 16 miles northeast of the PEC and Wastewater Disposal Changes Site, and the California Aqueduct is approximately three miles to the east.

The Wastewater Disposal Changes would be located on a 9.18-acre parcel immediately south of the PEC. This area consists mostly of the PEC construction laydown area. Approximately two

acres of the Site is currently used for agriculture (pomegranate trees). The PEC laydown area was previously identified and addressed in the PEC AFC. As with the PEC site, the Wastewater Disposal Changes would not be immediately adjacent to residences or businesses. The Project does not involve displacement of residences, communities, or businesses.

This socioeconomic analysis addresses economic and demographic conditions at the following resolutions. The socioeconomic study area pertaining to population and housing (as consistent with the PEC AFC) includes the unincorporated area of Fresno County within the Site vicinity and Fresno County as a whole. The Wastewater Disposal Changes area pertaining to the regional workforce and indirect and induced economic impacts consists of Fresno County. The environmental justice analysis evaluates the demographics and poverty for the population located within a six-mile radius of the Site.

## 5.10.2 Environmental Consequences

### Population and Housing

Population, Housing, and Workforce during Construction Phase

Construction of the UWSI is expected to require a total of 19 workers, and construction activities would occur over an estimated 10-week period. The schedule for the activities occurs near or following completion of the PEC construction. The PEC Final Staff Assessment (FSA) (Section 4.8, Socioeconomics) determines that the construction workforce employed during the construction of PEC would be expected to commute to the area from areas within a two-hour commuting distance, or stay in nearby hotels for the duration of the PEC project rather than to relocate permanently to the PEC vicinity. Construction of the UWSI would be anticipated to draw from the local workforce or temporary workers from the regional workforce. Similar to the PEC, temporary workers would be expected to commute, rather than relocate to the project area. As a result, construction of the UWSI would be expected to result in negligible, if any, impact to population during construction.

Since workers would be expected to be either local or would commute to the Site, the Wastewater Disposal Changes are anticipated to result in negligible impacts to housing. Based on the availability of lodging previously assessed in the PEC AFC, construction of the UWSI is expected to result in less than significant impacts to lodging and temporary housing. Additionally, due to the relatively small workforce and short duration needed for construction activities, the Wastewater Disposal Changes would result in a negligible impact to the regional workforce.

Population, Housing, and Workforce during Operation

Operation of the UWSI would not involve employment of additional employees and thus would not result in additional impacts to the population, housing, and regional workforce.

### Environmental Justice

Environmental Justice Screening Analysis

The environmental justice screening process analyzes the Wastewater Disposal Changes' potential for high and adverse environmental effects or health effect falling disproportionately upon a low income or minority population (Executive Order 12898). Typical environmental

justice concerns pertaining to environmental or health effects include a project's impacts to housing, traffic, noise, water quality, public health, and public services.

As previously analyzed in the PEC AFC (Section 5.10.4.2 Environmental Justice Screening Analysis), the area does not contain a low-income population within the environmental justice screening area. The area does contain Hispanic or Latino minority populations (97.84 percent). However, based on the analysis presented in Section 5.10.2 (Population and Housing), 5.10.2 (Public Services and Utilities), 5.5 (Water Resources), 5.11 (Traffic and Transportation), 5.12 (Noise), and 5.16 (Public Health and Safety), the construction and use of the UWSI would not expected to result in significant impacts to the environmental justice concerns pertaining to environmental or health effects. As a result, this analysis concludes that the Wastewater Disposal Changes would not result in environmental justice impacts.

**Public Services and Utilities**

Public Services

The Wastewater Disposal Changes supporting the PEC would not significantly increase the number of construction workers and would not result in an increase in operation workers. As a result, the Wastewater Disposal Changes would result in a negligible, if any, temporary increase to the population, and would not create the need for new or expanded schools, libraries, and park facilities. The Wastewater Disposal Changes area is served by fire protection, medical, and law enforcement services identified in the previously approved PEC AFC (Section 5.10.5). Construction and operation of the UWSI involves a negligible change in workers and would not require new or expanded police, fire, or medical facilities.

Utility Systems

As discussed in Section 3.0 *Overview of Changes*, the Wastewater Disposal Changes would not involve changes to public electrical service, natural gas systems, water supply and treatment systems, or sanitary systems.

**Fiscal Resources**

Property Tax

Following completion of the installation of the UWSI, the property will be reassessed for property value and tax rate. Based on preliminary discussion with the California Board of Equalization (BOE) (CBOE, 2008), a rough estimate of the applied tax rate for facilities associated with electrical generation is 1.1 percent. The estimated capital cost for the Wastewater Disposal Changes is $3.5 million. Based on this value, the additional property tax assessed for the Project during the first year of operation (2010) is expected to be approximately $38,500.

Sales Tax

The Wastewater Disposal Changes area is subject to a Fresno County sales tax rate of 8.975 percent, based on the California State Board of Equalization (2009). Construction of the UWSI is estimated to result in $250,000 expenditures in locally-purchased materials and supplies, which are expected to be purchased within Fresno County. As a result, the Wastewater Disposal Changes would result in approximately $22,438 in sales tax revenues. Cost estimates are based on 2009 dollars.

Indirect and Induced Economic Effects

Construction of the UWSI is expected to require 19 construction workers. The Wastewater Disposal Changes would require an estimated $250,000 in expenditures for locally-purchased materials and supplies, which would result in secondary (indirect and induced) impacts. IMPLAN Profession Version 2.0.1025 was used to create an input/output model assessing the secondary economic impacts (indirect and induced impacts) resulting from the construction of the UWSI. The modeling impact was based on an estimated initial capital cost of $3.5 million for the UWSI and appurtenant facilities, estimated expenditures of $250,000 for locally-purchased (Fresno County) materials and supplies, and 19 construction workers. Construction worker salary was estimated to be $96,000, which was determined using the California Employment Development Department Labor Market Info (EDD LMI) mean hourly wages for the anticipated workers by craft in Fresno County and projected construction schedules (EDD LMI, 2009).

The resulting indirect and induced effects of the UWSI construction occurring within Fresno County would be an additional one indirect and one induced job; and approximately $62,691 and $43,308 in indirect and induced income impacts, respectively (based on the annual local construction expenditure for materials and supplies). The output for dollars generated for other industries supplying the power generation industry was estimated at $155,163 and $141,693 for indirect and induced impacts to output, respectively. The dollar estimates are provided in 2009 dollars.

Once construction of the UWSI is completed, operation of the UWSI would not be expected to require substantive change in operation workers, salaries, or operations and maintenance costs previously analyzed for the approved PEC. Hence, operation of the Wastewater Disposal Changes is not expected to result in indirect and induced economic and employment effects in addition to impacts previously determined for the approved PEC.

### 5.10.3 Cumulative Impacts

The Wastewater Disposal Changes are expected to require a small increase of construction workers (i.e., 19 workers) over a 10-week timeframe, and no substantial increase in operation workers with respect to the population and workforce previously identified for the PEC project. As discussed previously in Section 5.10.2, *Environmental Consequences*, construction of the facilities is neither expected to cause increases in housing, nor significant adverse effects to temporary lodging. As a result, the Wastewater Disposal Changes are not expected to result in cumulatively significant adverse socioeconomic impacts.

### 5.10.4 LORS Compliance

The Wastewater Disposal Changes for PEC are subject to the socioeconomic-related LORS identified for the approved PEC AFC. No additional LORS have been identified that are considered to be applicable to socioeconomic issues for the Wastewater Disposal Changes.

### 5.10.5 References

California Employment Development Department Labor Market Info. Occupation Profile Data Library. Accessed on July 18, 2009 at: http://labormarketinfo.edd.ca.gov. 2009.

California Energy Commission. Panoche Energy Center Final Staff Assessment (Docket No. 06-AFC-5). September 2007.

California State Board of Equalization (BOE). California City and County Sales and Use Tax Rates. Accessed on July 17, 2009 at: http://www.boe.ca.gov. Date of last update: July 8, 2009.

California State Board of Equalization (BOE). Phone conversation with Ken Thompson. Phone log dated August 1, 2008. (URS Corporation, Jennifer Wu).

Panoche Energy Center, LLC. Panoche Energy Center Application for Certification (Docket No. 06-AFC-5). August 2006.

### 5.10.6 Conditions of Certification

The Wastewater Disposal Changes do not require changes to the socioeconomic-related COCs identified for the approved PEC.

## 5.11 TRAFFIC AND TRANSPORTATION

This section presents a discussion of the potential impacts of the Wastewater Disposal Changes. The discussion below includes the environmental consequences associated with the Wastewater Disposal Changes during construction and operation; cumulative impacts; mitigation measures; applicable LORS; and COCs.

### 5.11.1 Affected Environment

The Wastewater Disposal Changes area remains consistent with the affected environment presented for the approved PEC. For a map of roadways and ADT volumes, refer to Figure 5.11-2 *Project Study Area*.

### 5.11.2 Environmental Consequences

**Wastewater Disposal Changes Construction Worker Trips**

Based on the construction activities at the Site, it is anticipated that there will be minimal manpower needs during the construction of the UWSI. The key tasks involve excavation, earthmoving and transport of excavated materials offsite. The manpower needs onsite will be limited to equipment operators and ground crew to support to the earthmoving and overall site engineering (civil, mechanical, and electrical) construction activities.

**Table 5.11-1 Wastewater Disposal Changes Construction Worker Trips**

| Construction Components | Daily Trips | AM Peak Hour Trips | | PM Peak Hour Trips | |
|---|---|---|---|---|---|
| | | In | Out | In | Out |
| Civil | 14 | 7 | 0 | 0 | 7 |
| Mechanical | 10 | 5 | 0 | 0 | 5 |
| Electrical | 10 | 5 | 0 | 0 | 5 |
| Supervisory | 4 | 2 | 0 | 0 | 2 |
| Total | 38 | 19 | 0 | 0 | 19 |

As shown in Table 5.11-1, the above construction scenario describes a worst case condition assumption, overlapping construction activities as well as all workers arriving and leaving within the AM (7-9) and PM (4-6) peak hours respectively.

Based on the above findings, there is only a minimal increase in workers during the construction of the UWSI. The existing roadway circulation system has sufficient capacity to handle construction worker traffic. Thus, the Wastewater Disposal Changes will have no significant additional effect or impact on traffic and transportation.

**Excavated Material Export Trips**

Based on the excavation and site preparation activities, the following excavated material quantities are anticipated:

- Excavated Material Cut = 20,675 $yd^3$
- Excavated Material Fill = - 17,878 $yd^3$
- Potential Export Balance = 2,796 $yd^3$

Table 5.11-2 shows the estimated number of trucks that will used to haul the excavated material export for the UWSI.

**Table 5.11-2 Excavated Material Export Truck Movement Trips**

| Activity | Export Volume (cubic yards) | Equivalent Truck Loads | Duration | Trucks/ Day | Passenger Car Equivalent[2] |
|---|---|---|---|---|---|
| Wastewater Disposal Changes (Excavated Material Export) | 2,796 | 93[1] | 5 weeks (30 days) | 3 | 9 |

[1] – Haul truck capacity of 30 cubic yards. (Assumed 1 cubic yard excavated material = 1 ton equivalent weight)
[2] – Used a PCE factor of 3.

Based on the excavated material export trips presented above, the estimated three daily truck trips or nine daily passenger car equivalent trips could be reasonably accommodated by the existing roadway capacity of I-5 and Panoche Road. As compared to previous construction activities onsite, the Wastewater Disposal Changes would generate substantially less daily truck

and passenger car equivalent trips. Thus, the Wastewater Disposal Changes will not have a significant additional effect or impact on traffic and transportation.

**Traffic Impact Summary**

Due to the low trip generation potential of construction of the UWSI, no further quantitative traffic analysis was conducted beyond those presented in the previously approved PEC documentation.

The qualitative traffic assessment finds that the construction of the UWSI will not result in significant traffic impacts.

The qualitative traffic assessment finds that the operation of the Wastewater Disposal Changes will not result in significant traffic impacts.

### 5.11.3 Mitigation Measures

The same traffic mitigation measures for the previously approved PEC would apply to the construction of the UWSI. No additional traffic mitigation measures are needed.

### 5.11.4 LORS Compliance

All relevant and applicable traffic and transportation LORS presented in the PEC AFC will be complied with and followed for the Wastewater Disposal Changes.

### 5.11.5 References

URS Corporation. *Wastewater Disposal Changes Responses to Data Needs*, July 29, 2009.

### 5.11.6 Cumulative Impacts

Findings of no significant cumulative impacts as described in Section 5.11 of the previously approved PEC AFC remain the same for the Wastewater Disposal Changes.

### 5.11.7 Conditions of Certification

The Wastewater Disposal Changes do not require changes to the Traffic and Transportation COCs identified in the Traffic and Transportation section of the PEC Final Decision.

## 5.12 NOISE

This section analyzes the noise exposure from the Wastewater Disposal Changes. Changes in noise levels from the noise levels presented in the approved PEC AFC, Section 5.12, are anticipated to be minimal as existing well charge pumps will be used to pump the wastewater from the wastewater storage tank to the Wastewater Disposal Changes. The changes having the greatest potential to modify noise exposure from the previously approved PEC include construction activities and annual maintenance dredging operations. The effects of these modifications on noise exposure are discussed below.

### 5.12.1 Affected Environment

The affected noise environment for the Wastewater Disposal Changes is the same as that described in Section 5.12 of the previously approved PEC AFC, and in Sections 3.2 *Wastewater Disposal Changes Location* and 3.3 *Site Description* of this Petition.

### 5.12.2 Environmental Consequences

A detailed noise model incorporating the previously approved PEC design features was developed by Kimley-Horn and Associates, Inc. The results of the analysis were presented in the approved PEC AFC and data request responses and are summarized in subsequent paragraphs. As is the case on all projects at this stage of development, the data presented is representative of the anticipated Wastewater Disposal Changes noise emission levels and resulting overall project noise levels. The noise analysis will continue to be refined as detailed design efforts progress to ensure the overall project noise objectives are met.

The UWSI associated with the Wastewater Disposal Changes encompass a total of 9.18 acres, located directly south of PEC. They will be six feet in depth and be surrounded by berms six feet in height and approximately 20 feet wide. Existing injection well charge pumps will be used to pump the wastewater from the wastewater storage tank to the UWSI. The Wastewater Disposal Changes will not introduce any new noise-generating equipment.

Construction activities will consist of excavation, berm construction, installation of underground pipes and tie-ins to existing wastewater lines, and installation of underground electrical conduit and monitoring devices. Major construction equipment includes three scrapers, one water truck, two dump trucks, a diesel powered welding machine, and a HDPE fusion welding machine.

Section 5.12 of the previously approved AFC identified three noise sensitive receivers potentially impacted by construction or operation of PEC. Two of these receivers have since been relocated. The nearest noise sensitive receiver is now 3,300 feet from PEC. Given the location of the changes in relation to the original and relocated noise sensitive receivers and the limited equipment involved, project-related construction noise levels at the noise sensitive receivers will be less than the noise levels associated with the previous PEC construction.

Construction traffic activity will consist of soil distribution, material/equipment delivery, and construction worker vehicle trips (approximately 38 trips/day). Excavation will involve approximately 20,675 cubic yards of soil. Approximately 17,878 cubic yards of soil will be used as fill and for construction of the berms. The remaining 2,796 cubic yards of soil will be hauled offsite (3 truck trips/day for 30 days). Material and equipment staging will utilize existing facilities and no new construction staging area will be required. Project-related traffic noise will not be significant.

Construction duration will be approximately ten weeks. It will occur between the hours of 6:00 a.m. and 9:00 p.m. during weekdays and 7:00 a.m. and 5:00 p.m. on weekends and will comply with COC NOISE-7 of the PEC Final Decision. Noise associated with construction activities at the Site will be temporary in nature and mitigated to the extent feasible; therefore, construction of the UWSI will not result in a significant impact to the surrounding community.

Maintenance of the UWSI will consist of dredging on a periodic basis in order to maintain efficiency of the system. Dredging will be accomplished by a bulldozer/wheel loader and dump trucks and will be conducted over a period of several days during daytime hours (6:00 a.m. to 9:00 p.m.). Noise associated with dredging activities will be temporary in nature and mitigated to the extent feasible; therefore, dredging activities will not result in a significant impact to the surrounding community.

Table 5.12-1 presents the anticipated steady state noise level ($L_{90}$) of the previously approved PEC under full load at the locations identified in COC NOISE-4 as presented in the Final Decision. The data shown in Table 5.12-1 reflects PEC noise levels at the nearest sensitive receivers.

**Table 5.12-1 Predicted Project Noise Level (dBA $L_{90}$)**

| Location | Approx. Distance to Project (ft) | Project Noise Level (dBA $L_{90}$) |
|---|---|---|
| ML1 | 1,900 | 49 |
| ML2 | 800 | 58 |
| ML3 | 3,300 | 42 |

Source: Final Decision

Table 5.12-2 presents the cumulative levels based on the available monitoring and approved PEC project noise level data. These data are reflected in the Final Decision and First Amendment and indicate a maximum cumulative increase of 19 dBA $L_{90}$ at ML-2.

**Table 5.12-2 Summary of Cumulative Noise Levels (dBA $L_{90}$)**

| Location | Ambient Background Level (dBA $L_{90}$) | PEC Project Noise Level (dBA $L_{90}$) | Cumulative Noise Level (dBA $L_{90}$) | Predicted Change (dBA $L_{90}$) |
|---|---|---|---|---|
| ML1 | 42 | 49 | **56** | +14 |
| ML2 | 39 | 58 | **58** | +19 |
| ML3 | 41 | 42 | **47** | +6 |

Note: Cumulative levels also include noise levels generated by the Starwood Power Generation Station project. See NOISE Table 4 of the Final Decision.
Source: Final Decision

COCs NOISE-4 and NOISE-5 of the PEC Final Decision detail the conditions upon which the levels in Table 5.12-2 are acceptable. Subsequent to the PEC Final Decision, sensitive receivers ML1 and ML2 were relocated. ML1 was relocated to a location approximately 6,300 feet east of PEC and ML2 was relocated to a location approximately 3,800 feet north of PEC. As specified in COC NOISE-4, compliance noise measurements have been conducted at the new location of ML2 and at ML3 (this data is presented in Table 5.12-3 below). As shown in Table 5.12-3, noise level data obtained during the quietest four hour period of the noise measurement survey (1:00 a.m. to 5:00 a.m., 28 May, 2009) indicates that PEC is in full compliance with the noise conditions specified in the PEC Final Decision (Michael Theriault Acoustics Inc., 2009).

**Table 5.12-3 Summary of CEC Noise Level Compliance Assessment (dBA $L_{50}$)**

| Location | Cumulative Noise Level (dBA $L_{50}$) | CEC Maximum Permissible Level | Complies? |
|---|---|---|---|
| ML2 [Relocated] | **30** | 45 | Yes |
| ML3 | **36** | 45 | Yes |

Source: Michael Theriault Acoustics Inc., *Far-Field Noise Level Testing for the Panoche Energy Center*, June 10, 2009

The Wastewater Disposal Changes will have no effect on the overall sound levels of the approved PEC. Thus, the PEC Final Decision COCs do not need to be modified.

### 5.12.3 Mitigation Measures

No additional noise mitigation measures are required due to the Wastewater Disposal Changes.

### 5.12.4 LORS Compliance

The Wastewater Disposal Changes will comply with all applicable LORS referenced in the PEC AFC or the PEC Final Decision.

### 5.12.5 Involved Agencies and Agency Contacts

No additional agency involvement is required due to the Wastewater Disposal Changes.

### 5.12.6 Permits Required and Permit Schedule

No modifications or additions to permits or permit schedules are required due to the Wastewater Disposal Changes.

### 5.12.7 References

Michael Theriault Acoustics Inc., Far-Field Noise Level Testing for the Panoche Energy Center, June 10, 2009

### 5.12.8 Cumulative Impacts

No additional cumulative impacts result from the Wastewater Disposal Changes.

### 5.12.9 Conditions of Certification

No modifications or additions to noise COCs for the approved PEC are required for the Wastewater Disposal Changes.

## 5.13 VISUAL RESOURCES

The Wastewater Disposal Changes would not involve substantial changes to the findings and conclusions in Section 5.13, Visual Resources of the previously approved PEC AFC.

### 5.13.1 Affected Environment

Section 5.13.1 of the previously approved PEC AFC describes the inventory of visual resources within the vicinity of the previously approved PEC project site, including a description of the regional landscape setting, the visual sphere of influence (VSOI) of the approved PEC, and inventory methods and results. The Wastewater Disposal Changes are located within the VSOI identified for the approved PEC. Since PEC was approved, the facility has initiated and completed construction. Therefore, the previously approved PEC project and associated facilities (gas turbines, roads, administrative building, substation, etc.) constructed thus far would now be included as the existing setting.

The 9.18-acre Site would be located mostly on the PEC construction laydown area. Approximately two acres of the Site is currently being used for agriculture (pomegranate trees). Figure 5.13-2 *Architectural Rendering of Project Site* and Figure 5.13-5 *Aerial of Immediate Project Vicinity* have been revised to reflect the implementation of the Wastewater Disposal Changes.

The previously approved PEC AFC identified three Key Observation Points (KOPs) for the approved PEC project. KOP No. 1 was identified as a group of three residences located across West Panoche Road north of the PEC site, KOP No. 2 as a group of five residences adjacent to the existing PG&E Substation along West Panoche Road, and KOP No. 3 as the elevated intersection of West Panoche Road and Interstate (I-5). Both groups of residences, identified as KOPs No. 1 and 2, have since been relocated and will no longer be used for residential purposes, and therefore are no longer considered sensitive visual receptors.

### 5.13.2 Environmental Consequences

As described in detail in Section 3.0 *Overview of Changes*, once constructed, the Wastewater Disposal Changes would include two UWSI located directly south of the PEC site. The total footprint is 9.18 acres. The berms surrounding the UWSI would be approximately 20 feet wide and approximately six feet from the top of the berm to the existing ground. The bottom of the UWSI would be approximately six feet below ground surface.

The Wastewater Disposal Changes are not anticipated to be visible from any of the three KOPs established in the PEC AFC, due in large part to the berms height being only approximately six feet (the berms are tallest structures of the UWSI). Further, existing structures, agriculture development and/or other vegetative screening would occlude views of the UWSI from each KOP. Therefore, the simulations presented as Figures 5.13-13 through 5.13-15 in the PEC AFC remain unchanged. Because it was concluded that no new visual sensitive receptors or KOPs are identified in the immediate area and the simulations created for each of the three KOPs presented in the previously approved PEC AFC will not be revised, no additional simulations were prepared for this analysis. However, the aerial rendering was revised and is provided as Figure 5.13-2 *Architectural Rendering of Project Site.*

The relatively low height (approximately six feet) of the tallest feature of the UWSI would not create a visual intrusion in the viewshed and would remain largely invisible within the VSOI. Additionally, three other power plant sites are present in the immediate vicinity. PEC is directly

north of the Wastewater Disposal Changes area. Therefore, the Wastewater Disposal Changes would have a negligible effect on visual resources within the VSOI.

The Wastewater Disposal Changes are located adjacent to Davidson Avenue and would be clearly visible to travelers along that road. The development may be seen as a negative visual intrusion when compared to the previously use: agricultural production. However, traveler counts on Davidson Avenue are low and, because of the high level of cultural modification in the VSOI and immediate area (as discussed above and in the PEC AFC) travelers would not have expectations of pristine aesthetics. Additionally, travelers along the road would have short viewing durations and lower viewer sensitivity due to the nature of viewer activity and small scale of the development. Therefore, the potential for impacts along Davidson Avenue would be less than significant.

Because the operation of the UWSI would have a negligible effect on visual resources within the VSOI and would not significantly impact views from Davidson Avenue, it is anticipated that, once constructed, visual impacts from the operation of the UWSI would be less than significant.

Environmental consequences during the construction phase would occur primarily on the 9.18-acre area and last the extent of construction period (approximately 10 weeks). Site preparation includes digging the UWSI and other activities associated with the construction. Excavation work will consist of the removal, storage, and/or disposal of earth, sand, gravel, vegetation, organic matter, loose rock, and debris as necessary for construction. During this installation, construction activities and construction materials, equipment, trucks, and vehicles, would be visible to immediate areas due to the flat, open viewing conditions in the area. The construction equipment and activities may be a negative visual intrusion to the viewshed. However, the agricultural production in the area would obstruct some views to the construction area.

Indirect effects associated with the installation of the UWSI may include effects associated with fugitive dust, night lighting, and the presence of construction and operation equipment. Construction activities will be conducted in a manner that minimizes (visible) dust emissions and light pollution. Such construction activities will not contrast significantly with the existing character of the visual environment which often contains large scale agricultural equipment. Further, the PEC has been in the process of being constructed for 16 months and therefore, the activities associated with the UWSI construction are not anticipated to contrast with the existing conditions in the surrounding area. Construction activities associated with the UWSI would not have an effect on the viewshed. Therefore, potential visual impacts from the construction of the UWSI would be temporary and not significant.

Other than the analysis provided in this Petition, the assessment of environmental consequences presented in the previously approved PEC AFC is adequate to represent impacts to visual resources from the Wastewater Disposal Changes. Therefore, once constructed, the Wastewater Disposal Changes would not significantly change the visual analysis prepared and approved for the PEC AFC and would not create increased visual resource impacts.

### 5.13.3 Mitigation Measures

The Wastewater Disposal Changes would not change the findings and conclusions discussed in Section 5.13, Visual Resources, of the previously approved PEC AFC. No increased visual

impacts would occur. Therefore, no mitigation measures are recommended; consistent with the Final Decision for the previously approved PEC.

### 5.13.4 LORS Compliance

Construction and operation of the Wastewater Disposal Changes will comply with all applicable LORS related to visual resources identified for the previously approved PEC AFC. The LORS presented in Section 5.13.5 of the AFC are applicable to the project modifications and no additional LORS are recommended. Similarly, the agency contact information presented in Section 5.13.11 of the AFC is unchanged and the project modifications do not affect the required permits or schedule presented in Section 5.13.5 of the AFC.

### 5.13.5 References

There are no additional references.

### 5.13.6 Cumulative Impacts

No additional cumulative impacts to visual resources have been identified as part of this analysis. Cumulative impacts discussed in Section 5.13.3 of the previously approved PEC AFC are applicable to the Wastewater Disposal Changes.

### 5.13.7 Conditions of Certification

The Wastewater Disposal Changes do not require changes to the visual resources COCs identified in the PEC Final Decision.

## 5.14 WASTE MANAGEMENT

This section presents a discussion of potential impacts from the generation, storage, and disposal of hazardous and non-hazardous wastes from the Wastewater Disposal Changes. Included in the discussion below are descriptions of the potential waste streams to be generated during construction and operation of the UWSI descriptions of applicable waste disposal sites to be used by the Wastewater Disposal Changes, waste mitigation methods to minimize impacts to the environment, applicable LORS, potential cumulative impacts, and whether any changes to COCs would be necessary.

### 5.14.1 Affected Environment

The affected environment of the Wastewater Disposal Changes is described in detail in Sections 3.2 *Wastewater Disposal Changes Location* and 3.3 *Site Description* of this Petition. As described in more detail below in Section 5.14.2 *Environmental Consequences*, the Wastewater Disposal Changes may generate small quantities of hazardous and non-hazardous wastes during the construction and operational phases.

### 5.14.2 Environmental Consequences

The analysis of impacts related to waste management is based on significance criteria described in Section 5.14.2 of the previously approved AFC.

The Wastewater Disposal Changes would result in small amounts of construction waste and typical refuse generated by construction crews. Excess excavated soil that is not used onsite (estimated to be approximately 3,000 cubic yards) will be hauled offsite for disposal.

Solid waste will be segregated and recycled where practical. Non-recyclable waste will be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III landfill. Some hazardous wastes, such as waste lubricating oils may be generated during construction. Hazardous wastes would be handled and disposed of in accordance with applicable LORS. Hazardous wastes will be recycled or disposed of in a licensed Class I disposal facility, as appropriate.

Wastewater generated during construction will include sanitary wastes, and storm water runoff. Construction-related wastewater will be managed according the applicable LORS and the approved PEC AFC.

Operation of the UWSI would require periodic dredging of the bottom of the UWSI in order to loosen up any particulate deposits that would reduce the infiltration rate. The anticipated constituents would be primarily silica, with other particulates including salts an iron deposits. Waste from the bottom of the UWSI is not anticipated to be hazardous and would be analyzed and disposed of according to applicable regulations. No other waste is anticipated to be generated during operation of the UWSI.

Non-hazardous and hazardous waste landfills to be used during construction and operation of the project are identified in Table 5.14-1 *Waste Recycling/Disposal Facilities* of the previously approved PEC AFC. Hazardous and non-hazardous waste generated during construction and operation of the UWSI is not expected to significantly impact available landfill capacity.

### 5.14.3 Mitigation Measures

Implementation of Mitigation Measures WM-1 through WM-7, as described in the previously approved PEC AFC, provide waste management procedures for handling non-hazardous and hazardous wastes. No additional mitigation measures are necessary for the Wastewater Disposal Changes.

### 5.14.4 LORS Compliance

Construction and operation of the Wastewater Disposal Changes will comply with all applicable LORS related to waste management summarized for the previously approved PEC AFC. Section 5.14.4 of the approved PEC AFC summarizes the applicable LORS that govern the handling of non-hazardous and hazardous wastes, as well as the applicable permits that will be required for the Wastewater Disposal Changes.

### 5.14.5 References

There are no additional references.

### 5.14.6 Cumulative Impacts

The Class I and Class III landfills and recycling facilities in the vicinity of the Site have adequate recycling and disposal capacities for the Wastewater Disposal Changes. Therefore, cumulative

impacts from the Wastewater Disposal Changes and other projects in the region are not expected to be significant.

### 5.14.7 Conditions of Certification

The Wastewater Disposal Changes do not require changes to the waste management COCs identified in the PEC Final Decision.

## 5.15 HAZARDOUS MATERIALS HANDLING

This section presents a discussion of the potential impacts from storage and use of hazardous materials during construction and operation of the Wastewater Disposal Changes.

### 5.15.1 Affected Environment

The affected environment of the Wastewater Disposal Changes is described in detail in Sections 3.2 *Wastewater Disposal Changes Location* and 3.3 *Site Description* of this Petition. As described in more detail below in Section 5.15.2 *Environmental Consequences*, the implementation of Wastewater Disposal Changes will use and store small quantities of hazardous materials during the construction and operational phases of the Wastewater Disposal Changes.

### 5.15.2 Environmental Consequences

The analysis of impacts related to handling of hazardous materials from the Wastewater Disposal Changes is based on significance criteria described in Section 5.15.2 of the previously approved PEC AFC.

The Wastewater Disposal Changes would result in small amounts of construction-related hazardous materials to be used during construction, operation, and maintenance of the UWSI. These materials include fuels, oils, lubricants and cleaning chemical required to operate installation, construction and maintenance equipment, and are included in the previously approved PEC AFC.

As described in the previously approved PEC AFC, a Hazardous Materials Business Plan (HMBP) which outlines hazardous materials handling, storage, spill and release response, and reporting procedures was to be prepared prior to construction activities. The HMBP prepared for the previously approved PEC will be applicable for the Wastewater Disposal Changes. Impacts associated with the use of hazardous materials during construction are anticipated to be less than significant as a result of the implementation of procedures and mitigation measures as discussed in the previously approved PEC AFC.

### 5.15.3 Mitigation Measures

Implementation of Mitigation Measures HAZMAT-1 through HAZMAT-9, as described in the previously approved PEC AFC, provides management procedures for the handling of hazardous materials during construction and operation of the Wastewater Disposal Changes. These procedures and programs will minimize potential construction-related and operations-related impacts to a less than significant level. No further mitigation is required.

### 5.15.4 LORS Compliance

Construction and operation of the Wastewater Disposal Changes will comply with all applicable LORS related to hazardous materials handling. Section 5.15.4 of the previously approved PEC AFC summarizes the applicable LORS that govern the use and storage of hazardous materials, as well as the applicable permits that will be required for the Wastewater Disposal Changes.

### 5.15.5 References

There are no additional references.

### 5.15.6 Cumulative Impacts

Based on land uses in the surrounding area and the limited amount and type of hazardous materials to be used as part of the Wastewater Disposal Changes, no significant cumulative impacts due to hazardous material handling are expected from the Wastewater Disposal Changes in combination with future projects.

### 5.15.7 Conditions of Certification

The Wastewater Disposal Changes do not require changes to the COCs identified in the Hazardous Materials Handling section of the PEC Final Decision.

## 5.16 PUBLIC HEALTH AND SAFETY

### 5.16.1 Affected Environment

This Petition evaluates the effects on public health due to the Wastewater Disposal Changes construction and does not readdress or reanalyze the previously approved PEC AFC or First Amendment (for the Substation Expansion).

### 5.16.2 Affected Environment

Please see the Public Health section of the previously approved PEC AFC for a discussion of existing conditions in the vicinity of the PEC project site, which are identical for the Wastewater Disposal Changes, except that construction of the PEC is now complete.

### 5.16.3 Environmental Consequences

Temporary exhaust emissions from construction equipment will occur as a result of the construction of the UWSI. An analysis of the potential environmental impacts due to criteria pollutant emissions during construction of the Wastewater Disposal Changes is discussed in Section 5.2 *Air Quality* of this Petition. The only toxic air contaminant emitted as a result of the construction would be diesel particulate matter. Diesel particulate matter has carcinogenic and chronic health impacts, these occur after extended exposure. As the construction of the UWSI will take up to 2.5 months, no carcinogenic or chronic health impacts are anticipated due to the short exposure to diesel particulate matter.

The operation of the UWSI will have no stationary sources of toxic air contaminants. However, there maybe very small intermittent emissions associated with mobile sources used for maintenance and repair to the UWSI.

### 5.16.4 Cumulative Impacts

There are no additional cumulative impacts to those addressed for the approved PEC due to operation of the Wastewater Disposal Changes, because the operational Wastewater Disposal Changes will have negligibly small emissions of toxic air contaminants.

### 5.16.5 Mitigation Measures

The same construction mitigation measures described in the Public Health and Safety section of the previously approved PEC AFC are applicable to the Wastewater Disposal Changes. The operations of the Wastewater Disposal Changes will not cause emissions of toxic air contaminants, except very small amounts associated with vehicle and equipment activities for maintenance and repair tasks. Accordingly, no additional mitigation measures during operation are necessary.

### 5.16.6 LORS Compliance

The Wastewater Disposal Changes will comply with all applicable LORS related to public health and safety summarized for the previously approved PEC AFC.

### 5.16.7 Involved Agencies and Agency Contacts

Regulatory agencies and agency contacts for public health issues related to the Wastewater Disposal Changes are the same as those described in the previously approved PEC AFC.

### 5.16.8 Permits Required and Permit Schedule

Permitting requirements for the Wastewater Disposal Changes are no different from those described in the Public Health and Safety section of the previously approved PEC AFC.

### 5.16.9 References

There are no additional references.

### 5.16.10 Conditions of Certification

No new COCs pertaining to public health and safety are required for the Wastewater Disposal Changes. The COCs for protection of public health that were included in the PEC Final Decision are applicable and sufficient to ensure that impacts to health from the Wastewater Disposal Changes will remain below a level of significance.

## 5.17 WORKER SAFETY

This section addresses safety and health issues and describes or outlines systems and procedures that will be implemented to provide occupational safety and health protection for the Wastewater Disposal Changes workers, worker safety mitigation methods to minimize impacts to the Wastewater Disposal Changes workers, applicable LORS, potential cumulative impacts, and whether changes to the COCs would be necessary. All applicable elements of the Title 8 California Code of Regulations (CCR), General Industry Safety Orders (GISO), Construction Safety Orders (CSO), and Electrical Safety Orders (ESO), are addressed in the previously approved PEC AFC.

### 5.17.1 Affected Environment

The affected environment of the Wastewater Disposal Changes is described in detail in Sections 3.2 *Wastewater Disposal Changes Location* and 3.3 *Site Description* of this Petition.

### 5.17.2 Environmental Consequences

Construction, operation, and maintenance activities may expose workers to the hazards identified in Table 5.17-1 of the previously approved PEC AFC. Exposure to these hazards can be minimized through adherence to appropriate engineering design criteria and administrative controls, use of applicable personal protective equipment (PPE), and compliance with all applicable health and safety LORS. The programs, regulations, and preventive measures intended to control potential worker health and safety impacts associated with these hazards are described in the previously approved PEC AFC and encompass a comprehensive health, safety, and fire prevention program and an accident/injury prevention program intended to ensure healthful and safe operations at the Site.

### 5.17.3 Mitigation Measures

No significant unavoidable adverse impacts to worker safety are anticipated from the Wastewater Disposal Changes.

### 5.17.4 LORS Compliance

The Wastewater Disposal Changes will comply with all applicable LORS related to worker safety. Section 5.17.4 of the previously approved PEC AFC summarizes the applicable LORS that govern worker safety, as well as the applicable permits that will be required for the Wastewater Disposal Changes.

### 5.17.5 References

There are no additional references.

### 5.17.6 Cumulative Impacts

As the various projects within the vicinity will be responsible for complying individually with applicable worker safety requirements, no cumulative impacts on worker safety are expected as a result of the Wastewater Disposal Changes.

### 5.17.7 Conditions of Certification

The Wastewater Disposal Changes do not require changes to the COCs identified in the Worker Safety section of the previously approved PEC Final Decision.

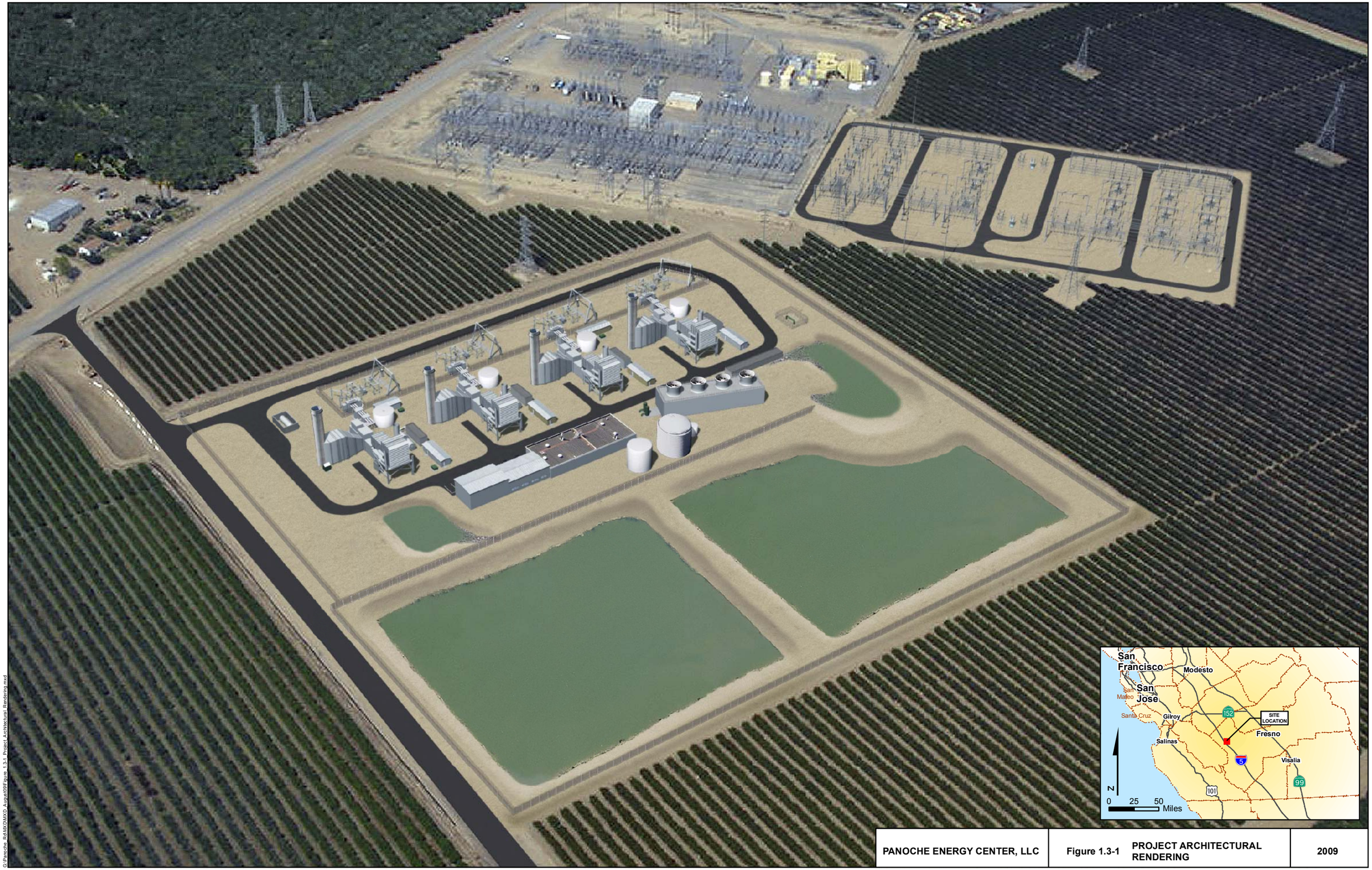
## 5.18 CUMULATIVE IMPACTS

Discussion of potential cumulative impacts to environmental resources are included within each environmental analysis section. The Wastewater Disposal Changes do not present significant, unmitigated cumulative impacts on the environment or human health.

# 6.0 LIST OF FIGURES

The following figures are attached to this Petition:

1.3-1 Project Architectural Rendering
3.2-1 General Project Vicinity
3.4-1 Project Site Plan
3.4-3 Grading and Drainage Plan
5.3-2A Site Geologic Map
5.3-2B Site Geologic Map
5.4-1 Agricultural Soils Surrounding Project Site
5.4-2 Existing Land Use Surrounding Project Site
5.5-3 Water Balance Flow Diagram
5.6-1 Biological Survey Area
5.6-2 Biological Resources within 1 Mile of the Project Site
5.7-1 Area Surveyed and Monitored for Cultural Resources
5.7-2 Area of Potential Effects & Previous Cultural Surveys
5.9-1 Current Land Use and Wastewater Disposal Changes Map
5.9-2 Zoning Designations Surrounding Project Site
5.9-3 Existing Land Use Surround Project Site
5.11-2 Project Study Area
5.13-2 Architectural Rendering of Project Site
5.13-5 Aerial of Immediate Project Vicinity




| | | |
|---|---|---|
| PANOCHE ENERGY CENTER, LLC | Figure 1.3-1 PROJECT ARCHITECTURAL RENDERING | 2009 |

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Gas Pipeline

Access Road

Substation Expansion
9.0 Acres

Panoche
Energy Center
Site - 12.82 Acres

Wastewater Surface
Impoundments - 9.18 Acres

Transmission Line

Chaney Ranch

Panoche Substation

Chounet Ranch* Chaney Ranch*
Tumey Hills* Monocline Ridge*

0 0.1 0.2 0.3 0.4 0.5 Miles
0 300 600 Meters
0 1,000 2,000 Feet
1 inch equals 2,000 feet (1:24,000)

N

## Legend

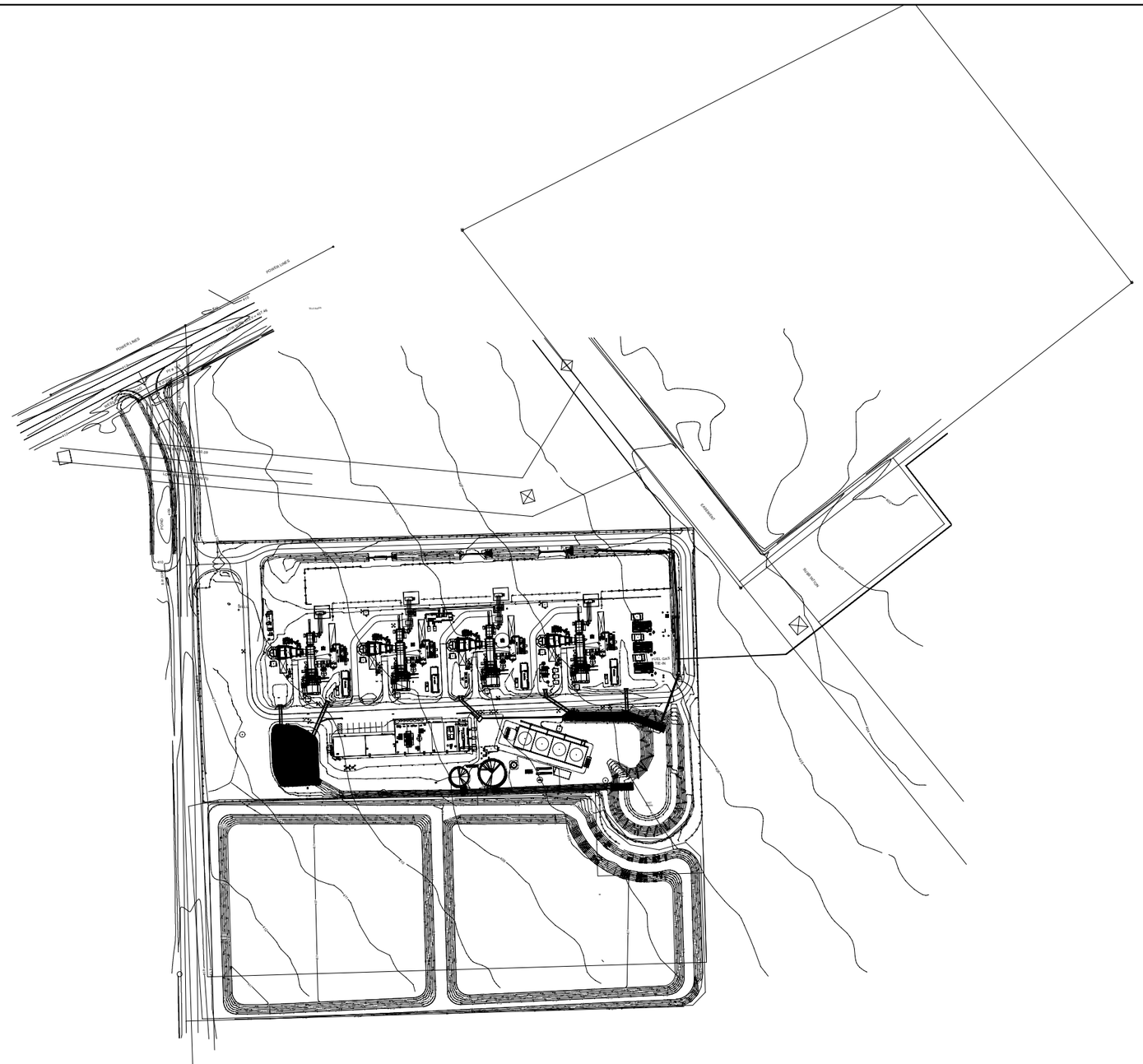
* 7.5 Minute USGS Quad Index

Source: USGS Topographic Quadrangles (GlobeExplorer 2006) 1:24,000 (Chaney Ranch (1971), Chounet Ranch (1971), Monocline Ridge (1971) and Turney Hills (1971)




| PANOCHE ENERGY CENTER, LLC | Figure 3.2-1 GENERAL PROJECT VICINITY | 2009 |
|---|---|---|

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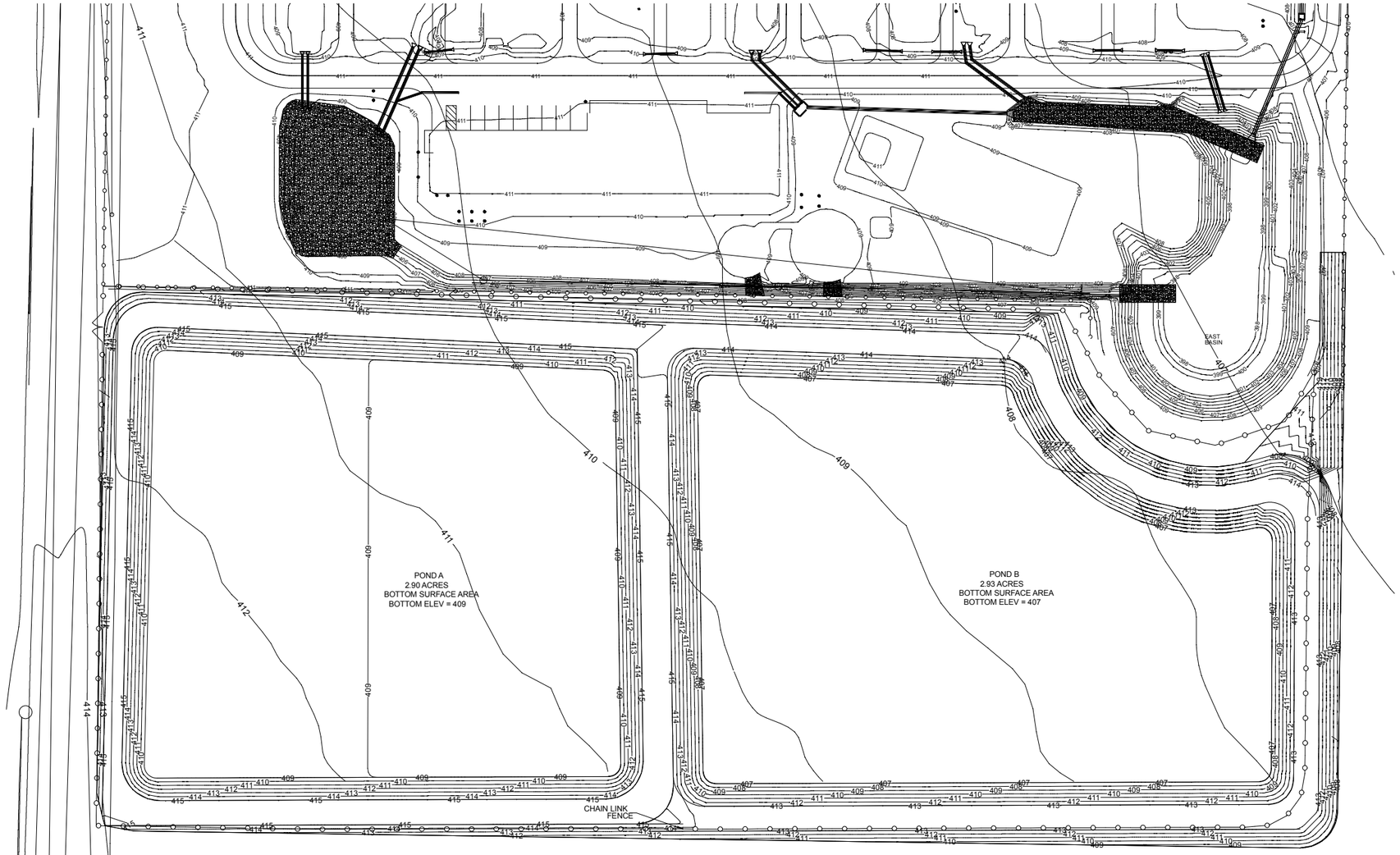






| | | |
|---|---|---|
| PANOCHE ENERGY CENTER, LLC | Figure 3.4-1 PROJECT SITE PLAN | 2009 |

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| | | |
|---|---|---|
| **PANOCHE ENERGY CENTER, LLC** | **Figure 3.4-3 GRADING AND DRAINAGE PLAN** | **2009** |

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Chaney Ranch Gas Field (Abandoned)

Gas Pipeline

Access Road

Panoche Energy Center Site - 12.82 Acres

Wastewater Surface Impoundments - 9.18 Acres

Substation Expansion 9.0 Acres

Transmission Line

Qa

Qg

Chaney Ranch

Panoche Substation

Chounet Ranch*

Chaney Ranch*

PANOCHE

FAIRFAX

AVENUE

ROAD

CALIFORNIA

PIPELINE

Creek

Panoche

0 0.1 0.2 0.3 0.4 0.5 Miles

0 300 600 Meters

0 1,000 2,000 Feet

1 inch equals 2,000 feet (1:24,000)

N

## Legend

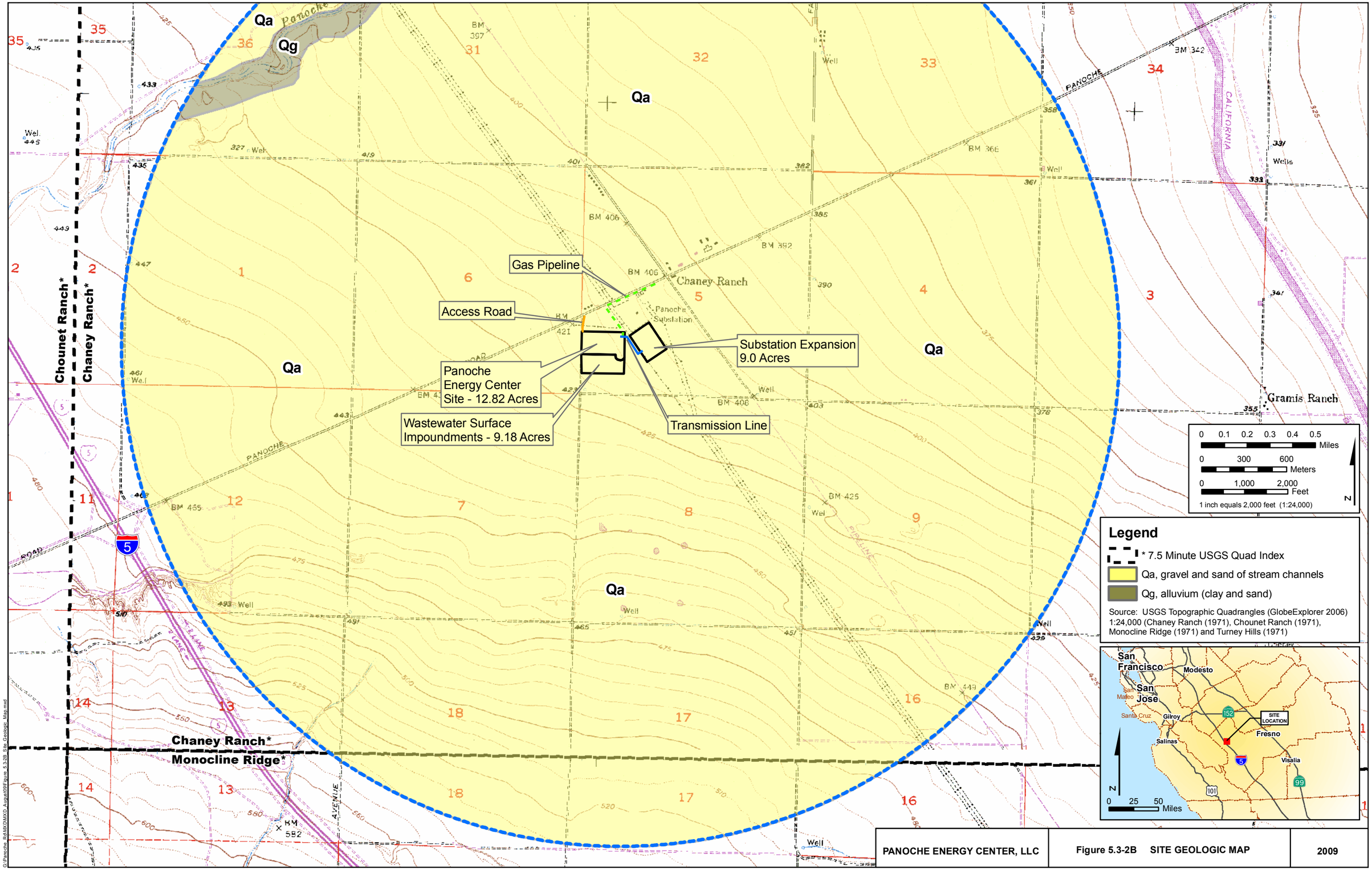
- Gas Well
- * 7.5 Minute USGS Quad Index
- Qa, gravel and sand of stream channels
- Qg, alluvium (clay and sand)

Source: USGS Topographic Quadrangles (GlobeExplorer 2006) 1:24,000 (Chaney Ranch (1971), Chounet Ranch (1971), Monocline Ridge (1971) and Turney Hills (1971)

San Francisco
Modesto
San Jose
San Mateo
Santa Cruz
Gilroy
Salinas
Fresno
Visalia
SITE LOCATION
152
5
99
101
0 25 50 Miles

G:\Panoche_Rd\MXD\MXD_August09\Figure_5.3-2A_Site_Geologic_Map.mxd

| PANOCHE ENERGY CENTER, LLC | Figure 5.3-2A SITE GEOLOGIC MAP | 2009 |
|---|---|---|




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| PANOCHE ENERGY CENTER, LLC | Figure 5.3-2B SITE GEOLOGIC MAP | 2009 |
|---|---|---|

Gas Pipeline

Access Road

Panoche
Energy Center
Site - 12.82 Acres

Substation Expansion
9.0 Acres

Wastewater Surface
Impoundments - 9.18 Acres

Transmission Line

Chaney Ranch

Panoche Substation

0 0.1 0.2 0.3 0.4 0.5 Miles
0 300 600 Meters
0 1,000 2,000 Feet
1 inch equals 2,000 feet (1:24,000)
N

## Legend

Soils

- *406 - Guijarral Sandy Loam, 2 to 5 Percent Slopes*
- *442 - Panoche Clay Loam, 0 to 2 Percent Slopes*
- *445 - Excelsior Sandy Loam, 0 to 2 Percent Slopes*
- *447 - Excelsior Sandy Loam, Sandy Substratum, 0 to 2 Percent Slopes*
- *477 - Westhaven Clay Loam, 0 to 2 Percent Slopes*
- *479 - Cerini Clay Loam, 0 to 2 Percent Slopes*
- *491 - Cerini Clay Loam, Subsided, 0 to 5 Percent Slopes*
- *492 - Panoche Loam, Subsided, 0 to 5 Percent Slopes*

* 7.5 Minute USGS Quad Index

Source: USGS Topographic Quadrangles (GlobeExplorer 2006) 1:24,000 (Chaney Ranch (1971), Chounet Ranch (1971), Monocline Ridge (1971) and Turney Hills (1971)




Chounet Ranch* Chaney Ranch*
Tumey Hills* Monocline Ridge*

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| PANOCHE ENERGY CENTER, LLC | Figure 5.4-1 AGRICULTURAL SOILS SURROUNDING PROJECT SITE | 2009 |
|---|---|---|

1 Mile from site

Gas Pipeline

Residential

Residential

Residential Farm

Wellhead Power

PG&E

Calpeak

Chaney Ranch

Farm Buildings

Access Road

Panoche Energy Center Site - 12.82 Acres

Wastewater Surface Impoundments - 9.18 Acres

Substation Expansion 9.0 Acres

Transmission Line

Chounet Ranch* Chaney Ranch*

Tumey Hills* Monocline Ridge*

0 0.1 0.2 0.3 0.4 0.5 Miles

0 300 600 Meters

0 1,000 2,000 Feet

1 inch equals 2,000 feet (1:24,000)

## Legend

ID Developed Area

* 7.5 Minute USGS Quad Index

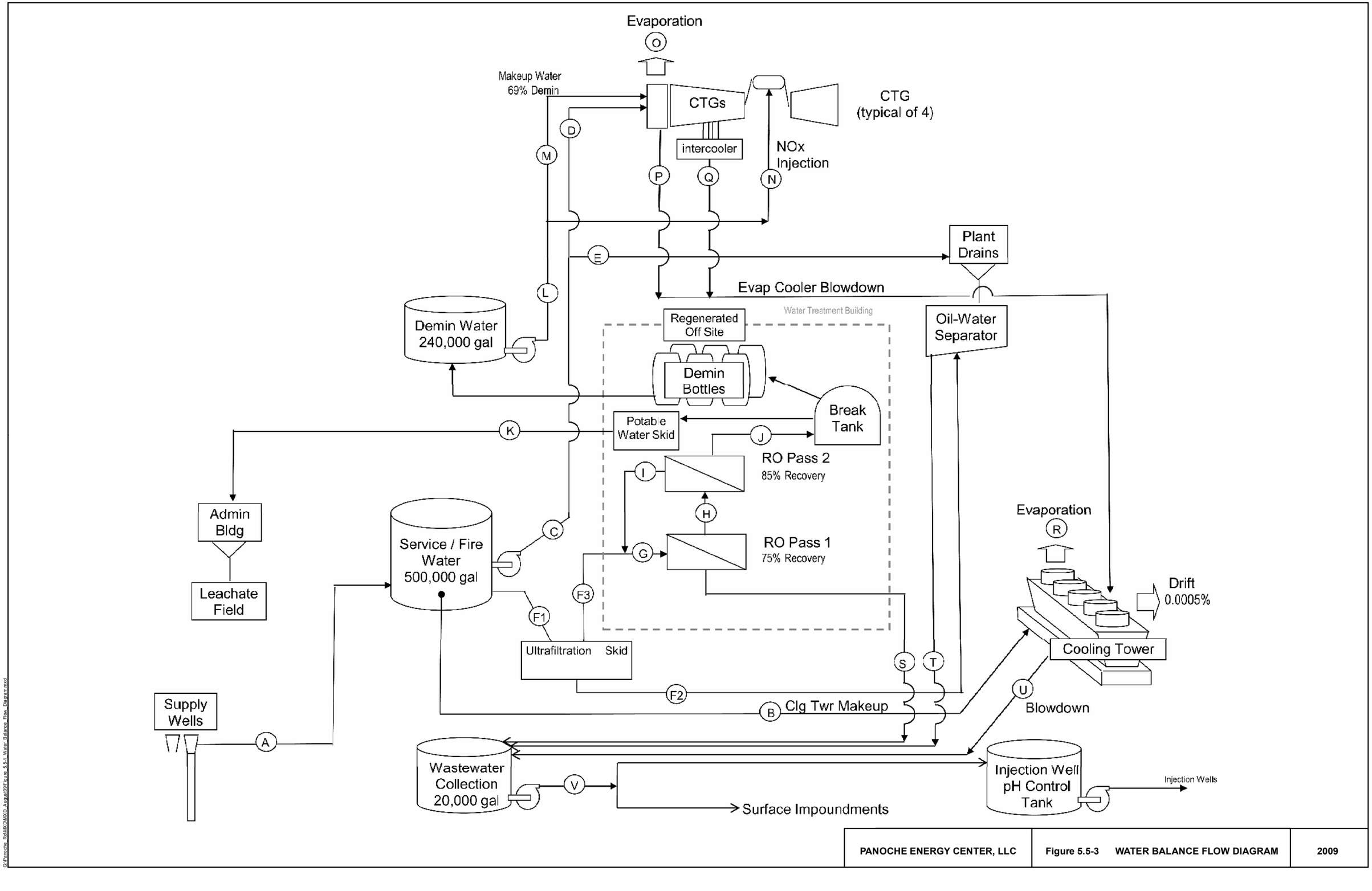
Source: USGS Topographic Quadrangles (GlobeExplorer 2006) 1:24,000 (Chaney Ranch (1971), Chounet Ranch (1971), Monocline Ridge (1971) and Turney Hills (1971)

San Francisco, Modesto, San Jose, San Mateo, Santa Cruz, Gilroy, Salinas, Fresno, Visalia, SITE LOCATION

0 25 50 Miles

G:\Panoche_RdMXD\MXD_August09\Figure_5-4-2_Existing_Land_Use_Surrounding_Project_Site.mxd

| PANOCHE ENERGY CENTER, LLC | Figure 5.4-2 EXISTING LAND USE SURROUNDING PROJECT SITE | 2009 |
|---|---|---|




| PANOCHE ENERGY CENTER, LLC | Figure 5.5-3 WATER BALANCE FLOW DIAGRAM | 2009 |
|---|---|---|

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G:\Panoche_Rd\MXD\MXD_August08\Figure_5.6-1_Biological_Survey_Area.mxd

| PANOCHE ENERGY CENTER, LLC | Figure 5.6-1 BIOLOGICAL SURVEY AREA | 2009 |
|---|---|---|




G:\Panoche_Rd\MXD\MXD_August09\Figure_5.6-2_Biological_Resources_within_1_Mile_of_Wastewater_Surface_Impoundment_Area.mxd

| | | |
|---|---|---|
| PANOCHE ENERGY CENTER, LLC | Figure 5.6-2 BIOLOGICAL RESOURCE WITHIN 1 MILE OF THE PROJECT SITE | 2009 |

Area Surveyed
(50ft. Buffer)

Access Road

Panoche Rd

Panoche Energy Center
Excavation Monitored for
Cultural Resources,
Facility Complete

Area Surveyed
(200ft. Buffer)

Proposed Wastewater
Surface Impoundments
9.18 Acres

0 0.02 0.04 0.06 0.08 0.1 Miles
0 75 150 Meters
0 200 400 Feet
1 inch equals 400 feet (1:4,800)
N

## Legend

- Area Surveyed
- Access Road
- Panoche Energy Center (Facility Complete)
- Proposed Wastewater Surface Impoundments

Source: DigitalGlobe (February 2008)




G:\Panoche_Rd\MXD\MXD_August09\Figure_5.3-2B_Site_Geologic_Map.mxd

| | | |
|---|---|---|
| PANOCHE ENERGY CENTER, LLC | Figure 5.7-1 AREA SURVEYED AND MONITORED FOR CULTURAL RESOURCES | 2009 |

STUDY AREA

Proposed Wastewater Surface Impoundments

FR321

FR1959

FR320

FR2015

Chaney Ranch

Panoche Substation

PANOCHE ROAD

CALIFORNIA

FAIRFAX

BM 342

BM 366

BM 392

BM 406

BM 405

BM 421

BM 439

BM 408

BM 426

BM 449

BM 465

BM 507 (1953)

0 0.1 0.2 0.3 0.4 0.5 Miles

0 300 600 Meters

0 1,000 2,000 Feet

1 inch equals 2,000 feet (1:24,000)

## Legend

- Area of Potential Effects (APE)
- ID Previous Cultural Survey
- * 7.5 Minute USGS Quad Index

Source: USGS Topographic Quadrangles (GlobeExplorer 2006) 1:24,000 (Chaney Ranch (1971), Chounet Ranch (1971), Monocline Ridge (1971) and Turney Hills (1971)

San Francisco, Modesto, San Jose, San Mateo, Santa Cruz, Gilroy, Salinas, Fresno, Visalia, SITE LOCATION, 0 25 50 Miles

Chounet Ranch* Chaney Ranch*
Tumey Hills* Monocline Ridge*

G:\Panoche_Re\MXD\MXD_July\Figure_5.7-3_Previous_Cultural_Surveys.mxd

| PANOCHE ENERGY CENTER, LLC | Figure 5.7-2 AREA OF POTENTIAL EFFECTS & PREVIOUS CULTURAL SURVEYS | 2008 |
|---|---|---|

PANOCHE RD.

Panoche Energy Center
12.82 Acres

Laydown Area
7.18 acres

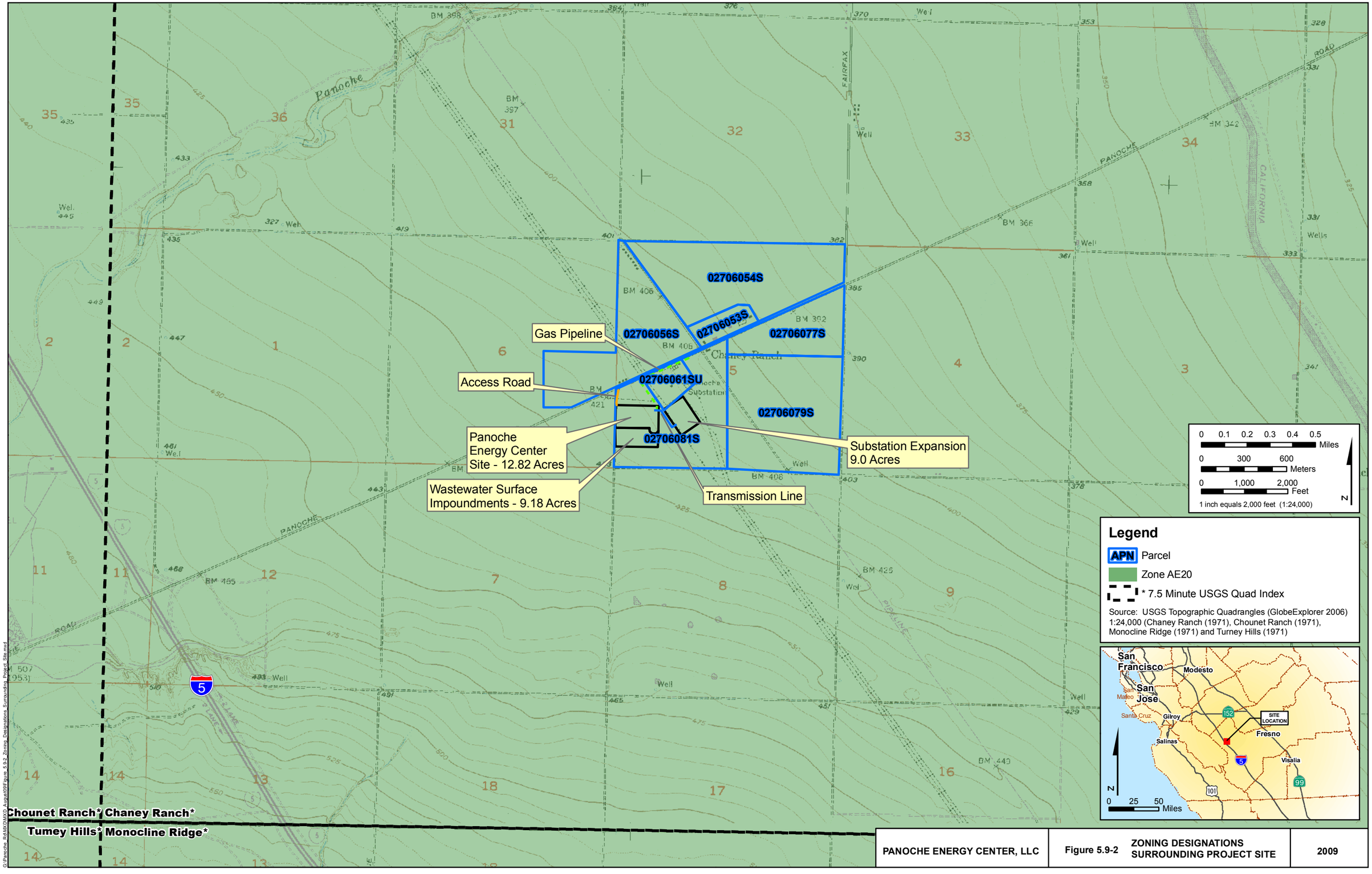
Pomegranate Orchard
2 Acres

N
0 100 200 Feet




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| | | |
|---|---|---|
| PANOCHE ENERGY CENTER, LLC | Figure 5.9-1 CURRENT LAND USE AND WASTEWATER DISPOSAL CHANGES | 2009 |




| PANOCHE ENERGY CENTER, LLC | Figure 5.9-2 ZONING DESIGNATIONS SURROUNDING PROJECT SITE | 2009 |
|---|---|---|

1 Mile from site

Gas Pipeline

Residential

Residential

Residential Farm

Wellhead Power

PG&E

Calpeak

Chaney Ranch

Farm Buildings

Access Road

Panoche Energy Center Site - 12.82 Acres

Wastewater Surface Impoundments - 9.18 Acres

Substation Expansion 9.0 Acres

Transmission Line

Chounet Ranch* Chaney Ranch*

Tumey Hills* Monocline Ridge*

0 0.1 0.2 0.3 0.4 0.5 Miles

0 300 600 Meters

0 1,000 2,000 Feet

1 inch equals 2,000 feet (1:24,000)

N

## Legend

ID Developed Area

* 7.5 Minute USGS Quad Index

Source: USGS Topographic Quadrangles (GlobeExplorer 2006) 1:24,000 (Chaney Ranch (1971), Chounet Ranch (1971), Monocline Ridge (1971) and Turney Hills (1971)




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| | | |
|---|---|---|
| PANOCHE ENERGY CENTER, LLC | Figure 5.9-3 EXISTING LAND USE SURROUNDING PROJECT SITE | 2009 |

## LEGEND

**R1 FWY** — I-5: 4 - Lane Interstate Freeway Facility, west of project. ADT = 51,500 vehicles per day. Existing LOS = B, Project Construction LOS = B, Project Operations LOS = B, Trucks = 25% to 30%

**R2 COL** — Panoche Rd: 2 - Lane Collector Road, north of project. ADT = 1,057 vehicles per day. Existing LOS = A, Project Construction LOS = A, Project Operations LOS = A, Trucks = 15%

**R3 LOC** — New PEC Access Road: 2 - Lane Local Road, west of project. ADT = 848 vehicles per day during construction, <24 vehicles Existing LOS = A, Project Construction LOS = A, Project Operations LOS = A, Trucks = <5%

Gas Pipeline

Access Road

Substation Expansion
9.0 Acres

Panoche
Energy Center
Site - 12.82 Acres

Wastewater Surface
Impoundments - 9.18 Acres

Transmission Line

R1 FWY

R2 COL

R3 LOC

Panoche

Chaney Ranch

Panoche Substation

FAIRFAX

PANOCHE ROAD

PIPELINE

Chounet Ranch* | Chaney Ranch*
Tumey Hills* | Monocline Ridge*

0 0.1 0.2 0.3 0.4 0.5 Miles
0 300 600 Meters
0 1,000 2,000 Feet
1 inch equals 2,000 feet (1:24,000)

N

## Legend

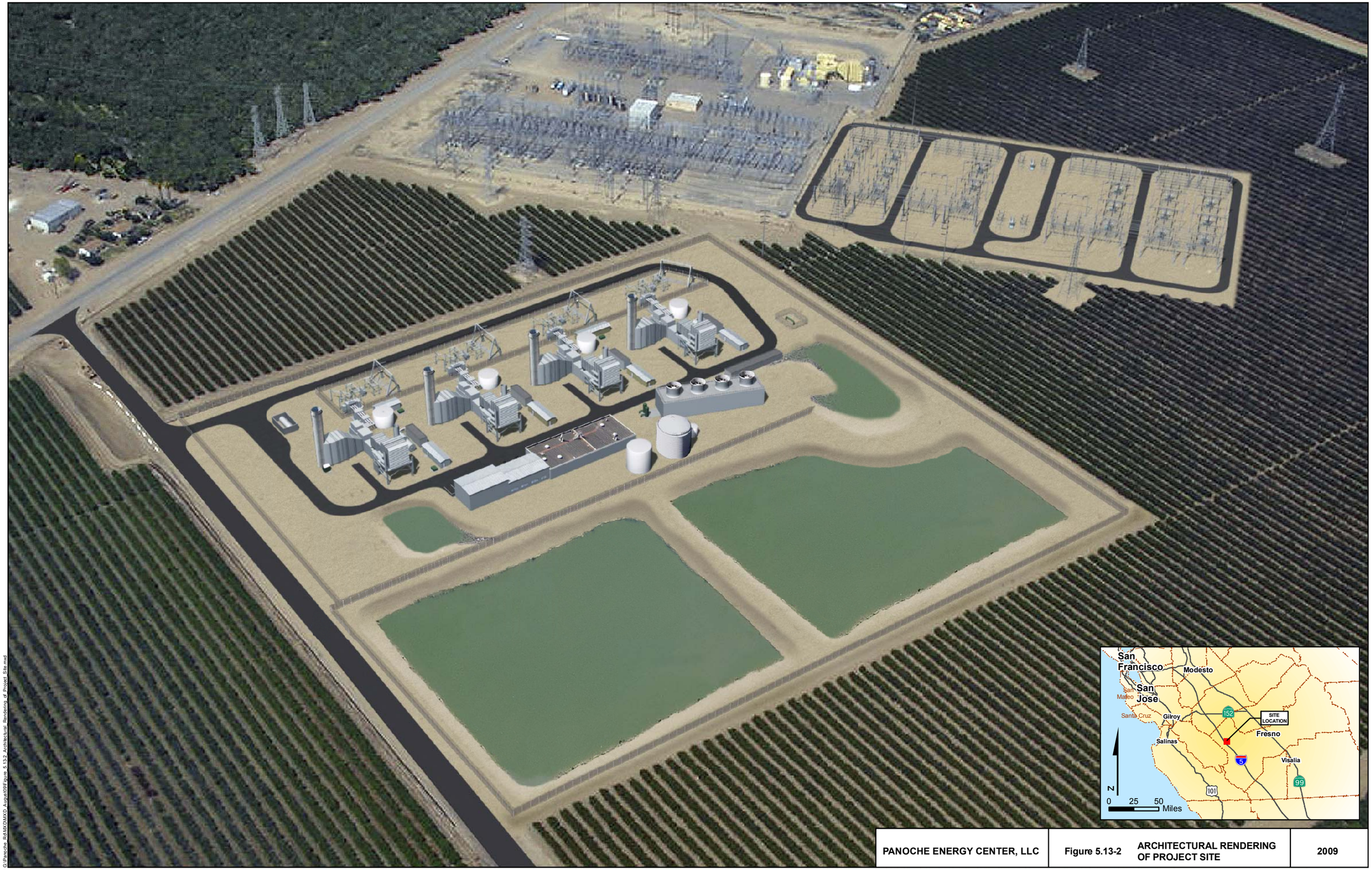
* 7.5 Minute USGS Quad Index

Source: USGS Topographic Quadrangles (GlobeExplorer 2006) 1:24,000 (Chaney Ranch (1971), Chounet Ranch (1971), Monocline Ridge (1971) and Turney Hills (1971)




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| PANOCHE ENERGY CENTER, LLC | Figure 5.11-2 PROJECT STUDY AREA | 2009 |
|---|---|---|




| PANOCHE ENERGY CENTER, LLC | Figure 5.13-2 | ARCHITECTURAL RENDERING OF PROJECT SITE | 2009 |
|---|---|---|---|

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G:\Panoche_Rd\MXD\MXD_August09\Figure_5.13-5_Aerial_of_Immediate_Project_Vicinity.mxd

| | | |
|---|---|---|
| PANOCHE ENERGY CENTER, LLC | Figure 5.13-5 AERIAL OF IMMEDIATE PROJECT VICINITY | 2009 |

# APPENDIX A
# AIR QUALITY

# Appendix A
# Air Quality
# Panoche Energy Center
# Wastewater Surface Impoundments
# Construction Emissions

Pollutant Name: PM10 Temperature: 90F Relative Humidity: 30%

| Speed MPH | LDA NCAT | LDA CAT | LDA DSL | LDA ALL | LDT1 NCAT | LDT1 CAT | LDT1 DSL | LDT1 ALL | LDT2 NCAT | LDT2 CAT | LDT2 DSL | LDT2 ALL | MDV NCAT | MDV CAT | MDV DSL | MDV ALL | LHD1 NCAT | LHD1 CAT | LHD1 DSL | LHD1 ALL | LHD2 NCAT | LHD2 CAT | LHD2 DSL | LHD2 ALL | MHD NCAT | MHD CAT | MHD DSL | MHD ALL | HHD NCAT | HHD CAT | HHD DSL | HHD ALL | OBUS NCAT | OBUS CAT | OBUS DSL | OBUS ALL | UBUS NCAT | UBUS CAT | UBUS DSL | UBUS ALL | MCY NCAT | MCY CAT | MCY DSL | MCY ALL | SBUS NCAT | SBUS CAT | SBUS DSL | SBUS ALL | MH NCAT | MH CAT | MH DSL | MH ALL | ALL NCAT | ALL CAT | ALL DSL | ALL ALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.777 | 0.258 | 0 | 0 | 0.982 | 0.562 | 0 | 0 | 1.138 | 0.996 | 0 | 0 | 2.121 | 0.653 | 0 | 0 | 1.394 | 0.919 | 0 | 0 | 1.258 | 1.065 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.843 | 0.422 |
| 5 | 0.104 | 0.055 | 0.232 | 0.056 | 0.101 | 0.071 | 0.133 | 0.076 | 0.105 | 0.136 | 0.235 | 0.136 | 0.106 | 0.109 | 0.100 | 0.109 | 0.101 | 0.024 | 0.114 | 0.054 | 0.101 | 0.044 | 0.146 | 0.103 | 0.101 | 0.068 | 0.948 | 0.838 | 0.101 | 0.086 | 2.774 | 2.751 | 0 | 0.067 | 0.906 | 0.62 | 0.101 | 0.097 | 0.32 | 0.369 | 0.08 | 0.005 | 0 | 0.056 | 0.101 | 0.088 | 1.408 | 1.206 | 0.101 | 0.038 | 0.51 | 0.101 | 0.089 | 0.082 | 2.328 | 0.396 |
| 10 | 0.074 | 0.036 | 0.182 | 0.036 | 0.072 | 0.047 | 0.105 | 0.051 | 0.075 | 0.089 | 0.184 | 0.089 | 0.075 | 0.071 | 0.085 | 0.071 | 0.066 | 0.016 | 0.089 | 0.04 | 0.066 | 0.029 | 0.115 | 0.078 | 0.066 | 0.044 | 0.744 | 0.657 | 0.066 | 0.056 | 1.882 | 1.866 | 0 | 0.044 | 0.711 | 0.484 | 0.066 | 0.064 | 0.232 | 0.118 | 0.063 | 0.004 | 0 | 0.044 | 0.066 | 0.058 | 1.105 | 0.945 | 0.066 | 0.012 | 0.4 | 0.077 | 0.067 | 0.053 | 1.588 | 0.405 |
| 15 | 0.055 | 0.024 | 0.146 | 0.025 | 0.054 | 0.032 | 0.084 | 0.036 | 0.056 | 0.061 | 0.148 | 0.061 | 0.056 | 0.049 | 0.068 | 0.049 | 0.045 | 0.011 | 0.072 | 0.031 | 0.045 | 0.02 | 0.092 | 0.061 | 0.045 | 0.03 | 0.597 | 0.526 | 0.045 | 0.038 | 1.23 | 1.22 | 0 | 0.03 | 0.571 | 0.386 | 0.045 | 0.044 | 0.174 | 0.085 | 0.052 | 0.003 | 0 | 0.036 | 0.045 | 0.039 | 0.887 | 0.757 | 0.045 | 0.008 | 0.321 | 0.061 | 0.053 | 0.037 | 1.047 | 0.268 |
| 20 | 0.043 | 0.018 | 0.12 | 0.018 | 0.042 | 0.024 | 0.069 | 0.027 | 0.043 | 0.044 | 0.121 | 0.045 | 0.044 | 0.035 | 0.056 | 0.036 | 0.032 | 0.009 | 0.059 | 0.025 | 0.032 | 0.014 | 0.075 | 0.049 | 0.032 | 0.022 | 0.49 | 0.431 | 0.032 | 0.027 | 0.857 | 0.85 | 0 | 0.021 | 0.468 | 0.316 | 0.032 | 0.031 | 0.135 | 0.065 | 0.043 | 0.003 | 0 | 0.031 | 0.032 | 0.028 | 0.726 | 0.621 | 0.032 | 0.006 | 0.264 | 0.049 | 0.044 | 0.027 | 0.756 | 0.199 |
| 25 | 0.035 | 0.013 | 0.101 | 0.014 | 0.034 | 0.018 | 0.058 | 0.021 | 0.035 | 0.034 | 0.102 | 0.034 | 0.036 | 0.027 | 0.047 | 0.027 | 0.024 | 0.006 | 0.049 | 0.02 | 0.024 | 0.01 | 0.063 | 0.041 | 0.024 | 0.016 | 0.411 | 0.362 | 0.024 | 0.02 | 0.718 | 0.712 | 0 | 0.016 | 0.393 | 0.264 | 0.024 | 0.023 | 0.109 | 0.051 | 0.041 | 0.002 | 0 | 0.028 | 0.024 | 0.021 | 0.61 | 0.52 | 0.024 | 0.004 | 0.221 | 0.041 | 0.038 | 0.02 | 0.637 | 0.157 |
| 30 | 0.03 | 0.011 | 0.086 | 0.011 | 0.029 | 0.015 | 0.05 | 0.017 | 0.03 | 0.027 | 0.087 | 0.028 | 0.031 | 0.022 | 0.04 | 0.022 | 0.019 | 0.004 | 0.042 | 0.017 | 0.019 | 0.008 | 0.054 | 0.035 | 0.019 | 0.012 | 0.352 | 0.31 | 0.019 | 0.016 | 0.614 | 0.609 | 0 | 0.012 | 0.337 | 0.226 | 0.019 | 0.018 | 0.091 | 0.041 | 0.039 | 0.002 | 0 | 0.027 | 0.019 | 0.016 | 0.523 | 0.443 | 0.019 | 0.003 | 0.19 | 0.034 | 0.035 | 0.016 | 0.528 | 0.134 |
| 35 | 0.027 | 0.009 | 0.076 | 0.01 | 0.026 | 0.013 | 0.043 | 0.015 | 0.027 | 0.023 | 0.076 | 0.023 | 0.027 | 0.018 | 0.035 | 0.019 | 0.015 | 0.004 | 0.037 | 0.015 | 0.015 | 0.006 | 0.048 | 0.03 | 0.015 | 0.01 | 0.309 | 0.271 | 0.015 | 0.013 | 0.545 | 0.541 | 0 | 0.01 | 0.295 | 0.198 | 0.015 | 0.014 | 0.079 | 0.035 | 0.038 | 0.002 | 0 | 0.027 | 0.015 | 0.013 | 0.458 | 0.39 | 0.015 | 0.003 | 0.166 | 0.03 | 0.034 | 0.014 | 0.468 | 0.118 |
| 40 | 0.025 | 0.008 | 0.068 | 0.009 | 0.024 | 0.011 | 0.039 | 0.013 | 0.025 | 0.021 | 0.068 | 0.021 | 0.026 | 0.016 | 0.031 | 0.017 | 0.013 | 0.003 | 0.033 | 0.013 | 0.013 | 0.005 | 0.043 | 0.027 | 0.013 | 0.008 | 0.276 | 0.243 | 0.013 | 0.011 | 0.51 | 0.506 | 0 | 0.008 | 0.264 | 0.177 | 0.013 | 0.012 | 0.07 | 0.031 | 0.04 | 0.002 | 0 | 0.028 | 0.013 | 0.011 | 0.411 | 0.349 | 0.013 | 0.002 | 0.149 | 0.027 | 0.034 | 0.012 | 0.437 | 0.11 |
| 45 | 0.024 | 0.008 | 0.062 | 0.008 | 0.024 | 0.01 | 0.036 | 0.012 | 0.025 | 0.019 | 0.063 | 0.019 | 0.025 | 0.015 | 0.029 | 0.016 | 0.011 | 0.003 | 0.03 | 0.012 | 0.011 | 0.005 | 0.039 | 0.024 | 0.011 | 0.007 | 0.253 | 0.222 | 0.011 | 0.009 | 0.51 | 0.506 | 0 | 0.007 | 0.242 | 0.162 | 0.011 | 0.011 | 0.065 | 0.028 | 0.043 | 0.002 | 0 | 0.03 | 0.011 | 0.01 | 0.376 | 0.32 | 0.011 | 0.002 | 0.136 | 0.024 | 0.036 | 0.012 | 0.435 | 0.109 |
| 50 | 0.025 | 0.008 | 0.038 | 0.008 | 0.024 | 0.01 | 0.033 | 0.012 | 0.025 | 0.019 | 0.059 | 0.019 | 0.026 | 0.015 | 0.027 | 0.015 | 0.01 | 0.002 | 0.028 | 0.011 | 0.01 | 0.004 | 0.037 | 0.023 | 0.01 | 0.007 | 0.237 | 0.208 | 0.01 | 0.009 | 0.545 | 0.54 | 0 | 0.007 | 0.227 | 0.152 | 0.01 | 0.01 | 0.063 | 0.027 | 0.049 | 0.003 | 0 | 0.034 | 0.01 | 0.009 | 0.352 | 0.299 | 0.01 | 0.002 | 0.128 | 0.023 | 0.04 | 0.011 | 0.462 | 0.115 |
| 55 | 0.027 | 0.008 | 0.055 | 0.008 | 0.026 | 0.011 | 0.032 | 0.012 | 0.027 | 0.02 | 0.056 | 0.02 | 0.027 | 0.016 | 0.026 | 0.016 | 0.01 | 0.002 | 0.027 | 0.011 | 0.01 | 0.004 | 0.035 | 0.022 | 0.01 | 0.006 | 0.227 | 0.199 | 0.01 | 0.008 | 0.614 | 0.609 | 0 | 0.006 | 0.217 | 0.145 | 0.01 | 0.009 | 0.062 | 0.026 | 0.038 | 0.003 | 0 | 0.041 | 0.01 | 0.008 | 0.337 | 0.287 | 0.01 | 0.002 | 0.122 | 0.022 | 0.046 | 0.012 | 0.517 | 0.128 |
| 60 | 0.03 | 0.009 | 0.054 | 0.009 | 0.029 | 0.012 | 0.031 | 0.013 | 0.03 | 0.022 | 0.055 | 0.022 | 0.031 | 0.017 | 0.025 | 0.017 | 0.009 | 0.002 | 0.027 | 0.01 | 0.009 | 0.004 | 0.034 | 0.021 | 0.009 | 0.006 | 0.222 | 0.195 | 0.009 | 0.008 | 0.718 | 0.712 | 0 | 0.006 | 0.212 | 0.142 | 0.009 | 0.009 | 0.064 | 0.027 | 0.073 | 0.004 | 0 | 0.05 | 0.009 | 0.008 | 0.33 | 0.28 | 0.009 | 0.002 | 0.119 | 0.021 | 0.056 | 0.013 | 0.601 | 0.148 |
| 65 | 0.035 | 0.01 | 0.054 | 0.01 | 0.034 | 0.013 | 0.031 | 0.013 | 0.036 | 0.025 | 0.055 | 0.025 | 0.036 | 0.02 | 0.025 | 0.02 | 0.01 | 0.002 | 0.027 | 0.01 | 0.01 | 0.004 | 0.034 | 0.021 | 0.01 | 0.007 | 0.222 | 0.195 | 0.01 | 0.008 | 0.857 | 0.85 | 0 | 0.006 | 0.212 | 0.142 | 0.01 | 0.009 | 0.068 | 0.028 | 0.095 | 0.005 | 0 | 0.066 | 0.01 | 0.009 | 0.33 | 0.28 | 0.01 | 0.002 | 0.119 | 0.021 | 0.072 | 0.015 | 0.713 | 0.176 |

Pollutant Name: PM10 - Tire Wear Temperature: 90F Relative Humidity: 30%

| Speed MPH | LDA NCAT | LDA CAT | LDA DSL | LDA ALL | LDT1 NCAT | LDT1 CAT | LDT1 DSL | LDT1 ALL | LDT2 NCAT | LDT2 CAT | LDT2 DSL | LDT2 ALL | MDV NCAT | MDV CAT | MDV DSL | MDV ALL | LHD1 NCAT | LHD1 CAT | LHD1 DSL | LHD1 ALL | LHD2 NCAT | LHD2 CAT | LHD2 DSL | LHD2 ALL | MHD NCAT | MHD CAT | MHD DSL | MHD ALL | HHD NCAT | HHD CAT | HHD DSL | HHD ALL | OBUS NCAT | OBUS CAT | OBUS DSL | OBUS ALL | UBUS NCAT | UBUS CAT | UBUS DSL | UBUS ALL | MCY NCAT | MCY CAT | MCY DSL | MCY ALL | SBUS NCAT | SBUS CAT | SBUS DSL | SBUS ALL | MH NCAT | MH CAT | MH DSL | MH ALL | ALL NCAT | ALL CAT | ALL DSL | ALL ALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 10 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 15 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 20 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 25 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 30 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 35 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 40 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 45 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 50 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 55 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 60 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |
| 65 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.036 | 0.036 | 0 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.008 | 0.011 | 0.004 | 0.004 | 0 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.006 | 0.008 | 0.031 | 0.013 |

Pollutant Name: PM10 - Brake Wear Temperature: 90F Relative Humidity: 30%

| Speed MPH | LDA NCAT | LDA CAT | LDA DSL | LDA ALL | LDT1 NCAT | LDT1 CAT | LDT1 DSL | LDT1 ALL | LDT2 NCAT | LDT2 CAT | LDT2 DSL | LDT2 ALL | MDV NCAT | MDV CAT | MDV DSL | MDV ALL | LHD1 NCAT | LHD1 CAT | LHD1 DSL | LHD1 ALL | LHD2 NCAT | LHD2 CAT | LHD2 DSL | LHD2 ALL | MHD NCAT | MHD CAT | MHD DSL | MHD ALL | HHD NCAT | HHD CAT | HHD DSL | HHD ALL | OBUS NCAT | OBUS CAT | OBUS DSL | OBUS ALL | UBUS NCAT | UBUS CAT | UBUS DSL | UBUS ALL | MCY NCAT | MCY CAT | MCY DSL | MCY ALL | SBUS NCAT | SBUS CAT | SBUS DSL | SBUS ALL | MH NCAT | MH CAT | MH DSL | MH ALL | ALL NCAT | ALL CAT | ALL DSL | ALL ALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 10 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 15 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 20 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 25 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 30 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 35 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 40 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 45 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 50 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 55 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 60 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |
| 65 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.028 | 0.028 | 0.028 | 0.028 | 0 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.006 | 0.006 | 0 | 0.006 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.013 | 0.009 | 0.013 | 0.025 | 0.015 |

Pollutant Name: Gasoline - ml/gal Temperature: 90F Relative Humidity: 30%

| Speed MPH | LDA NCAT | LDA CAT | LDA DSL | LDA ALL | LDT1 NCAT | LDT1 CAT | LDT1 DSL | LDT1 ALL | LDT2 NCAT | LDT2 CAT | LDT2 DSL | LDT2 ALL | MDV NCAT | MDV CAT | MDV DSL | MDV ALL | LHD1 NCAT | LHD1 CAT | LHD1 DSL | LHD1 ALL | LHD2 NCAT | LHD2 CAT | LHD2 DSL | LHD2 ALL | MHD NCAT | MHD CAT | MHD DSL | MHD ALL | HHD NCAT | HHD CAT | HHD DSL | HHD ALL | OBUS NCAT | OBUS CAT | OBUS DSL | OBUS ALL | UBUS NCAT | UBUS CAT | UBUS DSL | UBUS ALL | MCY NCAT | MCY CAT | MCY DSL | MCY ALL | SBUS NCAT | SBUS CAT | SBUS DSL | SBUS ALL | MH NCAT | MH C

**Panoche Energy Center**
**Wastewater Surface Impoundments--Construction Emissions**

**Onsite Emissions**

| | | Daily Emissions (lb/day) | | | | | | | | | | Annual Emissions (tons/year) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Activity** | **Emission Type** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** | **VOC** | **NOx** | **SOx** | **$CO_2$** | **$N_20$** | **$CH_4$** | **$CO_2e$** | **PM10** | **PM2.5** | **CO** | **VOC** | **NOx** | **SOx** | **$CO_2$** | **$N_20$** | **$CH_4$** | **$CO_2e$** |
| Wastewater Surface Impoundment | Combustion exhaust | 3.59 | 3.30 | 44.79 | 10.08 | 84.03 | 0.08 | 7,797 | 0.002 | 1.07 | 7,820 | 0.05 | 0.04 | 0.61 | 0.13 | 1.15 | 0.001 | 106.81 | 4.0E-05 | 0.01 | 107.13 |
| Construction | Fugitive dust | 30.06 | 4.17 | | | | | | | | | 0.50 | 0.07 | | | | | | | | |
| | **Total Onsite** | **33.66** | **7.47** | **44.79** | **10.08** | **84.03** | **0.08** | **7,797** | **0.002** | **1.07** | **7,820** | **0.54** | **0.11** | **0.61** | **0.13** | **1.15** | **0.001** | **106.81** | **4.0E-05** | **0.01** | **107.13** |

**Offsite Emissions from worker vehicles and dump truck travel**

| | | Daily Emissions (lb/day) | | | | | | | | | | Annual Emissions (tons/year) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Activity** | **Emission Type** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** | **VOC** | **NOx** | **SOx** | **$CO_2$** | **$N_20$** | **$CH_4$** | **$CO_2e$** | **PM10** | **PM2.5** | **CO** | **VOC** | **NOx** | **SOx** | **$CO_2$** | **$N_20$** | **$CH_4$** | **$CO_2e$** |
| Wastewater Surface Impoundment | Combustion exhaust | 0.86 | 0.74 | 26.35 | 4.29 | 11.07 | 0.03 | 3,733 | 0.11 | 0.19 | 3,769 | 0.01 | 0.01 | 0.66 | 0.08 | 0.17 | 0.001 | 87.28 | 2.9E-03 | 0.01 | 88.29 |
| Construction | Fugitive dust | 9.49 | 1.42 | | | | | | | | | 0.15 | 0.02 | | | | | | | | |
| | **Total Offsite** | **10.35** | **2.17** | **26.35** | **4.29** | **11.07** | **0.03** | **3732.51** | **0.11** | **0.19** | **3769.40** | **0.16** | **0.03** | **0.66** | **0.08** | **0.17** | **0.001** | **87.28** | **2.90E-03** | **0.01** | **88.29** |

**Panoche Construction Onsite Emissions (from AFC Appendix I, Air Quality Data, Attachment B (revised), Supporting Information on Estimation of Project Construction Emissions, Jan. 2007)**

*Daily Emissions (lb/day)*

| PM10 | PM2.5 | CO | VOC | NOx | SOx |
|---|---|---|---|---|---|
| 69.98 | 11.83 | 138.46 | 26.14 | 303.45 | 0.33 |

*Annual Emissions (tons/year)*

| PM10 | PM2.5 | CO | VOC | NOx | SOx |
|---|---|---|---|---|---|
| 13.09 | 3.25 | 28.28 | 4.98 | 28.87 | 0.04 |

**Comparsion of Wastewater Surface Impoundments Onsite Construction Emissions to Panoche Construction Onsite Emissions**

*Daily Emissions (lb/day)*

| PM10 | PM2.5 | CO | VOC | NOx | SOx |
|---|---|---|---|---|---|
| 48% | 63% | 32% | 39% | 28% | 23% |

*Annual Emissions (tons/year)*

## Wastewater Surface Impoundments Exhaust Emissions

**ONSITE**

**Diesel Equipment**

| Equipment | Quantity | Hours/Day | Horsepower | Days/year | Emission factors (lb/hr) | | | | | | | | | Hourly Emissions (lb/hr) | | | | | | | | Daily Emissions (lb/day) | | | | | | | | Annual Emissions (ton/yr) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | CO2e | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | CO2e | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | CO2e |
| Wheeled Loader | 1 | 6 | 500 | 28 | 0.087 | 0.080 | 0.823 | 0.228 | 2.302 | 0.002 | 236.796 | 0.00 | 0.021 | 0.09 | 0.08 | 0.82 | 0.23 | 2.30 | 0.00 | 236.80 | 0.00 | 0.02 | 237.23 | 0.52 | 0.48 | 4.94 | 1.37 | 13.81 | 0.01 | 1420.77 | 0.00 | 0.12 | 1423.36 | 0.01 | 0.01 | 0.07 | 0.02 | 0.19 | 0.00 | 19.54 | 0.00 | 0.00 | 19.57 |
| Scrapers | 3 | 6 | 500 | 28 | 0.146 | 0.134 | 1.652 | 0.381 | 3.607 | 0.003 | 321.140 | 0.00 | 0.034 | 0.44 | 0.40 | 4.96 | 1.14 | 10.82 | 0.01 | 963.42 | 0.00 | 0.10 | 965.59 | 2.63 | 2.42 | 29.74 | 6.86 | 64.93 | 0.06 | 5780.52 | 0.00 | 0.62 | 5793.51 | 0.04 | 0.03 | 0.41 | 0.09 | 0.89 | 0.00 | 79.48 | 0.00 | 0.01 | 79.66 |
| Forklift | 1 | 4 | 120 | 28 | 0.003 | 0.003 | 1.407 | 0.006 | 0.221 | 0.000 | 31.295 | 0.00 | 0.047 | 0.00 | 0.00 | 1.41 | 0.01 | 0.22 | 0.00 | 31.23 | 0.00 | 0.05 | 32.23 | 0.01 | 0.01 | 5.63 | 0.02 | 0.88 | 0.00 | 124.94 | 0.00 | 0.19 | 126.93 | 0.00 | 0.00 | 0.08 | 0.00 | 0.01 | 0.00 | 1.72 | 0.00 | 0.00 | 1.77 |
| Welding Machine | 1 | 6 | 50 | 22 | 0.029 | 0.027 | 0.304 | 0.126 | 0.274 | 0.000 | 25.935 | 0.00 | 0.011 | 0.03 | 0.03 | 0.30 | 0.13 | 0.27 | 0.00 | 25.93 | 0.00 | 0.01 | 26.17 | 0.18 | 0.16 | 1.83 | 0.76 | 1.65 | 0.00 | 155.61 | 0.00 | 0.07 | 157.04 | 0.00 | 0.00 | 0.02 | 0.01 | 0.02 | 0.00 | 1.71 | 0.00 | 0.00 | 1.73 |
| HDPE fusion machine | 1 | 6 | 50 | 22 | 0.029 | 0.027 | 0.304 | 0.126 | 0.274 | 0.000 | 25.935 | 0.00 | 0.011 | 0.03 | 0.03 | 0.30 | 0.13 | 0.27 | 0.00 | 25.93 | 0.00 | 0.01 | 26.17 | 0.18 | 0.16 | 1.83 | 0.76 | 1.65 | 0.00 | 155.61 | 0.00 | 0.07 | 157.04 | 0.00 | 0.00 | 0.02 | 0.01 | 0.02 | 0.00 | 1.71 | 0.00 | 0.00 | 1.73 |
| | | | | | | | | | | | | | Total | **0.59** | **0.54** | **7.80** | **1.63** | **13.89** | **0.01** | **1283.32** | **0.00** | **0.19** | **1287.39** | **3.51** | **3.23** | **43.96** | **9.76** | **82.92** | **0.07** | **7637.45** | **0.00** | **1.07** | **7659.89** | **0.05** | **0.04** | **0.59** | **0.13** | **1.13** | **0.00** | **104.16** | **0.00** | **0.01** | **104.46** |

**Trucks, Vehicles**

| Equipment | Quantity | Hours/Day | Miles/day Onsite | Horsepower | Days/year | Emission factors (g/mile) | | | | | | | | Hourly Emissions (lb/hr) | | | | | | | | Daily Emissions (lb/day) | | | | | | | | Annual Emissions (ton/yr) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | CO2e | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | CO2e | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | CO2e |
| Water Truck | 1 | 6 | 8 | 300 | 28 | 1.946 | 1.762452 | 13.834 | 7.408 | 27.765 | 0.03 | 3165.446 | 0.0051 | 0.0048 | 0.00572 | 0.005154 | 0.04068 | 0.02179 | 0.08165 | 8.8224E-05 | 9.3089717 | 1.5E-05 | 1.412E-05 | 9.3139176 | 0.0343369 | 0.030921768 | 0.2441 | 0.13071 | 0.48990935 | 0.0005293 | 55.85383 | 9E-05 | 8.4695E-05 | 55.883605 | 0.0005 | 0.0004252 | 0.00336 | 0.001797 | 0.006736 | 7.2785E-06 | 0.76799 | 1.23735E-06 | 1.16456E-06 | 7.68E-01 |
| Dump Truck | 2 | 6 | 6 | 300 | 28 | 1.946 | 1.762452 | 13.834 | 7.408 | 27.765 | 0.03 | 3165.446 | 0.0051 | 0.0048 | 0.00715 | 0.006442 | 0.05085 | 0.02723 | 0.10206 | 0.00011028 | 11.636215 | 1.9E-05 | 1.764E-05 | 11.642397 | 0.0429211 | 0.038652198 | 0.30512 | 0.16339 | 0.612386887 | 0.0006617 | 69.817288 | 0.00011 | 0.00010587 | 69.854381 | 0.0006 | 0.0005315 | 0.0042 | 0.002247 | 0.00842 | 9.09813E-06 | 0.95999 | 1.54688E-06 | 1.4557E-06 | 9.60E-01 |
| Pick-up trucks | 2 | 4 | 6 | 300 | 55 | 0.057 | 0.041 | 7.114 | 0.554 | 0.423 | 0.008 | 866.820 | 0.035 | 0.062 | 0.00031 | 0.000225 | 0.03923 | 0.00305 | 0.00233 | 4.4112E-05 | 4.7796599 | 0.00019 | 0.0003424 | 4.8459941 | 0.0012572 | 0.000900792 | 0.15691 | 0.01222 | 0.009329716 | 0.0001764 | 19.11864 | 0.00076 | 0.00136968 | 19.363976 | 3E-05 | 2.477E-05 | 0.00431 | 0.000336 | 0.000257 | 4.85233E-06 | 0.52576 | 2.09863E-05 | 3.76662E-05 | 5.33E-01 |
| Worker Vehicles | 15 | 1 | 0.5 | 200 | 55 | 0.057 | 0.041 | 7.114 | 0.554 | 0.423 | 0.008 | 866.820 | 0.035 | 0.062 | 0.00396 | 0.002885 | 0.11925 | 0.00929 | 0.00709 | 0.0001341 | 14.530166 | 0.00058 | 0.001041 | 14.731922 | 0.0009566 | 0.000884602 | 0.11925 | 0.00929 | 0.007090584 | 0.0001341 | 14.530166 | 0.00058 | 0.00104096 | 14.731922 | 3E-05 | 1.883E-05 | 0.00328 | 0.000255 | 0.000195 | 3.68777E-06 | 0.39958 | 1.59496E-05 | 2.86263E-05 | 4.05E-01 |
| | | | | | | | | | | | | | Total | **0.014** | **0.013** | **0.250** | **0.061** | **0.193** | **0.000** | **40.255** | **0.001** | **0.001** | **40.534** | **0.079** | **0.071** | **0.825** | **0.316** | **1.119** | **0.002** | **159.320** | **0.002** | **0.003** | **159.854** | **0.001** | **0.001** | **0.015** | **0.005** | **0.016** | **2.45E-05** | **2.653** | **3.97E-05** | **6.89E-05** | **2.667** |

Notes:
Equipment list, quantity from client
Horsepower estimated, hours of operation estimated from construction schedule
Diesel Equipment Emission factors from CARB Off-road Mobile Source Emission Factors (2009 data used). Values presented are scaled to match the HP presented.
Trucks, Vehicle Emission factors from Emfac2007
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions. PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for onroad or offroad diesel vehicles.
Assume construction day is 8 hours
Assume construction begins in 2009
assumed some workers will carpool, therefore estimated 1.25 workers per vehicle

**Work Schedule (from client)**

| | | |
|---|---|---|
| Civil Work (earthmoving) | 5 weeks = | 1.25 months |
| Mechanical Work | 4 weeks = | 1 months |
| Electrical Work (Underground conduit and monitoring) | 4 weeks = | 1 months |
| Total Duration of construction (overlap of some work included) | 10 weeks = | 2.5 months |

**Workers for Wastewater Surface Impoundment, underground pipe construction (from clien**

| | |
|---|---|
| Civil Workers | 7 |
| Mechanical Workers | 5 |
| Electrical Workers | 5 |
| Supervisors | 2 |
| **Total** | 19 |

## Wastewater Surface Impoundments Construction -Fugitive Dust Emissions
**OFFSITE**

**Travel on paved road**

$E = [ k * (sL/2)^{0.65} * (W/3)^{1.5} - C ] (1 - P/4N)$ EPA AP-42 Section 13.2.1 Paved Roads Equation 2

E = particulate emission factor (lb/VMT),

k = particle size multiplier for particle size range and units of interest

0.32 sL = road surface silt loading (grams per square meter) ($g/m^2$), Local CARB - Emission Inventory Database - Section 7.9 Entrained Paved Road Dust -

0.02 sL = road surface silt loading (grams per square meter) ($g/m^2$), Freeway Local Streets & Freeways (emission inventory code: 640-641-5400-0000), July 1997

W = average weight (tons) of the vehicles traveling the road, and

C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

constants

| | $PM_{2.5}$ | $PM_{10}$ |
|---|---|---|
| k | 0.0024 | 0.016 |
| C | 0.00036 | 0.00047 |

98 P = Mean number of days per with at least 0.01 inches of precipitation (from Panoche Junction COOP weather station Western Regional Climate Center)

365 N = number of days in the year (averaging period)

| Vehicle Type | Number of Vehicles per month per day | Number of Vehicles per year | Max Daily Offsite Round-trip Distance per Vehicle (mile/day) | Max Daily VMT (all vehicles) | Max Annual VMT (all vehicles) | Mean Vehicle Weight (tons) | Max. Operating Hours / Day | Max. Operating Days / Month | $PM_{2.5}$ EF (lbs/VMT) | $PM_{10}$ EF (lbs/VMT) | $PM_{2.5}$ (lbs/day) | $PM_{2.5}$ (tons/yr) | $PM_{10}$ (lbs/day) | $PM_{10}$ (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dump Trucks | 2 | 3 | 80 | 160 | 4400 | 27.375 | 1.6 | 22 | 0.008 | 0.051 | 1.22 | 0.017 | 8.12 | 0.11 |
| Worker Vehicles | 15 | 38 | 90 | 1368 | 75240 | 2 | 1.8 | 22 | 0.0002 | 0.001 | 0.21 | 0.0001 | 1.37 | 0.04 |
| | | | | | | | | **Total** | 0.008 | 0.052 | 1.42 | 0.02 | 9.49 | 0.15 |

Assume Dump Trucks and Worker Vehicles travel 80% on freeways and 20% on local roads

**Work Schedule (from client)**

| | | |
|---|---|---|
| Civil Work (earthmoving) | 5 weeks = | 1.25 months |
| Mechanical Work (underground pipe) | 4 weeks = | 1 months |
| Electrical Work (Underground conduit and monitoring) | 4 weeks = | 1 months |
| Total Duration of construction (overlap of some work included) | 10 weeks = | 2.5 months |

**Workers for Wastewater Surface Impoundment, underground pipe construction (from client)**

| | |
|---|---|
| Civil Workers | 7 |
| Mechanical Workers | 5 |
| Electrical Workers | 5 |
| Supervisors | 2 |
| **Total** | 19 |

**Wastewater Surface Impoundments Construction - Exhaust Emissions**
**OFFSITE**

**Trucks, Vehicles**

| | | | | | | Emission factors (g/mile) | | | | | | | | | Hourly Emissions (lb/hr) | | | | | | | | | Daily Emissions (lb/day) | | | | | | | | | Annual Emissions (ton/yr) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Quantity | Hours/Day | Miles/day Offsite/vehicle | Horsepower | Days/year | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | CO2e | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | CO2e | PM10 | PM2.5 | CO | VOC | NOx | SOx | CO2 | N20 | CH4 | CO2e |
| Dump Trucks | 2 | 1.6 | 80 | 300 | 28 | 1.946 | 1.752452 | 13.834 | 7.408 | 27.765 | 0.03 | 3165.446 | 0.0051 | 0.005 | 0.4292111 | 0.386521979 | 3.051236 | 1.633913408 | 6.12386687 | 0.00662 | 698.1728754 | 0.001125 | 0.001059 | 698.543814 | 0.686738 | 0.618435166 | 4.881978 | 2.61426 | 9.798186991 | 0.010587 | 1117.0766 | 0.0018 | 0.001694 | 1117.670103 | 9.44E-03 | 8.50E-03 | 6.71E-02 | 3.59E-02 | 1.35E-01 | 1.46E-04 | 1.54E+01 | 2.47E-05 | 2.33E-05 | 1.54E+01 |
| Worker Vehicles | 15 | 1.8 | 90 | 200 | 55 | 0.057 | 0.041 | 7.114 | 0.554 | 0.423 | 0.008 | 866.820 | 0.035 | 0.062 | 0.0955469 | 0.068460178 | 11.92492 | 0.928648625 | 0.709058427 | 0.01341 | 1453.016608 | 0.057999 | 0.104096 | 1473.1822 | 0.171984 | 0.12322832 | 21.464858 | 1.67157 | 1.276305168 | 0.024138 | 2615.42989 | 0.104398 | 0.187372 | 2651.727953 | 4.73E-03 | 3.39E-03 | 5.90E-01 | 4.60E-02 | 3.51E-02 | 6.64E-04 | 7.19E+01 | 2.87E-03 | 5.15E-03 | 7.29E+01 |
| | | | | | | | | | | | | | | **Total** | **0.525** | **0.455** | **14.976** | **2.563** | **6.833** | **0.020** | **2151.189** | **0.059** | **0.105** | **2171.726** | **0.859** | **0.742** | **26.347** | **4.286** | **11.074** | **0.035** | **3732.506** | **0.106** | **0.189** | **3769.398** | **0.014** | **0.012** | **0.657** | **0.082** | **0.170** | **8.09E-04** | **87.284** | **2.90E-03** | **5.18E-03** | **88.290** |

Notes:
Equipment list, quantity from client
Horsepower and hours of operation estimated
Assume worker vehicles come from Fresno, both dump trucks make 2 40-mile round trip trips to agricultural sites surrounding the project site to dispose of excess soil
Assume Average offsite Speed of 50 mph
Trucks, Vehicle Emission factors from Emfac2007

**Work Schedule (from client)**

| | | |
|---|---|---|
| Civil Work (earthmoving) | 5 weeks = | 1.25 months |
| Mechanical Work | 4 weeks = | 1 months |
| Electrical Work (Underground conduit and monitoring) | 4 weeks = | 1 months |
| Total Duration of construction (overlap of some work included) | 10 weeks = | 2.5 months |

**Workers for Wastewater Surface Impoundment, underground pipe construction (from client)**

| | |
|---|---|
| Civil Workers | 7 |
| Mechanical Workers | 5 |
| Electrical Workers | 5 |
| Supervisors | 2 |
| **Total** | 19 |

## Wastewater Surface Impoundments Construction -Fugitive Dust Emissions

**ONSITE**

**Excavation and Bulldozing**

$E = p * 1 * G^{1.5} / H^{1.4}$ PM10 Emissions from excavation (lb/hr)
EPA AP-42 Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED
OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)

0.75 p = particle size multiplier = 0.75 for PM10
18 G = Silt content (%) (from CEQA Table A9-9-F-1 for flue dust - fine soils located at site)
15 H = Moisture content of surface material (%) (from CEQA Table A9-9-F-2 for moist dirt)
1.29 lb/hr of PM10

| Equipment | Quantity | Hours/Day | Days/year | Watering Control Efficiency | PM10 Emissions (lb/hr) | PM10 Emissions (lb/day) | PM10 Emissions (tons/yr) | PM2.5 Emissions (lb/hr) | PM2.5 Emissions (lb/day) | PM2.5 Emissions (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|
| Loader | 1 | 4 | 28 | 61% | 0.50 | 2.02 | 0.03 | 0.11 | 0.45 | 0.01 |
| | | | | **Total** | **0.50** | **2.02** | **0.03** | **0.11** | **0.45** | **0.01** |

22 construction days per month
1.25 duration of activity (months)

PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions. PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for onroad or offroad diesel vehicles.
Water efficiency from WRAP Fugitive Dust Handbook, SCAQMD Table XI-A-- applying water every 3 hours to disturbed areas within construction site

**Grading**

$E = p^* .051 * (S)^{2.0}$

0.6 p = particle size multiplier = 0.60 for PM10
5 S = avg speed of vehicle (mph) (from AP-42 Table 11.9-3)
0.77 lb/VMT EPA AP-42 Table 11.9-1 EMISSION FACTOR EQUATIONS FOR
PM10 UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES

| Equipment | Quantity | Hours/Day | Days/year | Miles travelled per hour | Watering Control Efficiency | PM10 Emissions (lb/hr) | PM10 Emissions (lb/day) | PM10 Emissions (tons/yr) | PM2.5 Emissions (lb/hr) | PM2.5 Emissions (lb/day) | PM2.5 Emissions (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scrapers | 3 | 6 | 20 | 1 | 61% | 0.90 | 5.37 | 0.07 | 0.20 | 1.19 | 0.016 |

Water efficiency from WRAP Fugitive Dust Handbook, SCAQMD Table XI-A-- applying water every 3 hours to disturbed areas within construction site

**Dirt Piling or Material Handling** PM10 Emissions from Material Handling (lb/ton) from EPA AP-42 Chapter 13.2.4 Eq. 1
$E = k * 0.0032 * (U/5)^{1.3} / (M/2)^{1.4}$ E = Emission factor (lb/ton material handled)

6 U = Mean Wind speed (mph) from Fresno metr station
12 M = Moisture content of surface material (%) (from Table 13.2.4-1 for cover at landfill, closest surface material available)

| | $PM_{2.5}$ | $PM_{10}$ |
|---|---|---|
| k | 0.053 | 0.35 |

0.00003 lb/ton of PM2.5
0.00017 lb/ton of PM10

| Equipment | Quantity/ month | Hours/ Day | Material Handled per Day (ton) | Watering Control Efficiency | PM10 Emissions (lb/day) | PM2.5 Emissions (lb/day) | Number of Vehicles per year | Material Handled per year (ton) | PM10 Emissions (ton/yr) | PM2.5 Emissions (ton/yr) |
|---|---|---|---|---|---|---|---|---|---|---|
| Dump Trucks | 2 | 6 | 2,594 | 61% | 0.17 | 0.03 | 6 | 71,337 | 0.0023 | 0.0003 |
| Loader | 1 | 3 | 2,594 | 61% | 0.17 | 0.03 | 3 | 71,337 | 0.0023 | 0.0023 |
| | | | | **Total** | **0.33** | **0.05** | | | **0.005** | **0.003** |

Water efficiency from WRAP Fugitive Dust Handbook, SCAQMD Table XI-A-- applying water every 3 hours to disturbed areas within construction site

2256 yd3/day 2594 ton/day
62,032 yd3 71,337 tons 2300 density of soil (lb/yd3)
(USDA NRCS Physical Soil Properties from Fresno County
28 day construction schedule for pond digging and berm Western Part for Panoche Clay Loam soil)
assume each dump truck carries 25 yd3 = 28.75 tons

Berm around ponds: 3048 ft perimeter
6 ft tall
13.33 ft wide 243840 ft3 9031.1118 yd3

62,032 cubic yds of soil will be cut and filled
(from client)

32414 cubic yards cut
29618 cubic yards filled from cut
2796 cubic yards taken offsite 112 offsite dump truck loads 4 trips/day for dump trucks = 2 trips/day per dump truck

**Cover Storage Pile**

SCAQMD Table A9-9-E
E = 1.7 * G/1.5 * (365-H)/235 * I/15 * J
PM10 Emission factor from wind erosion of storage piles per day per acre

| | |
|---|---|
| 15 | G = Silt content (%) (from CEQA Table A9-9-E-1 for blended dirt) |
| 98 | H = Number of days with >= 0.01 inches of precipitation per year (from Panoche Junction COOP weather station WRCC) |
| 8 | I = Percentage of time that the unobstructed wind speed exceeds 12 mph at mean pile height |
| 0.5 | J = Fraction of TSP that is PM10 = 0.5 |
| 5.151 | lb/acre/day |

wind speed percentage based on 1984-92 (9 yrs) of wind speed data (actual hours > 10 knots) as
recorded at Fresno Air Terminal data from EPA SCRAM website

| Source | Quantity | Size of Pile (acre) | Hours/Day | Days/year | Watering Control Efficiency | PM10 Emissions (lb/hr) | PM10 Emissions (lb/day) | PM10 Emissions (tons/yr) | PM2.5 Emissions (lb/hr) | PM2.5 Emissions (lb/day) | PM2.5 Emissions (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cover Storage Pile | 1 | 1 | 24 | 28 | 61% | 0.08 | 2.01 | 0.03 | 0.02 | 0.45 | 0.01 |

Water efficiency from WRAP Fugitive Dust Handbook, SCAQMD Table XI-A-- applying water every 3 hours to disturbed areas within construction site
pile size assumed

**Travel on unpaved surfaces**

$E = k * (s/12)^a * (W/3)^b * [(365 - P)/365]$ EPA AP-42 Section 13.2.2 Unpaved Roads Equations 1a and 2

E = size-specific emission factor (lb/VMT)
k, a, b = empirical constants
8.5 s = surface material silt content (%) Construction Sites-scraper routes average silt content
W = mean vehicle weight (tons)

constants

| | $PM_{2.5}$ | $PM_{10}$ |
|---|---|---|
| k | 0.15 | 1.5 |
| a | 0.9 | 0.9 |
| b | 0.45 | 0.45 |

Industrial Roads

98 P = Mean number of days per with at least 0.01 inches of precipitation (from Panoche Junction COOP weather station Western Regional Climate Center))
61% Watering Control Efficiency (from WRAP Fugitive Dust Handbook, SCAQMD Table XI-A-- applying water every 3 hours to disturbed areas within construction site)

| Vehicle Type | Number of Vehicles per month per day | Max Daily Distance per Vehicle (mile/day) | Vehicle weight (tons) | Max Daily VMT | Max. Operating Hours / Day | Number of Vehicles per year | Max Annual VMT (all vehicles) | $PM_{2.5}$ EF (lbs/VMT) | $PM_{10}$ EF (lbs/VMT) | $PM_{2.5}$ (lbs/day) | $PM_{2.5}$ (tons/yr) | $PM_{10}$ (lbs/day) | $PM_{10}$ (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dump Truck | 2 | 5 | 27 | 10 | 6 | 3 | 275 | 0.218 | 2.176 | 0.85 | 0.012 | 8.49 | 0.12 |
| Water Truck | 1 | 8 | 20 | 8 | 6 | 1 | 220 | 0.189 | 1.889 | 0.59 | 0.008 | 5.89 | 0.08 |
| Forklift | 1 | 1 | 5 | 1 | 4 | 3 | 55 | 0.101 | 1.012 | 0.04 | 0.001 | 0.39 | 0.01 |
| Pickups | 2 | 5 | 2 | 10 | 4 | 5 | 550 | 0.067 | 0.670 | 0.26 | 0.007 | 2.61 | 0.07 |
| Pickup Trailer | 1 | 5 | 1 | 5 | 4 | 3 | 275 | 0.049 | 0.491 | 0.10 | 0.003 | 0.96 | 0.03 |
| Worker Vehicles | 15 | 0.5 | 2 | 8 | 1 | 38 | 418 | 0.067 | 0.670 | 0.20 | 0.005 | 1.99 | 0.05 |
| | | | | | | | | | **Total** | 2.03 | 0.04 | 20.33 | 0.36 |

distances estimated from plot plan
assumed some workers will carpool, therefore estimated 1.25 workers per vehicle
Weights from client, or weights from dump truck and water truck averaged between full and heavy loads

**Work Schedule (from client)**

| | | |
|---|---|---|
| Civil Work (earthmoving) | 5 weeks = | 1.25 months |
| Mechanical Work (underground pipe) | 4 weeks = | 1 months |
| Electrical Work (Underground conduit and monitoring) | 4 weeks = | 1 months |
| Total Duration of construction (overlap of some work included) | 10 weeks = | 2.5 months |

**Workers for Wastewater Surface Impoundment, underground pipe construction (from client)**

| | |
|---|---|
| Civil Workers | 7 |
| Mechanical Workers | 5 |
| Electrical Workers | 5 |
| Supervisors | 2 |
| **Total** | 19 |

**TOTAL ONSITE FUGITIVE DUST**

| $PM_{2.5}$ (lbs/day) | $PM_{2.5}$ (tons/yr) | $PM_{10}$ (lbs/day) | $PM_{10}$ (tons/yr) |
|---|---|---|---|
| 4.17 | 0.07 | 30.06 | 0.50 |

| | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2009 | Annual | Mon-Sun | 2.27E+09 | Air Compressors | D | 250 | Light Commercial Equipment | U | N | NHH | P | San Benito | NCC | MBU | 3.51E-01 | 7.82E-01 | 4.65E+00 | 5.02E-05 | 1.41E-04 | 5.66E-04 | 5.12E-02 | 5.77E-07 | 1.91E-05 | 0.00E+00 | 4.53E-06 | 2.45E-05 | 1.80E-04 | 6.42E-05 | 7.24E-04 | 7.38E-07 | 6.56E-02 | 0.00E+00 | 5.80E-06 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Air Compressors | D | 500 | Light Commercial Equipment | U | N | NHH | P | San Benito | NCC | MBU | 4.57E-01 | 1.02E+00 | 1.07E+01 | 1.04E-04 | 3.75E-04 | 1.17E-03 | 1.18E-01 | 1.16E-06 | 4.04E-05 | 0.00E+00 | 9.35E-06 | 3.96E-05 | 3.68E-04 | 1.02E-04 | 1.15E-03 | 1.14E-06 | 1.16E-01 | 0.00E+00 | 9.17E-06 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Air Compressors | D | 750 | Light Commercial Equipment | U | N | NHH | P | San Benito | NCC | MBU | 1.71E-01 | 3.81E-01 | 6.20E+00 | 6.09E-05 | 2.17E-04 | 6.92E-04 | 6.82E-02 | 6.86E-07 | 2.36E-05 | 0.00E+00 | 5.50E-06 | 6.20E-05 | 5.69E-04 | 1.60E-04 | 1.81E-03 | 1.80E-06 | 1.79E-01 | 0.00E+00 | 1.44E-05 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Air Compressors | D | 1000 | Light Commercial Equipment | U | N | NHH | P | San Benito | NCC | MBU | 4.22E-03 | 9.42E-03 | 2.08E-01 | 2.55E-06 | 9.36E-06 | 2.89E-05 | 2.29E-03 | 2.30E-08 | 8.79E-07 | 0.00E+00 | 2.30E-07 | 9.34E-05 | 9.94E-04 | 2.70E-04 | 3.07E-03 | 2.44E-06 | 2.43E-01 | 0.00E+00 | 2.44E-05 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Welders | D | 15 | Light Commercial Equipment | U | P | NHH | P | San Benito | NCC | MBU | 1.82E+00 | 3.21E+00 | 9.14E-01 | 2.06E-05 | 7.17E-05 | 1.19E-04 | 9.95E-03 | 1.55E-07 | 8.77E-06 | 0.00E+00 | 1.86E-06 | 2.73E-06 | 2.24E-05 | 6.42E-06 | 3.70E-05 | 4.83E-08 | 3.10E-03 | 0.00E+00 | 5.79E-07 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Welders | D | 25 | Light Commercial Equipment | U | P | NHH | P | San Benito | NCC | MBU | 1.60E+00 | 2.82E+00 | 1.46E+00 | 3.75E-05 | 9.62E-05 | 1.56E-04 | 1.59E-02 | 2.02E-07 | 1.13E-05 | 0.00E+00 | 3.38E-06 | 4.00E-06 | 3.41E-05 | 1.33E-05 | 5.53E-05 | 7.15E-08 | 5.64E-03 | 0.00E+00 | 1.20E-06 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Welders | D | 50 | Light Commercial Equipment | U | P | NHH | P | San Benito | NCC | MBU | 4.94E+00 | 8.69E+00 | 1.05E+01 | 5.49E-04 | 1.32E-03 | 1.19E-03 | 1.13E-01 | 1.46E-06 | 1.28E-04 | 0.00E+00 | 4.93E-05 | 1.47E-05 | 1.52E-04 | 6.32E-05 | 1.37E-04 | 1.68E-07 | 1.30E-02 | 0.00E+00 | 5.70E-06 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Welders | D | 120 | Light Commercial Equipment | U | P | NHH | P | San Benito | NCC | MBU | 3.84E+00 | 6.75E+00 | 1.22E+01 | 2.81E-04 | 9.26E-04 | 1.71E-03 | 1.33E-01 | 1.56E-06 | 1.47E-04 | 0.00E+00 | 2.53E-05 | 2.17E-05 | 1.37E-04 | 4.16E-05 | 2.53E-04 | 2.31E-07 | 1.97E-02 | 0.00E+00 | 3.75E-06 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Welders | D | 175 | Light Commercial Equipment | U | P | NHH | P | San Benito | NCC | MBU | 1.90E-02 | 3.34E-02 | 1.50E-01 | 2.29E-06 | 9.22E-06 | 1.88E-05 | 1.64E-03 | 1.85E-08 | 1.00E-06 | 0.00E+00 | 2.07E-07 | 2.99E-05 | 2.76E-04 | 6.85E-05 | 5.63E-04 | 5.52E-07 | 4.91E-02 | 0.00E+00 | 6.18E-06 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Welders | D | 250 | Light Commercial Equipment | U | N | NHH | P | San Benito | NCC | MBU | 4.22E-03 | 7.43E-03 | 4.01E-02 | 4.11E-07 | 1.19E-06 | 4.76E-06 | 4.42E-04 | 4.97E-09 | 1.57E-07 | 0.00E+00 | 3.71E-08 | 2.12E-05 | 1.60E-04 | 5.53E-05 | 6.40E-04 | 6.69E-07 | 5.95E-02 | 0.00E+00 | 4.99E-06 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Welders | D | 500 | Light Commercial Equipment | U | N | NHH | P | San Benito | NCC | MBU | 1.06E-02 | 1.86E-02 | 1.41E-01 | 1.29E-06 | 4.87E-06 | 1.51E-05 | 1.56E-03 | 1.53E-08 | 5.08E-07 | 0.00E+00 | 1.17E-07 | 2.74E-05 | 2.62E-04 | 6.97E-05 | 8.12E-04 | 8.22E-07 | 8.37E-02 | 0.00E+00 | 6.29E-06 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Pressure Washers | D | 15 | Light Commercial Equipment | U | N | NHH | P | San Benito | NCC | MBU | 2.49E-01 | 9.89E-02 | 2.22E-02 | 4.25E-07 | 1.74E-06 | 2.81E-06 | 2.42E-04 | 3.76E-09 | 1.71E-07 | 0.00E+00 | 3.83E-08 | 1.73E-06 | 1.76E-05 | 4.30E-06 | 2.84E-05 | 3.80E-08 | 2.44E-03 | 0.00E+00 | 3.88E-07 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Pressure Washers | D | 25 | Light Commercial Equipment | U | N | NHH | P | San Benito | NCC | MBU | 5.81E-02 | 2.30E-02 | 7.53E-03 | 1.47E-07 | 4.97E-07 | 8.06E-07 | 8.23E-05 | 1.04E-09 | 5.21E-08 | 0.00E+00 | 1.32E-08 | 2.26E-06 | 2.16E-05 | 6.36E-06 | 3.50E-05 | 4.53E-08 | 3.57E-03 | 0.00E+00 | 5.74E-07 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Pressure Washers | D | 50 | Light Commercial Equipment | U | P | NHH | P | San Benito | NCC | MBU | 1.15E-01 | 4.57E-02 | 3.01E-02 | 9.84E-07 | 2.65E-06 | 3.20E-06 | 3.26E-04 | 4.22E-09 | 2.71E-07 | 0.00E+00 | 8.87E-08 | 5.93E-06 | 5.80E-05 | 2.15E-05 | 7.01E-05 | 9.23E-08 | 7.14E-03 | 0.00E+00 | 1.94E-06 |
| 2009 | Annual | Mon-Sun | 2.27E+09 | Pressure Washers | D | 120 | Light Commercial Equipment | U | P | NHH | P | San Benito | NCC | MBU | 4.75E-02 | 1.89E-02 | 2.08E-02 | 3.81E-07 | 1.41E-06 | 2.61E-06 | 2.27E-04 | 2.66E-09 | 1.86E-07 | 0.00E+00 | 3.44E-08 | 9.87E-06 | 7.47E-05 | 2.02E-05 | 1.39E-04 | 1.41E-07 | 1.20E-02 | 0.00E+00 | 1.82E-06 |

**OFFROAD2007 Output CARB Emissions Inventory Model for Mobile Offroad Sources and Calculations for Tons/hr**

| CY | Season | AvgDays | Code | Equipment | Fuel | MaxHP | Class | C/R | Pre | Hand | Port | County | Air Basin | Air Dist. | Population | Activity (hr/day) total population | Consumption | ROG Exhaust (tons/day) | CO Exhaust (tons/day) | NOX Exhaust (tons/day) | CO2 Exhaust (tons/day) | SO2 Exhaust (tons/day) | PM Exhaust (tons/day) | N2O Exhaust (tons/day) | CH4 Exhaust (tons/day) | PM Exhaust/Activity (tons/hr) | ROG Exhaust/Activity (tons/hr) | NOX Exhaust/Activity (tons/hr) | SO2 Exhaust/Activity (tons/hr) | CO2 Exhaust/Activity (tons/hr) | N2O Exhaust/Activity (tons/hr) | CH4 Exhaust/Activity (tons/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2009 | Annual | Mon-Sun | 2.26E+09 | Tampers/Rammers | G2 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 4.14E+00 | 2.07E+00 | 4.17E-01 | 2.64E-05 | 1.13E-03 | 2.05E-05 | 2.15E-03 | 8.87E-08 | 1.81E-05 | 3.21E-06 | 1.64E-06 | 8.73E-06 | 5.46E-04 | 1.28E-05 | 9.92E-06 | 4.29E-08 | 1.04E-03 | 1.55E-06 | 7.93E-07 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Plate Compactors | G2 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 3.56E-01 | 2.01E-01 | 4.05E-02 | 2.54E-06 | 1.09E-04 | 1.99E-06 | 2.09E-04 | 8.61E-09 | 1.75E-06 | 3.12E-07 | 1.58E-07 | 8.73E-06 | 5.45E-04 | 1.27E-05 | 9.92E-06 | 4.29E-08 | 1.04E-03 | 1.55E-06 | 7.88E-07 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Other General Industrial Equipmen | G2 | | 15 Industrial Equipment | U | N | NHH | NP | San Benito | NCC | MBU | 8.17E-02 | 8.40E-02 | 3.31E-02 | 1.56E-06 | 8.99E-05 | 1.20E-06 | 1.72E-04 | 7.08E-09 | 8.00E-08 | 1.58E-07 | 9.72E-08 | 9.52E-07 | 1.07E-03 | 1.86E-05 | 1.42E-05 | 8.42E-08 | 2.04E-03 | 1.88E-06 | 1.16E-06 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Generator Sets | G2 | | 2 Light Commercial Equipment | C | N | NHH | P | San Benito | NCC | MBU | 2.21E+00 | 8.14E-01 | 5.83E-02 | 2.01E-05 | 1.42E-04 | 2.10E-06 | 2.62E-04 | 1.08E-08 | 1.18E-06 | 6.05E-07 | 1.25E-06 | 1.45E-06 | 1.75E-04 | 2.46E-05 | 2.58E-06 | 1.33E-08 | 3.22E-04 | 7.43E-07 | 1.53E-06 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Generator Sets | G2 | | 2 Light Commercial Equipment | R | N | NHH | P | San Benito | NCC | MBU | 1.74E+00 | 4.30E-01 | 3.37E-02 | 1.42E-05 | 8.41E-05 | 1.06E-06 | 1.39E-04 | 5.71E-09 | 7.17E-07 | 3.10E-07 | 8.84E-07 | 1.67E-06 | 1.95E-04 | 3.31E-05 | 2.47E-06 | 1.33E-08 | 3.22E-04 | 7.20E-07 | 2.05E-06 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Generator Sets | G2 | | 15 Light Commercial Equipment | C | N | NHH | P | San Benito | NCC | MBU | 2.23E-02 | 8.21E-03 | 4.88E-03 | 5.19E-07 | 1.36E-05 | 1.93E-07 | 2.38E-05 | 9.80E-10 | 1.83E-08 | 2.00E-08 | 3.22E-08 | 2.22E-06 | 1.65E-03 | 6.31E-05 | 2.35E-05 | 1.19E-07 | 2.90E-03 | 2.44E-06 | 3.92E-06 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Generator Sets | G2 | | 15 Light Commercial Equipment | R | N | NHH | P | San Benito | NCC | MBU | 1.70E-02 | 4.21E-03 | 2.76E-03 | 6.74E-07 | 7.59E-06 | 8.77E-08 | 1.22E-05 | 5.02E-10 | 2.58E-08 | 9.43E-09 | 4.19E-08 | 6.12E-06 | 1.80E-03 | 1.60E-04 | 2.08E-05 | 1.19E-07 | 2.90E-03 | 2.24E-06 | 9.95E-06 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Pumps | G2 | | 2 Light Commercial Equipment | C | N | NHH | P | San Benito | NCC | MBU | 8.80E+00 | 6.22E+00 | 3.58E-01 | 6.73E-05 | 7.43E-04 | 1.79E-05 | 2.03E-03 | 8.36E-08 | 7.35E-06 | 4.93E-06 | 4.18E-06 | 1.18E-06 | 1.19E-04 | 1.00E-05 | 2.87E-06 | 1.35E-08 | 3.27E-04 | 7.93E-07 | 6.73E-07 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Pumps | G2 | | 2 Light Commercial Equipment | R | N | NHH | P | San Benito | NCC | MBU | 6.91E+00 | 3.28E+00 | 2.29E-01 | 7.23E-05 | 5.50E-04 | 8.71E-06 | 1.07E-03 | 4.42E-08 | 4.63E-06 | 2.48E-06 | 4.49E-06 | 1.41E-06 | 1.68E-04 | 2.20E-05 | 2.65E-06 | 1.35E-08 | 3.27E-04 | 7.56E-07 | 1.37E-06 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Pumps | G2 | | 15 Light Commercial Equipment | C | P | NHH | P | San Benito | NCC | MBU | 2.37E+00 | 1.68E+00 | 8.67E-01 | 6.45E-05 | 2.38E-03 | 4.12E-05 | 4.38E-03 | 1.80E-07 | 3.67E-05 | 4.22E-06 | 4.01E-06 | 2.19E-05 | 1.42E-03 | 3.85E-05 | 2.46E-05 | 1.08E-07 | 2.61E-03 | 2.52E-06 | 2.39E-06 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Pumps | G2 | | 15 Light Commercial Equipment | R | P | NHH | P | San Benito | NCC | MBU | 1.86E+00 | 8.86E-01 | 4.96E-01 | 8.34E-05 | 1.37E-03 | 1.96E-05 | 2.31E-03 | 9.53E-08 | 1.94E-05 | 2.08E-06 | 5.18E-06 | 2.19E-05 | 1.55E-03 | 9.42E-05 | 2.21E-05 | 1.08E-07 | 2.61E-03 | 2.35E-06 | 5.85E-06 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Pumps | G2 | | 25 Light Commercial Equipment | C | P | NHH | P | San Benito | NCC | MBU | 2.87E-02 | 2.03E-02 | 2.25E-02 | 1.51E-06 | 6.31E-05 | 9.99E-07 | 1.13E-04 | 4.64E-09 | 9.44E-07 | 7.40E-08 | 9.40E-08 | 4.65E-05 | 3.11E-03 | 7.45E-05 | 4.93E-05 | 2.29E-07 | 5.55E-03 | 3.65E-06 | 4.63E-06 |
| 2009 | Annual | Mon-Sun | 2.26E+09 | Pumps | G2 | | 25 Light Commercial Equipment | R | P | NHH | P | San Benito | NCC | MBU | 2.23E-02 | 1.06E-02 | 1.22E-02 | 1.21E-06 | 3.44E-05 | 4.83E-07 | 5.89E-05 | 2.43E-09 | 4.94E-07 | 3.69E-08 | 7.53E-08 | 4.65E-05 | 3.25E-03 | 1.14E-04 | 4.56E-05 | 2.29E-07 | 5.55E-03 | 3.48E-06 | 7.09E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Asphalt Pavers | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 9.04E-02 | 9.82E-02 | 5.96E-02 | 4.61E-06 | 1.79E-04 | 3.34E-06 | 2.76E-04 | 7.87E-09 | 2.31E-06 | 2.81E-07 | 2.43E-07 | 2.36E-05 | 1.82E-03 | 4.70E-05 | 3.40E-05 | 8.02E-08 | 2.81E-03 | 2.86E-06 | 2.48E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Asphalt Pavers | G4 | | 25 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.53E-01 | 1.68E-01 | 2.57E-01 | 2.04E-05 | 7.94E-04 | 1.29E-05 | 1.15E-03 | 2.92E-08 | 9.67E-06 | 7.42E-07 | 1.07E-06 | 5.76E-05 | 4.73E-03 | 1.21E-04 | 7.68E-05 | 1.74E-07 | 6.87E-03 | 4.42E-06 | 6.39E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Asphalt Pavers | G4 | | 50 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 8.48E-02 | 9.11E-02 | 2.17E-01 | 9.78E-06 | 2.48E-04 | 1.45E-05 | 1.66E-03 | 2.02E-08 | 1.27E-07 | 5.68E-07 | 5.15E-07 | 1.40E-06 | 2.73E-03 | 1.07E-04 | 1.59E-04 | 2.22E-07 | 1.82E-02 | 6.24E-06 | 5.66E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Asphalt Pavers | G4 | | 120 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 4.66E-02 | 5.01E-02 | 2.00E-01 | 6.89E-06 | 1.14E-04 | 2.14E-05 | 1.72E-03 | 1.66E-08 | 1.33E-07 | 5.14E-07 | 3.63E-07 | 2.66E-06 | 2.28E-03 | 1.38E-04 | 4.28E-04 | 3.32E-07 | 3.44E-02 | 1.03E-05 | 7.25E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Tampers/Rammers | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.91E-01 | 9.55E-02 | 4.96E-02 | 4.33E-06 | 1.52E-04 | 2.54E-06 | 2.24E-04 | 6.38E-09 | 1.87E-06 | 2.39E-07 | 2.28E-07 | 1.96E-05 | 1.59E-03 | 4.53E-05 | 2.66E-05 | 6.68E-08 | 2.34E-03 | 2.51E-06 | 2.39E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Plate Compactors | G4 | | 5 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 7.02E+00 | 3.47E+00 | 6.53E-01 | 9.52E-05 | 1.48E-03 | 4.18E-05 | 3.61E-03 | 1.25E-07 | 1.18E-06 | 5.70E-06 | 5.02E-06 | 3.40E-05 | 4.27E-04 | 2.75E-05 | 1.21E-05 | 3.60E-08 | 1.04E-03 | 1.65E-06 | 1.45E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Plate Compactors | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 7.45E+00 | 4.21E+00 | 1.92E+00 | 1.61E-04 | 5.85E-03 | 1.02E-04 | 8.76E-03 | 2.50E-07 | 7.35E-05 | 1.00E-05 | 8.48E-06 | 1.75E-05 | 1.39E-03 | 3.82E-05 | 2.42E-05 | 5.94E-08 | 2.08E-03 | 2.38E-06 | 2.01E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Rollers | G4 | | 5 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 7.82E-01 | 1.78E-01 | 5.01E-02 | 6.19E-06 | 1.27E-04 | 2.61E-06 | 9.02E-04 | 9.52E-08 | 3.22E-07 | 3.27E-07 | 4.78E-07 | 7.11E-04 | 3.48E-05 | 1.55E-05 | 5.07E-08 | 1.47E-03 | 1.86E-06 | 1.83E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Rollers | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.27E+00 | 1.08E+00 | 6.13E-01 | 4.70E-05 | 1.84E-03 | 3.40E-05 | 2.84E-03 | 8.10E-08 | 2.38E-05 | 2.96E-06 | 2.48E-06 | 2.21E-05 | 1.71E-03 | 4.37E-05 | 3.16E-05 | 7.53E-08 | 2.64E-03 | 2.75E-06 | 2.30E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Rollers | G4 | | 25 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 8.54E-01 | 7.26E-01 | 9.01E-01 | 7.07E-05 | 2.78E-03 | 4.48E-05 | 4.05E-03 | 1.03E-07 | 3.39E-05 | 2.86E-06 | 3.73E-06 | 4.67E-05 | 3.83E-03 | 9.74E-05 | 6.17E-05 | 1.41E-07 | 5.58E-03 | 3.93E-06 | 5.14E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Rollers | G4 | | 50 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 5.97E-02 | 1.02E-01 | 2.71E-01 | 1.40E-05 | 3.50E-04 | 1.77E-05 | 2.01E-03 | 2.45E-08 | 1.54E-07 | 6.68E-07 | 7.36E-07 | 1.52E-06 | 3.44E-03 | 1.38E-04 | 1.74E-04 | 2.41E-07 | 1.98E-02 | 6.57E-06 | 7.24E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Rollers | G4 | | 120 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.12E-01 | 1.91E-01 | 8.94E-01 | 3.58E-05 | 5.78E-04 | 9.33E-05 | 7.59E-03 | 7.33E-08 | 5.88E-07 | 2.11E-06 | 1.88E-06 | 3.08E-06 | 3.03E-03 | 1.87E-04 | 4.88E-04 | 3.84E-07 | 3.97E-02 | 1.10E-05 | 9.83E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Paving Equipment | G4 | | 5 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 9.83E+00 | 4.58E+00 | 9.30E-01 | 1.34E-04 | 2.13E-03 | 5.88E-05 | 5.12E-03 | 1.77E-07 | 1.67E-06 | 7.79E-06 | 7.07E-06 | 3.64E-05 | 4.65E-04 | 2.92E-05 | 1.28E-05 | 3.86E-08 | 1.12E-03 | 1.70E-06 | 1.54E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Paving Equipment | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.66E+01 | 9.12E+00 | 5.59E+00 | 4.66E-04 | 1.70E-02 | 2.95E-04 | 2.52E-02 | 7.26E-07 | 2.13E-04 | 2.53E-05 | 2.46E-05 | 2.34E-04 | 1.86E-03 | 5.11E-05 | 3.23E-05 | 7.96E-08 | 2.79E-03 | 2.78E-06 | 2.70E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Paving Equipment | G4 | | 25 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 3.70E-01 | 2.03E-01 | 2.80E-01 | 2.33E-05 | 8.73E-04 | 1.32E-05 | 1.25E-03 | 3.16E-08 | 1.04E-05 | 8.19E-07 | 1.23E-06 | 5.15E-05 | 4.31E-03 | 1.15E-04 | 6.53E-05 | 1.56E-07 | 6.14E-03 | 4.04E-06 | 6.06E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Paving Equipment | G4 | | 50 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 2.32E-01 | 1.11E-01 | 2.61E-01 | 8.75E-06 | 2.48E-04 | 1.54E-05 | 2.10E-03 | 2.55E-08 | 1.60E-07 | 6.27E-07 | 4.61E-07 | 1.44E-06 | 2.23E-03 | 7.87E-05 | 1.39E-04 | 2.29E-07 | 1.88E-02 | 5.64E-06 | 4.15E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Paving Equipment | G4 | | 120 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 5.97E-02 | 2.86E-02 | 1.07E-01 | 2.64E-06 | 4.75E-05 | 9.88E-06 | 9.52E-04 | 9.20E-09 | 7.38E-08 | 2.52E-07 | 1.39E-07 | 2.58E-06 | 1.66E-03 | 9.20E-05 | 3.45E-04 | 3.21E-07 | 3.32E-02 | 8.78E-06 | 4.83E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Surfacing Equipment | G4 | | 5 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.80E+00 | 9.90E-01 | 2.06E-01 | 3.07E-05 | 4.59E-04 | 1.35E-05 | 1.15E-03 | 3.96E-08 | 3.74E-07 | 1.74E-06 | 1.62E-06 | 3.78E-07 | 4.64E-04 | 3.10E-05 | 1.36E-05 | 4.00E-08 | 1.16E-03 | 1.76E-06 | 1.64E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Surfacing Equipment | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 5.36E+00 | 7.40E+00 | 2.97E+00 | 2.39E-04 | 8.90E-03 | 1.72E-04 | 1.37E-02 | 3.91E-07 | 1.15E-04 | 1.73E-05 | 1.26E-05 | 1.56E-05 | 1.20E-03 | 3.23E-05 | 2.33E-05 | 5.29E-08 | 1.86E-03 | 2.34E-06 | 1.70E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Surfacing Equipment | G4 | | 25 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 7.34E-02 | 1.01E-01 | 9.95E-02 | 8.19E-06 | 3.07E-04 | 5.18E-06 | 4.46E-04 | 1.13E-08 | 3.74E-06 | 3.60E-07 | 4.31E-07 | 3.69E-05 | 3.03E-03 | 8.09E-05 | 5.12E-05 | 1.12E-07 | 4.41E-03 | 3.56E-06 | 4.26E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Signal Boards | G4 | | 5 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 2.23E-02 | 7.94E-03 | 2.68E-03 | 3.54E-07 | 6.50E-06 | 1.55E-07 | 1.43E-05 | 4.93E-10 | 4.66E-09 | 1.69E-08 | 1.86E-08 | 5.86E-07 | 8.19E-04 | 4.45E-05 | 1.95E-05 | 6.21E-08 | 1.80E-03 | 2.13E-06 | 2.35E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Signal Boards | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.59E-01 | 1.23E-01 | 7.66E-02 | 5.84E-06 | 2.30E-04 | 4.22E-06 | 3.55E-04 | 1.01E-08 | 2.98E-06 | 3.54E-07 | 3.08E-07 | 2.41E-05 | 1.86E-03 | 4.73E-05 | 3.42E-05 | 8.21E-08 | 2.88E-03 | 2.87E-06 | 2.49E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Trenchers | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.47E+00 | 1.74E+00 | 1.18E+00 | 9.25E-05 | 3.54E-03 | 6.69E-05 | 5.45E-03 | 1.55E-07 | 4.57E-05 | 5.32E-06 | 4.87E-06 | 2.62E-05 | 2.03E-03 | 5.30E-05 | 3.83E-05 | 8.91E-08 | 3.12E-03 | 3.05E-06 | 2.79E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Trenchers | G4 | | 25 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.14E+00 | 1.35E+00 | 1.98E+00 | 1.59E-04 | 6.11E-03 | 1.01E-04 | 8.87E-03 | 2.25E-07 | 7.44E-05 | 5.87E-06 | 8.37E-06 | 5.50E-05 | 4.52E-03 | 1.18E-04 | 7.44E-05 | 1.66E-07 | 6.56E-03 | 4.34E-06 | 6.19E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Trenchers | G4 | | 50 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 5.43E-01 | 5.99E-01 | 1.33E+00 | 6.00E-05 | 1.54E-03 | 8.70E-05 | 1.02E-02 | 1.24E-07 | 7.84E-07 | 3.55E-06 | 3.16E-06 | 1.31E-06 | 2.57E-03 | 1.00E-04 | 1.45E-04 | 2.08E-07 | 1.71E-02 | 5.93E-06 | 5.27E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Trenchers | G4 | | 120 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.80E-01 | 1.99E-01 | 8.57E-01 | 4.86E-04 | 8.99E-03 | 5.39E-07 | 7.14E-04 | 5.73E-07 | 2.05E-06 | 1.54E-06 | 4.48E-06 | 2.45E-03 | 1.48E-04 | 3.59E-07 | 1.05E-05 | 7.77E-08 | 1.03E-03 | 7.37E-06 | 1.77E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Bore/Drill Rigs | G4 | | 15 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 4.19E-02 | 1.43E-02 | 1.18E-02 | 1.00E-06 | 3.62E-05 | 5.84E-07 | 5.33E-05 | 1.52E-09 | 4.46E-07 | 4.49E-08 | 5.28E-08 | 3.13E-05 | 2.54E-03 | 7.03E-05 | 4.10E-05 | 1.07E-07 | 3.74E-03 | 3.15E-06 | 3.70E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Bore/Drill Rigs | G4 | | 25 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 2.08E-01 | 7.08E-02 | 1.08E-01 | 8.99E-06 | 3.38E-04 | 4.79E-06 | 4.77E-04 | 1.21E-08 | 3.99E-06 | 2.91E-07 | 4.74E-07 | 5.64E-05 | 4.77E-03 | 1.27E-04 | 6.76E-05 | 1.71E-07 | 6.73E-03 | 4.11E-06 | 6.69E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Bore/Drill Rigs | G4 | | 50 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 2.63E-02 | 7.71E-03 | 2.10E-02 | 7.39E-07 | 1.99E-05 | 1.36E-06 | 1.68E-04 | 2.05E-09 | 1.29E-07 | 5.01E-08 | 3.90E-08 | 1.67E-06 | 2.59E-03 | 9.59E-05 | 1.77E-04 | 2.65E-07 | 2.18E-02 | 6.50E-06 | 5.05E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Bore/Drill Rigs | G4 | | 120 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 1.21E-01 | 3.54E-02 | 2.38E-01 | 6.22E-06 | 1.09E-04 | 2.46E-05 | 2.10E-03 | 2.03E-08 | 1.63E-07 | 4.66E-07 | 3.28E-07 | 4.60E-06 | 3.08E-03 | 1.76E-04 | 6.95E-04 | 5.73E-07 | 5.94E-02 | 1.32E-05 | 9.26E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Bore/Drill Rigs | G4 | | 175 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 2.99E-02 | 8.76E-03 | 7.95E-02 | 1.24E-06 | 2.49E-05 | 9.59E-06 | 7.24E-04 | 7.19E-09 | 5.77E-08 | 1.47E-07 | 6.53E-08 | 6.58E-06 | 2.84E-03 | 1.41E-04 | 1.09E-03 | 8.21E-07 | 8.26E-02 | 1.68E-05 | 7.46E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Concrete/Industrial Saws | G4 | | 5 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 7.69E-01 | 2.74E-01 | 7.59E-02 | 1.00E-05 | 1.84E-04 | 4.40E-06 | 4.05E-04 | 1.40E-08 | 1.32E-07 | 5.25E-07 | 5.29E-07 | 4.81E-07 | 6.72E-04 | 3.66E-05 | 5.10E-05 | 1.08E-07 | 1.48E-03 | 1.92E-06 | 1.93E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Concrete/Industrial Saws | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 3.46E+00 | 2.94E+00 | 2.11E+00 | 1.62E-04 | 6.33E-03 | 1.17E-04 | 9.77E-03 | 2.79E-07 | 8.19E-05 | 9.15E-06 | 8.52E-06 | 2.79E-05 | 2.15E-03 | 5.50E-05 | 3.98E-05 | 9.48E-08 | 3.32E-03 | 3.11E-06 | 2.90E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Concrete/Industrial Saws | G4 | | 25 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.08E+00 | 9.20E-01 | 1.28E+00 | 1.01E-04 | 3.97E-03 | 6.39E-05 | 5.78E-03 | 1.46E-07 | 4.84E-05 | 3.85E-06 | 5.32E-06 | 5.26E-05 | 4.31E-03 | 1.10E-04 | 6.94E-05 | 1.59E-07 | 6.28E-03 | 4.19E-06 | 5.78E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Concrete/Industrial Saws | G4 | | 50 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 9.79E-02 | 1.64E-01 | 4.59E-01 | 5.10E-06 | 3.51E-04 | 7.44E-06 | 3.86E-03 | 4.69E-08 | 2.96E-07 | 5.46E-07 | 2.68E-07 | 1.81E-06 | 2.15E-03 | 3.12E-05 | 4.54E-05 | 2.87E-07 | 2.36E-02 | 3.33E-06 | 1.64E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Concrete/Industrial Saws | G4 | | 120 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 5.61E-02 | 9.39E-02 | 4.44E-01 | 2.10E-06 | 9.58E-05 | 4.86E-06 | 4.13E-03 | 3.99E-08 | 3.20E-07 | 3.34E-07 | 1.10E-07 | 3.40E-06 | 1.02E-03 | 2.24E-05 | 5.17E-05 | 4.25E-07 | 4.40E-02 | 3.55E-06 | 1.18E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Cement and Mortar Mixers | G4 | | 5 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.40E+01 | 3.52E+00 | 9.32E-01 | 1.20E-04 | 2.30E-03 | 5.25E-05 | 4.92E-03 | 1.70E-07 | 1.60E-06 | 6.48E-06 | 6.31E-06 | 4.55E-07 | 6.53E-04 | 3.40E-05 | 1.49E-05 | 4.82E-08 | 1.40E-03 | 1.84E-06 | 1.79E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Cement and Mortar Mixers | G4 | | 15 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 2.37E+01 | 5.97E+00 | 3.25E+00 | 3.86E-04 | 1.06E-02 | 1.33E-02 | 1.27E-04 | 3.80E-07 | 1.04E-04 | 1.32E-05 | 2.04E-05 | 1.74E-05 | 1.77E-03 | 6.47E-05 | 2.12E-05 | 6.37E-08 | 2.23E-03 | 2.22E-06 | 3.41E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Cement and Mortar Mixers | G4 | | 25 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 9.96E-02 | 2.51E-02 | 4.25E-02 | 4.61E-06 | 1.38E-04 | 1.48E-06 | 1.75E-04 | 4.45E-09 | 1.37E-06 | 9.56E-08 | 2.43E-07 | 5.43E-05 | 5.49E-03 | 1.84E-04 | 5.89E-05 | 1.77E-07 | 6.98E-03 | 3.81E-06 | 9.68E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Cranes | G4 | | 50 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 2.99E-02 | 3.40E-02 | 6.66E-02 | 3.02E-06 | 7.73E-05 | 4.34E-06 | 5.10E-04 | 6.20E-09 | 3.91E-08 | 1.88E-07 | 1.59E-07 | 1.15E-06 | 2.28E-03 | 8.89E-05 | 1.28E-04 | 1.83E-07 | 1.50E-02 | 5.54E-06 | 4.68E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Cranes | G4 | | 120 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 5.97E-02 | 6.79E-02 | 2.34E-01 | 8.09E-06 | 1.34E-04 | 2.43E-05 | 2.02E-03 | 1.95E-08 | 1.56E-07 | 6.33E-07 | 4.26E-07 | 2.30E-06 | 1.97E-03 | 1.19E-04 | 3.58E-04 | 2.87E-07 | 2.97E-02 | 9.31E-06 | 6.27E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Cranes | G4 | | 175 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 2.39E-03 | 2.72E-03 | 1.47E-02 | 2.56E-07 | 5.03E-06 | 1.84E-06 | 1.33E-04 | 1.32E-09 | 1.06E-08 | 3.55E-08 | 1.35E-08 | 3.89E-06 | 1.85E-03 | 9.42E-05 | 6.77E-04 | 4.85E-07 | 4.88E-02 | 1.31E-05 | 4.96E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Crushing/Proc. Equipment | G4 | | 15 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 3.80E-02 | 3.01E-02 | 2.35E-02 | 1.79E-06 | 7.06E-05 | 1.30E-06 | 1.09E-04 | 3.11E-09 | 9.14E-07 | 9.78E-08 | 9.46E-08 | 3.04E-05 | 2.34E-03 | 5.96E-05 | 4.31E-05 | 1.03E-07 | 3.62E-03 | 3.25E-06 | 3.14E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Crushing/Proc. Equipment | G4 | | 25 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 2.49E-02 | 1.97E-02 | 2.92E-02 | 2.21E-06 | 8.73E-05 | 1.40E-06 | 1.27E-04 | 3.22E-09 | 1.06E-07 | 8.35E-08 | 1.16E-07 | 5.40E-05 | 4.42E-03 | 1.12E-04 | 7.05E-05 | 1.63E-07 | 6.44E-03 | 4.23E-06 | 5.90E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Crushing/Proc. Equipment | G4 | | 120 Construction and Mining Equipment | U | P | NHH | P | San Benito | NCC | MBU | 3.46E-02 | 2.29E-02 | 1.82E-01 | 5.45E-06 | 9.28E-05 | 1.89E-05 | 1.59E-03 | 1.54E-08 | 1.23E-07 | 3.32E-07 | 2.87E-07 | 5.40E-06 | 4.05E-03 | 2.38E-04 | 8.26E-04 | 6.73E-07 | 6.97E-02 | 1.45E-05 | 1.25E-05 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Rough Terrain Forklifts | G4 | | 50 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.19E-02 | 1.35E-02 | 4.52E-02 | 2.04E-06 | 5.23E-05 | 2.94E-06 | 3.46E-04 | 4.20E-09 | 2.65E-08 | 9.94E-08 | 1.08E-07 | 1.96E-06 | 3.87E-03 | 2.18E-04 | 3.11E-07 | 2.56E-02 | 7.35E-06 | 7.96E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Rough Terrain Forklifts | G4 | | 120 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 1.70E-01 | 1.92E-01 | 1.02E+00 | 3.52E-05 | 5.82E-04 | 1.06E-04 | 8.78E-03 | 8.48E-08 | 6.80E-07 | 2.25E-06 | 1.85E-06 | 3.54E-06 | 3.03E-03 | 1.83E-04 | 5.51E-04 | 4.42E-07 | 4.57E-02 | 1.17E-05 | 9.64E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Rough Terrain Forklifts | G4 | | 175 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 5.97E-03 | 6.76E-03 | 5.55E-02 | 9.70E-07 | 1.90E-05 | 6.97E-06 | 5.02E-04 | 4.99E-09 | 4.00E-08 | 1.11E-07 | 5.11E-08 | 5.92E-06 | 2.82E-03 | 1.43E-04 | 1.03E-03 | 7.38E-07 | 7.43E-02 | 1.64E-05 | 7.55E-06 |
| 2009 | Annual | Mon-Sun | 2.26S.E+09 | Rubber Tired Loaders | G4 | | 50 Construction and Mining Equipment | U | P | NHH | NP | San Benito | NCC | MBU | 2.98E-02 | 4.19E-02 | 1.04E-01 | 5.05E

| | | |

Title : Pinnacle_ElvapPond
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2009/07/15 14:55:39
Scen Year: 2009 -- All model years in the range 1965 to 2009 selected.
Season : Annual
Area : San Benito

Year: 2009 -- Model Years 1965 to 2009 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average — San Benito — County Average

Table 1: Running Exhaust Emissions (grams/mile, grams/idle-hour)

Pollutant Name: Total Organic Gases — Temperature: 90F — Relative Humidity: 30%

| Speed MPH | LDA NCAT | LDA CAT | LDA DSL | LDA ALL | LDT1 NCAT | LDT1 CAT | LDT1 DSL | LDT1 ALL | LDT2 NCAT | LDT2 CAT | LDT2 DSL | LDT2 ALL | MDV NCAT | MDV CAT | MDV DSL | MDV ALL | LHD1 NCAT | LHD1 CAT | LHD1 DSL | LHD1 ALL | LHD2 NCAT | LHD2 CAT | LHD2 DSL | LHD2 ALL | MHD NCAT | MHD CAT | MHD DSL | MHD ALL | HHD NCAT | HHD CAT | HHD DSL | HHD ALL | OBUS NCAT | OBUS CAT | OBUS DSL | OBUS ALL | UBUS NCAT | UBUS CAT | UBUS DSL | UBUS ALL | MCY NCAT | MCY CAT | MCY DSL | MCY ALL | SBUS NCAT | SBUS CAT | SBUS DSL | SBUS ALL | MH NCAT | MH CAT | MH DSL | MH ALL | ALL NCAT | ALL CAT | ALL DSL | ALL ALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23.669 | 25.938 | 3.612 | 18.517 | 23.668 | 24.804 | 3.612 | 12.659 | 23.777 | 24.346 | 3.612 | 6.2 | 0 | 0 | 15.411 | 15.281 | 0 | 24.12 | 3.612 | 10.601 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23.668 | 24.123 | 3.612 | 6.741 | 0 | 0 | 0 | 0 | 0.421 | 0.727 | 12.929 | 3.513 |
| 5 | 20.892 | 0.626 | 0.366 | 0.816 | 20.339 | 0.96 | 0.236 | 1.157 | 20.407 | 0.765 | 0.39 | 0.881 | 25.976 | 0.787 | 0.197 | 0.892 | 19.715 | 0.496 | 0.484 | 0.535 | 19.714 | 1.932 | 0.685 | 1.338 | 29.701 | 6.158 | 0.936 | 1.851 | 102.956 | 14.22 | 13.235 | 13.256 | 0 | 5.173 | 0.774 | 2.273 | 35.824 | 9.932 | 1.564 | 8.571 | 6.068 | 4.263 | 0 | 5.444 | 29.565 | 15.744 | 1.121 | 3.885 | 29.699 | 2.244 | 0.335 | 2.579 | 11.841 | 0.836 | 10.839 | 3.329 |
| 10 | 14.881 | 0.419 | 0.287 | 0.554 | 14.487 | 0.655 | 0.185 | 0.785 | 14.536 | 0.514 | 0.306 | 0.598 | 18.501 | 0.526 | 0.155 | 0.602 | 12.922 | 0.325 | 0.38 | 0.372 | 12.921 | 1.267 | 0.537 | 0.928 | 19.465 | 4.038 | 0.735 | 1.32 | 67.465 | 9.321 | 7.408 | 7.432 | 0 | 3.392 | 0.607 | 1.556 | 23.477 | 6.511 | 0.989 | 5.649 | 4.748 | 3.197 | 0 | 4.246 | 19.376 | 10.319 | 0.88 | 2.67 | 19.464 | 1.472 | 0.263 | 1.699 | 8.678 | 0.564 | 6.092 | 1.979 |
| 15 | 11.092 | 0.294 | 0.231 | 0.396 | 10.799 | 0.469 | 0.149 | 0.569 | 10.835 | 0.364 | 0.246 | 0.426 | 13.79 | 0.37 | 0.124 | 0.427 | 8.829 | 0.222 | 0.305 | 0.269 | 8.829 | 0.866 | 0.431 | 0.671 | 13.298 | 2.76 | 0.59 | 0.978 | 46.083 | 6.37 | 3.568 | 3.597 | 0 | 2.32 | 0.487 | 1.112 | 16.039 | 4.449 | 0.743 | 3.881 | 3.926 | 2.525 | 0 | 3.473 | 13.238 | 7.051 | 0.706 | 1.913 | 13.298 | 1.007 | 0.211 | 1.167 | 6.676 | 0.4 | 2.962 | 1.102 |
| 20 | 8.652 | 0.218 | 0.189 | 0.297 | 8.423 | 0.352 | 0.122 | 0.431 | 8.452 | 0.27 | 0.202 | 0.319 | 10.756 | 0.273 | 0.102 | 0.318 | 6.289 | 0.158 | 0.25 | 0.203 | 6.289 | 0.617 | 0.354 | 0.505 | 9.471 | 1.967 | 0.484 | 0.753 | 32.812 | 4.538 | 1.887 | 1.913 | 0 | 1.654 | 0.4 | 0.827 | 11.422 | 3.169 | 0.578 | 2.78 | 3.397 | 2.1 | 0 | 2.977 | 9.428 | 5.023 | 0.579 | 1.427 | 9.47 | 0.718 | 0.173 | 0.835 | 5.391 | 0.297 | 1.587 | 0.687 |
| 25 | 7.062 | 0.169 | 0.159 | 0.234 | 6.876 | 0.277 | 0.102 | 0.343 | 6.899 | 0.21 | 0.169 | 0.25 | 8.779 | 0.212 | 0.086 | 0.249 | 4.67 | 0.118 | 0.21 | 0.158 | 4.67 | 0.459 | 0.297 | 0.394 | 7.031 | 1.461 | 0.406 | 0.6 | 24.353 | 3.37 | 1.519 | 1.538 | 0 | 1.229 | 0.335 | 0.64 | 8.479 | 2.354 | 0.466 | 2.076 | 3.075 | 1.838 | 0 | 2.675 | 6.999 | 3.73 | 0.486 | 1.107 | 7.031 | 0.533 | 0.145 | 0.623 | 4.37 | 0.232 | 1.28 | 0.553 |
| 30 | 6.033 | 0.137 | 0.136 | 0.193 | 5.873 | 0.228 | 0.088 | 0.285 | 5.893 | 0.172 | 0.145 | 0.206 | 7.499 | 0.173 | 0.073 | 0.204 | 3.615 | 0.091 | 0.18 | 0.128 | 3.615 | 0.355 | 0.254 | 0.32 | 5.442 | 1.132 | 0.348 | 0.494 | 18.941 | 2.609 | 1.228 | 1.242 | 0 | 0.953 | 0.287 | 0.514 | 6.562 | 1.822 | 0.389 | 1.616 | 2.913 | 1.693 | 0 | 2.518 | 5.417 | 2.887 | 0.417 | 0.891 | 5.441 | 0.413 | 0.124 | 0.485 | 4.067 | 0.19 | 1.037 | 0.456 |
| 35 | 5.392 | 0.117 | 0.119 | 0.167 | 5.249 | 0.196 | 0.077 | 0.247 | 5.267 | 0.147 | 0.127 | 0.177 | 6.702 | 0.147 | 0.064 | 0.176 | 2.917 | 0.074 | 0.138 | 0.108 | 2.917 | 0.287 | 0.223 | 0.268 | 4.39 | 0.914 | 0.305 | 0.42 | 15.195 | 2.105 | 1.014 | 1.025 | 0 | 0.77 | 0.252 | 0.428 | 5.293 | 1.471 | 0.336 | 1.311 | 2.887 | 1.64 | 0 | 2.404 | 4.37 | 2.33 | 0.365 | 0.743 | 4.39 | 0.334 | 0.109 | 0.393 | 3.8 | 0.164 | 0.858 | 0.39 |
| 40 | 5.043 | 0.105 | 0.107 | 0.151 | 4.909 | 0.176 | 0.069 | 0.225 | 4.926 | 0.131 | 0.114 | 0.16 | 6.268 | 0.132 | 0.058 | 0.158 | 2.454 | 0.062 | 0.141 | 0.094 | 2.453 | 0.241 | 0.2 | 0.233 | 3.692 | 0.769 | 0.273 | 0.368 | 12.773 | 1.77 | 0.877 | 0.886 | 0 | 0.648 | 0.226 | 0.37 | 4.451 | 1.237 | 0.301 | 1.109 | 2.993 | 1.67 | 0 | 2.566 | 3.675 | 1.96 | 0.327 | 0.642 | 3.691 | 0.281 | 0.098 | 0.332 | 3.726 | 0.147 | 0.743 | 0.35 |
| 45 | 4.935 | 0.098 | 0.098 | 0.144 | 4.804 | 0.166 | 0.063 | 0.214 | 4.82 | 0.123 | 0.104 | 0.151 | 6.133 | 0.124 | 0.053 | 0.15 | 2.151 | 0.054 | 0.129 | 0.084 | 2.151 | 0.212 | 0.183 | 0.208 | 3.236 | 0.674 | 0.25 | 0.332 | 11.192 | 1.552 | 0.816 | 0.823 | 0 | 0.568 | 0.207 | 0.33 | 3.901 | 1.085 | 0.279 | 0.977 | 3.248 | 1.789 | 0 | 2.776 | 3.221 | 1.718 | 0.3 | 0.574 | 3.235 | 0.246 | 0.089 | 0.291 | 3.835 | 0.139 | 0.691 | 0.334 |
| 50 | 5.053 | 0.097 | 0.092 | 0.143 | 4.919 | 0.163 | 0.059 | 0.212 | 4.936 | 0.121 | 0.098 | 0.15 | 6.28 | 0.122 | 0.049 | 0.149 | 1.965 | 0.05 | 0.121 | 0.078 | 1.965 | 0.194 | 0.171 | 0.193 | 2.956 | 0.616 | 0.234 | 0.308 | 10.222 | 1.418 | 0.831 | 0.838 | 0 | 0.519 | 0.193 | 0.303 | 3.563 | 0.991 | 0.267 | 0.897 | 3.687 | 2.014 | 0 | 3.146 | 2.942 | 1.569 | 0.28 | 0.53 | 2.956 | 0.225 | 0.084 | 0.267 | 4.144 | 0.138 | 0.702 | 0.342 |
| 55 | 5.413 | 0.1 | 0.088 | 0.15 | 5.27 | 0.168 | 0.056 | 0.221 | 5.288 | 0.125 | 0.093 | 0.156 | 6.729 | 0.126 | 0.047 | 0.154 | 1.871 | 0.047 | 0.116 | 0.074 | 1.871 | 0.184 | 0.164 | 0.184 | 2.814 | 0.587 | 0.224 | 0.294 | 9.731 | 1.35 | 0.924 | 0.929 | 0 | 0.495 | 0.185 | 0.291 | 3.393 | 0.944 | 0.266 | 0.857 | 4.379 | 2.383 | 0 | 3.734 | 2.802 | 1.494 | 0.268 | 0.506 | 2.814 | 0.214 | 0.08 | 0.254 | 4.7 | 0.144 | 0.776 | 0.373 |
| 60 | 6.069 | 0.108 | 0.086 | 0.164 | 5.908 | 0.181 | 0.055 | 0.24 | 5.928 | 0.135 | 0.091 | 0.169 | 7.544 | 0.137 | 0.046 | 0.169 | 1.857 | 0.047 | 0.113 | 0.073 | 1.857 | 0.183 | 0.16 | 0.181 | 2.793 | 0.582 | 0.219 | 0.289 | 9.656 | 1.34 | 1.093 | 1.096 | 0 | 0.491 | 0.181 | 0.287 | 3.366 | 0.936 | 0.274 | 0.854 | 5.444 | 2.966 | 0 | 4.643 | 2.78 | 1.483 | 0.262 | 0.499 | 2.792 | 0.213 | 0.078 | 0.252 | 5.594 | 0.158 | 0.912 | 0.431 |
| 65 | 7.119 | 0.123 | 0.086 | 0.189 | 6.931 | 0.205 | 0.055 | 0.274 | 6.954 | 0.153 | 0.091 | 0.193 | 8.85 | 0.156 | 0.046 | 0.193 | 1.92 | 0.048 | 0.113 | 0.074 | 1.92 | 0.189 | 0.16 | 0.184 | 2.888 | 0.602 | 0.219 | 0.292 | 9.987 | 1.385 | 1.339 | 1.34 | 0 | 0.508 | 0.181 | 0.292 | 3.482 | 0.968 | 0.292 | 0.886 | 7.081 | 3.88 | 0 | 6.046 | 2.875 | 1.534 | 0.262 | 0.508 | 2.888 | 0.22 | 0.078 | 0.26 | 6.988 | 0.182 | 1.111 | 0.521 |

Pollutant Name: Carbon Monoxide — Temperature: 90F — Relative Humidity: 30%

| Speed MPH | LDA NCAT | LDA CAT | LDA DSL | LDA ALL | LDT1 NCAT | LDT1 CAT | LDT1 DSL | LDT1 ALL | LDT2 NCAT | LDT2 CAT | LDT2 DSL | LDT2 ALL | MDV NCAT | MDV CAT | MDV DSL | MDV ALL | LHD1 NCAT | LHD1 CAT | LHD1 DSL | LHD1 ALL | LHD2 NCAT | LHD2 CAT | LHD2 DSL | LHD2 ALL | MHD NCAT | MHD CAT | MHD DSL | MHD ALL | HHD NCAT | HHD CAT | HHD DSL | HHD ALL | OBUS NCAT | OBUS CAT | OBUS DSL | OBUS ALL | UBUS NCAT | UBUS CAT | UBUS DSL | UBUS ALL | MCY NCAT | MCY CAT | MCY DSL | MCY ALL | SBUS NCAT | SBUS CAT | SBUS DSL | SBUS ALL | MH NCAT | MH CAT | MH DSL | MH ALL | ALL NCAT | ALL CAT | ALL DSL | ALL ALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 138.675 | 146.177 | 26.3 | 106.34 | 138.672 | 142.428 | 26.3 | 75.891 | 139.033 | 140.913 | 26.3 | 40.616 | 0 | 0 | 54.638 | 54.18 | 0 | 140.168 | 26.3 | 65.106 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 138.672 | 140.178 | 26.3 | 43.708 | 0 | 0 | 0 | 0 | 2.466 | 4.123 | 47.482 | 14.011 |
| 5 | 206.148 | 6.527 | 2.514 | 8.391 | 196.324 | 12.03 | 2.188 | 13.513 | 194.755 | 8.782 | 2.704 | 9.875 | 373.72 | 7.625 | 2.039 | 9.186 | 382.37 | 4.171 | 3.026 | 4.63 | 382.362 | 18.508 | 3.486 | 12.366 | 575.025 | 60.818 | 9.824 | 21.931 | 2745.58 | 185.624 | 18.616 | 20.388 | 0 | 57.601 | 9.106 | 25.653 | 642.028 | 109.531 | 5.83 | 104.736 | 46.936 | 18.979 | 0 | 37.912 | 573.544 | 153.325 | 12.399 | 49.871 | 575.004 | 43.404 | 3.724 | 49.453 | 119.751 | 9.188 | 16.069 | 12.816 |
| 10 | 150.254 | 5.769 | 1.733 | 7.118 | 143.094 | 10.253 | 1.508 | 11.206 | 141.949 | 7.707 | 1.865 | 8.49 | 272.392 | 6.715 | 1.406 | 7.834 | 254.395 | 2.775 | 2.087 | 3.104 | 254.39 | 12.314 | 2.404 | 9.276 | 382.27 | 40.463 | 6.774 | 14.799 | 1826.666 | 123.498 | 13.834 | 15.001 | 0 | 38.323 | 6.279 | 17.199 | 427.149 | 72.872 | 3.669 | 69.615 | 38.31 | 16.303 | 0 | 31.331 | 381.585 | 102.009 | 8.349 | 33.434 | 382.557 | 28.878 | 2.568 | 32.917 | 88.835 | 7.798 | 11.888 | 10.239 |
| 15 | 115.332 | 5.157 | 1.251 | 6.179 | 109.836 | 8.921 | 1.089 | 9.561 | 108.957 | 6.852 | 1.346 | 7.444 | 209.082 | 5.989 | 1.015 | 6.834 | 178.822 | 1.95 | 1.506 | 2.195 | 178.818 | 8.656 | 1.735 | 5.843 | 268.92 | 28.443 | 4.888 | 10.514 | 1284.016 | 86.81 | 10.157 | 10.974 | 0 | 26.938 | 4.531 | 12.167 | 300.255 | 51.224 | 2.452 | 48.894 | 33.262 | 14.472 | 0 | 27.188 | 268.227 | 71.705 | 6.169 | 23.637 | 268.91 | 20.299 | 1.853 | 23.146 | 69.743 | 6.777 | 8.719 | 8.391 |
| 20 | 93.228 | 4.653 | 0.945 | 5.472 | 88.785 | 7.897 | 0.822 | 8.355 | 88.075 | 6.159 | 1.016 | 6.631 | 169.011 | 5.398 | 0.766 | 6.071 | 132.806 | 1.449 | 1.137 | 1.637 | 132.803 | 6.428 | 1.31 | 4.352 | 199.719 | 21.124 | 3.692 | 7.862 | 953.603 | 64.472 | 7.731 | 8.336 | 0 | 20.006 | 3.422 | 9.074 | 222.991 | 38.043 | 1.74 | 36.286 | 30.254 | 13.246 | 0 | 24.756 | 199.205 | 53.253 | 4.659 | 17.62 | 199.712 | 15.075 | 1.399 | 17.194 | 57.942 | 6.002 | 6.633 | 7.111 |
| 25 | 79.363 | 4.232 | 0.747 | 4.926 | 75.581 | 7.098 | 0.65 | 7.453 | 74.976 | 5.589 | 0.803 | 5.987 | 143.873 | 4.908 | 0.606 | 5.475 | 104.208 | 1.137 | 0.899 | 1.286 | 104.206 | 5.044 | 1.035 | 3.419 | 156.712 | 16.573 | 2.918 | 6.187 | 749.258 | 50.389 | 6.53 | 7 | 0 | 15.698 | 2.703 | 7.133 | 174.973 | 29.851 | 1.311 | 28.455 | 28.98 | 12.493 | 0 | 23.631 | 156.309 | 41.786 | 3.683 | 13.848 | 156.707 | 11.829 | 1.106 | 13.493 | 50.939 | 5.397 | 5.383 | 6.285 |
| 30 | 71.148 | 3.879 | 0.618 | 4.5 | 67.758 | 6.468 | 0.537 | 6.775 | 67.216 | 5.117 | 0.664 | 5.472 | 128.983 | 4.499 | 0.501 | 5.005 | 86.391 | 0.942 | 0.743 | 1.066 | 86.39 | 4.182 | 0.857 | 2.833 | 129.919 | 13.741 | 2.414 | 5.125 | 620.328 | 41.939 | 5.513 | 5.902 | 0 | 13.014 | 2.237 | 5.91 | 145.038 | 24.747 | 1.049 | 23.578 | 29.234 | 12.161 | 0 | 23.712 | 129.585 | 34.642 | 3.046 | 11.473 | 129.915 | 9.807 | 0.915 | 11.186 | 47.383 | 4.918 | 4.708 | 5.659 |
| 35 | 67.172 | 3.582 | 0.535 | 4.168 | 63.971 | 5.974 | 0.465 | 6.271 | 63.459 | 4.724 | 0.575 | 5.06 | 121.774 | 4.156 | 0.434 | 4.635 | 75.671 | 0.825 | 0.644 | 0.931 | 75.669 | 3.663 | 0.741 | 2.477 | 113.797 | 12.036 | 2.089 | 4.467 | 543.347 | 36.735 | 4.68 | 5.022 | 0 | 11.399 | 1.937 | 5.161 | 127.057 | 21.676 | 0.891 | 20.643 | 31.056 | 12.25 | 0 | 24.977 | 113.504 | 30.343 | 2.637 | 10.025 | 113.793 | 8.59 | 0.792 | 9.796 | 46.633 | 4.538 | 4.001 | 5.197 |
| 40 | 66.786 | 3.331 | 0.484 | 3.917 | 63.603 | 5.593 | 0.422 | 5.914 | 63.094 | 4.398 | 0.521 | 4.736 | 121.074 | 3.87 | 0.393 | 4.351 | 70.028 | 0.764 | 0.583 | 0.857 | 70.026 | 3.39 | 0.672 | 2.284 | 105.31 | 11.138 | 1.893 | 4.098 | 502.828 | 33.995 | 4.031 | 4.35 | 0 | 10.549 | 1.754 | 4.752 | 117.582 | 20.06 | 0.804 | 19.097 | 34.745 | 12.83 | 0 | 27.66 | 105.039 | 28.08 | 2.389 | 9.234 | 105.307 | 7.949 | 0.717 | 9.063 | 48.553 | 4.239 | 3.455 | 4.883 |
| 45 | 69.928 | 3.123 | 0.459 | 3.741 | 66.596 | 5.315 | 0.4 | 5.693 | 66.063 | 4.153 | 0.494 | 4.491 | 126.772 | 3.635 | 0.373 | 4.144 | 68.47 | 0.747 | 0.553 | 0.833 | 68.468 | 3.314 | 0.637 | 2.222 | 102.967 | 10.89 | 1.795 | 3.938 | 491.641 | 33.239 | 3.566 | 3.881 | 0 | 10.314 | 1.664 | 4.612 | 114.966 | 19.613 | 0.77 | 18.667 | 40.936 | 14.05 | 0 | 32.244 | 102.702 | 27.455 | 2.265 | 8.968 | 102.964 | 7.772 | 0.68 | 8.838 | 53.478 | 4.014 | 3.069 | 4.717 |
| 50 | 77.108 | 2.933 | 0.456 | 3.642 | 73.434 | 5.138 | 0.397 | 5.61 | 72.846 | 3.924 | 0.49 | 4.325 | 139.787 | 3.448 | 0.37 | 4.018 | 70.731 | 0.771 | 0.549 | 0.833 | 70.73 | 3.424 | 0.632 | 2.28 | 106.369 | 11.25 | 1.781 | 4.025 | 507.881 | 34.337 | 3.285 | 3.614 | 0 | 10.653 | 1.651 | 4.719 | 118.763 | 20.261 | 0.783 | 19.28 | 50.791 | 16.189 | 0 | 39.606 | 106.095 | 28.362 | 2.248 | 9.186 | 106.365 | 8.029 | 0.675 | 9.146 | 62.302 | 3.861 | 2.839 | 4.713 |
| 55 | 89.541 | 2.822 | 0.473 | 3.63 | 85.274 | 5.069 | 0.412 | 5.688 | 84.591 | 3.772 | 0.509 | 4.245 | 162.326 | 3.31 | 0.384 | 3.982 | 77.199 | 0.842 | 0.57 | 0.921 | 77.198 | 3.737 | 0.656 | 2.469 | 116.096 | 12.279 | 1.849 | 4.311 | 554.323 | 37.477 | 3.188 | 3.55 | 0 | 11.629 | 1.714 | 5.093 | 129.623 | 22.114 | 0.846 | 21.04 | 66.367 | 19.744 | 0 | 51.296 | 115.797 | 30.956 | 2.334 | 9.926 | 116.091 | 8.763 | 0.701 | 9.976 | 76.765 | 3.787 | 2.768 | 4.909 |
| 60 | 109.5 | 2.732 | 0.514 | 3.729 | 104.282 | 5.131 | 0.448 | 5.972 | 103.448 | 3.683 | 0.553 | 4.27 | 198.511 | 3.226 | 0.417 | 4.061 | 89.023 | 0.971 | 0.619 | 1.049 | 89.021 | 4.309 | 0.713 | 2.823 | 133.876 | 14.16 | 2.01 | 4.863 | 639.22 | 43.217 | 3.275 | 3.696 | 0 | 13.411 | 1.863 | 5.798 | 149.476 | 25.501 | 0.97 | 24.261 | 91.325 | 25.603 | 0 | 70.08 | 133.531 | 35.697 | 2.537 | 11.315 | 133.871 | 10.105 | 0.762 | 11.496 | 100.021 | 3.808 | 2.854 | 5.377 |
| 65 | 141.022 | 2.691 | 0.585 | 3.986 | 134.302 | 5.369 | 0.509 | 6.549 | 133.227 | 3.67 | 0.629 | 4.436 | 255.655 | 3.21 | 0.475 | 4.3 | 108.461 | 1.183 | 0.704 | 1.262 | 108.459 | 5.25 | 0.811 | 3.406 | 163.108 | 17.251 | 2.286 | 5.783 | 778.795 | 52.653 | 3.546 | 4.063 | 0 | 16.339 | 2.119 | 6.965 | 182.114 | 31.069 | 1.182 | 29.558 | 132.344 | 33.386 | 0 | 101.001 | 162.688 | 43.491 | 2.885 | 13.611 | 163.102 | 12.312 | 0.867 | 13.996 | 137.794 | 3.96 | 3.102 | 6.25 |

Pollutant Name: Carbon Dioxide — Temperature: 90F — Relative Humidity: 30%

| Speed MPH | LDA NCAT | LDA CAT | LDA DSL | LDA ALL | LDT1 NCAT | LDT1 CAT | LDT1 DSL | LDT1 ALL | LDT2 NCAT | LDT2 CAT | LDT2 DSL | LDT2 ALL | MDV NCAT | MDV CAT | MDV DSL | MDV ALL | LHD1 NCAT | LHD1 CAT | LHD1 DSL | LHD1 ALL | LHD2 NCAT | LHD2 CAT | LHD2 DSL | LHD2 ALL | MHD NCAT | MHD CAT | MHD DSL | MHD ALL | HHD NCAT | HHD CAT | HHD DSL | HHD ALL | OBUS NCAT | OBUS CAT | OBUS DSL | OBUS ALL | UBUS NCAT | UBUS CAT | UBUS DSL | UBUS ALL | MCY NCAT | MCY CAT | MCY DSL | MCY ALL | SBUS NCAT | SBUS CAT | SBUS DSL | SBUS ALL | MH NCAT | MH CAT | MH DSL | MH ALL | ALL NCAT | ALL CAT | ALL DSL | ALL ALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4776.899 | 4776.9 | 4098 | 4551.383 | 4776.9 | 4776.9 | 4098.001 | 4388.068 | 4776.9 | 4776.901 | 4098.001 | 4182.924 | 0 | 0 | 6466.295 | 6412.024 | 0 | 4776.9 | 4098 | 4329.368 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4776.9 | 4776.899 | 4098 | 4202.119 | 0 | 0 | 0 | 0 | 84.851 | 135.937 | 5739.206 | 1416.779 |
| 5 | 1403.587 | 1169.327 | 352.034 | 1168.245 | 1367.668 | 1431.228 | 346.485 | 1354.208 | 1366.785 | 1447.431 | 350.253 | 1442.707 | 1672.464 | 1905.232 | 345.721 | 1964.599 | 2513.51 | 2513.51 | 520.586 | 1851.501 | 2513.51 | 2513.51 | 531.733 | 1378.469 | 2513.51 | 2513.51 | 1505 | 1631.154 | 2513.51 | 2513.51 | 3845.361 | 3834.183 | 0 | 2513.51 | 1505 | 1848.7 | 2513.51 | 2513.51 | 2394.362 | 2475.403 | 224.719 | 262.734 | 0 | 237.008 | 2513.51 | 2513.51 | 1505 | 1659.67 | 2513.51 | 2513.51 | 1505 | 2346.573 | 691.218 | 1413.068 | 3272.626 | 1825.047 |
| 10 | 1049.202 | 867.178 | 352.034 | 866.82 | 1027.076 | 1062.547 | 346.485 | 1011.801 | 1026.442 | 1073.96 | 350.253 | 1070.878 | 1255.386 | 1472.634 | 345.721 | 1458.442 | 1672.267 | 1672.267 | 520.586 | 1289.702 | 1672.267 | 1672.267 | 531.733 | 1019.039 | 1672.267 | 1672.267 | 1505 | 1325.924 | 1672.267 | 1672.267 | 3165.446 | 3152.914 | 0 | 1672.267 | 1505 | 1562.005 | 1672.267 | 1672.267 | 2394.362 | 1903.217 | 192.255 | 219.031 | 0 | 200.91 | 1672.267 | 1672.267 | 1505 | 1530.653 | 1672.267 | 1672.267 | 1505 | 1644.59 | 527.132 | 1041.732 | 2721.558 | 1416.447 |
| 15 | 822.829 | 673.727 | 352.034 | 673.838 | 805.499 | 825.971 | 346.485 | 792.029 | 805.002 | 834.596 | 350.253 | 832.547 | 984.552 | 1144.27 | 345.721 | 1134.188 | 1175.484 | 1175.484 | 520.586 | 957.94 | 1175.484 | 1175.483 | 531.733 | 806.783 | 1175.484 | 1175.484 | 1505 | 1463.781 | 1175.484 | 1175.484 | 2595.938 | 2584.036 | 0 | 1175.485 | 1505 | 1392.701 | 1175.484 | 1175.484 | 2394.362 | 1565.322 | 167.043 | 189.137 | 0 | 173.862 | 1175.485 | 1175.484 | 1505 | 1454.464 | 1175.484 | 1175.484 | 1505 | 1230.028 | 419.912 | 805.259 | 2259.991 | 1130.882 |
| 20 | 671.663 | 546.639 | 352.034 | 547.033 | 656.738 | 670.294 | 346.485 | 647.376 | 656.328 | 677.223 | 350.253 | 675.834 | 802.818 | 928.464 | 345.721 | 921.065 | 873 | 873 | 520.586 | 755.935 | 873 | 873 | 531.733 | 677.543 | 873 | 873 | 1505 | 1425.944 | 873 | 873 | 2183.16 | 2172.164 | 0 | 873 | 1505 | 1289.615 | 873 | 873 | 2394.362 | 1359.583 | 147.396 | 166.461 | 0 | 153.559 | 873 | 873 | 1505 | 1408.073 | 873 | 873 | 1505 | 977.614 | 347.19 | 650.651 | 1925.421 | 936.627 |
| 25 | 569.657 | 462.351 | 352.034 | 462.918 | 556.086 | 566.906 | 346.485 | 551.286 | 555.734 | 572.784 | 350.253 | 571.821 | 679.891 | 785.29 | 345.721 | 779.663 | 685.012 | 685.012 | 520.586 | 630.393 | 685.012 | 685.012 | 531.733 | 597.223 | 685.012 | 685.012 | 1505 | 1402.428 | 685.012 | 685.012 | 2042.685 | 2031.29 | 0 | 685.012 | 1505 | 1225.549 | 685.012 | 685.012 | 2394.362 | 1231.719 | 132.085 | 151.721 | 0 | 138.433 | 685.012 | 685.012 | 1505 | 1379.243 | 685.012 | 685.012 | 1505 | 920.742 | 297.22 | 548.507 | 1811.567 | 852.774 |
| 30 | 501.613 | 407.168 | 352.034 | 407.836 | 488.798 | 499.122 | 346.485 | 483.273 | 488.482 | 504.362 | 350.253 | 503.671 | 597.728 | 691.523 | 345.721 | 687.048 | 567.895 | 567.895 | 520.586 | 552.18 | 567.895 | 567.895 | 531.733 | 547.184 | 567.895 | 567.895 | 1505 | 1387.778 | 567.895 | 567.895 | 1924.234 | 1912.85 | 0 | 567.895 | 1505 | 1185.635 | 567.895 | 567.895 | 2394.362 | 1152.06 | 120.208 | 142.507 | 0 | 127.417 | 567.895 | 567.895 | 1505 | 1361.281 | 567.895 | 567.895 | 1505 | 723.012 | 263.041 | 481.814 | 1715.563 | 759.98 |
| 35 | 458.37 | 372.948 | 352.034 | 373.668 | 445.899 | 457.009 | 346.485 | 449.11 | 445.607 | 461.895 | 350.253 | 461.366 | 545.363 | 633.351 | 345.721 | 629.584 | 497.421 | 497.421 | 520.586 | 505.116 | 497.421 | 497.421 | 531.733 | 517.073 | 497.421 | 497.421 | 1505 | 1378.963 | 497.421 | 497.421 | 1827.808 | 1816.642 | 0 | 497.421 | 1505 | 1161.618 | 497.421 | 497.421 | 2394.362 | 1104.126 | 111.102 | 138.034 | 0 | 119.808 | 497.421 | 497.421 | 1505 | 1350.473 | 497.421 | 497.421 | 1505 | 664.203 | 240.423 | 440.514 | 1637.41 | 710.597 |
| 40 | 434.509 | 354.883 | 352.034 | 355.621 | 422.06 | 434.697 | 346.485 | 428.348 | 421.779 | 439.437 | 350.253 | 438.986 | 516.283 | 602.614 | 345.721 | 599.215 | 460.326 | 460.326 | 520.586 | 480.343 | 460.326 | 460.326 | 531.733 | 501.224 | 460.326 | 460.326 | 1505 | 1374.323 | 460.326 | 460.326 | 1753.407 | 1742.554 | 0 | 460.326 | 1505 | 1148.976 | 460.326 | 460.326 | 2394.362 | 1078.896 | 104.285 | 138.011 | 0 | 115.187 | 460.326 | 460.326 | 1505 | 1344.784 | 460.326 | 460.326 | 1505 | 633.249 | 226.832 | 418.705 | 1577.108 | 680.134 |
| 45 | 427.15 | 350.308 | 352.034 | 351.039 | 414.441 | 428.937 | 346.485 | 422.971 | 414.162 | 433.696 | 350.253 | 433.257 | 507.022 | 594.795 | 345.721 | 591.481 | 450.085 | 450.085 | 520.586 | 473.504 | 450.085 | 450.085 | 531.733 | 496.848 | 450.085 | 450.085 | 1505 | 1373.041 | 450.085 | 450.085 | 1701.031 | 1690.532 | 0 | 450.085 | 1505 | 1145.486 | 450.085 | 450.085 | 2394.362 | 1071.93 | 99.41 | 142.605 | 0 | 113.373 | 450.085 | 450.085 | 1505 | 1343.213 | 450.085 | 450.085 | 1505 | 624.703 | 220.879 | 413.148 | 1534.658 | 666.13 |
| 50 | 435.351 | 358.082 | 352.034 | 359.786 | 422.115 | 438.358 | 346.485 | 417.709 | 421.83 | 443.272 | 350.253 | 442.784 | 516.445 | 607.962 | 345.721 | 604.478 | 464.953 | 464.953 | 520.586 | 483.433 | 464.953 | 464.953 | 531.733 | 503.201 | 464.953 | 464.953 | 1505 | 1374.901 | 464.953 | 464.953 | 1670.679 | 1660.56 | 0 | 464.953 | 1505 | 1150.553 | 464.953 | 464.953 | 2394.362 | 1082.042 | 96.238 | 152.492 | 0 | 114.42 | 464.953 | 464.953 | 1505 | 1345.493 | 464.953 | 464.953 | 1505 | 637.11 | 222.041 | 422.504 | 1510.038 | 667.567 |
| 55 | 459.91 | 378.328 | 352.034 | 378.991 | 445.881 | 463.151 | 346.485 | 454.747 | 445.578 | 468.335 | 350.253 | 467.742 | 545.527 | 642.339 | 345.721 | 638.428 | 507.469 | 507.469 | 520.586 | 511.826 | 507.469 | 507.469 | 531.733 | 521.366 | 507.469 | 507.469 | 1505 | 1380.219 | 507.469 | 507.469 | 1662.352 | 1652.659 | 0 | 507.469 | 1505 | 1165.042 | 507.469 | 507.469 | 2394.362 | 1110.961 | 94.618 | 169 | 0 | 118.663 | 507.469 | 507.469 | 1505 | 1352.014 | 507.469 | 507.469 | 1505 | 672.588 | 230.569 | 447.027 | 1503.309 | 684.639 |
| 60 | 503.507 | 413.488 | 352.034 | 413.102 | 488.408 | 505.143 | 346.485 | 493.794 | 488.079 | 510.699 | 350.253 | 509.943 | 597.526 | 700.395 | 345.721 | 695.775 | 585.19 | 585.19 | 520.586 | 563.73 | 585.19 | 585.19 | 531.733 | 554.573 | 585.19 | 585.19 | 1505 | 1389.942 | 585.19 | 585.19 | 1676.049 | 1666.894 | 0 | 585.19 | 1505 | 1191.529 | 585.19 | 585.19 | 2394.362 | 1163.824 | 94.474 | 194.395 | 0 | 126.775 | 585.19 | 585.19 | 1505 | 1363.933 | 585.19 | 585.19 | 1505 | 737.444 | 247.553 | 488.652 | 1514.411 | 710.824 |
| 65 | 571.231 | 463.728 | 352.034 | 464.291 | 554.763 | 568.3 | 346.485 | 552.55 | 554.394 | 574.328 | 350.253 | 573.342 | 678.625 | 787.534 | 345.721 | 781.864 | 712.968 | 712.968 | 520.586 | 649.062 | 712.968 | 712.968 | 531.733 | 609.168 | 712.968 | 712.968

GHG Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009

**Table C.4 Methane and Nitrous Oxide Emission Factors for Highway Vehicles by Model Year**

| Vehicle Types/Model Years | $N_2O$ (g/mile) | $CH_4$ (g/mile) |
|---|---|---|
| **Gasoline Passenger Cars** | | |
| Model Years 1984-1993 | 0.0647 | 0.0704 |
| Model Year 1994 | 0.0560 | 0.0531 |
| Model Year 1995 | 0.0473 | 0.0358 |
| Model Year 1996 | 0.0426 | 0.0272 |
| Model Year 1997 | 0.0422 | 0.0268 |
| Model Year 1998 | 0.0393 | 0.0249 |
| Model Year 1999 | 0.0337 | 0.0216 |
| Model Year 2000 | 0.0273 | 0.0178 |
| Model Year 2001 | 0.0158 | 0.0110 |
| Model Year 2002 | 0.0153 | 0.0107 |
| Model Year 2003 | 0.0135 | 0.0114 |
| Model Year 2004 | 0.0083 | 0.0145 |
| Model Year 2005 - Present | 0.0079 | 0.0147 |
| **Gasoline Light Trucks (Vans, Pickup Trucks, SUVs)** | | |
| Model Years 1987-1993 | 0.1035 | 0.0813 |
| Model Year 1994 | 0.0982 | 0.0646 |
| Model Year 1995 | 0.0908 | 0.0517 |
| Model Year 1996 | 0.0871 | 0.0452 |
| Model Year 1997 | 0.0871 | 0.0452 |
| Model Year 1998 | 0.0728 | 0.0391 |
| Model Year 1999 | 0.0564 | 0.0321 |
| Model Year 2000 | 0.0621 | 0.0346 |
| Model Year 2001 | 0.0164 | 0.0151 |
| Model Year 2002 | 0.0228 | 0.0178 |
| Model Year 2003 | 0.0114 | 0.0155 |
| Model Year 2004 | 0.0132 | 0.0152 |
| Model Year 2005 - Present | 0.0101 | 0.0157 |

**Table C.4 Methane and Nitrous Oxide Emission Factors for Highway Vehicles by Model Year (continued)**

| Vehicle Types/Model Years | $N_2O$ (g/mile) | $CH_4$ (g/mile) |
|---|---|---|
| **Gasoline Heavy-Duty Vehicles** | | |
| Model Years 1985-1986 | 0.0515 | 0.4090 |
| Model Year 1987 | 0.0849 | 0.3675 |
| Model Years 1988-1989 | 0.0933 | 0.3492 |
| Model Years 1990-1995 | 0.1142 | 0.3246 |
| Model Year 1996 | 0.1680 | 0.1278 |
| Model Year 1997 | 0.1726 | 0.0924 |
| Model Year 1998 | 0.1693 | 0.0641 |
| Model Year 1999 | 0.1436 | 0.0578 |
| Model Year 2000 | 0.1092 | 0.0493 |
| Model Year 2001 | 0.1235 | 0.0528 |
| Model Year 2002 | 0.1307 | 0.0546 |
| Model Year 2003 | 0.1240 | 0.0533 |
| Model Year 2004 | 0.0785 | 0.0341 |
| Model Year 2005 - Present | 0.0177 | 0.0326 |
| **Diesel Passenger Cars** | | |
| Model Years 1960-1982 | 0.0012 | 0.0006 |
| Model Years 1983 - Present | 0.0010 | 0.0005 |
| **Diesel Light Trucks** | | |
| Model Years 1960-1982 | 0.0017 | 0.0011 |
| Model Years 1983-1995 | 0.0014 | 0.0009 |
| Model Years 1996 - Present | 0.0015 | 0.0010 |
| **Diesel Heavy-Duty Vehicles** | | |
| All Model Years | 0.0048 | 0.0051 |

Source: Gasoline vehicle factors from EPA Climate Leaders, Mobile Combustion Guidance, (2008) based on U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 (2007). Diesel vehicle factors based on U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 (2007), Annex 3.2, Table A-98.

Reference source 2:

Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)

$CO_2$ GWP (SAR, 1996) = 1

$CH_4$ GWP (SAR, 1996) = 21

$N_2O$ GWP (SAR, 1996) = 310

# APPENDIX B
# BIOLOGICAL RESOURCES

URS

## Ken McDonald

*Botanist/Restoration Ecologist*

### Areas of Expertise

California's Native Flora;

Special Status Species Surveys, Monitoring, and Habitat Assessment;

Native Habitat Restoration and Monitoring;

Vegetation Mapping and Quantitative Botanical Surveys;

Functional and Data Analysis;

CFGC, ESA, and CEQA/NEPA compliance; and

Wildlife Biology, Biological Monitoring, Biological Resource Assessment, Desert Tortoise Surveys, Burrowing Owl Surveys, and Flora and Fauna Identification

### Years of Experience

With URS 8 Years

### Education

B.S./1999/Botany /Humboldt State University, Arcata, California

- B.S./1999/Environmental Biology/ Humboldt State University, Arcata, California

### Overview

Mr. McDonald is a botanist and restoration ecologist with 8 years of relevant environmental consulting experience. He specializes in the identification, analysis, and restoration of California vegetation. Mr. McDonald has conducted surveys of plant communities throughout California. He participated and lead field based: focused and quantitative vegetation surveys; vegetation mapping; supported the development of revegetation plans; performing restoration compliance inspections, data analysis, functional analysis, and so forth. Ken has also supported the preparation of a variety of environmental compliance documents. Mr. McDonald has prepared numerous biological reports, assessments, and restoration plans to demonstrate compliance with the California Coastal Act, Clean Water Act (CWA), California Fish and Game Codes (CFGC), federal and state Endangered Species Acts (ESA), California Environmental Quality Act (CEQA), and National Environmental Policy Act (NEPA), etc.

***Project Specific Experience:***

**Solar I Desert Tortoise Presence/Absence Surveys, San Bernardino County, CA.**

Conducted a 15,000 acre desert tortoise survey for a proposed solar/thermal generating facility. Performed protocol desert tortoise surveys, vegetation community mapping, rare plant surveys, and an assessment of special aquatic resource areas.

**Solar II Flat-Tailed Horned Focused Surveys, Imperial County, CA.**

Conducted a 7000 acre Flat tail horned lizard survey for a proposed solar/thermal generating facility. Performed protocol Flat tail horned lizard surveys, vegetation community mapping, rare plant surveys, and an assessment of special aquatic resource areas.

**Southern California Edison, Palmdale, CA; Project Botanist**

Performed vegetation community mapping along a 43 mile transmission line proposed for upgrades. Compiled data and vegetation maps for submission to the California Public Utility Commission (CPUC).

**City of Selma, Fresno County, CA; Project Botanist**

Conducted literature review, reconnaissance biological surveys, and vegetation mapping of the City of Selma, California. The

purpose of the surveys was to describe the existing biological resources and habitat quality as it occurs within a specific portions within the City of Selma.

**Riparian Restoration and Enhancement Plan for Santa Margarita River, Naval Air Station, Camp Pendleton, San Diego County -- Geofon Incorporated; Project Restoration Ecologist**

Vegetation community mapping and supporting the creation of a conceptual mitigation plan. Assisted in the development of a restoration plan and a habitat monitoring plan for the Camp Pendleton Marine Air Station. Monitored restoration and enhancement of existing least Bell's vireo habitat and riparian vegetation adjacent to the helicopter landing area on Camp Pendleton. Monitored construction for biological compliance.

**Environmental Services on the SR-125 Project, San Diego County -- Otay River Constructors; Project Botanist**

Vegetation community mapping and surveying for sensitive plant species. Assisted with creation of a Mitigation Monitoring Plan, special aquatic resource permitting, development of a Biological Assessment, and so forth. Additional tasks included supporting the development and implementation an environmental awareness training program, and other tasks during construction of the Caltrans Gap Connector portion of the SR-125 Toll Road route.

**Line 85 Natural Gas Replacement Project, Kern County -- Sempra Energy Utilities/Southern Calfornia Gas Company; Project Botanist**

Conducted sensitive plant surveys. Provided complete biological permitting services for an approximately 21.5-mile natural gas pipeline replacement project in the Grapevine/Lebec, in Kern and northern Los Angeles County.

**Tonner Hills Restoration and Implementation Monitoring Plan, Brea, Orange County -- Nuevo Energy/Ullom Associates; Project Botanist and Restoration Ecologist**

Data base search and sensitive plant field surveys, vegetation mapping, exotic plant removal monitoring, construction monitoring, and restoration implementation and maintenance monitoring. Approximately 120 acres of native vegetation communities were restored or enhanced. Special aquatic resource area evaluations were also conducted.

**Biological Resource Assessment of a Surface Mining Quarry, Sanger, Fresno County -- Vulcan Materials Company; Project Botanist**

Conducted literature review and performed a vegetation surveys. Plant communities were identified and mapped. The project included the expansion of mining activities on the existing extraction and processing site.

**Fiber-Optic Communications Innerduct Project, multiple counties, California -- Level 3 Communications; Project Botanist/Monitoring Biologist**

Responsibilities included assisting in the preparation of environmental documentation, and biological monitoring of in areas supporting habitat of special status species and special aquatic resource areas. The project area crossed 40 states and serves 50 U.S. cities, with a total of 15,000 miles of fiber-optic network. Approximately 75 percent of the buried fiber-optic cable system is located within railroad right-of-ways, with the rest located within highway right-of-ways and limited private land.

**Professional Societies/Affiliates**

California Native Plant Society

Southern California Botanists

Society for Ecological Restoration – California

California Native Grass Association

California Invasive Plant Council

California Botanical Society

Botanical Society of America

The American Society of Plant Taxonomists

Audubon Society – Sea and Sage Chapter

URS

**Areas of Expertise**

Wildlife Biology, Biological Monitoring, Biological Resource Assessment, Desert Tortoise Surveys, and Flora and Fauna Identification

**Years of Experience**

With URS: 2 Years

**Education**

MS Biology - California State University Long Beach (CSULB)
BS Ecology and Environmental Biology – CSULB
AA - Los Angeles Harbor College

**Registration/Certification**

- Desert Tortoise Council Tortoise Handling Workshop
- Fairy Shrimp Identification by Mary Belk

# Dennis E. Miller

*Ecologist*

## OVERVIEW

Mr. Miller has an extensive background in field research and ecological studies. As a biologist Mr. Miller has participated in projects which include vegetation mapping, small mammal trapping, vernal pool branchiopod surveys, protocol USFWS special status species surveys and avian and botanical surveys. He has prepared numerous biological reports, assessments, to demonstrate compliance with the Federal Energy Regulatory Commission (FERC), Federal Railroad Administration (FRA), Federal Highway Administration (FHWA), California High-Speed Rail Authority (Authority), California Department of Transportation (Caltrans), California Costal Commission (CCC), state and federal Endangered Species Acts, and Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Mr. Miller has participated in consultation with regulating agencies including California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS). The following describes Mr. Miller's experience in greater detail.

**San Bernardino Valley Water Conservation District and Bureau of Land Management Land Exchange at the Upper Santa Ana River Wash**

Conducted biological field surveys, data collection and prepared Biological Assessment and Biological Technical Reports to document compliance with NEPA, CEQA, and federal Endangered Species Acts for the land exchange at the Upper Santa Ana River Wash. Disclosed and evaluated the onsite habitat conditions and determined the potential for occurrence of common and special status species, their habitats, and other special aquatic resource areas (e.g., Clean Water Act and CFGC jurisdictional features) within the proposed Project's study area.

**Carrizo Energy, LLC; San Luis Obispo County: Senior Biologist**

Mr. Miller is assisting Carrizo Energy, LLC, to gain environmental permits to license and build their Carrizo Energy Solar Farm (CESF). Mr. Miller has performed small mammal trapping and reporting to document compliance the federal and state Endangered Species Acts for the proposed Project. The project consists of approximately 195 Compact Linear Fresnel Reflector (CLFR) solar concentrating lines, associated steam drums, steam turbine generators (STGs), air-cooled condensers (ACCs), and infrastructure, producing up to a nominal 177 megawatts (MW) net. The CESF is located in an unincorporated area of eastern

San Luis Obispo County, west of Simmler and northwest of California Valley, California.

**Verizon Wireless- Vasquez canyon site, Saugus, Los Angeles County, CA**

Conducted field surveys for biological resources at the proposed Project site. The field surveys and data collection supported the installation of cell phone tower pad and shelter and the Project's anticipated 500 foot physical ground disturbance footprint. Disclosed and evaluated the onsite habitat conditions and determined the potential for occurrence of common and special status species, their habitats, and other special aquatic resource areas (e.g., Clean Water Act and CFGC jurisdictional features) within the proposed Project's study area.

**Fairmont Avenue Extension Project; City of Glendale Transportation Department: Natural Resources**

The City of Glendale is attempting to alleviate existing operational problems, improve safety and accommodate anticipated traffic growth – with the Fairmont Avenue Extension Project. As such, the City of Glendale is improving and extending Fairmont Avenue from its current terminus at San Fernando Road to Flower Street. This extension includes elevating Fairmont Avenue - via a grade-separation viaduct, over San Fernando Road, the Southern California Regional Rail Authority (SCRRA) tracks and the Verdugo Wash. The improvements will provide congestion relief for regional and local traffic and improve safety along the affected roadways. URS was responsible for the preparation of permit applications, reports, and assessments to document compliance with the Clean Water Act (CWA), California Fish and Game Codes, and the federal / state Endangered Species Acts. Additional responsibilities included instructing, monitoring and developing mitigation packages in accordance with local, sate, and federal agency standards.

**Orange County Department of Public Works, Huntington Beach and Talbert Channel Cathodic Protection and Coating Repair Project; Biologist**

Performed wetlands and other waters jurisdictional determination for Huntington Beach and Talbert flood control channels, which both extend from intertidal areas to 3 miles inland. Performed an eelgrass survey within tidally-influenced portions of the channel and authored an eelgrass survey report. Authored a jurisdictional determination report for submittal to USACE, RWQCB, CDFG, and CCC. Prepared USACE, RWQCB, CDFG, and CCC permit applications.

**First Industrial Reality Trust, Riverside County, CA**

Performed riparian riverine/vernal pool/fairy shrimp surveys and drafted biotechnical and Riverside County MSHCP Compliance documents detailing survey findings per MSHCP requirements for the South Perris Industrial Project which consists of the development of three distribution centers within the City of Perris, Riverside County, California.

# APPENDIX C
# CULTURAL RESOURCES

**CULTURAL RESOURCES TECHNICAL REPORT**

# PETITION TO AMEND PANOCHE ENERGY CENTER (06-AFC-5C)

*Prepared for*

Panoche Energy Center, LLC

*Prepared by*

Brian Hatoff, MA, RPA
Maureen Kick, MA, RPA

July 15, 2009

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612

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Attachment 2 Records Search Results (Confidential Filing)

Attachment 3 Native American Consultation (Confidential Filing)

## List of Acronyms

| | |
|---|---|
| AFC | Application for Certification |
| APE | area of potential effects |
| B.P. | before present |
| CEC | California Energy Commission |
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| CRHR | California Register of Historic Resources |
| DPR | Department of Parks and Recreation |
| HDPE | high density polyethylene |
| JRP | JRP Historical Consulting, LLC |
| LORS | Laws, ordinances, regulations, and standards |
| NAHC | Native American Heritage Commission |
| NHPA | National Historic Preservation Act |
| NRHP | National Register of Historic Places |
| PEC | Panoche Energy Center |
| PRC | (California) Public Resources Code |
| PTA | Petition to Amend |
| RPA | Registered Professional Archaeologist |
| SHPO | State Historic Preservation Officer |
| SSJVIC | Southern San Joaquin Valley Information Center |
| URS | URS Corporation |

| | |
|---|---|
| **TITLE:** | Cultural Resources Report for the Panoche Energy Center Petition to Amend-Wastewater Disposal Changes |
| **AUTHORS:** | Brian Hatoff, RPA, and<br>Maureen S. Kick, RPA<br>URS Corporation<br>1333 Broadway, Suite 800<br>Oakland, California 94612 |
| **DATE:** | July 17, 2009 |
| **SOURCE OF COPIES:** | Southern San Joaquin Valley Information Center, California State University, Bakersfield, CA |

**ABSTRACT:**

Panoche Energy Center, LLC (PECL) proposes to construct two unlined wastewater surface impoundments (UWSI) within a 9.18-acre area immediately south of the PEC facility. The previously approved PEC is a 400 megawatt simple-cycle power plant that has recently been constructed immediately north of the modification. This technical report addresses and analyzes the impacts of the additional 9.18-acre modification only and not the previously approved PEC project, and reports the results of the cultural resources investigation conducted to inventory and assess the significance of cultural resources that could be affected by the modification.

Because the modification is within close proximity to the approved PEC project, previously conducted literature review and survey information were utilized. Similarly, no new Native American consultation was initiated, as the modification is adjacent to the previously permitted project, and the Native American contacts identified by the Native American Heritage Commission had no concerns regarding this area.

An intensive pedestrian survey of the Wastewater Disposal Changes area and a 200-ft buffer area was conducted in July 2008. This and all previous surveys and monitoring activities within the project vicinity have been negative for cultural resources.

No cultural resources were identified within the vicinity of the modification; therefore, no significant impacts to known cultural resources or unique archaeological resources are anticipated. While the probability of encountering resources during construction activities is low, significant impacts to unknown subsurface resources could occur. To reduce impacts associated with unanticipated discoveries, the measures set forth in the Cultural Resources Mitigation and Monitoring Plan would be implemented.

## 1.1 INTRODUCTION

Panoche Energy Center, LLC (PECL) proposes to construct two UWSI within a 9.18-acre area immediately south of the PEC facility. The previously approved PEC is a 400 megawatt simple-cycle power plant that has recently been constructed immediately north of the modification.

California Energy Commission (CEC) regulations require that the project undergo environmental assessment. Under the California Environmental Quality Act (CEQA), the potential impacts of the project to cultural resources must be evaluated. Although not considered a Federal undertaking at this time, the project has been concurrently assessed with regard to requirements of Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations, set forth as 36 Code of Federal Regulations (CFR) 800.

This document, prepared by URS Corporation (URS), is a technical report of the methods and results of the cultural resources inventory and associated activities conducted in order to identify and evaluate cultural resources potentially impacted by the modification.

### 1.1.1 Regulations and Compliance Overview

Cultural resources work was conducted in compliance with *Instructions to the California Energy Commission Staff for the Review of and Information Requirements for an Application for Certification* (CEC 1992) and *Rules of Practice and Procedure & Power Plant Site Certification Regulations Revisions* (CEC 2006).

Laws, ordinances, regulations, and standards (LORS) pertinent to the identification, assessment of significance, and assessment of and mitigation of adverse effects to cultural resources are identified in Section 6. All cultural resources work for this project was carried out under the direct supervision of an archaeologist who meets the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. The report was prepared by the following individuals:

- Brian W. Hatoff, Senior Project Archaeologist, M.A., and Registered Professional Archaeologist (RPA) – 30 years experience in cultural resources management and archaeological studies in the western United States; Cultural Resources Specialist for the PEC project.

- Maureen Kick, Archaeologist, M.A., and RPA – six years of experience in cultural resources management and archaeological studies in North America and two years of experience in California; Alternate Cultural Resources Specialist for the PEC project.

- Dean Martorana, M.A., and RPA – eight years of experience in cultural resource management and archaeological studies throughout California.

## 1.2 PROJECT LOCATION AND DESCRIPTION

### 1.2.1 Project Location and Components

The proposed modification to the existing approved PEC project is located in a rural area of Fresno County, California, generally southeast of the intersection of West Panoche Road and Davidson Avenue (See Figure 1 in Attachment 1). The nearest city is Mendota, approximately 16 miles northeast of the site. Interstate 5 is approximately 1.5-miles west and the California Aqueduct is approximately 3 miles to the east. Land use in the vicinity is primarily agricultural; pomegranates, almonds, grapes, and field crops are cultivated. Several rural residences are also located in the vicinity. Industrial facilities in the vicinity include the PG&E Panoche Substation, the Starwood Power Generation Station, the Calpeak Plan Check Power Generation Facility, and the Wellhead Power Generation Facility. The specific location of the site where the proposed Wastewater Disposal Changes would occur is Township 15 South, Range 13 East (Mount Diablo Baseline Meridian). The Assessor Parcel Number is 027-060-81S.

The site for the Wastewater Disposal Changes (Site) was recently mostly used as a construction laydown area for the PEC. Approximately 2.0 acres of the Site is currently being use for agriculture (pomegranate trees). The Site is essentially flat and the elevation is approximately 420-feet above mean sea level. The surface is composed of sands, silts, and clays common to alluvial fan deposits in the area with generally loose and dry soils.

The Wastewater Disposal Changes are located directly south of the PEC facility. The UWSI would be constructed with earthen berms approximately six feet high and 20 feet wide. The outside edge of the southern berm would lie at the edge of the property boundary. The surface area of the base of UWSI-1 would be 2.90 acres; the surface area of the base of UWSI-2 would be 2.93 acres. Existing injection well charge pumps would be used to pump wastewater from the storage tank to the surface impoundments. Six-inch diameter carbon steel piping would be used aboveground and six-inch high density polyethylene (HDPE) piping would be used underground.

#### Access Routes

Access for the construction, maintenance and use of the proposed modification would be via Davidson Road from Panoche Road or using other existing onsite roads and driveways (See Figure 1 in Attachment 1).

#### Earthwork

The UWSI would be constructed using cut and fill. Approximately 20,675 cubic yards will be cut and approximately 17,878 cubic yards of that material will be used for fill. The additional 2,796 cubic yards of material will be transported offsite. No material will be imported from offsite locations.

### 1.2.2 Area of Potential Effects

The archaeological area of potential effects (APE) includes the entire 9.18-acre footprint of the proposed UWSI as well as all temporary construction staging or laydown areas and all access routes (See Figure 2 in Attachment 1). There are no linear components of the proposed modification.

## 2.1 ENVIRONMENTAL SETTING

The climate of eastern Fresno County is classified as Mediterranean with mild, moderately wet winters, and hot dry summers. Regional climate is controlled primarily by the Pacific high-pressure system over the eastern Pacific Ocean, although local climate is strongly influenced by topography. Precipitation occurs mainly during the months of November through April and is generally associated with winter storm systems. Any rainfall that occurs during the summer is usually light and associated with isolated showers or thunderstorms.

Central California was subjected to a series of climatic fluctuations over the past several millennia. Generally warm/dry episodes were interspersed with intermittent cool/moist periods (Moratto et al. 1978). The Altithermal Period (a warm/dry episode) ended approximately 2,900 years ago leading to changes in animal and plant populations and distributions. A subsequent climatic cooling trend was established for the next 1,400 years which was then somewhat abruptly replaced by climatic warming which continues to the present. Following the introduction of livestock by European Americans the abundant and widespread native grasslands of central California were replaced by non-native species that dominate today.

Shorter-term climatic and ecological fluctuations also may have been significant to human use of the study area. The Recess Peak Glacial Advance, marked by cooler temperatures and increased precipitation, began sometime around 2,700 to 2,800 years ago (Banks & Orlin 1984: 3.2), and reached a peak with record amounts of annual rainfall between 1,900 and 1,500 years ago. Rainfall then declined rapidly and gave way to warmer climate, which predominated between about 1,500 and 900 years ago. After this time, pulses in glaciations have continued to result in alternating epochs of warm dry climate and cooler moister climate into modern times. A worldwide phenomenon know as Medieval Climatic Anomaly may have been expressed in the study area by two prolonged periods of drought, between 1,300 and 1,100 before present (B.P.) and again between 800 and 650 B.P. (Ingram 1955).

Prior to their draining in the mid-19th century, the San Joaquin Valley contained large lakes and marshes, including Tulare Lake, Buena Vista Lake, and the Fresno Slough. Tulare Lake was a large freshwater lake, and a related marshland covered the study area. These lakes, marshlands, rivers, and streams provided habitat for a wide variety of aquatic birds and plants, freshwater mollusks, amphibians, and fish (Moratto 1984).

## 2.2 PREHISTORIC SETTING

California has supported a continuous cultural occupation for at least the last 10,000 years (Elsasser 1978). The cultural occupation of the northern San Joaquin Valley can be divided into three time periods or horizons, which help to define the practices and subsistence patterns of the people of that region. The designations Early, Middle and Late Horizons were developed as a chronological sequence by Beardsley (1948, 1954) based upon his work in the Sacramento-San Joaquin Delta region to the San Francisco Bay area (Elsasser 1978:37).

### 2.2.1 Early Period

The Early Period in California generally refers to the time frame between roughly 10,000 and 7,000 years B.P. Early Period components have been identified along the fossil lakeshores of Tulare Lake and Buena Vista Lake, in the east central and southwestern portions of the San Joaquin Valley, respectively. Lithic (stone) artifact assemblages associated with the Early Period in the San Joaquin Valley are characterized by the presence of stemmed projectile points. The Witt site, on the fossil lakeshore of Tulare Lake also featured 'fluted' and concave based projectile points, associated with terminal Pleistocene 'Clovis' assemblages in other regions of North America (Moratto 1984). The Buena Vista Lake site (CA-KER-116), in Kern County, is the other primary San Joaquin Valley site yielding Early Period stemmed points from lower layers in the stratigraphy. Stemmed points have also been recovered from several sites in the foothills at the margins of the valley, namely at the Skyrocket sites (CA-CAL-629, -630) in the Calaveras County foothills, and at the Clark's Flat site (CA-STA-S342) in the Stanislaus County foothills. Other Early Period lithic artifacts include cobble core tools (choppers and scrapers) and flake tools, as well as crescent-shaped, leaf-shaped, ovate, and lanceolate bifaces. Groundstone artifacts of this period are typically expedient, showing light use wear, and often exhibit multiple forms of use wear.

### 2.2.2 Middle Period

The Middle Period (7,000-2,500 B.P.) is characterized by an increase in groundstone implements and by 'Pinto' or 'Stanislaus Stemmed' projectile points. These points have been recovered at CA-KER-116, the Witt site, the Skyrocket sites, and the Clark's Flat site. While much of the flaked-stone tool assemblage in the Middle Period is similar to that of the Early Period, the presence of more groundstone milling equipment with extensive use wear suggests a greater reliance on hard seeds than in the Early Period.

### 2.2.3 Late Period

The Late Period refers to the time period between approximately 2,500 B.P. and European contact, at which time Native American lifeways were recorded in the ethnographic/historic record. The material culture patterns observed at contact emerged during the Late Period, and the ethno-historic record provides a valuable resource for understanding Late Period archaeology. The archaeological record for the Late Period reveals a significantly different suite of material culture than that seen in Middle Period assemblages. Heavily utilized mortar and pestle technology (associated primarily with acorn processing), and bow and arrow technology, both emerge during the Late Period. Large occupation sites, representing semi-permanent and permanent villages emerge during this time as well. On the western margins of the San Joaquin Valley, these village sites typically feature dark-colored midden deposits, multiple excavated house pit depressions, and large, excavated communal structures. Other artifacts typical of Late Period deposits include freshwater and marine shell ornaments, ornaments and utilitarian implements of steatite and faunal bone, obsidian from eastern California sources, and notched cobbles thought to be associated with fishing.

## 2.3 ETHNOGRAPHY

The previously approved project and project changes are located within the boundaries of the Northern Valley Yokuts territory, at the northeastern end of the San Joaquin Valley, near Little Panoche Creek. Ethno-linguistic groups throughout the Northern California territories interacted with each other along their boundaries, and as such the ethno-linguistic boundaries are not considered permanent. The following discussion is summarized form Wallace (1978).

"Yokuts" is a term applied to a large and diverse number of people inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. The Northern Valley Yokuts inhabited a 40- to 60-mile-wide area straddling the San Joaquin River, south of the Mokelumne River, east of the Diablo Range, and north of the sharp bend that the San Joaquin River takes to the northeast. The Southern Valley Yokuts inhabited the San Joaquin Valley south of the bend in the river. Although they were divided geographically and ecologically, they had similar linguistic styles. For the Northern Valley Yokuts, the San Joaquin River and its main tributaries served as a lifeline to the valley (Wallace 1978:462).

The Northern Valley tribes closely resembled the Yokuts groups to the south, although there were some cultural differences. The northerners had greater access to salmon and acorns, two important dietary resources, and some of their religious practices reflected the influences of groups to their north, such as the Miwok. While inhumation was the usual practice in the southern valley, the Northern Valley Yokuts either cremated their dead or buried them in a flexed position (Wallace 1978:464, 468).

The Northern Valley Yokuts built their riverside villages on mounds along the water's edge to avoid the spring floods, which were a result of heavy Sierra snow melts. Living beside rivers and streams provided plentiful river perch, Sacramento pike, salmon, and sturgeon. Hunting provided waterfowl such as geese and ducks as well as land animals such as antelope, elk, and brown bear although by all indications fish constituted a majority of the diet. The surrounding woodland, grasslands, and marshes provided acorns, tule root, and seeds.

A chief headed the tribelet (small, usually village-centered corporate groups typical of prehistoric California), which averaged around 300 people. Family houses were round or oval, sunken, with a conically shaped pole frame, and covered with tule mats. Each village also had a lodge for dances and other community functions, as well as a sweathouse (Wallace 1978:462-464).

The Northern Valley Yokuts used bone harpoon tips used for fishing, stone sinkers for nets, chert projectile points for hunting, mortars and pestles, scrapers, knives, and bone awl tools to procure and manufacture food. Marine shells, procured from coastal peoples, were used for necklaces and other adornments, and marine shell beads sometimes accompanied the deceased. They used tule reed rafts to navigate the waterways for fishing and fowling. The Yokuts also manufactured a range of intricate baskets for a variety of purposes, including storing, cooking, eating, winnowing, hopper mortars, and the transport of food materials. Very little is known of the Northern Valley Yokuts' clothing, but drawings of their tattoos show that they served not only as a decoration but also as a form of identity (Wallace 1978:464).

Historic accounts from an unnamed Spanish expedition in 1810 and 1811 recall that the Spaniards named one of the Yokuts' village Pescadero ("fisherman") after seeing the Indians catching fish. During the time of Mexican land grants, Rancho Pescadero north of Tracy was named for the Yokuts village. According to early accounts, the Yokuts traded with neighboring tribes and were fairly peaceful. Initially, the Diablo Range served as a natural barrier against heavy recruitment by the coastal Spanish missions. However, by the early 19th century, Spanish, and later, Mexican missionaries began to explore the inner valleys in search of neophytes. The Yokuts became irritated with the intrusion, and soon began fighting back and stealing horses from rancheros and missions in retaliation for intrusion. Eventually, the Northern Valley Yokuts were decimated by missionization, usurpation of land by rancheros, "49ers", farmers, and epidemics, malaria being the most devastating, in 1833.

## 2.4 HISTORIC SETTING

### 2.4.1 Early European Contact and the Missions

The study area is located near a former marshland that was connected to Tulare Lake. Up to the second half of the 19th-century, this lake was the largest freshwater lake west of the Great Lakes. This lake was also home to several bands of Yokuts, to whom fugitives from the missions would often flee.

Though the Spanish missions were concentrated in the coastal areas of California, Spanish soldiers and priests made frequent forays into the San Joaquin Valley. The area surrounding Tulare Lake was a frequent target of Spanish parties searching for fugitives (Cook 1976; Smith 2004), and it is likely that fugitive-seeking expeditions also brought back unwilling converts from the this region (Cook 1976).

An 1804 expedition to find land on which to establish a mission was met with disinterest and a lack of cooperation on the part of the Tulare Indians. Further unsuccessful attempts to find land for an interior mission were made in 1806 and 1813. Father Zalvidea's journals of an 1806 expedition to capture runaway neophytes in the San Joaquin Valley described the valley as a dry, miserable place, not suitable for settlement. This description helped to discourage attempts at settlement for over a decade (Smith 2004).

From the 1820's through the 1840's parties from the missions, Anglo-American and French fur trappers, and Russian explorers began to explore the San Joaquin Valley. These explorations caused international tensions, but also increased the American interest in California that had initially been sparked by the belief in Manifest Destiny. In 1848, at the conclusion of the Mexican-American War (1846-1848), California was among the lands ceded to the United States as part of the peace settlement.

Although dangers such as raids by the Yokuts were common, land in the San Joaquin Valley began to be granted by the Mexican authorities in the 1840's, a practice that continued when the U.S. government took possession of California.

### 2.4.2 The Gold Rush and Agricultural Boom

John Sutter discovered gold near his mill near Sacramento in 1848. Though he and his men originally tried to keep it secret, word soon got out and the Gold Rush began. The Central Valley and the Sierra Nevada were soon host to a teeming mass of placer miners and those who sought to make a living either by providing for the needs and desires of, or else making victims of, these miners. The City of San Francisco sprang up almost overnight, several towns were established throughout California, and many of those already established grew quickly as the population boomed. In 1850, California's population was deemed large enough for it to be eligible for statehood.

Near the study area, the town of Fresno City, west of the current location of the City of Fresno, was established at the head of the Fresno Slough to serve the needs of California's fledgling riverboat industry. Fresno County was formed out of part of the larger Mariposa County in 1856.

This general area was plagued by many of California's worst bandits, reportedly including the notorious Joaquin Murieta, though both the existence and the location of Joaquin Murieta has been questioned, throughout the mid-19th century.

As many would-be miners found mining too difficult, the competition too fierce, or the payout too small, many turned to farming the soils of the Central Valley. This eventually resulted in the draining of many of the swamps and lakes, including Lake Tulare near the study area.

Chinese workers, who had originally come to work in the mines, soon found themselves employed in the draining of California's waters, as well as in the capacity of farmhands. In addition to the well-known "Chinatowns" located in most large cities, and many small towns, in 19th century California, the Chinese workers left behind evidence of their activities in the form work camps, the remains of which are still occasionally visible on the landscape.

These Chinese workers, and later migrant workers from other parts of Asia, would be the frequent targets of anti-migrant hostilities, both in the state and federal legislatures, in the streets of California's towns, and in the state's agricultural fields. In the 1890's, Fresno was host to anti-Chinese riots among white workers (Takaki 1998).

With the draining of the lakes and swamps of California's Central Valley, it became possible to farm a much greater expanse of land. Agriculture first became a dominant business in the study area during the 1860's in the form of livestock ranching. In the 1870's, the coming of the railroad provided a larger market to farmers and also an easier mode of travel by which settlers could come to California, ushering an era of general farming (County of Fresno 2006).

Irrigation began in the late 1860's, but remained controversial given the relatively limited water supply of the region. However, as irrigation became more common throughout the late 19th and early 20th centuries, the harsh, dry environment demonized by Zalvidea became a fertile, if still hot, agricultural powerhouse.

Throughout the remainder of the 19th century, Fresno County's population continued to grow, though it still remained relatively sparse as befits a primarily agricultural area. Many of the modern cities, including Fresno, Reedley, and Sanger were either founded or incorporated. Many of the markers of American culture, including newspapers, the railroad, and public transportation in the form of streetcars either were established or expanded in operation (Fresno Historical Society 2001).

### 2.4.3 The 20th Century through WWII

Fresno County's population growth rapidly increased during the first half of the 20th century, starting with a population of over 37,000 in 1900 and continuing to grow to 276,515 people by 1950. Canals, dams, and artificial bodies of water including Hume Lake were created to supply water to both the people and agricultural fields of Fresno County. In 1914, Firebaugh, near which the study area is located, was incorporated.

Throughout the tumultuous events of the early 20th century, including the early growth of the labor movement, WWI, the Great Depression, and conflicts between laborers native to California and migrant laborers from Asia, Central and South America, and, during the Great Depression, the south and Midwest of the United States, Fresno County continued to grow, and even prosper. The founding of new towns, newspapers, educational institutions (including a normal school and the first junior college in California), and the coming of mass-communication in the form of radio all served to tie Fresno County into the larger United States.

Increases in the price of Fresno's popular crops, such as raisins, raised land prices within the County and the growth of both staple and cash crops brought money to the area. South of the study area, the Kettleman Oil Fields were discovered in 1928, bringing yet another source of income to the area.

With the outbreak of WWII, anti-Japanese fervor led to the establishment of the Japanese internment camps in California and other parts of the western U.S. The establishment of temporary detention camps in eastern Fresno County and the Fresno Assembly Center would see this region play a role in WWII in addition to that of producing food, supplies, and soldiers.

### 2.4.4 The Late 20th Century

As with the rest of California, the post-WWII return of soldiers and growth of families led to even further population growth. By 1950, Fresno County had a population of 276,515, and more cities continued to be incorporated throughout the 1940's and 1950's. By 1954, Fresno County had become the leading agricultural production county in the nation, and the presence of agriculture, major transportation corridors (including State Highway 99, State Highway 152, Interstate 5, a railroad, and an airport converting from military to civilian use), industries, both related to agriculture and not, began to grow in and around Fresno.

Fresno County continued to grow throughout the second half of the 20th century, reaching a population of 799,407 by 2000 (Umbach 2002). An increasingly broad ethnic community has led to a rich cultural life in Fresno County, though it has also played a role in racial tension related to labor and immigration. Though Fresno County is now home to many different industries, it has maintained its agricultural character.

## 3.1 LITERATURE REVIEW

A records search for previously recorded archaeological sites and previous cultural resource surveys within a 1-mile radius of the Wastewater Disposal Changes was conducted through the Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System at California State University Bakersfield on September 4, 2008, by information center personnel. No cultural resources were previously recorded within the search radius and four cultural resource studies had been previously conducted within 1-mile of the proposed Site (Attachment 2).

Additionally, JRP Historical Consulting, LLC (JRP) conducted archival research and developed the historic context for the study area.

**Table 1. Previous Studies Conducted within the Study Area**

| Study Number | Author | Date | Title | Within Project Area? | Positive for Cultural Resources? |
|---|---|---|---|---|---|
| FR-00320 | Canaday *et. al.* | 1992 | Archaeological Survey of Right-of-Way Corridor and Extra Work Spaces Construction Spread 5 B, California | No | Negative within 1 mile of the study area. |
| FR-00321 | Moratto and Jackson | 1990 | Cultural Resources Assessment Report, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon and California, Phase 1: Cultural Resources Inventory Atlas | No | Negative within 1 mile of study area. |
| FR-01959 | Moratto *et.al.* | 1994 | Archaeological Investigations PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon and California | No | Negative within 1 mile of study area. |
| FR-02015 | Aspen Environmental Group | 2001 | Los Banos-Gates 500 kV Transmission Project, Application No. 01-04-012, Draft Supplemental Environmental Impact Report | No | Negative within 1 mile of study area. |

## 4.1 NATIVE AMERICAN CONSULTATION

URS contacted the Native American Heritage Commission (NAHC) on August 25, 2008, to request a review of its Sacred Lands File and a list of the individuals and groups that should be contacted regarding information or concerns related to the project areas. A search of the Sacred Lands File, conducted on August 29, 2008 was negative; however, the NAHC provided a list of eight individuals that may have knowledge or concerns regarding cultural resources in the area. Letters and a map of the area were sent to these individuals on September 2, 2008. The letter inquired whether the individuals had any concerns or wished to provide input regarding cultural resources in the project area. No responses to the informational letter were received. Follow-up telephone calls were made on September 15, 2008. To date, five responses have been received.

- John Davis, Chairman of the Kings River Choinumni Farm Tribe replied on September 15, 2008 that he had no comments or concerns regarding the area.

- The Cultural Resources Department of the Table Mountain Rancheria and Kenneth Woodrow, Chairperson of the Esohm Valley Band of Indians, replied on September 15, 2008, that they would review the provided information and contact URS if they had any further questions or concerns.

- Rosemary Smith, Chairperson of the Choinumni Tribe of Yokuts, responded on September 15, 2008, that she would like to consult with Lawrence Bill of the Sierra Nevada Native American Coalition regarding the project. On September 16, 2008, Chairperson Smith contacted URS and stated that Mr. Bill would be contacting URS regarding the proposed project. On September 16, 2008, Mr. Bill contacted URS and requested additional information regarding the project, and stated that he may be interested in arranging a site visit. URS sent an informational letter and project location map to Mr. Bill on September 17, 2008.

- Lalo Franco, of the Santa Rosa Rancheria responded on September 17, 2008, and stated that the Santa Rosa Rancheria would like to have a burial agreement in place in the event of discoveries and that he would forward information regarding this to URS. To date, URS has not received any information.

Native American consultation for this project is ongoing. Information concerning consultation with Native American groups and individuals, including copies of the informational letter and records of telephone conversations is appended to this report (Attachment 3).

## 5.1 FIELD SURVEY

### 5.1.1 Prior Surveys and Cultural Resource Monitoring in the Vicinity of the Proposed Modification

The entire APE for the Wastewater Disposal Changes was subject to intensive pedestrian survey on two prior occasions in June 2006, for the initial permitting of the PEC facility, and in July 2008 for an additional proposed energy facility (West Valley Energy Center). Archaeologists from URS Corporation performed these surveys; both were negative and the results have previously been reported to the CEC.

JRP conducted field surveys for built-environment resources on June 5, 2006 and January 22, 2007. Two agricultural/residential complexes, a section of Panoche Road and the Panoche Substation were identified within ½ mile radius of the PEC project and were recorded and evaluated. Transmission lines associated with the substation were also evaluated. It was recommended that none of the identified resources met the criteria for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR). In August 2008, JRP personnel reviewed the study area for the proposed modification and concluded that all built environment resources in the study area for the proposed Site had been identified and evaluated during the PEC project, and that no additional surveys or evaluations were necessary.

Archaeological monitoring was conducted for all ground disturbing activities related to the PEC project, including clearing and grading of the PEC laydown area, which is the location of the proposed UWSI. Monitoring was negative for archaeological resources.

## 6.1 STATE, FEDERAL, LOCAL COMPLIANCE REQUIREMENTS

The proposed modification would comply with all applicable State, Federal, and local LORS, as described below.

### 6.1.1 State Mandates

Cultural resources include archaeological and historical objects, sites and districts, historic buildings and structures, and sites and resources of concern to local Native Americans and other ethnic groups. Cultural resources which meet the criteria of eligibility to the CRHR are termed "historic resources". Archaeological resources which do not meet CRHR criteria may also be evaluated as "unique"; impacts to such resources could be considered significant as described below (CEQA Guideline revisions Oct. 26, 1998).

Before impacts or mitigation of impacts can be addressed, a site must first be determined to be a historic resource or a unique resource. For archaeological resources subsurface testing would be necessary to determine if a subsurface component is present, whether the extent of surface and/or subsurface materials would be affected by the proposed action, and to determine the resource(s) in question have the potential to answer local and regional research questions. If a resource is determined to be a historic resource or unique resource, a program to mitigate anticipated impacts must be implemented through avoidance or data recovery for archaeological resources; or for built environment resources by following the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings and Guidelines for Rehabilitating Historic Buildings. Sites determined not to be historic resources or unique resources need not be addressed as to mitigation of impacts.

### 6.1.2 Federal Mandates

Federal laws, procedures, and policies affecting the treatment of cultural resources include the Antiquities Act of 1906, Public Law 59-209, Executive Order 11593, Section 106 of the National Historic Preservation Act of 1966 (NHPA) (Public Law 89-665), as amended, Public Law 93-291, the National Environmental Policy Act of 1969 (Public Law 91-190), the Federal Land Policy Management Act of 1969 (Public Law 94-94-579), and regulations 36 CFR 60 and 36 CFR 800. For management purposes, a cultural resource must be recommended as either eligible or not eligible to the NRHP to determine effect and the need for mitigation of potential effects. If the property (cultural resource) is determined eligible, then a determination of effect (36 CFR 800) must be provided. If the property is identified as not eligible, then no determinations of effect or mitigation measures are necessary. Recommendations are reviewed and approved by the State Office of Historic Preservation and the Advisory Council on Historic Preservation. Specific criteria for significance / importance determinations are addressed in Section 6.2 *Specific Criteria for Assessing and Determining Significance*.

### 6.1.3 Local Mandates

The General Plan states that the goal of Fresno County is to identify, protect, and enhance important archaeological and historic resources within the County. In order to achieve this goal, a number of policies, measures and programs targeting the management of cultural resources have been adopted by the County. In general, compliance with CEQA and Section 106 satisfies the County's criteria for treatment of cultural resources.

## 6.2 SPECIFIC CRITERIA FOR ASSESSING AND DETERMINING SIGNIFICANCE

In considering impact significance under the CEQA the significance of the resource itself must first be determined. Generally, under CEQA a historical resource (these include both built-environment and archaeological resources) is considered significant if it meets the criteria for listing on the CRHR criteria for inclusion on the CRHR are set forth in CEQA, Section 15064.5 and defined as follows:

7. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

8. Is associated with lives of persons important in our past;

9. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individuals, or possesses high artistic values; or

10. Had yielded, or may be likely to yield, information important in prehistory or history.

Section 15064.5 of CEQA also assigns special importance to the remains of Native American and specifies procedures to be used when human remains are discovered. These procedures are spelled out under PRC 5097.98. Criteria for eligibility for the CRHR are very similar to those (detailed below) which qualify a property for the NRHP, under the NHPA. Note that a property that is eligible for the NRHP is also eligible to the CRHR.

Impacts to "unique archaeological resources" are also considered under CEQA, as described under PRC 21083.2. A unique archaeological resource means an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets on of the following criteria:

a) Contains information needed to answer important scientific questions and there is demonstrable public interest in that information;

b) Has a special and particular quality, such as being the oldest of its type or the best available example of its type;

c) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

d) A non-unique archaeological resource means an archaeological artifact, object, or site which does not meet the above criteria.

To determine site significance through application of National Register criteria, several levels of potential significance through application of National Register criteria, several levels of potential significance which reflect different (although not necessarily mutually exclusive) values must be considered.

As provided in 36 CFR 60.6 and 36 CFR 64: The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

## 7.1 ENVIRONMENTAL CONSEQUENCES

At the state level, CEQA, Appendix G states that a project potentially would have significant impacts if it would cause substantial adverse change in significance of an historical resource (i.e., a cultural resource eligible to the CRHR, or archaeological resource defined as unique). A non-unique archaeological resource need be given no further consideration, other than the simple recordation of its existence.

At the federal level, the implementing regulations of Section 106 of the NHPA (36 CFR 800), impacts to identified cultural resources need to be considered only if the resource is a "Historic Property"; that is, only if it meets the criteria of eligibility for the NRHP (36 CFR 60.4).

Conclusions made in this section regarding the potential for encountering cultural resources, were based upon the results of cultural resources investigation undertaken for the Wastewater Disposal Changes as described in the report.

### 7.1.1 Proposed Wastewater Disposal Changes

There are no previously recorded cultural resources located within the Site vicinity. Intensive pedestrian survey of the proposed APE including a 200-ft buffer was negative for cultural resources. Built environment resources within the study area have been evaluated and recommended not eligible for the CRHR or NRHP.

Based upon the results of recent cultural resources monitoring of ground disturbing activities at the adjacent approved PEC, the likelihood that significant subsurface cultural resources are located within the Wastewater Disposal Changes APE is low. No significant impacts are anticipated for the construction, operation or maintenance of the proposed modification.

## 7.2 LORS COMPLIANCE

The archaeological investigations described above served to identify cultural resources that are present within the APE. The proposed project changes would comply with CEQA, NHPA and all applicable LORS.

No cultural resources were identified within the vicinity of the proposed modification and no significant impacts to known cultural resources or unique archaeological resources are anticipated. To reduce impacts associated with unanticipated discoveries, the measures set forth in the Cultural Resources Mitigation and Monitoring Plan developed for the PEC would be implemented.

Aspen Environmental Group.

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# Attachment 1
# Figures

Area Surveyed
(50ft. Buffer)

Access Road

Panoche Rd

Panoche Energy Center
Excavation Monitored for
Cultural Resources,
Facility Complete

Area Surveyed
(200ft. Buffer)

Proposed Wastewater
Surface Impoundments
9.18 Acres

0 0.02 0.04 0.06 0.08 0.1 Miles
0 75 150 Meters
0 200 400 Feet
1 inch equals 400 feet (1:4,800)
N

## Legend

- Area Surveyed
- Access Road
- Panoche Energy Center (Facility Complete)
- Proposed Wastewater Surface Impoundments

Source: DigitalGlobe (February 2008)




| | | | |
|---|---|---|---|
| PANOCHE ENERGY CENTER, LLC | Figure 1 | AREA SURVEYED AND MONITORED FOR CULTURAL RESOURCES | 2009 |

G:\Panoche_Rd\MXD\MXD_August09\Figure_5.3-2B_Site_Geologic_Map.mxd

STUDY AREA

Proposed Wastewater Surface Impoundments

FR321

FR1959

FR320

FR2015

Chaney Ranch

Panoche Substation

PANOCHE ROAD

CALIFORNIA

FAIRFAX

BM 342

BM 366

BM 392

BM 406

BM 405

BM 421

BM 439

BM 408

BM 426

BM 449

BM 465

BM 507 (1953)

0 0.1 0.2 0.3 0.4 0.5 Miles

0 300 600 Meters

0 1,000 2,000 Feet

1 inch equals 2,000 feet (1:24,000)

N

## Legend

- Area of Potential Effects (APE)
- ID Previous Cultural Survey
- * 7.5 Minute USGS Quad Index

Source: USGS Topographic Quadrangles (GlobeExplorer 2006) 1:24,000 (Chaney Ranch (1971), Chounet Ranch (1971), Monocline Ridge (1971) and Turney Hills (1971)




Chounet Ranch* Chaney Ranch*
Tumey Hills* Monocline Ridge*

G:\Panoche_Rd\MXD\MXD_July\Figure_5.7-3_Previous_Cultural_Surveys.mxd

| PANOCHE ENERGY CENTER, LLC | Figure 2 AREA OF POTENTIAL EFFECTS & PREVIOUS CULTURAL SURVEYS | 2008 |
|---|---|---|

# Attachment 2
# Records Search Results

This appendix is confidential and is not appropriate for public distribution. Copies have been provided to the California Energy Commission under separate cover.

# Attachment 3
# Native American Consultation

This appendix is confidential and is not appropriate for public distribution. Copies have been provided to the California Energy Commission under separate cover.

# APPENDIX D
# LAND USE

Gilmore
Wood
Vinnard
& Magness

A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW

FORMERLY
THOMAS & SNELL

JAMES O. DEMSEY
ROBERT J. TYLER
DAVID M. GILMORE
RUSSELL O. WOOD
GERALD D. VINNARD
MARCUS D. MAGNESS

OF COUNSEL:
WILLIAM H. LEIFER

HOWARD B. THOMAS
(1912-1993)
T. NEWTON RUSSELL
(1918-2001)

March 3, 2009

Fresno County Department of Public Works & Planning
Development Services Division
2220 Tulare Street, 6th Floor
Fresno, California 93721

Re: Petition for Partial Cancellation of Williamson Act Contract
Contract No. 367
APN: 027-060-80s & 027-060-84s

Ladies and Gentlemen:

Our firm represents PAO Investments, LLC, a California limited liability company. On behalf of PAO Investments, LLC (the "Company"), we herewith submit the Company's petition for partial cancellation of Williamson Act Contract with respect to the above-referenced parcels. (See enclosures.) This letter constitutes the Company's proposal for the specified alternative use of the property, filed pursuant to Government Code § 51282(e).

**Background**

The petition is an application for partial cancellation (Gov. Code § 51282) Agricultural Preserve Contract No. 367. Contract 367 applies to several sections of land, now under various ownership. This application relates to a 128 acre (more or less) parcel of land situated in the Southwest Quarter of Section 5, Township 15 South, Range 13 East, Mount Diablo Base & Meridian identified as Assessor Parcel Numbers 027-060-80s, -82s, -83s and -84s (the "Subject Parcel"). The Subject Parcel is designated Agriculture under the Fresno County General Plan, zoned AE-20 (Exclusive Agriculture), and is located southeast of the intersection of W. Panoche Road and Davidson Avenue, approximately 2 miles east of Interstate 5.

The Subject Parcel is a single parcel of real property, but has been ascribed several Assessor Parcel Numbers as a result of two partial cancellations of the Williamson Act Contract. Both of the prior cancellations were effected for the purpose of allowing the construction and operation of

STREET ADDRESS
7108 N. FRESNO ST.
SUITE 410
FRESNO, CALIFORNIA 93720

MAILING ADDRESS
POST OFFICE BOX 28907
FRESNO, CALIFORNIA 93729-8907

EMAIL ADDRESS
MMAGNESS@GWVM.COM

TELEPHONE (559) 448-9800
FACSIMILE (559) 448-9899

natural gas fired thermal power plants to provide electricity for the people of the State of California, generally, and Fresno County, particularly.

The portion of the Subject Parcel identified as Assessor Parcel Number 027-060-80s is 12.82 acres in size and is referred to herein as the "Power Plant Site." The Power Plant Site is currently leased to the owner/operator ("Operator") of a 400 megawatt thermal power plant ("Plant"). The Operator has determined that it would be advantageous to purchase the Power Plant Site. However, the Power Plant Site is too small to conform with the Fresno County General Plan and with existing zoning. This application has been filed in order to create a legal, conforming parcel of land that could be sold to an affiliate of the Operator. In a nutshell, this application seeks to cancel Agricultural Preserve Contract No. 367 as it affects a 9.18 acre portion of the Subject Parcel (the "Additional Property") lying contiguous to and southerly of the Power Plant Site within the portion currently identified as Assessor Parcel Number 027-060-84s. The Additional Property, together with the Power Plant Site, would then become a separate 22-acre parcel (to be created under the Subdivision Map Act) that conforms with the Fresno County General Plan and zoning ordinance.

**Specified Alternative Use and Permitting Authorities**

**(Gov. Code, § 51282(e))**

Most of the Additional Property is vacant, but a portion is planted to pomegranates. The specified alternative use for the Additional Property is to provide additional land to create a legal parcel consistent with the Fresno County General Plan and zoning ordinance. Said additional land would become part of the land already being used for the Plant. The governmental authority that has permitting authority with respect to the Plant is the California Energy Commission. The governmental authority that has permitting authority with respect to the creation of a conforming legal parcel is the County of Fresno, California.

**Factual Basis Supporting Required Findings**

Pursuant to Government Code § 51282(a), in order to approve this application for partial cancellation of Agricultural Preserve Contract No. 367, the Fresno County Board of Supervisors must make one of two alternative findings. The first possible finding is that the cancellation is consistent with the purposes of the Williamson Act. The second possible finding is that the cancellation is in the public interest. Because of the nature of the specified alternative use for the Additional Property, both findings would be supported by the facts.

**CANCELLATION IS IN THE PUBLIC INTEREST**

Government Code § 51282(c) provides that cancellation is in the public interest where other public concerns substantially outweigh the objectives of the Williamson Act and where there is no proximate non-contracted land that is both available and suitable for the specified alternative use. The proposed alternative use of the Additional Property is in the public interest as it allows for the creation of a legal parcel of real property that is both consistent with the Fresno County General Plan and its zoning ordinance. (The Power Plant Site, by itself, is smaller than required under the Fresno County General Plan and zoning ordinance.)

**CANCELLATION IS CONSISTENT WITH THE WILLIAMSON ACT**

In order for the Fresno County Board of Supervisors to find that the cancellation is consistent with the purposes of the Williamson Act, the Board must make the five (5) findings required under Government Code § 51282(b). Each is addressed below.

**1) The cancel lation is for land on which a notice of nonrenewal has been served.**

A Notice of Non-Renewal for the entire Subject Parcel was served and was accepted by the County Recorder on November 6, 2006 and assigned Document No. 2006-0236374.

**2) Cancellati on is not likely to result in the removal of adjacent lands from agricultural use.**

The Additional Property is located within an unincorporated portion of western Fresno County, and does not lie within any other jurisdictions. It is bounded by existing agricultural uses in all directions (save and except for the existing PG&E substation and adjoining Plant). Agriculture is the primary use, encompassing approximately 96% of all land within a 3-mile radius with the same percent representing the amount of land covered under Williamson Act contracts.

The sole purpose of the cancellation is to allow for its annexation to the Power Plant Site to create a legal parcel under the Subdivision Map Act that conforms with both the Fresno County General Plan and its zoning ordinance. The Power Plant Site is not subject to a Williamson Act contract and property added thereto must, likewise be free of obligations imposed under the Williamson Act in order to allow the continued use of such land for power plant purposes. The California Energy Commission has already found the power plant in question to be in the best interest of the citizens of the State of California. Therefore, the approval of this cancellation would not induce further Williamson Act cancellations. Indeed, because the purpose of the cancellation is to allow the creation of a legal parcel, there will be no spin-off development.

**3) Cancellati on is for an alternative use that is consistent with the adopted General Plan.**

Here, the sole purpose of the cancellation is to allow for the creation of a legal parcel that conforms with the County's General Plan. The Subject Parcel is designated Agriculture in the Fresno County General Plan and is zoned for Exclusive Agriculture (AE-20) – i.e. parcels containing a minimum of 20 acres in size. Here, the cancellation will allow for the creation of a 22-acre parcel and a 106 acre parcel, both of which conform with the County's General Plan and zoning ordinance.

The General Plan identifies one of its policies of the County to allow certain uses by discretionary permit in areas designated Agriculture. Policy LU-A.3 and Table LU-3 are as follows:

> "The County may allow by discretionary permit in areas designated Agriculture, special agricultural uses and agriculturally-related activities, including value-added processing facilities, and certain non-agricultural uses listed in Table LU-3. Approval of these and similar uses in areas designated Agriculture shall be subject to the following criteria:
>
> a. The use shall provide a needed service to the surrounding agricultural area which cannot be provided more efficiently within urban areas or which requires location in a non-urban area because of unusual site requirements or operational characteristics;
>
> b. The use should not be sited on productive agricultural lands if less productive land is available in the vicinity;
>
> c. The operational or physical characteristics of the use shall not have a detrimental impact on water resources or the use or management of surrounding properties within at least one-quarter (1/4) mile radius."

The Panoche Energy Center project has already been approved and is situated on the Power Plant Site – which is 12.82 acres in size. There is no less productive land adjacent to the Power Plant Site in order to create a parcel that is of sufficient size to conform with the General Plan and zoning ordinance. Further, the creation of a legal parcel will have no affect on the water resources in the vicinity of the Additional Property.

**4) Cancellati on will not result in discontiguous patterns of urban development.**

The County of Fresno has already determined that the development and operation of the Plant would not result in discontiguous patterns of urban development. This finding was made when it approved the partial cancellation of the Williamson Act contract with respect to the Power Plant Site. Here, the cancellation simply allows for the addition of land to the Power Plant Site in order to create a legal parcel that conforms to the General Plan and zoning ordinances. Creating such a legal parcel will not result in discontiguous patterns of urban development. Indeed, it will have no affect on patterns of urban development.

**5) That there is no proximate noncontracted land which is both available and suitable for the use to which it is proposed the contracted land be put, or, that development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.**

There is no proximate noncontracted land which is both available and suitable for the specified alternative use. By definition, in order to create a legal parcel that includes the Power Plant Site, adjoining land must be added. All of the lands that adjoin the Power Plant Site are subject to Williamson Act contracts. Hence, there are no proximate noncontracted lands for the proposed use.

**Conclusion**

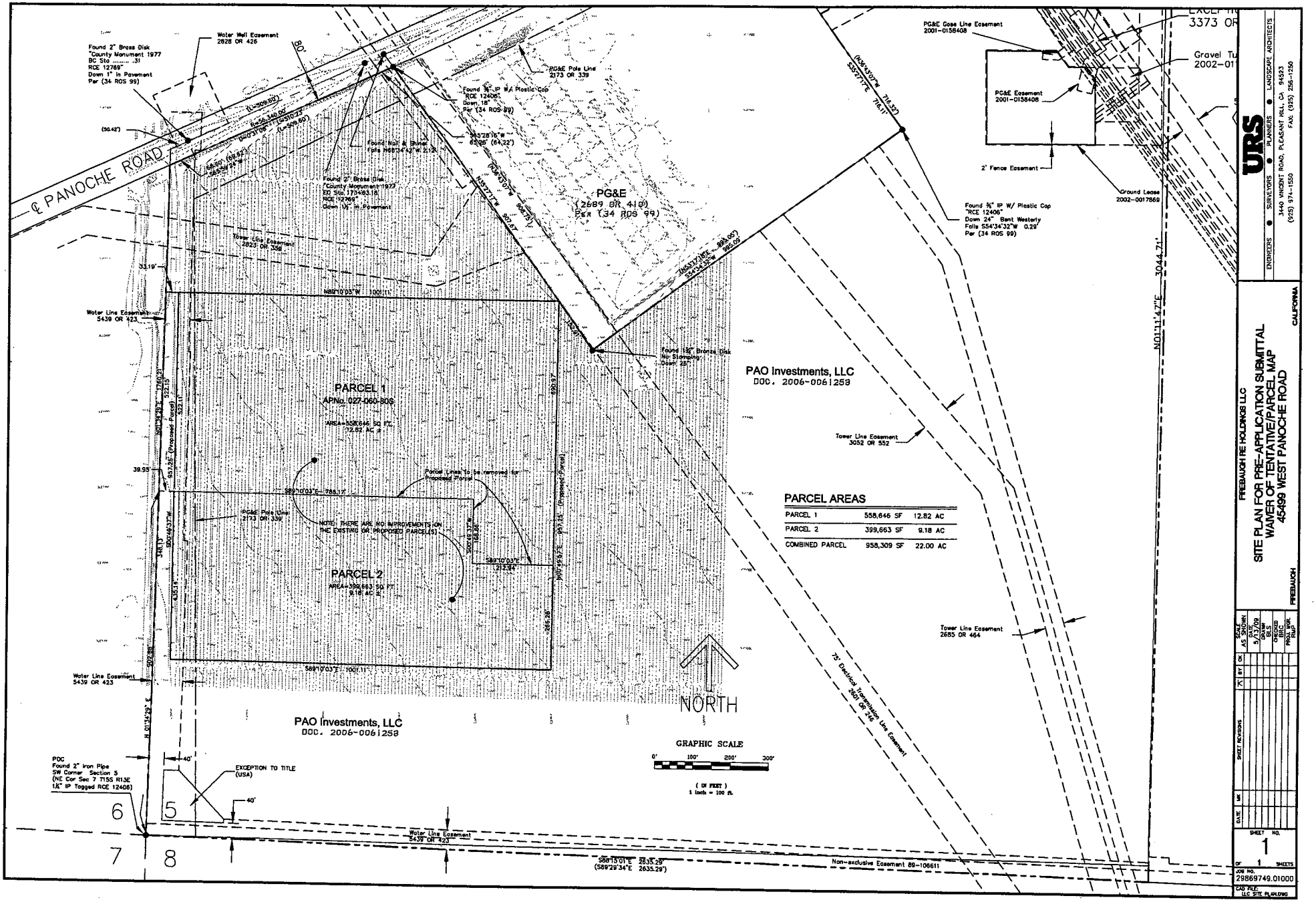
For the foregoing reasons, PAO Investments, LLC respectfully requests that the Fresno County Board of Supervisors approve its application and cancel Agricultural Preserve Contract No. 367 as it applies to the Additional Property.

Very truly yours,

Marcus D. Magness

Enclosures

cc: PAO Investments, LLC
Panoche Energy Center, LLC


℄ PANOCHE ROAD
Found 2" Brass Disk "County Monument 1977 BC Sta ..... .31 RCE 12769" Down 1" In Pavement Per (34 ROS 99)
Water Well Easement 2828 OR 426
80'
(50.42')
R=26,340.00'
Δ=0°31'08"
(L=509.60')
(L=510.13')
Found 3/4" IP W/A Plastic Cap RCE 12406" Down, 18" ± Per (34 ROS 99)
S45°28'16"W 65.28' (64.22')
Found Nail & Shiner Ties N88°34'43"W 31.2'±
Found 2" Brass Disc "County Monument 1977 BC Sta. 173+83.16 RCE 12769" Down 1/2" In Pavement
PG&E Pole Line 2173 OR 339
PG&E (2689 OR 410) Per (34 ROS 99)
N39°27'17"W 907.47'
Tower Line Easement 2823 OR 308
33.19'
N89°10'03"W 1001.11'
Water Line Easement 5439 OR 423
PARCEL 1
APNo. 027-060-809
AREA=558,646 SQ. FT. 12.82 AC ±
Found 1/2" Bronze Disk No Stamping Down 28'
PAO Investments, LLC DOC. 2006-0061258
N01°14'42"E 1760.21'
522.15'
N01°14'42"E 957.82' (Proposed Parcel)
322.11'
39.95'
Parcel Lines to be removed for Proposed Parcel
S89°10'03"E 788.17'
PG&E Pole Line 2173 OR 339
NOTE: THERE ARE NO IMPROVEMENTS ON THE EXISTING OR PROPOSED PARCEL(S)
S00°49'57"W 318.13'
S00°49'57"W 182.08'
S89°10'03"E 212.84'
PARCEL 2
AREA=399,663 SQ. FT. 9.18 AC. ±
S00°49'57"W 957.24' (Proposed Parcel)
265.28'
S89°10'03"E 1001.11'
Water Line Easement 5439 OR 423
PAO Investments, LLC DOC. 2006-0061258
POC Found 2" Iron Pipe SW Corner Section 5 (NE Cor Sec 7 T15S R13E 1/4" IP Tagged RCE 12406)
40'
EXCEPTION TO TITLE (USA)
40'
6
5
7
8
Water Line Easement 5439 OR 423
S89°13'01"E 2635.28'
(S89°29'34"E 2635.29')
Non-exclusive Easement 89-106611
NORTH
GRAPHIC SCALE
0' 100' 200' 300'
( IN FEET )
1 inch = 100 ft.
PG&E Gase Line Easement 2001-0158408
PG&E Easement 2001-0158408
2' Fence Easement
Ground Lease 2002-0017869
Found 3/4" IP W/ Plastic Cap "RCE 12406" Down 24" Bent Westerly Falls S54°34'32"W 0.29' Per (34 ROS 99)
(N34°43'07"W 716.37')
S55°17'17"E 716.11'
EXCEPTION TO TITLE 3373 OR
Gravel Tu 2002-01
N01°11'42"E 3044.71'
Tower Line Easement 3052 OR 552
Tower Line Easement 2685 OR 464
75' Electrical Transmission Line Easement 3501 OR 246
PARCEL AREAS
PARCEL 1 558,646 SF 12.82 AC
PARCEL 2 399,663 SF 9.18 AC
COMBINED PARCEL 958,309 SF 22.00 AC
URS
ENGINEERS ● SURVEYORS ● PLANNERS ● LANDSCAPE ARCHITECTS
3440 VINCENT ROAD, PLEASANT HILL, CA 94523
(925) 974-1550 FAX (925) 256-1250
FIREBAUGH RE HOLDINGS LLC
SITE PLAN FOR PRE-APPLICATION SUBMITTAL
WAIVER OF TENTATIVE/PARCEL MAP
45499 WEST PANOCHE ROAD
FIREBAUGH CALIFORNIA
SCALE AS SHOWN
DATE 5/13/09
DRAWN BLC
CHECKED BLC
PROJ. MGR. RJB
SHEET REVISIONS
NO. BY DATE
SHEET NO. 1 OF 1 SHEETS
JOB NO. 29869749.01000
CAD FILE: LLC SITE PLAN.DWG

Development Services Division

Rec'd 3/11/09

# Pre-Application Review

## Department of Public Works and Planning

NUMBER: 37487
APPLICANT:
PHONE:

PROPERTY LOCATION: 45499 W. PANOCHE RD
APN: 027 - 060 - 30S/34S ALCC: No (Yes) # 367 VIOLATION NO. —
CNEL: No ✓ Yes (level) LOW WATER: No ✓ Yes WITHIN ½ MILE OF CITY: No ✓ Yes
ZONE DISTRICT: AE-20 ; SRA: No ✓ Yes HOMESITE DECLARATION REQ'D.: No ✓ Yes
LOT STATUS:
Zoning: (✓ Conforms; ( ) Legal Non-Conforming lot; ( ) Deed Review Req'd (see Form #236) → SEE PERMIT RECORDS
Merger: May be subject to merger: No ✓ Yes ZM# Initiated In process
Map Act: ( ) Lot of Rec. Map; ( ) On '72 rolls; (✓ Other ; ( ) Deeds Req'd (see Form #236)
SCHOOL FEES: No ✓ Yes DISTRICT: MENDOTA UNIFIED PERMIT JACKET: No Yes ✓
FMFCD FEE AREA: (✓ Outside ( ) District No.: FLOOD PRONE: No Yes ✓
PROPOSAL MAPPING PROCEDURE TO CREATE 2 PARCELS WITH A MINIMUM LOT AREA OF 20 AC

COMMENTS:
ORD. SECTION(S): BY: DATE: 3/3/09

### GENERAL PLAN POLICIES:

LAND USE DESIGNATION: Ag ( ) GPA:
COMMUNITY PLAN: ( ) AA:
REGIONAL PLAN: ( ) CUP:
SPECIFIC PLAN: ( ) DRA:
SPECIAL POLICIES: ( ) VA:
SPHERE OF influence: ( ) AT:
ANNEX REFERRAL (LU-G17/MOU):
COMMENTS:

### PROCEDURES AND FEES:

( ) TPM/PM $ 1207.00
( ) MINOR VA:
( ) HD: $305.00
( ) ALCC:
( ) IS/PER*: $ 259.00
( ) Viol. (35%):
Filing Fee: $ $1771.00
Pre-Application Fee: - $247.00
Total County Filing Fee: $ 1524.00

### FILING REQUIREMENTS:

(✓) Land Use Applications and Fees
(✓) This Pre-Application Review form
(✓) Copy of Deed / Legal Description
( ) Photographs
( ) Letter Verifying Deed Review
(✓) IS Application and Fees*
* Upon review of project materials, an Initial Study (IS) with fees may be required.
(✓) Site Plans - 15 copies (folded to 8.5"X11") + 1 - 8.5"x11" reduction
( ) Floor Plan & Elevations - 8 copies (folded to 8.5"X11") + 1 - 8.5"x11" reduction
( ) Project Description / Operational Statement (Typed)
( ) Statement of Variance Findings
( ) Statement of Intended Use (ALCC)
( ) Dependency Relationship Statement
( ) Resolution/Letter of Release from City of
Referral Letter #

### OTHER FILING FEES:

( ) Resources Div. Project Review Fee: $60 or $593 depending on proposa
( ) Archaeological Inventory Fee: $25 at time of filing
(Separate check to Southern San Joaquin Valley Info. Center)
( ) CA Dept. of Fish & Game (DFG): ($50) ($50+$2,768.25 ($50+$1,993.00)
(Separate check to Fresno County Clerk for pass-thru to DFG.
Must be paid prior to IS closure and prior to setting hearing date.)

BY: Shay Dewey DATE: 03/20/09
PHONE NUMBER: (559) 442-2418

PLU # 113 Fee: $247.00
Note: This fee will apply to the application fee if the application is submitted within six (6) months of the date on this receipt.

001 PRE-AP 247.00
CHECK $247.00

### NOTE: THE FOLLOWING REQUIREMENTS MAY ALSO APPLY:

( ) COVENANT
( ) MAP CERTIFICATE
( ) PARCEL MAP
( ) FINAL MAP
( ) FMFCD FEES
( ) ALUC or ALCC
( ) SITE PLAN REVIEW
( ) BUILDING PLANS
( ) BUILDING PERMITS
( ) WASTE FACILITIES PERMIT
( ) SCHOOL FEES
( ) OTHER (see reverse side)

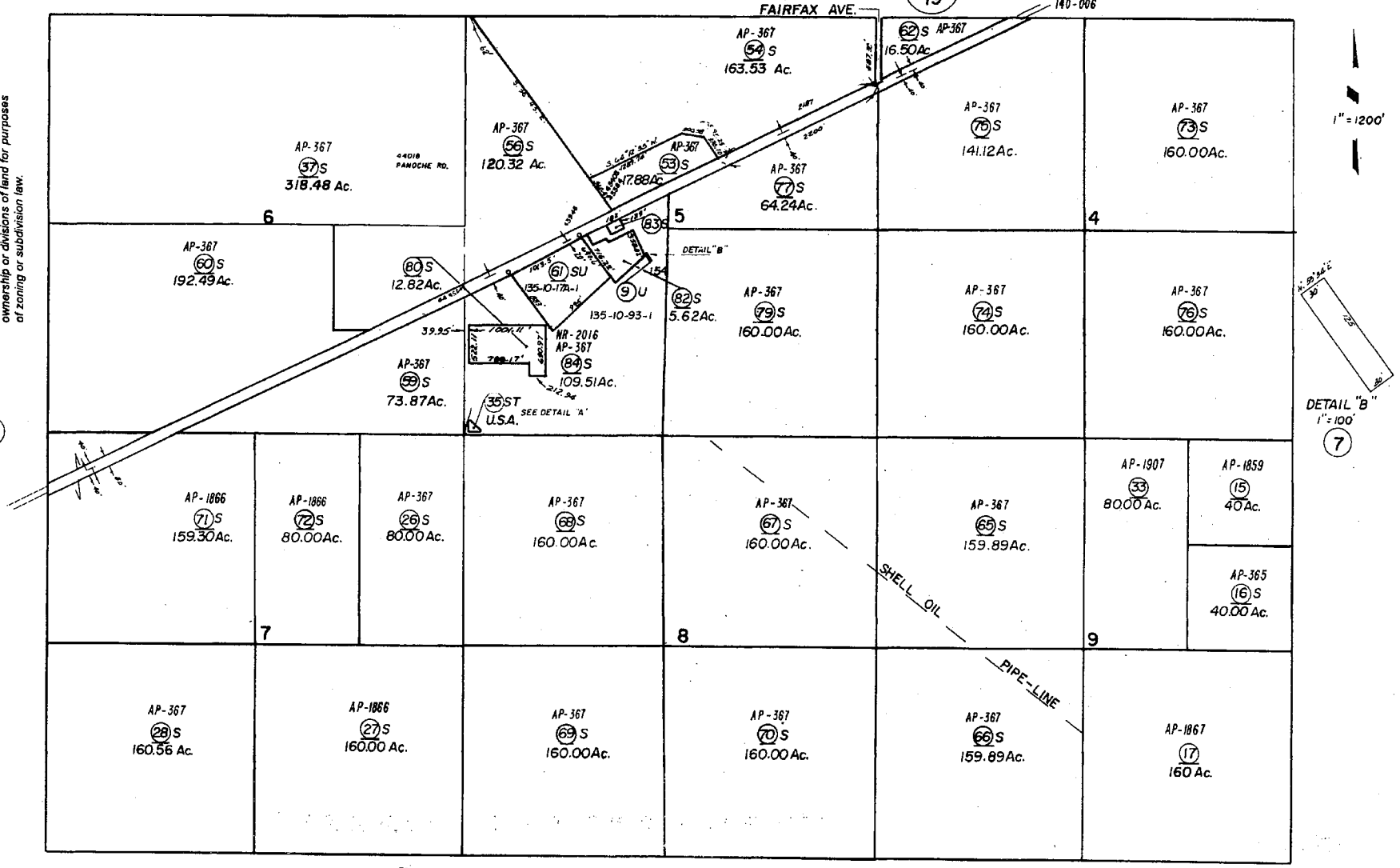

FAIRFAX
RANCHE
AE20
02706080S
AE20
02706081S

# SEC'S. 4,5,6,7,8 & 9 T. 15 S., R. 13 E., M.D.B.& M.

Bk. 19

27-06

Tax Area 140-006




— NOTE — This map is for Assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.

Agricultural Preserve

DETAIL "A" 1" = 200'

S.W Cor. Sec. 5, T.15S., R.13E.

(12)

NOTE - Assessor's Block Numbers Shown in Ellipses.
Assessor's Parcel Numbers Shown in Circles

Assessor's Map Bk. 27 - Pg. 06

County of Fresno, Calif.

1963

| Parcel Information - 027060805 |
| --- |
| Address - 43649 W PANOCHE |
| Address - 43883 W PANOCHE |
| Building Permits - G1829 |
| Building Permits - 016737 |
| Building Permits - 018112 |
| Building Permits - 018114 |
| Building Permits - 023932 |
| Building Permits - 024679 |
| Building Permits - 018112 |
| Building Permits - 017725 |
| Building Permits - 017727 |
| Building Permits - 024298 |
| Building Permits - 027501 |
| Building Permits - PC 1570 |
| Building Permits - PC 2083 |
| Building Permits - 016120 |
| Building Permits - 018112 |
| Building Permits - 018113 |
| Building Permits - 018114 |
| Building Permits - 023932 |
| Building Permits - 024679 |
| Building Permits - 027501 |
| Building Permits - 018112 |
| Building Permits - 018113 |
| Building Permits - 018114 |
| Building Permits - B91515 |
| Building Permits - X1628 |
| Conditional Use Permits - CU2971 |
| Site Plan Reviews - SPR 7584 |
| Site Plan Reviews - SPR 7586 |
| Site Plan Reviews - GP9706 |
| Site Plan Reviews - GV9706 |
| Tentative Parcel Maps - TPMW88-63 |
| Tentative Tract Maps - CCL32487 |
| Tentative Tract Maps - CCL32861 |
| Tentative Tract Maps - 36483 |
| Zoning - AE20 |
| Postal Zones - ME |
| Postal Zones - FI |
| Unified School Districts - Mendota Unified |
| Pest Control Districts - WEST FRESNO RED DISTRICT |
| Mosquito Abatement Districts - FRESNO-WESTSIDE |
| California Water Districts - WESTLANDS |
| Dry Well Limits - NO RESTRICTIONS |
| Septic Factor - 80 |
| Fire Districts - Fresno County Fire Protec |
| Resource Conservation Dist - Westside Resource Cons. |
| Power Company Service Dist - PG&E - FRESNO #8 |
| Telephone Company Service Areas - FIREBAUGH (SBC) |
| Westlands Wtr Dist Lines - DISTRIBUTION |
| Census Tracts - 008302 |
| Supervisor Districts - District 1 |
| Sec-Twp/Rng - 5-15S/13E |
| Quadsheet - CHANEY_RANCH |

| Parcel Information - 027060815 |
| --- |
| Address - 43627 W PANOCHE |
| Building Permits - G1829 |
| Building Permits - 016737 |
| Building Permits - 018112 |
| Building Permits - 018114 |
| Building Permits - 023932 |
| Building Permits - 024679 |
| Building Permits - 018112 |
| Building Permits - 017725 |
| Building Permits - 017727 |
| Building Permits - 024298 |
| Building Permits - 027501 |
| Building Permits - PC 1570 |
| Building Permits - PC 2083 |
| Building Permits - 016120 |
| Building Permits - 018112 |
| Building Permits - 018113 |
| Building Permits - 018114 |
| Building Permits - 023932 |
| Building Permits - 024679 |
| Building Permits - 027501 |
| Building Permits - 018112 |
| Building Permits - 018113 |
| Building Permits - 018114 |
| Building Permits - B91515 |
| Building Permits - X1628 |
| Conditional Use Permits - CU2971 |
| Site Plan Reviews - SPR 7584 |
| Site Plan Reviews - SPR 7586 |
| Site Plan Reviews - GP9706 |
| Site Plan Reviews - GV9706 |
| Site Plan Reviews - GV10042 |
| Tentative Parcel Maps - TPMW88-63 |
| Tentative Parcel Maps - TPMW88-63 |
| Tentative Tract Maps - CCL32487 |
| Tentative Tract Maps - CCL32861 |
| Tentative Tract Maps - 36483 |
| Zoning - AE20 |
| Postal Zones - ME |
| Postal Zones - FI |
| Unified School Districts - Mendota Unified |
| Pest Control Districts - WEST FRESNO RED DISTRICT |
| Mosquito Abatement Districts - FRESNO-WESTSIDE |
| California Water Districts - WESTLANDS |
| Fema (Zone A) - A |
| Dry Well Limits - NO RESTRICTIONS |
| Septic Factor - 80 |
| Fire Districts - Fresno County Fire Protec |
| Resource Conservation Dist - Westside Resource Cons. |
| Power Company Service Dist - PG&E - FRESNO #8 |
| Telephone Company Service Areas - FIREBAUGH (SBC) |
| Westlands Wtr Dist Lines - DISTRIBUTION |
| Westlands Wtr Dist Lines - DISTRIBUTION |
| Westlands Wtr Dist Lines - DISTRIBUTION |

| Parcel Information - 027060816 |
| --- |
| Westlands Wtr Dist Lines - DISTRIBUTION |
| Westlands Wtr Dist Lines - DISTRIBUTION |
| Westlands Wtr Dist Lines - DISTRIBUTION |
| Westlands Wtr Dist Lines - DISTRIBUTION |
| Census Tracts - 008302 |
| Supervisor Districts - District 1 |
| Sec-Twp/Rng - 5-15S/13E |
| Quadsheet - CHANEY_RANCH |

# County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING
**ALAN WEAVER, DIRECTOR**


**Divisions of Land from Property**
**Subject to a Williamson Act Contract**

**SUBJECT: Williamson Act Contract (ALCC) No. 367**
**Minimum Parcel Size for New Parcels Created Under the Contract is 20 Acres**

**Rescission of the existing Williamson Act Contracts and entry into a new Williamson Act contract may be required, if the proposed mapping application would result in a parcel which contains a portion of an existing Williamson Act Contract which does not meet the minimum acreage requirement of the subject Williamson Act Contract. Please contact the Policy Planning Unit at (559) 262-4022 to discuss the resulting parcel configuration for a determination of whether rescission and re-entry would be required.**

The property, on which you propose to file a mapping application, is subject to a Williamson Act Contract. In order to complete the mapping application process, the owner of the property must submit, for review and approval, a Statement of Intended Use (Statement) that provides the following information:

- Address, size of parcel, and assessor's parcel number;
- The purpose of the land division;
- Description of the existing agricultural use of the property to be divided and the agricultural use of each parcel resulting from the mapping application;
- Property owner's commitment that any development of the land will be related to the primary use of the land for agricultural purposes and will be in compliance with all local codes, uniform rules, and ordinances.
- **The Statement must be signed under penalty of perjury and must be notarized.**

The purpose of the Statement is to provide specific facts that are necessary for staff to determine that the division will not result in a residential use or other uses not related to the primary use of the land for agricultural purposes and that are not in compliance with all local codes, uniform rules, and ordinances. (A use is determined to be related when it is required for, or is part of, the permitted commercial agricultural use of the land.) The Statement must be submitted for approval prior to, or included with the mapping application as one of the required filing documents.

**If the mapping application is subsequently approved, the approval letter and any required map will contain the following note:**

*Land Uses and Divisions are restricted under Williamson Act Contract No. 367 (Contract), entered between the landowner and Fresno County in accordance with the California Land Conservation Act (Act).*

*To ensure continued compliance with the limitations of the Contract and the Act, any use or proposed or future improvement, including any residential use proposed under this or a future application, must be related to the primary use of the land for agricultural purposes and must be in compliance with all local codes, uniform rules, and ordinances.*

*Failure to adhere to the terms of the Contract and applicable Government Code Sections, including Section 51200 et seq. and also Section 66474 et. seq., may be determined to constitute a Material Breach as described in the Government Code at Section 51250 et. seq., resulting in removal of structures or the levying of a penalty equal to 25 percent of the fair market value of the parcels created and the structures found to be in Material Breach.*

The above-stated information pertains only to regulations and procedures that apply to Williamson Act Contracts. Your proposal must also adhere to all applicable codes, rules, ordinances, and requirements. For zoning ordinance requirements, please contact the Department's Zoning and Permit Unit at (559) 262-4211. For information regarding land division requirements, please contact the Development Engineering Unit at (559) 262-4022.

If you have any questions regarding any information in this handout, please contact the Policy Planning Unit at (559) 262-4022.

Please be advised that any residential structure subsequently proposed for construction on any resulting parcel must be incidental to the agricultural use of that parcel, and approval of a building permit may be subject to guidelines in effect at the time of the determination. Such guidelines may require factual specificity necessary to be provided for staff to determine that the residential structure is incidental to the commercial agricultural use of the Contracted land. Further, even if the County subsequently approves a building permit for a residential structure that exceeds 2,500 square feet on the basis that it is incidental to the agricultural use, the owners may be subject to substantial penalties if the approval is thereafter challenged and found invalid or void. If it is determined that the structure is not incidental to the agricultural use, or otherwise constitutes a material breach of the Contract, the owners may be subject to the penalties provided in Government Code Section 51250 resulting in removal of the structure(s) or the levying of a penalty equal to 25% of the unrestricted fair market value of the land plus 25% of the value of the improvements constituting the Material Breach.

# DEPARTMENT OF CONSERVATION

**DIVISION OF LAND RESOURCE PROTECTION**

801 K STREET • MS 18-01 • SACRAMENTO, CALIFORNIA 95814

PHONE 916 / 324-0850 • FAX 916 / 327-3430 • TDD 916 / 324-2555 • WEBSITE conservation.ca.gov


RECEIVED
JUN 29 2009
FRESNO COUNTY
DEPT. OF
PUBLIC WORKS & PLANNING

June 24, 2009

Mr. Tawanda Mtunga, Planner
Fresno County Department of
Public Works and Planning
Development Services Division
2220 Tulare Street, Sixth Floor
Fresno, CA 93721

Dear Mr. Mtunga:

Subject: Partial Cancellation of Land Conservation (Williamson Act) Contract
ALCC No. 367 (RLCC 838); APN 027-060-80s, 84s portion - PAO Investments

Thank you for submitting notice to the Department of Conservation (Department) as required by Government Code §51284.1 for the above referenced matter.

The petition proposes to cancel a 9.18-acre portion of the parcel's 128 prime agricultural acres subject to Williamson Act Contract No. 367 for development of a 400-megawatt thermal power plant. The parcel's remaining is currently undergoing the nonrenewal process for contract termination. The site is located south and adjacent to West Panoche Road, between South Brannan Avenue and South Fairfax Avenue in Fresno County.

Cancellation Findings

Government Code §51282 states that tentative approval for cancellation may be granted only if the local government makes either of the following findings:

1) cancellation is **consistent** with purposes of the Williamson Act, or
2) cancellation is in the **public interest**.

However, Fresno County requires that ***both*** findings be made for the approval of a tentative cancellation.

The Department has reviewed the revised petition and additional information provided, and offers the following comments.

Cancellation is Consistent with the Purposes of the Williamson Act

For cancellation to be consistent with purposes of the Williamson Act, Fresno County Board of Supervisors (Board) must make **all** of the following five findings:

1) a notice of nonrenewal has been served,

2) cancellation is not likely to result in removal of adjacent land from agricultural use,
3) the alternative use is consistent with the County General Plan,
4) discontiguous patterns of urban development will not result, and
5) there is no proximate noncontracted land which is available and suitable for the use proposed on the contracted land, or, development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

(1) Notice of nonrenewal has been served:
The landowner served a notice of nonrenewal. The 128.49-acre portion of Contract No. 367 (APN 027-060-78s) is scheduled to expire on December 31, 2016.

(2) Removal of adjacent land from agricultural use not a likely result:
Development of the proposed power generation facility will not negatively affect adjacent agricultural lands or cause their removal from agricultural use.

(3) Alternative use is consistent with County General Plan:
The proposed alternative use will not produce discontiguous patterns of urban development due to the location of the existing PG&E substation.

(4) Discontiguous patterns of urban development will not result:
Based on information provided, the Department agrees with the determination that discontiguous patterns of urban development are not likely to occur.

(5) There is no available and suitable proximate noncontracted land for the use proposed on the contracted land:
The Department would concur that there is not proximate noncontracted land that is suitable or available for the alternative use proposed.

Cancellation is in the Public Interest

For the cancellation to be in the public interest, the Board must make **both** of the following findings:

1) other public concerns substantially outweigh the objectives of the Williamson Act, and
2) there is no proximate noncontracted land which is available and suitable for the use proposed on the contracted land, or, development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

Due to the passage of recent legislation regarding renewable energy, the Department would concur that the public concerns substantially outweigh the objectives of the Williamson Act.

Our comments above in section (5) already address the proximate lands issue.

Provided the information received is accurate and correct, the Department concurs that the Board has a basis to find cancellation of the 9.18-acre portion of the contract consistent with the purposes of the Williamson Act.

Required Notice

Legislation effective January 1, 2005, requires the county assessor to send notice to the Department and landowner of the current fair market value of the land and of the opportunity to request a formal review from the assessor prior to any action giving tentative approval to the cancellation of any contract (SB 1820, Machado, Chapter 794, Statutes of 2004 (Government Code §51283(a)). To date, the Department has **not** received the required notice of the parcel's cancellation valuation from the county assessor.

Thank you for the opportunity to provide comments on the proposed cancellation. Please provide our office with a copy of the Notice of the Public Hearing on this matter ten (10) working days before the hearing and a copy of the published notice of the Board's decision within 30 days of the tentative cancellation pursuant to Government Code §51284. If you have any questions concerning our comments, please contact Sharon Grewal, Environmental Planner at (916) 327-6643.

Sincerely,

Brian R. Leahy
Assistant Director

# County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING
**ALAN WEAVER**, DIRECTOR

# Agricultural Land Conservation Committee Staff Report
# Agenda Item No. 2
# September 2, 2009

**SUBJECT:** **Review and make recommendation to forward to the Board of Supervisors regarding request for PARTIAL CANCELLATION of AGRICULTURAL LAND CONSERVATION CONTRACT NO. 367 (RLCC NO. 884), proposing to remove a 9.18-acre portion of a 128-acre parcel from Contract restrictions to allow the creation of a 22-acre parcel to include an existing thermal power plant and accessory facilities.**

**LOCATION:** **Located south of and adjacent to West Panoche Road, between South Brannan and South Fairfax Avenues, approximately 11.7 miles southwest of the City of Mendota (SUP. DIST.: 1) (APN: Portion of 027-060-84s).**

Applicant/Owner: PAO Investments

**STAFF CONTACT:** **Tawanda Mtunga, Planner**
**(559) 262-4196**

**Mohammad Khorsand, Senior Planner**
**(559) 262-4870**

**RECOMMENDATION:**

Staff believes that the required findings can be made, and recommends the application for partial cancellation of Agricultural Land Conservation Contract No. 367 be forwarded to the Board of Supervisors with a recommendation for approval, subject to the following conditions:

1. Payment in full of the cancellation fee.
2. Unless the cancellation fee is paid or a Certificate of Cancellation of Contract is issued within one year from the date of the recording of this certificate, the cancellation fee shall be recomputed as of the date of notice by the landowner to the Board of Supervisors, as required by Government Code Section 51283.4.
3. The landowner shall obtain the necessary land use entitlements, including a Tentative Parcel Map Waiver to separate the plant site from the rest of the property.

4. The 11.73-acre portion of the 128-acre parcel located north of the power plant and east of the PG&E substation shall continue to be farmed and not be created as a separate parcel. This restriction shall be recorded in a covenant running with the land as a means of disclosure to potential buyers of the subject property.

**BACKGROUND:**

The Agricultural Land Conservation Committee reviews requests for cancellation of agricultural land conservation contracts for consistency with the purposes of the Williamson Act, pursuant to Section 51282 of the Government Code. The Committee's action to approve or deny an application for contract cancellation becomes a recommendation to the Board of Supervisors.

The subject property is located south of and adjacent to West Panoche Road, between South Brannan and South Fairfax Avenues, approximately 11.7 miles southwest of the City of Mendota. (See Location Map Exhibit "A", Zoning Map Exhibit "B", and Existing Land Use Map Exhibit "C") (SUP. DIST.: 1) (APN: Portion of 027-060-84s).

The applicant has filed a request for partial cancellation of Agricultural Land Conservation Contract (ALCC) No. 367. The proposal seeks to remove 9.18 acres of prime agricultural land from Contract restrictions, and together with a 12.8-acre portion of the parcel that had previously been removed from the contract, create a 22-acre parcel to contain the thermal plant and its accessory facilities. (See Tentative Parcel Map No.09-19- Exhibit D)

Staff had a concern with the 11.73-acre triangular portion of the128-acre parcel directly to the north of the proposed 22-acre "plant site" parcel. The concern was that the proposed Tentative Parcel Map isolates an 11.73-acre portion of the property between the power plant and the PG&E substation. This could set the stage for creation of an 11.73-acre substandard parcel through a variance application in the Agricultural Zone district. Staff discussed this concern with the applicants and their representative. Staff suggested that the proposed parcel for the plant site should include the11.73-acre triangular portion, instead of land south of the plant. The applicant's representative has indicated that there are existing power line easements on the 11.73-acre portion, and that the 9.18-acre portion to the south contains facilities associated with the plant operation. To address staff's concern, the applicants have agreed to a condition of approval that the11.73-acre portion will continue to be farmed and will not be created as a separate parcel (See condition No. 4). This will be a condition of approval for the Parcel Map as well.

**FISCAL IMPACT:**

There is no net County cost associated with the recommended action. Property taxes would increase on the land to be removed from ALCC No. 367. The applicant paid the County a fee of $3,290.00 to process the application, and is aware of the penalty that would be levied by the State Department of Conservation (DOC). This penalty is 12½ percent of the current fair market value of the land being removed from contract, as though it were free of contractual restrictions. This amount was calculated by the Assessor's Office to be $5,737.50.

**IMPACTS ON JOB CREATION:**

Approval of the recommended action should not impact the creation of jobs in Fresno County.

**DISCUSSION:**

In order to approve a cancellation request, the Board of Supervisors must determine that the action is consistent with the Land Conservation Act of 1965. The law requires that five findings be made. Staff's analysis determines that the following required findings can be made:

1. *That the cancellation is for land on which Notice of Nonrenewal has been served, pursuant to Section 51245 of the Government Code.*

   An executed Notice of Partial Nonrenewal for ALCC No. 367 was accepted by the County Recorder on November 6, 2006, and was assigned Document No. 2006-0236374. Nonrenewal was initiated on the entire 128 acres that comprise APN 027-060-84s.

   Based on the fact stated above, staff believes this finding can be made.

2. *That the cancellation is not likely to result in the removal of adjacent lands from agricultural use.*

   The subject property and adjacent parcels are currently in agricultural use, with the exception of a 19.13-acre parcel, which contains the existing PG&E substation and a 12.82- acre portion of the subject parcel, which contains the 400 megawatt thermal power plant. In their response, the Department of Conservation assumed that the cancellation is for the development of a power generating facility, and indicated that development of the facility will not result in removal of adjacent lands. Staff would like to clarify that the power plant is existing and occupies an approximate 12.82-acre portion of the property. The applicants are requesting partial contract cancellation on an additional 9.18-acre portion of the 128-acre parcel immediately south of the power plant. If the cancellation is approved, a Tentative Parcel Map will be processed to create a 22-acre parcel to contain the power plant and its accessory facilities on a separate, non-contracted parcel.

   The applicant has indicated that the 106-acre balance of the property will remain in farming. As previously mentioned, the applicants and staff have agreed on recording a covenant in order to inform the potential buyers of the property that the11.73-acre portion of the property will remain in farming and will not become a separate, substandard parcel through a zone variance application.

   Based on these facts, staff believes this finding can be made.

3. *That the cancellation is for an alternative use that is consistent with the provisions of the County General Plan.*

   The subject property is designated as Agriculture in the Fresno County General Plan. The proposed alternate use of the property is to allow creation of a separate conforming parcel to include the power plant and its accessory facilities. The applicant has stated that approval of the cancellation will not result in any spin-off development. The remaining 106-acre parcel meets the minimum 20-acre parcel requirement for the Williamson Act contract size for prime land, and the power plant is an operation that is allowed.

Based on the facts stated above, staff believes this finding can be made.

4. *That the cancellation will not result in discontinuous patterns of urban development.*

The proposed cancellation will not result in any new development. The existing thermal power plant is not considered an urban development. Therefore, staff believes this finding can be made.

5. *That there is no proximate, non-contracted land which is both available and suitable for the use to which it is proposed that the contracted land be put, or that development of the contracted land would provide more contiguous patterns of urban development than development of proximate non-contracted land.*

The reason for this partial cancellation is to place the power plant on a separate, legal, non-contracted land for financing reasons. All the land surrounding the power plant is under contract. Therefore, no non-contracted land in the vicinity of the power plant is available or feasible to accomplish the applicant's intent.

Based on the facts mentioned above, staff believes this finding can be made.

**ENVIRONMENTAL DETERMINATION:**

It has been determined, pursuant to Section 15061 (b) (3) of the State of California Environmental Quality Act (CEQA) Guidelines that the project will not have a significant effect on the environment, and is not subject to CEQA. Staff would also like to note that the environmental determination on the existing thermal power plant on the12.82-acre portion was considered statutorily exempt from CEQA under Section 15271.

**OTHER REVIEWING AGENCIES:**

As of January 1, 2001, Government Code Section 51284.1(a) requires notification to be provided by the County to the Director of the State Department of Conservation (the Director) once a cancellation application has been accepted as complete. Under Government Code Section 51284.1(c), the Director's comments are required to be considered by the Board of Supervisors before acting on the proposed cancellation. Pursuant to the Director's June 24, 2009 letter, the Department of Conservation is not opposed to the proposed cancellation request. The Director's comments are attached as Exhibit "E".

Staff notes that the DOC cited concerns with the public interest finding. It should be noted that staff advised the DOC that Fresno County has required only one set of findings since the Legislature authorized this approach in enacting AB 2074 (Stats. 1981, Ch. 105) Section 2 of that bill amended Government Code Section 51282 to "expand the ability of local agency to cancel a Williamson Act contract by permitting the Board to grant tentative approval for the cancellation if it makes one of the (required) findings."

**CONCLUSION:**

Based upon the above analysis, staff recommends approval of partial cancellation of Agricultural Land Conservation Contract No. 367, subject to the conditions listed under the Recommendation section of this report.

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Staff report with Exhibits A-E

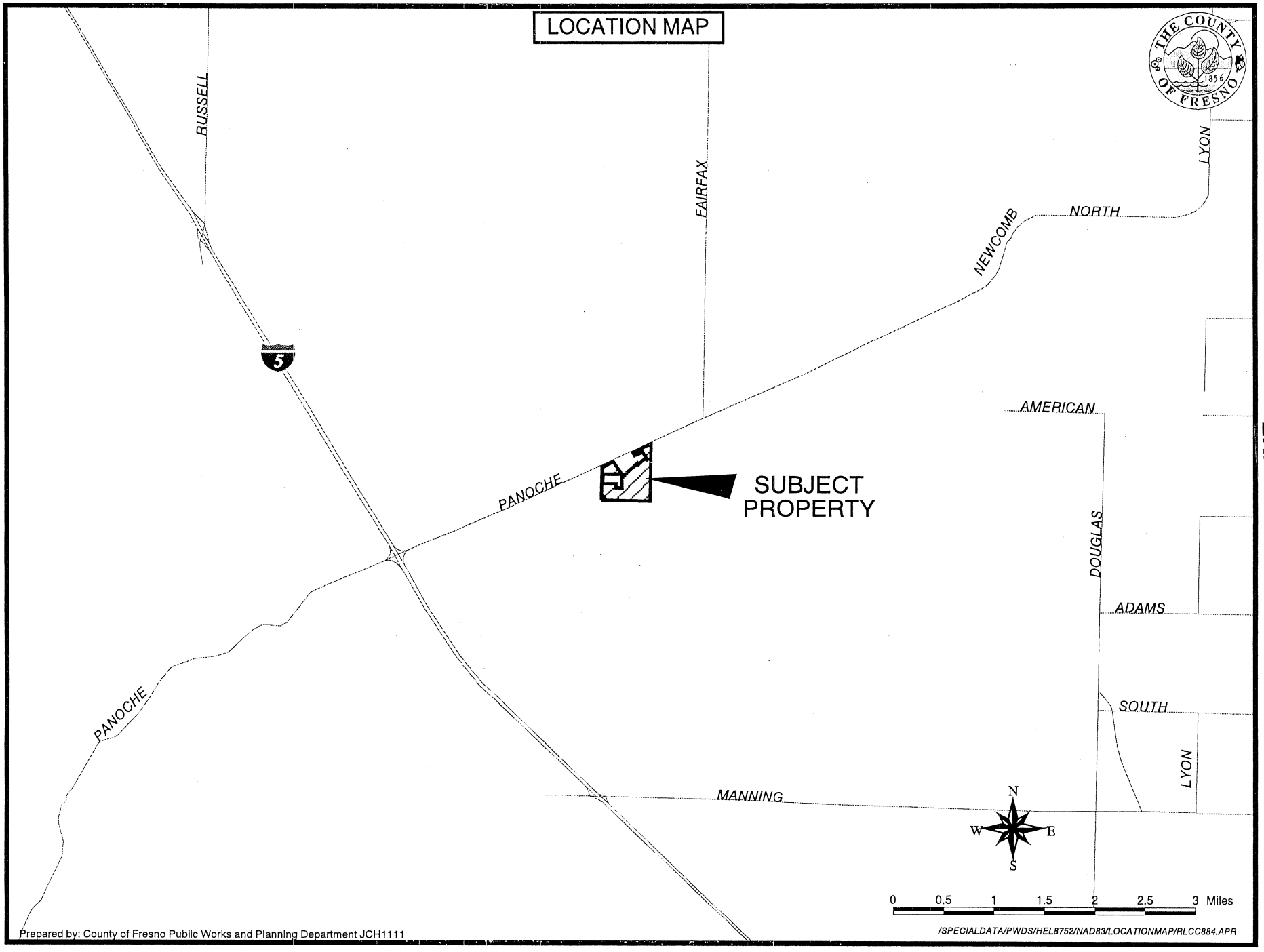

LOCATION MAP
THE COUNTY OF FRESNO
1856
RUSSELL
FAIRFAX
LYON
NEWCOMB
NORTH
5
AMERICAN
PANOCHE
SUBJECT PROPERTY
DOUGLAS
ADAMS
SOUTH
PANOCHE
LYON
MANNING
N
W
E
S
0 0.5 1 1.5 2 2.5 3 Miles
Prepared by: County of Fresno Public Works and Planning Department JCH1111
/SPECIALDATA/PWDS/HEL8752/NAD83/LOCATIONMAP/RLCC884.APR

EXHIBIT 'A'

RLCC 884
STR 05 - 15/13

# EXISTING ZONING MAP

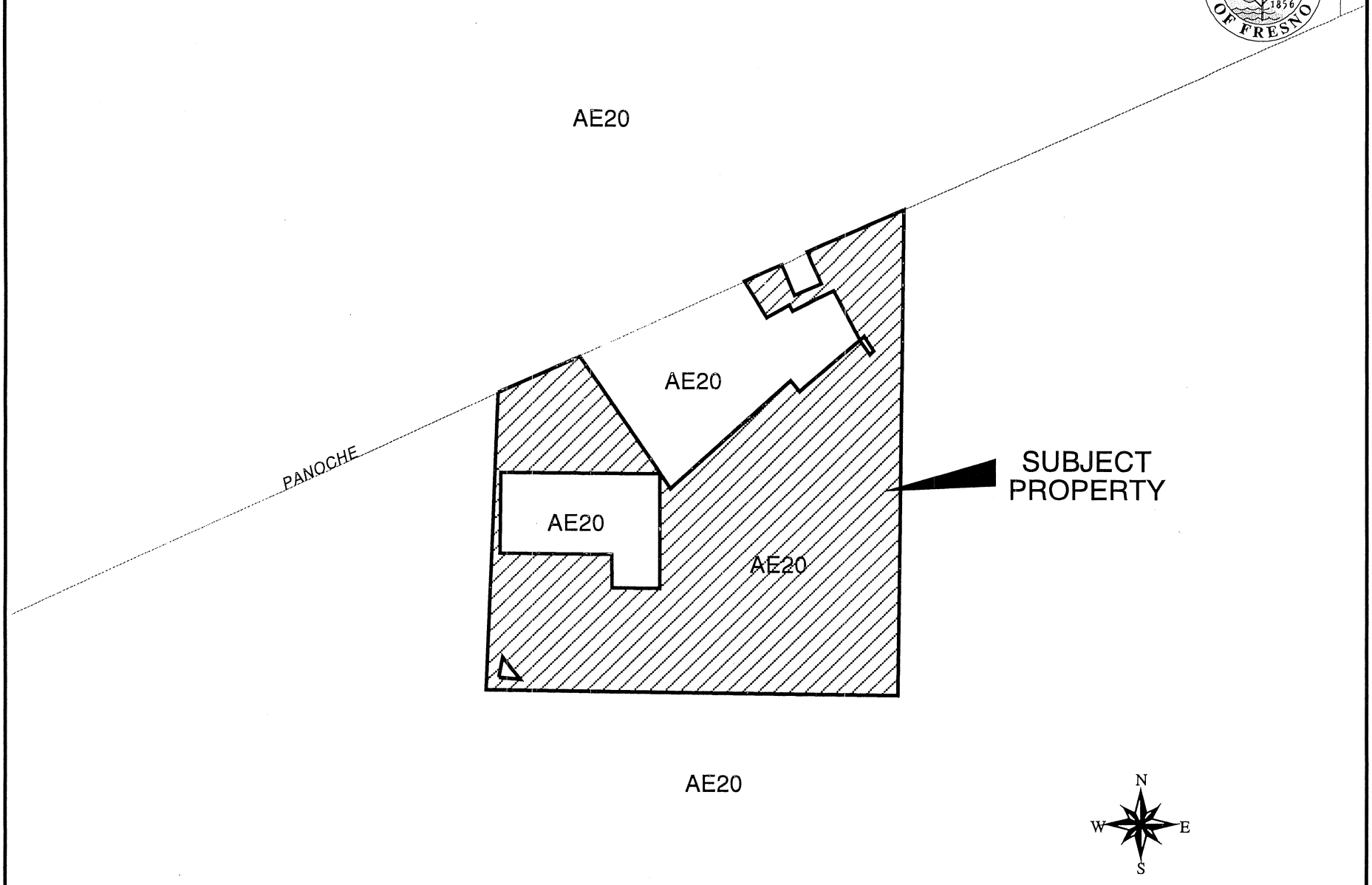


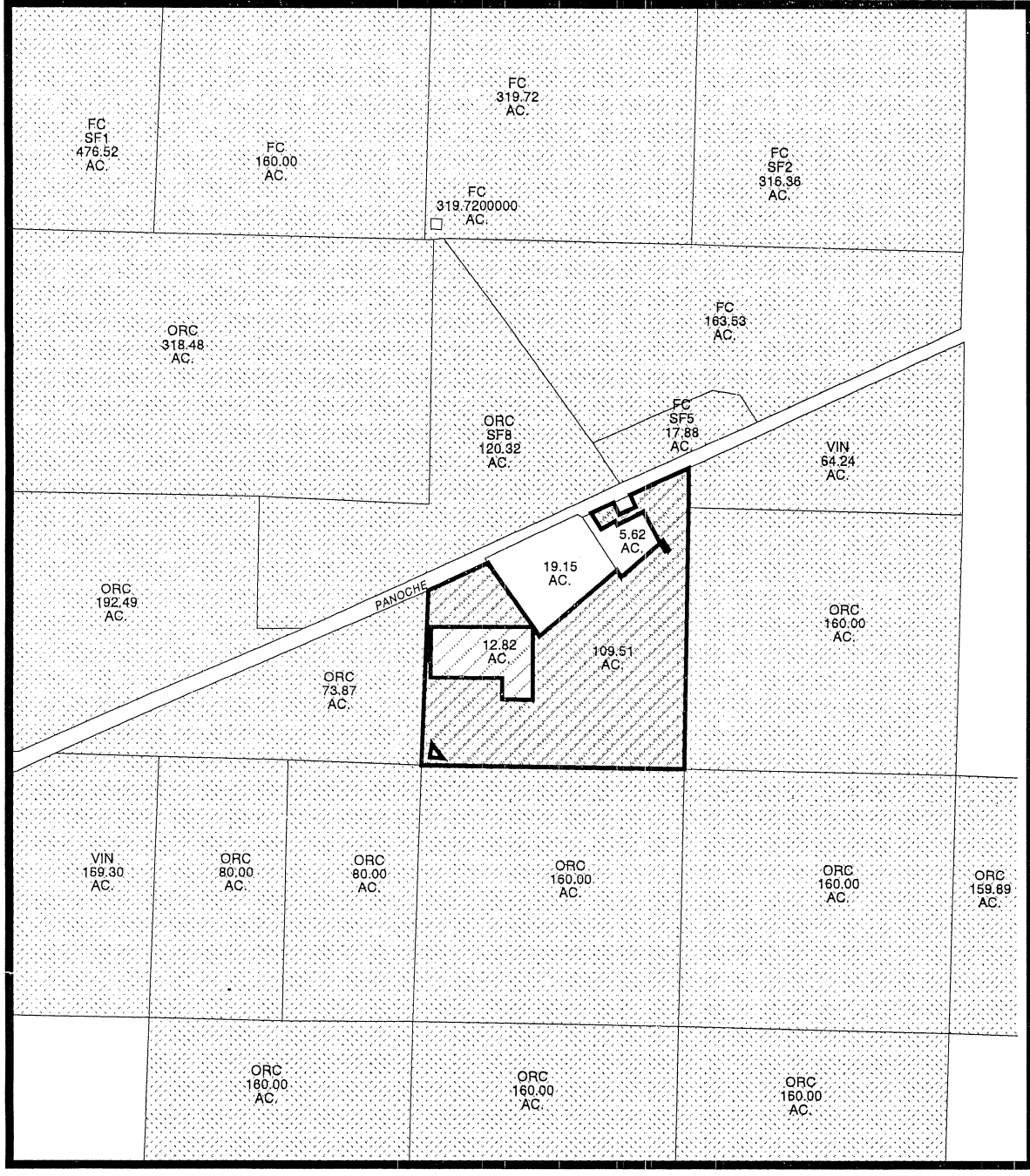

EXHIBIT 'B'

PUBLIC WORKS and PLANNING DEPARTMENT

DRAWN BY: HEL

RLCC 884

# EXISTING LAND USE MAP




| Legend |
| --- |
| FC - FIELD CROP |
| ORC - ORCHARD |
| SF# - SINGLE FAMILY RESIDENCE |
| VIN - VINEYARD |

Subject Property

Ag Contract Land

N

W E

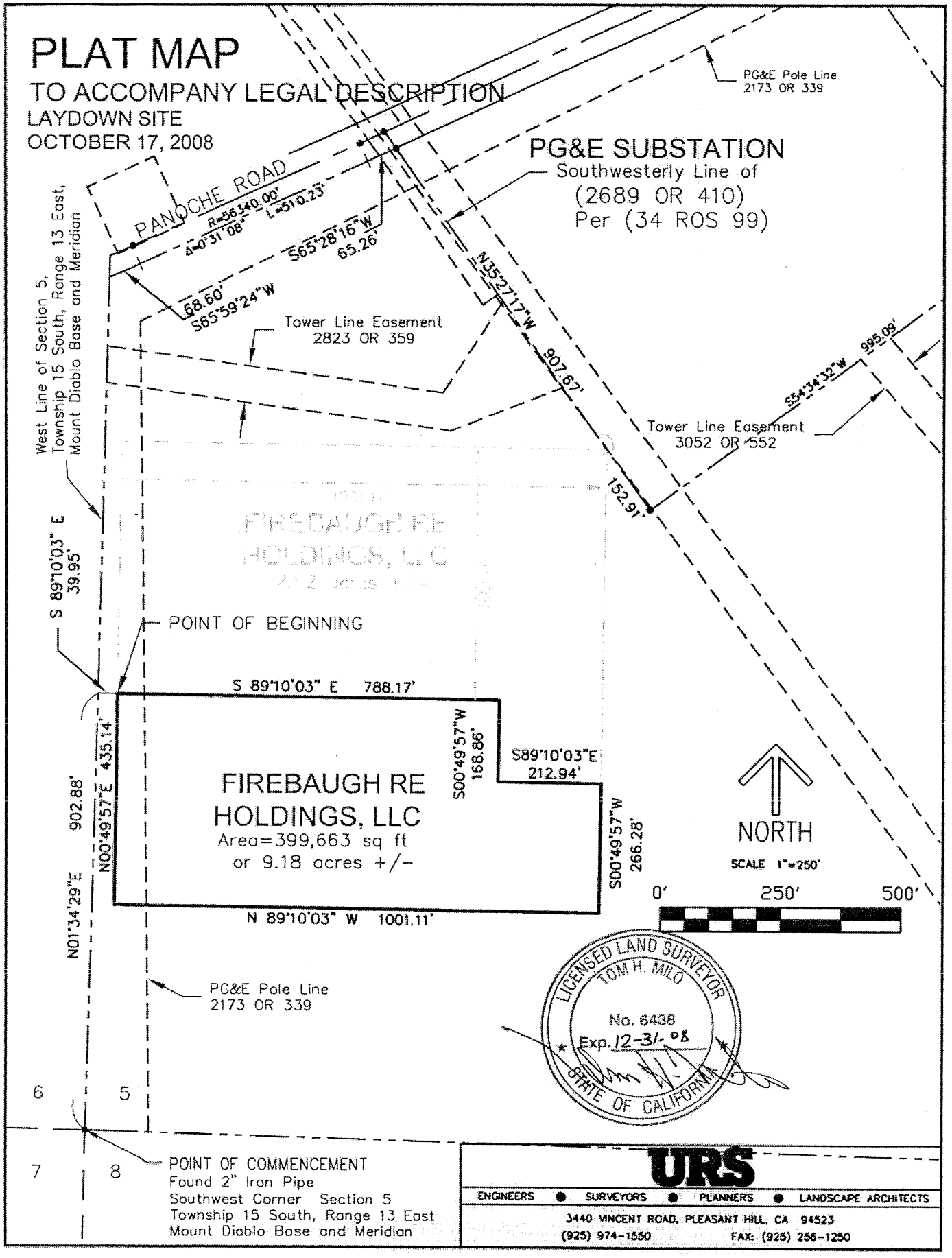
S

500 0 500 1000 1500 2000 Feet

Prepared by: County of Fresno The Department of Public Works and Planning HEL8752

EXHIBIT C

EXHIBIT 'D'




URS
ENGINEERS ● SURVEYORS ● PLANNERS ● LANDSCAPE ARCHITECTS
3440 VINCENT ROAD, PLEASANT HILL, CA 94523
(925) 974-1550 FAX: (925) 256-1250

# DEPARTMENT OF CONSERVATION

## DIVISION OF LAND RESOURCE PROTECTION

801 K STREET • MS 18-01 • SACRAMENTO, CALIFORNIA 95814

PHONE 916 / 324-0850 • FAX 916 / 327-3430 • TDD 916 / 324-2555 • WEBSITE conservation.ca.gov


RECEIVED
JUN 29 2009
FRESNO COUNTY
DEPT. OF
PUBLIC WORKS & PLANNING

June 24, 2009

Mr. Tawanda Mtunga, Planner
Fresno County Department of
Public Works and Planning
Development Services Division
2220 Tulare Street, Sixth Floor
Fresno, CA 93721

Dear Mr. Mtunga:

Subject: Partial Cancellation of Land Conservation (Williamson Act) Contract
ALCC No. 367 (RLCC 838); APN 027-060-80s, 84s portion - PAO Investments

Thank you for submitting notice to the Department of Conservation (Department) as required by Government Code §51284.1 for the above referenced matter.

The petition proposes to cancel a 9.18-acre portion of the parcel's 128 prime agricultural acres subject to Williamson Act Contract No. 367 for development of a 400-megawatt thermal power plant. The parcel's remaining is currently undergoing the nonrenewal process for contract termination. The site is located south and adjacent to West Panoche Road, between South Brannan Avenue and South Fairfax Avenue in Fresno County.

Cancellation Findings

Government Code §51282 states that tentative approval for cancellation may be granted only if the local government makes either of the following findings:

1) cancellation is **consistent** with purposes of the Williamson Act, or
2) cancellation is in the **public interest**.

However, Fresno County requires that ***both*** findings be made for the approval of a tentative cancellation.

The Department has reviewed the revised petition and additional information provided, and offers the following comments.

Cancellation is Consistent with the Purposes of the Williamson Act

For cancellation to be consistent with purposes of the Williamson Act, Fresno County Board of Supervisors (Board) must make **all** of the following five findings:

1) a notice of nonrenewal has been served,

2) cancellation is not likely to result in removal of adjacent land from agricultural use,
3) the alternative use is consistent with the County General Plan,
4) discontiguous patterns of urban development will not result, and
5) there is no proximate noncontracted land which is available and suitable for the use proposed on the contracted land, or, development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

(1) Notice of nonrenewal has been served:
The landowner served a notice of nonrenewal. The 128.49-acre portion of Contract No. 367 (APN 027-060-78s) is scheduled to expire on December 31, 2016.

(2) Removal of adjacent land from agricultural use not a likely result:
Development of the proposed power generation facility will not negatively affect adjacent agricultural lands or cause their removal from agricultural use.

(3) Alternative use is consistent with County General Plan:
The proposed alternative use will not produce discontiguous patterns of urban development due to the location of the existing PG&E substation.

(4) Discontiguous patterns of urban development will not result:
Based on information provided, the Department agrees with the determination that discontiguous patterns of urban development are not likely to occur.

(5) There is no available and suitable proximate noncontracted land for the use proposed on the contracted land:
The Department would concur that there is not proximate noncontracted land that is suitable or available for the alternative use proposed.

Cancellation is in the Public Interest

For the cancellation to be in the public interest, the Board must make **both** of the following findings:

1) other public concerns substantially outweigh the objectives of the Williamson Act, and
2) there is no proximate noncontracted land which is available and suitable for the use proposed on the contracted land, or, development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

Due to the passage of recent legislation regarding renewable energy, the Department would concur that the public concerns substantially outweigh the objectives of the Williamson Act.

Our comments above in section (5) already address the proximate lands issue.

Provided the information received is accurate and correct, the Department concurs that the Board has a basis to find cancellation of the 9.18-acre portion of the contract consistent with the purposes of the Williamson Act.

Required Notice

Legislation effective January 1, 2005, requires the county assessor to send notice to the Department and landowner of the current fair market value of the land and of the opportunity to request a formal review from the assessor prior to any action giving tentative approval to the cancellation of any contract (SB 1820, Machado, Chapter 794, Statutes of 2004 (Government Code §51283(a)). To date, the Department has **not** received the required notice of the parcel's cancellation valuation from the county assessor.

Thank you for the opportunity to provide comments on the proposed cancellation. Please provide our office with a copy of the Notice of the Public Hearing on this matter ten (10) working days before the hearing and a copy of the published notice of the Board's decision within 30 days of the tentative cancellation pursuant to Government Code §51284. If you have any questions concerning our comments, please contact Sharon Grewal, Environmental Planner at (916) 327-6643.

Sincerely,

Brian R. Leahy
Assistant Director

# APPENDIX E
# WATER RESOURCES

**APPENDIX E**
**ANTIDEGRADATION ANALYSIS**
**Unlined Wastewater Surface Impoundments**
**Panoche Energy Center, LLC**
**Western Fresno County, CA**

**September 21, 2009**

The Panoche Energy Center, LLC (PECL), as owner/operator of the PEC, is considering filing a Report of Waste Discharge (ROWD) with the Regional Water Quality Control Board, Central Valley Region (RWQCB) for the discharge of the facility's wastewater to two onsite, unlined wastewater surface impoundments (UWSI). Currently, PEC's wastewater is being discharged to four, onsite, deep injection wells under a permit issued by the United States Environmental Protection Agency, Region IX ("USEPA"). The injection wells, however, have been found incapable of injecting the maximum expected wastewater volume, and thus, are not a reliable discharge option for the life of the PEC facility.

PECL prepared this Antidegradation Analysis to evaluate the potential discharge to surface impoundments in light of State Water Resources Control Board (SWRCB) Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California (Resolution). The Resolution directs that "existing high quality [water] will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in [State] policies" (emphasis added). The Resolution also directs that any activities that result in discharges to "existing high quality waters" are required to use "the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

The analysis herein demonstrates that groundwater in the upper semi-confined aquifer is not a "high quality" water and is not known to be used within several miles of the PEC facility, except for two emergency-backup supply wells. These wells serve two nearby peaking power plants, but significant demineralization of the groundwater is needed prior to its use at those facilities. Vicinity irrigation wells are typically completed in the lower confined aquifer, because groundwater from the semi-confined aquifer is too salty for crops. PEC's proposed discharge of the facility's wastewater to two onsite UWSI will not unreasonably affect present or anticipated future beneficial uses of groundwater in the upper semi-confined aquifer.

## Facility Description

PEC uses four inter-cooled, natural-gas-fired, combustion turbine generators (CTGs) to provide up to 400 megawatts of much-needed electricity to power-consumers in California. The CTGs employ the latest-generation technology, enabling greater efficiency of power production using less natural gas and producing substantially less

$NO_x$ and greenhouse gas emissions than previous CTG designs. This technology, know as "inter-coolers," reduces temperatures in the combustion passes in the CTG. The use of air-cooled inter-coolers was considered by PEC, but the water-cooled design was chosen due to its superior energy efficiency over the air-cooled design.

The plant is located in an unincorporated area in western Fresno County on West Panoche Road, about two miles northeast of the I-5 freeway. The plant is adjacent to a PG&E electrical substation. Three smaller "peaking" power plants are in the immediate vicinity. Otherwise, area land use is primarily cropland (e.g., pomegranates, almonds, vineyards) with a few rural residences and farm buildings. The nearest residence is located about 1.5 miles northeast of the power plant site.

The PEC is designed for cyclic applications with 10-minute starts to provide clean, flexible power generation for peaking and intermediate needs. It will enable the electrical grid's reliance on renewable energy sources, namely, wind and solar, by meeting instantaneous variations in those sources' electrical output. The plant is expected to operate up to 5,000 hours per year (in contrast to typical "peaking plants" that operate less than 500 hours per year). This level of power generation would supply enough electricity for roughly 300,000 homes in California. The California Energy Commission (CEC) issued its Final Decision approving the license for the project on December 19, 2007. The plant began commercial operation on June 1, 2009.

**Regional Hydrogeology**

The facility is located in the Westside Sub-Basin of the San Joaquin Valley Groundwater Basin. Aquifers underling the facility include an upper semi-confined zone and a lower confined zone that are separated by the Corcoran Clay member of the Tulare Formation. First-encountered groundwater is present at approximately 170 feet below ground surface (bgs). Based on e-logs from onsite well boreholes, the Corcoran Clay is present beneath the facility from approximately 650 to 760 feet bgs.

Water quality in the semi-confined aquifer is substantially worse than in the confined aquifer. (For this reason, PEC relies on the confined aquifer for its source of production water.) PEC recently installed an onsite monitoring well, screened from 150 to 210 feet bgs for purposes of evaluating water quality and aquifer characteristics in the first-encountered groundwater. Groundwater samples collected in July and August 2009 contained total dissolved solids (TDS) concentrations ranging from 4,000 to 4,900 milligrams per liter (mg/l). Analytical results for first-encountered groundwater at PEC are summarized on the attached Table 1 titled "Baseline & Predicted Groundwater Quality", along with RWQCB and USEPA water quality objectives (WQOs).

Potential groundwater beneficial uses listed in the Basin Plan for the PEC area include municipal (MUN) and agricultural (AGR) uses. However, the analytical results for the first-encountered groundwater indicate that many of the semi-confined-aquifer background groundwater concentrations substantially exceed the municipal and/or agricultural WQOs. For example, regarding municipal WQOs, the first-encountered groundwater nitrate concentration of about 393 mg/l is more than eight times the primary

maximum contaminant level (MCL) of 45 mg/l, the arsenic concentration of about 24 ug/l is more than twice the primary MCL of 10 ug/l, the selenium concentration of about 495 ug/l is more than nine times the primary MCL of 50 ug/l, the TDS concentration of about 4,500 mg/l is more than 4 times the upper secondary MCL of 1,000 mg/l, and the sulfate concentration of about 2,200 mg/l is more than four times the upper secondary MCL of 500 mg/l.

Regarding agricultural WQOs, groundwater with a TDS concentration of greater than 2,000 mg/l is considered to be severely restricted for irrigation use (FAO Publication 29). The first-encountered groundwater TDS concentration of about 4,500 mg/l is more than twice this objective. Two of the most common toxic ions in irrigation water are chloride and boron (FAO 29). The most sensitive crops show chloride impacts at a concentration of about 100 mg/l, and many crops, including grapes which are grown in the PEC vicinity, show impacts at a concentration of 250 mg/l, which is substantially less than the background groundwater concentration of about 403 mg/l. The most sensitive crops, including grapes which are grown in the PEC vicinity, show boron impacts at concentrations of about 500 ug/l, and many crops show impacts at concentrations of 2,000 ug/l, which is substantially less than the groundwater concentration of about 3,230 ug/l. In addition, the groundwater selenium concentration of about 495 ug/l is more than 24 times the FAO-recommended maximum irrigation-water concentration of 20 ug/l.

Thus, several constituents in the existing groundwater render it unusable for municipal and agricultural purposes, unless the water is first treated to remove these constituents.

A few widely spaced irrigation wells are present in the general vicinity of PEC. Newer irrigation wells are supposed to be screened exclusively in the confined aquifer; older wells may be screened and/or filter-packed across both aquifers. Local farmers use these wells when they are unable to obtain surface water for irrigation. The local farmers purposely do not have wells screened exclusively in the semi-confined aquifer, because groundwater from the semi-confined aquifer is too salty for their crops.

Only two supply wells in the plant vicinity are known to be screened within the semi-confined aquifer. These are emergency backup supply wells for the Calpeak-Panoche and Starwood-Midway peaker power plants, located about 1,000 and 1,500 feet, respectively, northeast of PEC. The Starwood-Midway well is known to be screened from 400 to 500 feet bgs. The Calpeak-Panoche well is known to be 500 feet deep, and the top of the screen is assumed to be at a similar depth as the Starwood-Midway well, based on reported analytical results. Both of these plants have demineralizing water-treatment systems that would be used to treat the groundwater before use. The Calpeak-Panoche plant normally gets its source water by truck provided by a local farmer from either his surface water supply or his irrigation wells. The Starwood-Midway plant normally gets its source water by pipeline from a local farmer's surface water supply (sediment-filter backwash water).

In summary, the groundwater in the semi-confined aquifer, in its existing state (i.e. without treatment), has very limited beneficial uses. Due to the fact that the upper semi-confined aquifer is of far lower quality than that quality established in adopted State

Board policies (including the Basin Plan), the groundwater beneath the two proposed UWSI does not meet the requirements of a "high quality" water that is to be maintained under SWRCB Resolution No. 68-16. Moreover, the discharge of the plant wastewater is unlikely to have more than a minimal impact on the potential usability of the groundwater, and such impact, if any, is consistent with maximum benefit to the people of the State of California given the projected benefits of the overall PEC project.

**Water Supply/Treatment and Wastewater**

PEC process water will continue to be provided from two onsite supply wells that are screened exclusively in the confined-aquifer zone below the Corcoran Clay. Process water uses will continue to include fire-protection water, plant service water, sanitary water, cooling tower makeup, combustion turbine $NO_x$ injection (treated water), and combustion turbine inlet air evaporative cooler makeup (partly from treated water). Water treatment for a portion of the process water will consist of a two-stage, reverse osmosis (RO) system, followed by trailer-mounted demineralizers that are regenerated offsite. Almost all of the RO-reject water will result from treatment of water for use in highly reducing the $NO_x$ air emissions from the plant. To conserve water, reject from the second-stage RO unit will be recycled as influent to the first-stage unit. Plant wastewater will consist of approximately 74-percent cooling-tower blowdown, 25-percent RO reject, and 1-percent oil/water separator effluent (the influent to the oil/water separator is plant washdown water that is not treated in the RO system prior to use). For 5,000 hours of operation, the plant is anticipated to require at maximum approximately 1,166 acre-feet per year (afy) of source water, and to produce approximately 387 afy of wastewater that requires disposal. The attached three-page Water Balance illustrates and quantifies the plant's anticipated maximum water and wastewater flows and qualities.

**Wastewater Disposal Alternatives**

The proposed Project consists of the development and use of two onsite UWSI, designed to accommodate all of PEC's process wastewater. Alternative (or additional) water sources were evaluated as part of the overall wastewater alternative screening process, but none of the wastewater options that involved changes to the water supply were deemed "reasonable." Given this, each of the "reasonable" alternatives discussed herein assumes a baseline condition that PEC will continue to rely on its onsite production wells as its source of water.

Before describing individual Alternatives considered herein, below is a list of the basic conditions and notions from which PEC based their consideration of whether an alternative is "reasonable":

1. Annual withdrawal volume from PEC's production wells will not increase beyond that of the original AFC.

2. Use of land that includes the existing laydown area is preferred, as this will minimize environmental impacts compared to using non-adjacent land resources, including agricultural land.

3. Any load-consuming increases should not be beyond those specified in the Power Purchase Agreement. This supports the overall relatively high energy efficiency that the facility affords and ensures that power plant efficiency is not adversely affected.

4. Minimize new linear components such as pipelines that entangle need for easements, land use rights and that would increase the disturbance of agricultural land and environmental effects.

5. Continue use of PEC's current water source (onsite wells).

6. Support implementation before the next load demand season begins in May 2010.

PECL considered the environmental impacts of various Project site locations associated with the reasonable wastewater disposal alternatives set forth herein. Aside from the "no project alternative." all of the reasonable wastewater disposal alternatives would require additional land to that originally permitted for the operation of PEC. Generally, adjacent or nearby sites offer clear advantages over remote sites. The 7.18-acre existing PEC laydown area offers the best, or baseline, site due to its proximity to the wastewater source and because this area has already been disturbed and mitigated for environmental impacts.

PEC investigated numerous wastewater disposal alternatives. Many were dismissed as being unreasonable or unavailable. These include:

- Pumping or trucking wastewater to a WWTP
- Discharging wastewater to a brine line to Pacific Ocean
- Adding injection wells
- Changing the production water source – (i.e., WWTP effluent, aqueduct water, agricultural irrigation tail water)
- Discharging to a nearby water body
- Regenerating deionizer systems offsite
- Zero liquid discharge (ZLD)

**Pumping or Trucking Wastewater to a WWTP –** Sending PEC's wastewater to a local WWTP is unreasonable mainly because of prohibitive water quality issues. WWTP discharge permits do not allow for increases in Electrical Conductivity that is greater than 500 micro-mhos/cm above incoming WWTP water. PEC's wastewater (at ~6,600 micro-mhos/cm) is well beyond that regulatory limitation.

**Discharging Wastewater to a Brine Line to Pacific Ocean** – There is no existing or planned brine line (to the Pacific Ocean) in close proximity to the PEC facility. Building and using such a dedicated brine line is economically prohibitive, and would take several years to permit and construct.

**Adding Injection Wells** – PEC originally thought that two injection wells would be sufficient to handle the maximum permitted wastewater volumes. The construction and commissioning of an additional two wells has provided PEC with further evidence that this technology is not suited for its wastewater disposal needs due to unfavorable geological attributes.

**Changing the Production Water Source** – PEC's reliance on water cooling is essential in maximizing the facility's electrical output and efficiency. To meet energy requirements of its power sales agreement, PEC must continue to rely on water for cooling the gas turbines. Alternative water sources were considered in an effort to improve the wastewater quality beyond what is presently permitted and produced. Beyond the groundwater currently used, there are two types of water sources near PEC: (1) wastewater treatment plant (WWTP) effluent, and (2) State and Federal Aqueduct water. State Water Policy 75-58 effectively prohibits the use of aqueduct water for power plant cooling, so this water option was dismissed. Several WWTPs within a 45 mile radius of PEC were evaluated. Aside from the prohibitive costs associated with constructing and operating a long water pipeline, the limiting factor for dismissing this water source was the relatively high TDS, silica, and other constituents found in the WWTP effluent. These high concentrations did not provide significant improvements to projected wastewater quality when compared to the existing onsite wells. As a result of this lack of suitable water source alternatives, none of the "reasonable" wastewater alternatives (as described below) involved changes to the existing water source.

**Discharging to a Nearby Water Body** – When considering the potential to discharge to a water body, i.e., "waters of the U.S.," regulations effectively require that the receiving stream is sufficiently voluminous and the wastewater is sufficiently low in solids to ensure that there are no significant "loading" impacts to the receiving water body. In PEC's case, there are no receiving water bodies in close proximity to the facility that would promote this opportunity.

**Regenerating Deionizer Systems Offsite** – This is a technically available option, but it is too costly, both economically and environmentally. At full load, the project would require up to ten demineralizer trailer rigs be moved in and out of service per day. PEC is presently and temporarily relying on an offsite regeneration process to reduce the amount of wastewater generated onsite (due to the under-performing injection wells inability to accommodate the full designed wastewater flow rate). While implemented on a temporary basis, this offsite regeneration process would be prohibitively expensive at full capacity. In addition, an offsite regeneration process of PEC's scale would impose environmental impacts associated with truck fuel use. Further, the injection wells cannot be relied on in the long term so this alternative does not meet reliability standards.

**Zero Liquid Discharge** – A ZLD system would require a parasitic electrical load that would consume roughly about 8% of the plant's gross power production due to the nature of forcing wastewater through membranes and then evaporating the membrane reject stream. ZLD processes require continuous, steady-state operation to prevent equipment fouling and to minimize power consumption. Thus, ZLD processes will not work reliably in a batch mode, as would be presented by PEC's "peaking" operations. If a ZLD system was used, PEC would not be able to reliably and efficiently produce electricity according to its power purchase agreement with PG&E. Further, a ZLD system would result in extremely high capital and O&M costs. In addition to reliability and costs prohibitions, and as a direct result of lowered energy conversion efficiency, more greenhouse gases (GHG or $CO_2$) would be generated on an electrical output basis. Under its current configuration, PEC produces about 1,100 pounds of $CO_2$ for each megawatt-hour of electricity. A ZLD system would increase $CO_2$ production for each megawatt-hour to 1,190 pounds, which at maximum operation would result in an additional 90,000 tons of $CO_2$ per year. . Therefore, a ZLD system is considered an unviable option for treating PEC's wastewater.

PEC considers the following Project Alternatives to be "reasonable:"

- Double-lined evaporation pond(s)
- Onsite Un-lined Wastewater Surface Impoundment(s)

**Double-Lined Evaporation Pond(s) -** Discharge to a double-lined evaporation pond in accordance with Title 27 of the California Code of Regulations would require a total pond area of approximately 80 to 100 acres for the amount of wastewater PEC generates. The pond(s) would require periodic sediment cleaning and offsite disposal (likely as Class 1 or 2 waste). This would increase environmental impacts due to dust, traffic, greenhouse gas emissions, and use of landfill space. In addition, evaporation increases the concentration of selenium in the pond water, which could create a potential threat to waterfowl. Lastly, preventing leakage over the 20-year projected life-span of PEC would be extremely difficult for a double-lined pond of this size. At the end of the project life, the pond(s) would need to be closed in accordance with Title 27 of the California Code of Regulations. A double-lined pond of this size would also have an extremely high capital cost (estimated to be $40 million). All of these factors make an 80 to 100-acre double-lined evaporation pond a highly impractical discharge alternative.

**Onsite Unlined Wastewater Surface Impoundment(s) -** There are no nearby surface receiving waters suitable for wastewater disposal, so discharge to a UWSI is the only practical surface discharge option. Reliance on UWSI would require fewer resources while promoting higher energy production efficiencies than any of the other alternatives. PECL has proposed to use two smaller ponds rather than a single large pond to afford good maintenance practices. The ponds will allow wastewater to percolate into the virtually unusable upper semi-confined aquifer, which contains low–quality groundwater that is generally worse quality than the PEC wastewater. As evaluated in PECL's Petition to Amend, Section 5.5, Water Resources, this discharge will be compliant with LORS and not produce any significant adverse environmental impacts.

In summary, the PECL has chosen the onsite unlined wastewater surface impoundments alternative because it affords the best balance between minimizing environmental impacts and optimizing energy efficiency, reliability and availability.

**Fate & Transport Analysis**

PEC performed vadose-zone geochemical modeling and groundwater modeling to estimate the potential impact of discharging the plant's wastewater to unlined surface impoundments. The vadose-zone geochemical modeling used the PHREEQC software program to analyze potential geochemical reactions including complexation, cation-exchange, dissolution/precipitation, and oxidation-reduction processes. Chemical adsorption and desorption were not included in the model, because over the 20-year projected life of the project they would not likely be a substantial factor. Varied ranges of acidity (pH between 4.0 and 8.2) and oxidation-reduction potential (eH between 4 and 8 millivolts) were modeled. The modeling results indicate that there may be some short-term dissolution of minerals from the vadose-zone materials into the percolating wastewater. However, the modeling indicates that, over the long term, such dissolution should be relatively minimal. The results also indicate that there are several solid phases which potentially may precipitate from the percolating wastewater within the vadose zone. However, the mineral concentrations in the wastewater are not great enough to assure to a reasonable likelihood that such precipitation will in fact occur. Based on these results, it was judged reasonably conservative to assume for the groundwater modeling that the percolated wastewater at the bottom of the vadose zone will have the same chemical concentrations as at the ground surface.

The groundwater modeling used the MODFLOW software program to estimate the steady-state groundwater flow condition with the added recharge from the surface impoundments. Hydrogeologic parameters published by USGS for the semi-confined aquifer in the plant vicinity were used in the model. The transport model MT3D was used to estimate the advective/dispersive transport of dissolved chemical constituents in the semi-confined aquifer for a 20-year period after the surface-impoundment recharge begins mixing in with groundwater. The first three pages of the attached groundwater modeling figures illustrate the model discretization, key parameters, and predicted steady-state potentiometric surface contours after recharge begins. The UWSI are predicted to cause a moderate mounding of groundwater with a maximum increase in the water-table elevation of about 32 feet directly below the center of the impoundments, decreasing to a 20-foot increase at the edge of the impoundment, and decreasing further moving laterally away from the impoundment.

The mixing of percolated wastewater and native groundwater in the semi-confined aquifer was modeled using TDS as an indicator parameter. Pages 4 and 5 of the attached groundwater modeling figures show a cross-section view and plan view, respectively, of predicted TDS concentrations in the semi-confined aquifer at a simulated time of 20 years after the surface-impoundment recharge begins mixing in with groundwater. Since the wastewater is predicted to have a lesser TDS concentration than the baseline groundwater, the simulated TDS concentrations within the volume of groundwater affected by the recharge are lesser than the baseline value by up to 5.6 percent. Similarly,

several other constituents such as calcium, magnesium, chloride, and nitrate are also predicted to have lesser than baseline concentrations within the volume of affected groundwater. Thus, the discharge will substantially improve the groundwater quality for these constituents. Some constituents such as sodium, sulfate, and silica are predicted to have greater than baseline concentrations within the volume of affected groundwater. This volume after 20 years of discharge is predicted to extend about 5,800 feet downgradient of the UWSI and 240 feet vertically below the water table. Predicted maximum concentrations within this volume of groundwater are presented in Column J of the attached Table 1.

For modeling purposes, two hypothetical wells (Wells A and B) were placed in the model at the downgradient edge of the surface impoundment. Well A was screened in the model from a depth of 400 to 500 feet bgs, which is consistent with the only known supply wells in the semi-confined aquifer within the facility vicinity. Any future wells would likely be screened at a similar depth to take advantage of the better water quality and production in the lower portion of the semi-confined aquifer. To provide a more conservative estimate of potential impacts to future supply wells, Well B was screened in the model from a depth of 300 to 500 feet bgs. Page 6 of the attached groundwater modeling figures provides a time-concentration graph for predicted TDS concentrations in these two wells. The results indicate that the TDS concentration in Well A would be virtually unchanged after 20 years of the proposed discharge, and in Well B would decrease about 1 percent from 4,470 mg/l to about 4,420 mg/l.

**Analysis of Wastewater Constituents**

Overall, the PEC discharge is predicted to cause a decrease in groundwater TDS concentrations and in concentrations of constituents such as calcium, magnesium, chloride, and nitrate. There are seven constituents, however, for which the predicted maximum concentrations within the volume of affected groundwater are greater than the baseline groundwater concentration and are also greater than the municipal and/or agricultural WQOs. These constituents are discussed in turn below:

- **Arsenic.** The background arsenic concentration is approximately 24 ug/l. The municipal WQO is 10 ug/l, which is less than the background concentration. The agricultural WQO is 100 ug/l. The predicted maximum groundwater concentration after PEC's proposed discharge is 94 ug/l, which is greater than the background concentration and less than the agricultural WQO. Since the background concentration is already greater than the municipal WQO, and since the discharge is not predicted to cause the groundwater concentration to exceed the agricultural WQO, the discharge will cause no further WQO exceedances. In terms of potential municipal uses, arsenic removal would be required even for the background groundwater. If the discharge occurred as proposed, the overall level of required water treatment would very likely decrease due to the substantial concentration decreases in other constituents such as nitrate and selenium.

- **Boron.** The background groundwater boron concentration is approximately 3,225 ug/l. There is no municipal WQO for boron and the agricultural WQO based on actual crops in the PEC vicinity is 500 ug/l. The predicted maximum groundwater concentration of boron after PEC's proposed discharge is 10,600 ug/l, which is greater than the background concentration and the agricultural WQO. The most sensitive crops, including grapes which are grown in the PEC vicinity, show boron impacts at concentrations of about 500 ug/l. Many other crops show impacts at concentrations of 2,000 ug/l, which is substantially less than the groundwater concentration of about 3,230 ug/l. In terms of potential agricultural uses, boron removal would be required even for the background groundwater. If the discharge occurred, the overall level of required water treatment would likely change very little because there is another constituent (selenium) which is present in the background groundwater at a greater multiple of its agricultural WQO than would be the case for boron after discharge.

- **Fluoride.** The background fluoride concentration is approximately 0.07 mg/l. The municipal WQO is 2.0 mg/l. The agricultural WQO is 1.0 mg/l. The predicted maximum groundwater concentration after discharge is 1.24 mg/l, which is greater than the background concentration and slightly higher than the agricultural WQO. In terms of potential agricultural uses, if the discharge occurred, the overall level of required water treatment would likely change very little because there is another constituent (selenium) which is present in the background groundwater at a greater multiple of its agricultural WQO than would be the case for fluoride after discharge.

- **Manganese.** The background manganese concentration is less than 10 ug/l. The municipal WQO is 50 ug/l (this is based on a secondary MCL due to taste and odor concerns, not on a primary MCL). The agricultural WQO is 200 ug/l. The predicted maximum groundwater concentration after discharge is 160 ug/l, which is greater than the background concentration and less than the agricultural WQO. In terms of potential municipal uses, if the discharge occurred, the overall level of required water treatment prior to municipal use would very likely decrease due to the substantial concentration decreases in other constituents such as nitrate and selenium.

- **Molybdenum.** The background molybdenum concentration is less than 10 ug/l. There is no municipal WQO. The agricultural WQO is 10 ug/l. The predicted maximum groundwater concentration after discharge is 154 ug/l, which is greater than the background concentration and the agricultural WQO. In terms of potential agricultural uses, if the discharge occurred, the overall level of required water treatment would likely change very little because there is another constituent (selenium) which is present in the background groundwater at a greater multiple of its agricultural WQO than would be the case for molybdenum after discharge.

- **Sodium.** The background sodium concentration is approximately 528 mg/l. There is no municipal WQO. The agricultural WQO is nominally 69 mg/l. The predicted maximum groundwater concentration after discharge is 1,330 mg/l, which is greater than the background concentration and the agricultural WQO. In terms of potential agricultural uses, if the discharge occurred, the overall level of required water treatment would likely change very little because there is another constituent (selenium) which is present in the background groundwater at a greater multiple of its agricultural WQO than would be the case for sodium after discharge.

- **Sulfate**. The background sulfate concentration is approximately 2,200 mg/l. The municipal WQO is 500 mg/l. There is no agricultural WQO. The predicted maximum groundwater concentration after discharge is 2,380 mg/l, which is slightly greater than the background concentration and is greater than the municipal WQO. Since the background concentration is already greater than the municipal WQO, and since there is no agricultural WQO, the discharge will cause no further WQO exceedances. In terms of potential municipal uses, sulfate removal would be required even for the background groundwater. If the proposed discharge occurred, the overall level of required water treatment would very likely decrease due to the substantial concentration decreases in other constituents such as nitrate and selenium.

In summary, the discharge is predicted to cause only one new exceedance of a municipal WQO (for manganese, and that WQO is based only on a secondary MCL) and only two new exceedances of agricultural WQOs (for fluoride and molybdenum). The discharge is predicted to cause four other constituents (arsenic, boron, sodium, and sulfate) to exceed municipal or agricultural WQOs by a somewhat greater margin than the background groundwater already exceeds the WQOs. In terms of both potential municipal or agricultural uses, however, water treatment would be required even for the background groundwater. If the proposed discharge to UWSI occurred, the overall level of required water treatment would likely change very little or actually decrease due to the substantial concentration decreases in other constituents such as TDS, chloride, nitrate, selenium, and strontium.

**Conclusions**

The PEC will continue to provide substantial benefits to power-consumers in California by employing very high-efficiency CTGs to produce much-needed electricity with significantly lower environmental impacts than previous-generation CTGs. The water-treatment system will continue to include internal recycling to minimize the amount of source water required, and most of the treated water will continue to be devoted to $NO_x$ control.

Unfortunately, existing deep injection wells do not appear capable of handling the volume of wastewater that may be produced by the plant during peak operations. The only other alternative that appears reasonably feasible is discharge to onsite UWSI.

The groundwater in the semi-confined aquifer is of extremely poor quality with several minerals and metals at background concentrations that substantially exceed WQOs. Without treatment, this groundwater is unsuitable for beneficial uses. This is validated by the fact that this water source has not historically been used, nor is it presently used, for potable or agricultural purposes. The only two known supply wells in the plant vicinity that are screened in the semi-confined aquifer are screened relatively deep (400 to 500 feet bgs) to take advantage of somewhat-better water quality and production. Further, these wells are solely emergency backup supply wells connected to demineralizing water treatment systems at nearby peaking power plants. Future supply wells screened in the semi-confined aquifer are considered unlikely given the poor groundwater quality, but if installed, would likely be screened relatively deep similar to these two existing wells.

The wastewater discharge is unlikely to affect the usability of the groundwater. The baseline groundwater requires treatment for almost any conceivable use. The affected volume of groundwater will also require treatment for almost any conceivable use. However, treatment of the affected volume of groundwater will be easier than treatment of the baseline groundwater, because the affected volume will have a lower TDS concentration than the baseline groundwater.

Overall, the proposed discharge to two UWSI would have, at worst, only a relatively minimal impact on the current and future usability of groundwater. The existing groundwater in the semi-confined aquifer is not a "high quality" water that is to be maintained under SWRCB Resolution No. 68-16. The proposed discharge would not unreasonably affect present and anticipated beneficial uses of the groundwater, because the groundwater will require treatment for almost any conceivable use regardless of whether the discharge occurs. If the discharge does occur, the level of required treatment will likely be less than without the proposed discharge, because the concentration of TDS and other constituents in the groundwater for which extensive treatment is required will be less than background levels of such constituents. Moreover, any potential minimal impact is overcome by the increased overall benefit to the people of California that the use of the two UWSI would provide.

Notwithstanding the foregoing, if the semi-confined aquifer is considered a "high quality water," no treatment method exists to make salts disappear. Any treatment method will only cause the salts to be concentrated into a smaller volume. However, the analysis summarized herein indicates that the proposed discharge would not create a condition of pollution or nuisance, and would maintain the highest water quality consistent with maximum benefit to the people of the State. The best practicable control method for the discharge appears to be a wastewater and groundwater monitoring program to verify the quantity/quality of the discharged wastewater and to assess whether impacts to groundwater are relatively similar to the predicted impacts.

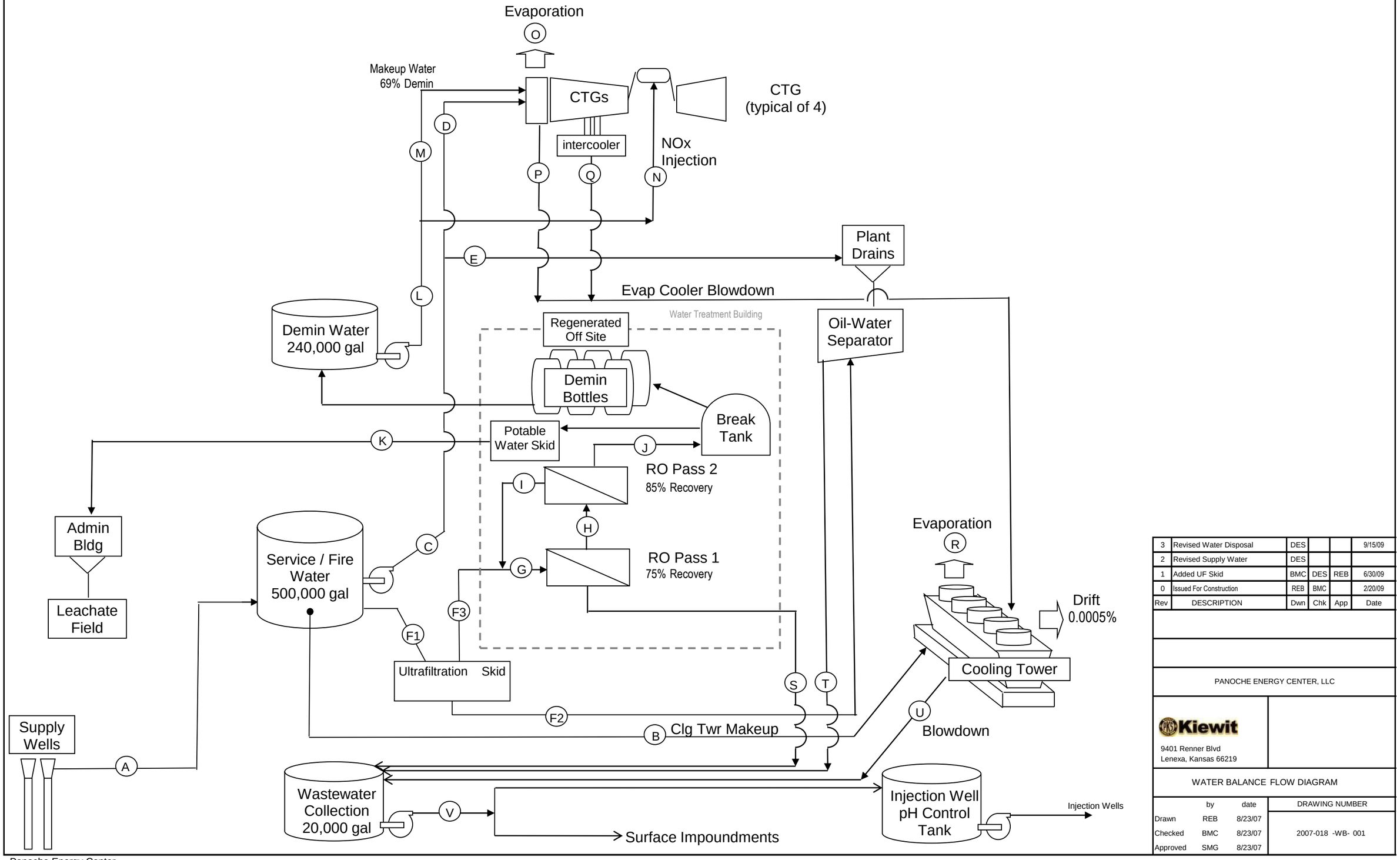
Based on the information provided herein, any de minimus groundwater degradation from the proposed PEC UWSI is in the best interest of, and is consistent with, the maximum benefit to the citizens of the State of California. Operation of PEC will supply a cleaner, more reliable electrical supply to the State during periods of intermediate and peak use, PEC provides increased employment in the area, and any groundwater

degradation anticipated by constituents such as fluoride, manganese, and molybdenum is de minimus compared to the anticipated improvement of groundwater quality by constituents such as calcium, magnesium, chloride, and nitrate. Moreover, the proposed discharge will not unreasonably affect present and anticipated future beneficial uses of the upper semi-confined aquifer.

Attachments:

Table 1 – Baseline & Predicted Groundwater Quality, 8/26/09 (1 page)
Water Balance (3 pages)
Groundwater modeling figures (6 pages)

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | **TABLE 1** | | | | | | | | | | | |
| 2 | | **BASELINE  PREDICTED GROUNDWATER QUALITY** | | | | | | | | | | | |
| 3 | | **Panoche Energy Center** | | | | | | | | | | | |
| 4 | | 26-Aug-09 | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | RWQCB Water Quality Objectives (WQOs) | | | | | |
| 7 | | | Panoche Energy Center | | | | | | | Receiving Groundwater Quality Estimates | | | |
| 8 | Parameter | Units | MW-4 7/16/09 (LF) | MW-4 7/16/09 (LF) | MW-4 8/7/09 (FF) | MW-4 8/7/09 (LF) | Average | Municipal | Agricultural | Predicted Maximum Concentration in First-Encountered Groundwater Downgradient of the Pond | Concentration Greater Than Baseline Concentration? | Concentration Greater Than WQO(s) ? | Baseline Concentration Was Already Greater Than WQO(s) ? |
| 9 | Calcium | mg/L | 360 | 380 | 440 | 440 | 405 | n/a | n/a | 48 | | | |
| 10 | Magnesium | mg/L | 280 | 300 | 330 | 340 | 313 | n/a | n/a | 12 | | | |
| 11 | Sodium | mg/L | 510 | 500 | 560 | 540 | 528 | n/a | 69 | 1,330 | Yes | Yes | Yes |
| 12 | Potassium | mg/L | 10 | 10 | 12 | 11 | 11 | n/a | n/a | 8.0 | | | |
| 13 | Sulfate | mg/L | 2,000 | 2,100 | 2,300 | 2,400 | 2,200 | 250 - 500 | n/a | 2,380 | Yes | Yes | Yes |
| 14 | Chloride | mg/L | 360 | 360 | 450 | 440 | 403 | 250 - 500 | 250 | 302 | | | |
| 15 | Nitrate | mg/L | 360 | 370 | 420 | 420 | 393 | 45 | n/a | 10 | | | |
| 16 | Silica (SiO2) | mg/L | 45 | 47 | 47 | 45 | 46 | n/a | n/a | 157 | Yes | | |
| 17 | Bicarbonate (as CaCO3) | mg/L | 130 | 140 | 130 | 130 | 133 | n/a | n/a | 150 | Yes | | |
| 18 | Total Dissolved Solids | mg/L | 4,300 | 4,000 | 4,800 | 4,900 | 4,500 | 500 - 1,000 | 450 - 2,000 | 4,250 | | | |
| 19 | pH | std. | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 6.5 - 8.5 | 6.5 - 8.4 | 8.0 | | | |
| 20 | Fluoride | mg/L | 0.26 | 0.32 | 0.32 | 0.30 | 0.30 | 2.0 | 1.0 | 1.24 | Yes | Yes | |
| 21 | Ammonia | mg/L | 0.1 | 0.1 | 0.12 | 0.1 | 0.07 | 1.5 | n/a | 1.1 | Yes | | |
| 22 | | | | | | | | | | | | | |
| 23 | Trace Metals -- Dissolved | | | | | | | | | | | | |
| 24 | Aluminum | ug/L | 50 | 50 | 50 | 50 | 50 | 1,000 | 5,000 | 50 | | | |
| 25 | Antimony | ug/L | 2 | 2 | 2 | 2 | 2 | 6 | n/a | 2 | | | |
| 26 | Arsenic | ug/L | 18 | 21 | 32 | 26 | 24 | 10 | 100 | 94 | Yes | Yes | Yes |
| 27 | Barium | ug/L | 50 | 50 | 50 | 50 | 50 | 1,000 | n/a | 50 | | | |
| 28 | Beryllium | ug/L | 1 | 1 | 1 | 1 | 1 | 4 | 100 | 1 | | | |
| 29 | Boron | ug/L | 3,200 | 3,300 | 3,200 | 3,200 | 3,225 | n/a | 500 | 10,600 | Yes | Yes | Yes |
| 30 | Cadmium | ug/L | 1 | 1 | 1 | 1 | 1 | 5 | 10 | 1 | | | |
| 32 | Chromium -- Total | ug/L | 21 | 20 | 19 | 14 | 19 | 50 | 100 | 10 | | | |
| 34 | Copper | ug/L | 50 | 50 | 50 | 50 | 50 | 1,000 | 200 | 50 | | | |
| 35 | Cyanide | ug/L | 20 | 20 | 10 | 10 | 15 | 150 | n/a | 10 | | | |
| 36 | Iron | ug/L | 50 | 50 | 50 | 50 | 50 | 300 | 5,000 | 238 | Yes | | |
| 37 | Lead | ug/L | 5 | 5 | 5 | 5 | 5 | 15 | 5,000 | 5 | | | |
| 38 | Manganese | ug/L | 10 | 10 | 10 | 10 | 10 | 50 | 200 | 160 | Yes | Yes | |
| 39 | Mercury | ug/L | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 2 | n/a | 0.4 | | | |
| 40 | Molybdenum | ug/L | 10 | 10 | 10 | 10 | 10 | n/a | 10 | 154 | Yes | Yes | |
| 41 | Nickel | ug/L | 10 | 10 | 18 | 12 | 10 | 100 | 200 | 10 | | | |
| 42 | Phosphorous -- Total | ug/L | 1000 | 1000 | 100 | 100 | 550 | n/a | n/a | 408 | Yes | | |
| 43 | Selenium -- Total | ug/L | 370 | 390 | 700 | 520 | 495 | 50 | 20 | 11 | | | |
| 44 | Silver | ug/L | 10 | 10 | 10 | 10 | 10 | 100 | n/a | 10 | | | |
| 45 | Strontium | ug/L | 4,900 | 5,200 | 5,600 | 5,500 | 5,300 | n/a | n/a | 453 | | | |
| 46 | Thallium | ug/L | 1 | 1 | 1 | 1 | 1 | 2 | n/a | 1 | | | |
| 47 | Tin | ug/L | 5 | 5 | 25 | 5 | 5 | n/a | n/a | 5 | | | |
| 48 | Titanium | ug/L | 50 | 50 | 50 | 50 | 50 | n/a | n/a | 50 | | | |
| 49 | Vanadium | ug/L | 10 | 10 | 10 | 10 | 10 | 50 | 100 | 10 | | | |
| 50 | Zinc | ug/L | 50 | 50 | 50 | 50 | 50 | 5,000 | 2,000 | 50 | | | |
| 51 | | | | | | | | | | | | | |
| 52 | Panoche Energy Center's baseline first-encountered groundwater monitoring results (screen from 150' to 210' bgs). | | | | | | | | | | | | |
| 53 | For averaging, non-detect results were replaced with 1/2 the laboratory reporting limit. | | | | | | | | | | | | |
| 54 | Based on Kiewit's wastewater quality estimate that assumes non-detect source-water results are still non-detect after cycling up source water (further testing is in progress to verify this assumption). | | | | | | | | | | | | |
| 55 | bgs  below ground surface | | | | | | | | | | | | |
| 56 | FF  field filtered | | | | | | | | | | | | |
| 57 | LF  laboratory filtered | | | | | | | | | | | | |
| 58 | | | | | | | | | | | | | |




| Rev | DESCRIPTION | Dwn | Chk | App | Date |
|---|---|---|---|---|---|
| 3 | Revised Water Disposal | DES | | | 9/15/09 |
| 2 | Revised Supply Water | DES | | | |
| 1 | Added UF Skid | BMC | DES | REB | 6/30/09 |
| 0 | Issued For Construction | REB | BMC | | 2/20/09 |

PANOCHE ENERGY CENTER, LLC

Kiewit

9401 Renner Blvd
Lenexa, Kansas 66219

WATER BALANCE FLOW DIAGRAM

| | by | date | DRAWING NUMBER |
|---|---|---|---|
| Drawn | REB | 8/23/07 | 2007-018 -WB- 001 |
| Checked | BMC | 8/23/07 | |
| Approved | SMG | 8/23/07 | |

| | | NORMAL OPERATION | | | | | | PEAK DAY OPERATION | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Case Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | Case ID | 1st Qtr | 2nd Qtr | 3rd Qtr | 4th Qtr | Wtd Avg | High | Low | Avg | Wtd Avg |
| | Ambient Temperature | 52 | 68 | 80 | 56 | 65 | 114 | 80 | 97 | 97 |
| | Wet Bulb Temperature | 48 | 57 | 64 | 49 | 55 | 74 | 64 | 69 | 69 |
| | Relative Humidity | 73.6 | 51.5 | 41.9 | 66.2 | 56.8 | 14.6 | 41.8 | 23.7 | 26.0 |
| | Ambient Pressure | 14.500 | 14.500 | 14.500 | 14.500 | 14.500 | 14.500 | 14.500 | 14.500 | 14.500 |
| | Inlet Air Cooler Status | N/A | N/A | N/A | N/A | N/A | On | On | On | On |
| | Description CTs in service | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | Flow from SW Tank | 1157.0 | 1297.3 | 1375.5 | 1190.5 | 1265.8 | 1658.1 | 1379.1 | 1520.1 | 1519.4 |
| | SW Tank Net Flow | 643.0 | 502.7 | 424.5 | 609.5 | 534.2 | 141.9 | 420.9 | 279.9 | 280.6 |
| | Supply Well Use | 64% | 72% | 76% | 66% | 70% | 92% | 77% | 84% | 84% |
| A | Supply Wells to SW Tank | 1800.0 | 1800.0 | 1800.0 | 1800.0 | 1800.0 | 1800.0 | 1800.0 | 1800.0 | 1800.0 |
| B | Cooling Tower Makeup | 790.1 | 923.4 | 994.5 | 823.5 | 892.9 | 1257.7 | 998.1 | 1129.2 | 1128.6 |
| C | Service Water Flow | 5.0 | 11.9 | 19.0 | 5.0 | 11.0 | 38.5 | 19.0 | 29.0 | 28.8 |
| D | Service water to evap coolers | 0.0 | 6.9 | 14.0 | 0.0 | 6.0 | 33.5 | 14.0 | 24.0 | 23.8 |
| E | Washdown hose use | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| F1 | UF System Feed | 379.9 | 379.9 | 379.9 | 379.9 | 379.9 | 379.9 | 379.9 | 379.9 | 379.9 |
| F2 | UF System Backwash | 17.9 | 17.9 | 17.9 | 17.9 | 17.9 | 17.9 | 17.9 | 17.9 | 17.9 |
| F3 | RO System Feed | 362.0 | 362.0 | 362.0 | 362.0 | 362.0 | 362.0 | 362.0 | 362.0 | 362.0 |
| G | RO Pass 1 Inlet Flow | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 | 407.8 |
| H | RO Pass 2 Inlet Flow | 305.9 | 305.9 | 305.9 | 305.9 | 305.9 | 305.9 | 305.9 | 305.9 | 305.9 |
| I | RO Pass 2 Reject to Pass 1 | 45.9 | 45.9 | 45.9 | 45.9 | 45.9 | 45.9 | 45.9 | 45.9 | 45.9 |
| J | RO Product Water | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 | 260.0 |
| K | Potable water to admin bldg | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| | Demin Tank Net Flow | 17.1 | 8.7 | 4.7 | 17.1 | 11.3 | -25.9 | 4.6 | -11.2 | -10.9 |
| | Water Treatment System Use | 93% | 97% | 98% | 93% | 96% | 100% | 98% | 100% | 100% |
| L | Demineralized Water Flow | 240.3 | 248.7 | 252.7 | 240.3 | 246.1 | 283.3 | 252.8 | 268.6 | 268.3 |
| M | Demin water to evap coolers | 0.0 | 15.4 | 31.2 | 0.0 | 13.4 | 74.5 | 31.1 | 53.3 | 53.1 |
| N | NOx injection | 240.3 | 233.3 | 221.5 | 240.3 | 232.8 | 208.8 | 221.7 | 215.3 | 215.3 |
| O | Evap cooler evaporation | 0.0 | 18.9 | 38.3 | 0.0 | 16.4 | 91.4 | 38.2 | 65.4 | 65.1 |
| P | Evaporative cooler blowdown | 0.0 | 3.4 | 7.0 | 0.0 | 3.0 | 16.6 | 6.9 | 11.9 | 11.8 |
| Q | Intercooler condensation | 0.0 | 0.0 | 10.6 | 0.0 | 3.4 | 57.6 | 8.6 | 31.7 | 32.4 |
| R | Cooling Tower Evaporation | 526.7 | 617.9 | 674.7 | 549.0 | 599.5 | 887.9 | 675.8 | 781.9 | 781.9 |
| S | RO rejects | 102.0 | 102.0 | 102.0 | 102.0 | 102.0 | 102.0 | 102.0 | 102.0 | 102.0 |
| T | Oil/Water Sep Effluent | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 |
| U | Cooling Tower Blowdown | 263.4 | 308.9 | 337.4 | 274.5 | 299.7 | 444.0 | 337.9 | 390.9 | 390.9 |
| V | Wastewater Flow - WT Operating | 388.2 | 433.8 | 462.2 | 399.4 | 424.6 | 568.8 | 462.8 | 515.8 | 515.8 |
| | Wastewater Flow - Average | 381.5 | 430.4 | 460.4 | 392.6 | 420.2 | 568.8 | 461.0 | 515.8 | 515.8 |

Notes:

1) All Flows are displayed in GPM
2) Based on GE APPS performance
3) RO 1st Pass Recovery Rate 75%
4) RO 2nd Pass Recovery Rate 85%
5) Overall RO Recovery Rate 72%
6) Cooling Tower Drift 0.0005%
   gpm 0.14
7) Cooling Twr Cycles of Conc. **3.00**
8) Evap Cooler Cycles of Conc. 6.50
9) Evap Cooler demin split 69%
10) Service Water Use, gpm 5
11) Potable water demand 2.6
12) Annual Capacity Factor 57%
13) Weighted averages based on hours at the different operating conditions

| | | 1st Qtr | 2nd Qtr | 3rd Qtr | 4th Qtr | Wtd Avg | High | Low | Avg | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Daily Operation | hours | 18 | 18 | 24 | 18 | 20 | 6 | 6 | 12 | 24 |
| Water Used | 1000 gal | 1,250 | 1,401 | 1,981 | 1,286 | 1,526 | 597 | 496 | 1095 | 2188 |
| Wastewater Made | 1000 gal | 412 | 465 | 663 | 424 | 507 | 205 | 166 | 371 | 742 |

| | | | | | | Total |
|---|---|---|---|---|---|---|
| Annual Operation | hours | 1,100 | 1,100 | 1,600 | 1,200 | 5,000 |
| Water Use | 1000 gal | 76,364 | 85,621 | 132,050 | 85,716 | 379,751 |
| | Acre-ft | 234 | 263 | 405 | 263 | 1,166 |
| Wastewater | 1000 gal | 25,177 | 28,406 | 44,197 | 28,269 | 126,049 |
| Creation | Acre-ft | 77 | 87 | 136 | 87 | 387 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | Revised Supply Water | DES | | | |
| 2 | Revised Supply Water | DES | | | |
| 1 | Added UF Skid | BMC | DES | REB | 6/30/09 |
| 0 | Issued For Construction | REB | BMC | | 2/20/09 |

PANOCHE ENERGY CENTER, LLC

Kiewit
9401 Renner Blvd
Lenexa, Kansas 66219

WATER BALANCE FLOW VALUES

| | by | date | DRAWING NUMBER |
|---|---|---|---|
| Drawn | REB | 8/23/07 | |
| Checked | BMC | 8/23/07 | 2007-018 -WB- 002 |
| Approved | SMG | 8/23/07 | |

## WATER QUALITIES

| | | Stream | Supply / Svc Wtr | | Demin Water | | Evap Clr Blwdwn | | RO Rejects | | OWS Effluent | | Circulating Water | | Wastewater | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Diagram ID | A to F | | J | | P | | S | | T | | U | | V | |
| **CATIONS** | | | as such | as CaCO3 | as such | as CaCO3 | as such | as CaCO3 | as such | as CaCO3 | as such | as CaCO3 | as such | as CaCO3 | as such | as CaCO3 |
| Ca | 2.50 | | 16.0 | 40 | 0.16 | 0.40 | 32 | 81 | 57 | 142 | 16.0 | 40 | 48 | 120 | 48 | 121 |
| Mg | 4.12 | | 3.9 | 16 | 0.04 | 0.16 | 8 | 32 | 14 | 57 | 3.9 | 16 | 12 | 48 | 12 | 48 |
| Na | 2.17 | | 439 | 953 | 0.80 | 1.74 | 885 | 1920 | 1558 | 3382 | 439 | 953 | 1317 | 2858 | 1325 | 2876 |
| K | 1.28 | | 2.5 | 3 | 0.01 | 0.01 | 5 | 6 | 9 | 11 | 2.5 | 3 | 8 | 10 | 8 | 10 |
| Total | | | | 1012 | | 2.31 | | 2039 | | 3592 | | 1012 | | 3036 | | 3054 |
| **ANIONS** | | | | | | | | | | | | | | | | |
| M Alk | | | 190 | 200 | | 1.00 | | 403 | | 710 | | 200 | | 150 | | 150 |
| SO4 | 1.04 | | 645 | 671 | 0.65 | 0.67 | 1300 | 1352 | 2290 | 2381 | 645 | 671 | 2368 | 2462 | 2383 | 2479 |
| Cl | 1.41 | | 100 | 141 | 0.40 | 0.56 | 202 | 284 | 355 | 501 | 100 | 141 | 300 | 423 | 302 | 426 |
| NO3 | 0.81 | | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 |
| CO2 | 1.14 | | 2 | | | | 3 | 3 | | | | | | | | |
| SiO2 | 0.84 | | 52.0 | | 0.10 | | 105 | | 185 | | 52.0 | | 156 | | 157 | |
| Total | | | | 1012 | | 2.23 | | 2039 | | 3592 | | 1012 | | 3035 | | 3054 |
| HCO3 | 0.82 | | | 180 | | | | | | | | 180 | | | | |
| pH | | | 8.4 | | 6.0 - 8.0 | | 8.0 | | 8.5 | | 8.4 | | 8.0 | | 7.0 | |
| Total Hardness | | | | 56 | | 0.56 | | 113 | | 199 | | 56 | | 168 | | 169 |
| Spec Cond | | | 2100 | | <1.0 | | 3962 | | 6949 | | 2100 | | 6564 | | 6606 | |
| TDS | | | 1350 | | 2 | | 2547 | | 4467 | | 1258 | | 4220 | | 4247 | |
| TSS | | | 0.0 | | | | 50.0 | | | | 0.0 | | 50.0 | | 35.7 | |
| Turbidity | | NTU | | | | | | | 0.0 | | 0.0 | | 100.0 | | 71.3 | |
| Ortho Phosphate | | | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 0.5 | | 0.3 | |
| Chlorine Residual | | | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 1.0 | | 0.7 | |
| Oil/Grease | | | | | | | 0.0 | | 0.0 | | 0.0 | | | | | |
| BOD5 | | | | | | | | | 18 | | 0 | | | | | |
| COD | | | | | | | | | 18 | | 0 | | | | | |
| F | | | 0.41 | | | | 0.83 | | 1.46 | | 0.41 | | 1.23 | | 1.24 | |
| NH3 | | | 0.36 | | | | 0.73 | | 1.28 | | 0.36 | | 1.08 | | 1.09 | |
| **Trace Metals, ppb** | | | | | | | | | | | | | | | | |
| Aluminum | Al | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Antimony | Sb | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Arsenic | As | | 31 | | 0.09 | | 62 | | 110 | | 31 | | 93 | | 94 | |
| Ba | Ba | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Beryllium | Be | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Boron | B | | 3500 | | 10.50 | | 7053 | | 12425 | | 3500 | | 10500 | | 10565 | |
| Cadmium | Cd | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Chromium | Cr | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Copper | Cu | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Cyanide | Cn | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Iron | Fe | | 79 | | 0.24 | | 159 | | 280 | | 79 | | 237 | | 238 | |
| Lead | Pb | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Manganese | Mn | | 53 | | 0.16 | | 107 | | 188 | | 53 | | 159 | | 160 | |
| Mercury | Hg | | 0.00 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Molybdenum | Mo | | 51 | | 0.15 | | 103 | | 181 | | 51 | | 153 | | 154 | |
| Nickel | Ni | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Phosphorous | P | | 135 | | 0.41 | | 272 | | 479 | | 135 | | 405 | | 408 | |
| Selenium | Se | | 3.8 | | 0.01 | | 8 | | 13 | | 4 | | 11 | | 11 | |
| Silver | Ag | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Strontium | Sr | | 150 | | 0.45 | | 302 | | 533 | | 150 | | 450 | | 453 | |
| Thalium | Tl | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Tin | Sn | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Titanium | Ti | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Vanadium | V | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |
| Zinc | Zn | | 0 | | 0.00 | | 0 | | 0 | | 0 | | | | | |

Notes:

1) Values are expressed as mg/l (ppm) or standard units except as noted.
2) Sodium was added to provide a balance of cations and anions.
3) RO Reject Concentration 3.6
4) Supply water based upon a combination of samples received on 8/11/08 and 10/6/08.
5) Wastewatter pH is controlled with acid injection
6) Evap cooler blowdown and intercooler condensate (P&Q) are added to the circ water system. Their water quality impacts are negligible.

| | | | | | |
|---|---|---|---|---|---|
| 3 | Revised Supply Water Quality | DES | | | |
| 2 | Revised Supply Water | DES | | | |
| 1 | Updated Supply Water | BMC | DES | REB | 6/30/09 |
| 0 | Issued For Construction | REB | BMC | | 2/20/09 |

PANOCHE ENERGY CENTER, LLC

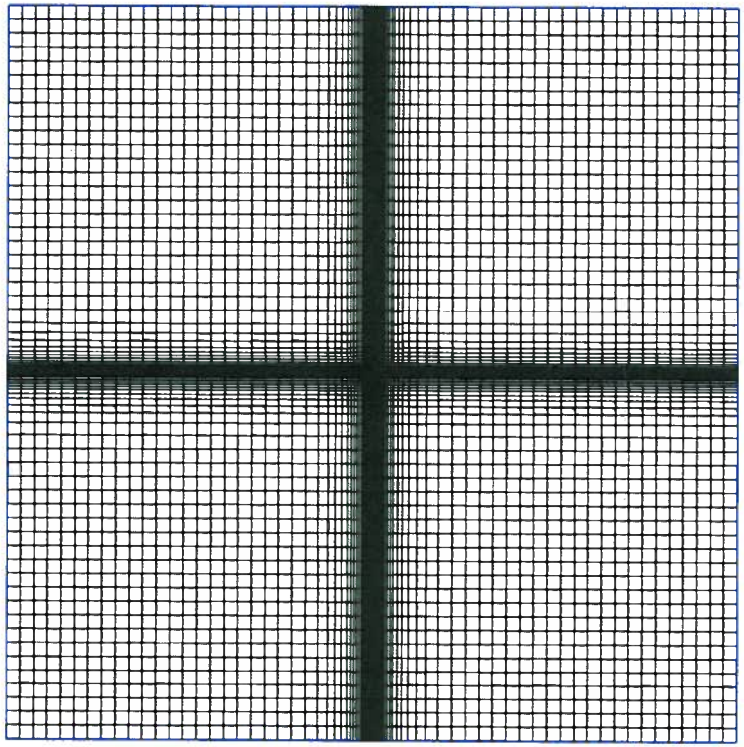
Kiewit

9401 Renner Blvd
Lenexa, Kansas 66219

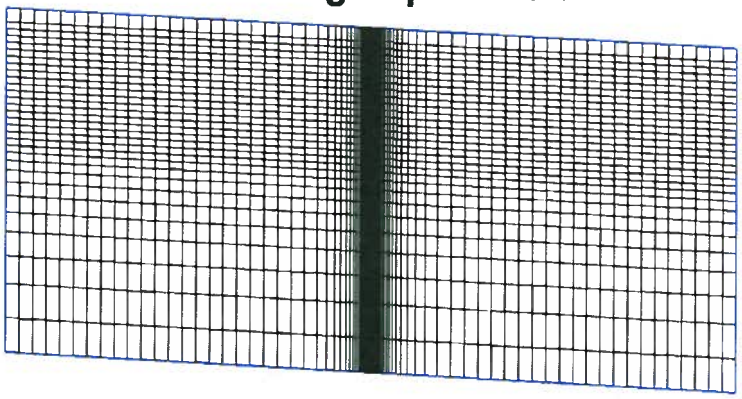
WATER BALANCE WATER QUALITIES

| | by | date | DRAWING NUMBER |
|---|---|---|---|
| Drawn | REB | 8/23/07 | |
| Checked | BMC | 8/23/07 | 2007-018 -WB- 003 |
| Approved | SMG | 8/23/07 | |

**Groundwater Model**
**Panoche Energy Center**



**Model grid plan view**



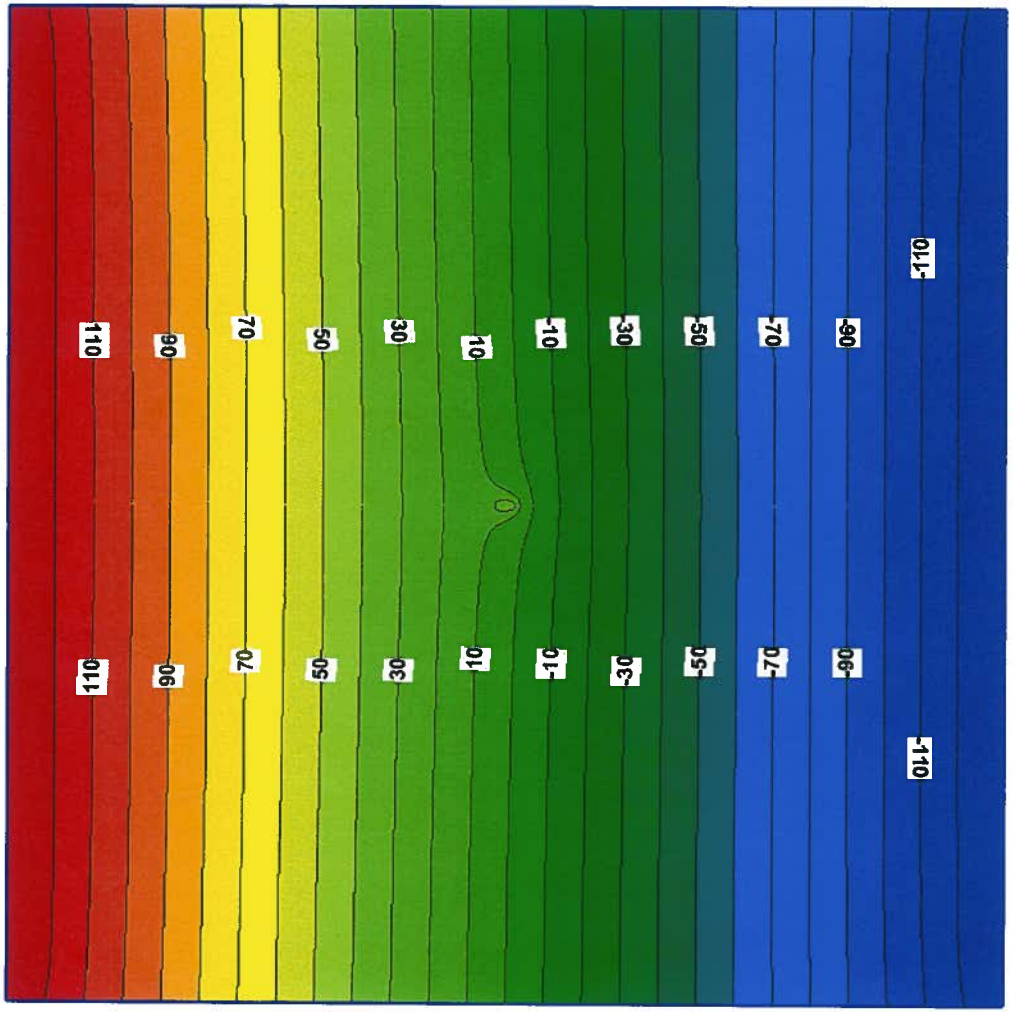
**Model grid** (Cross-section, vertical exaggeration = 50)

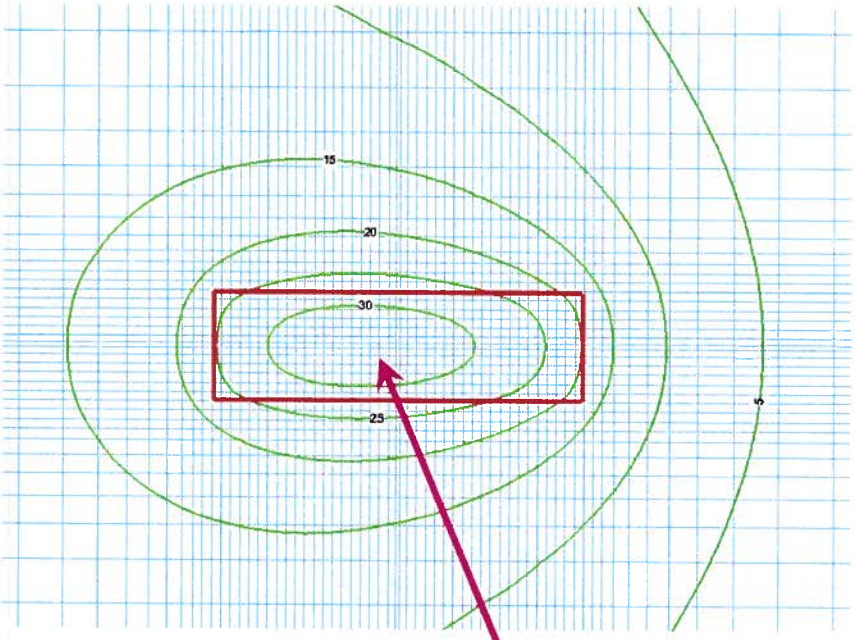
**Model Domain:**
- Length=10.0 miles = 52,800 ft
- Width = 10.0 Miles = 52,800 ft
- Thickness = 490 ft

**Model Grid:**
- Pond area: 25X25 ft
- Model edge: 1,000X1,000 ft
- Rows = 95
- Columns = 121
- Layers = 30

**Aquifer Parameters:**
- K_h = 10 feet/day
- K_v = 0.1 foot/day
- natural gradient = 0.005

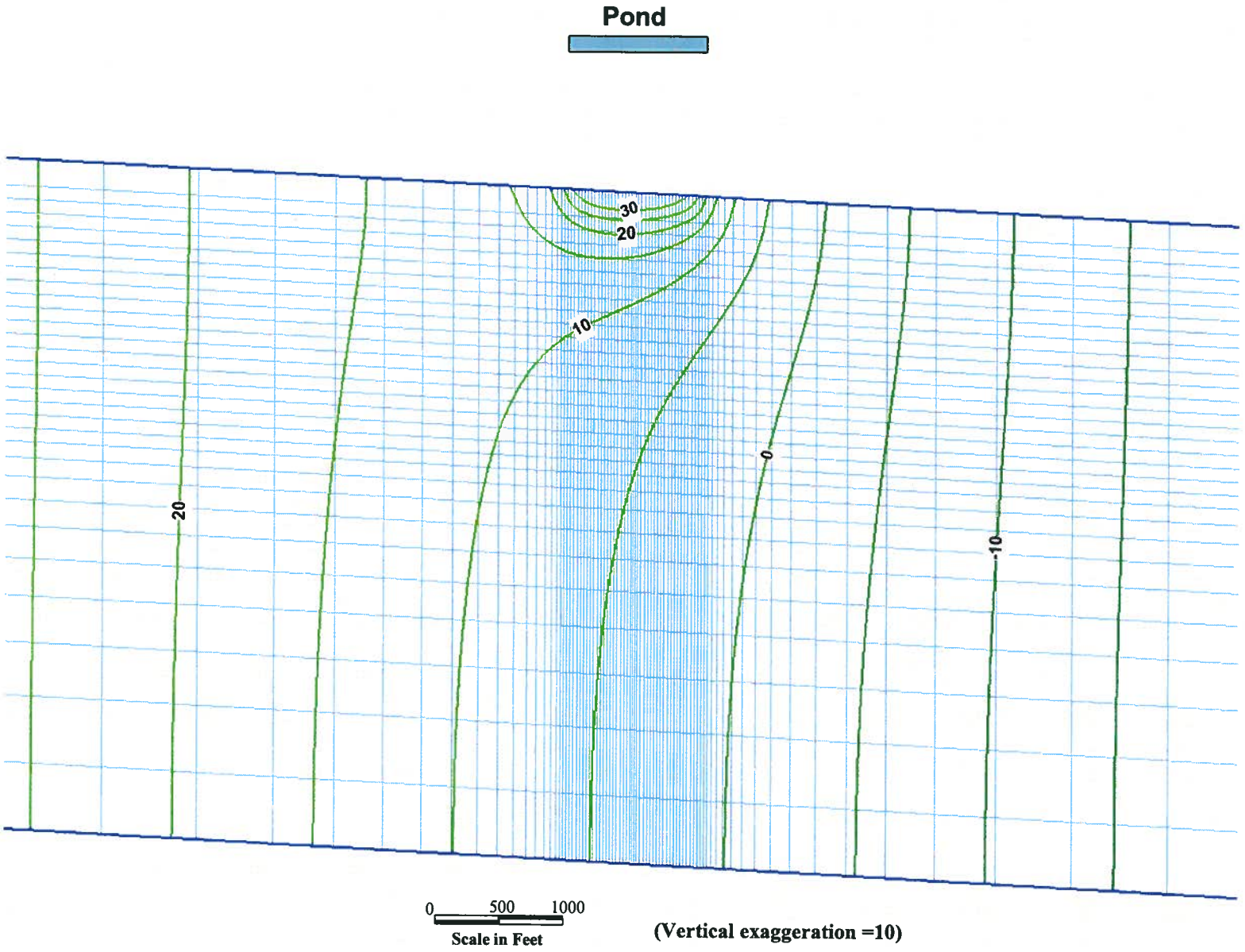
| Layer Thickness (ft) | |
|---|---|
| 10 | First 20 layers |
| 12 | Layer 21 |
| 14 | Layer 22 |
| 17 | Layer 23 |
| 20 | Layer 24 |
| 24 | Layer 25 |
| 28 | Layer 26 |
| 35 | Layer 27 |
| 40 | Layer 28 |
| 50 | Layer 29 |
| 50 | Layer 30 |



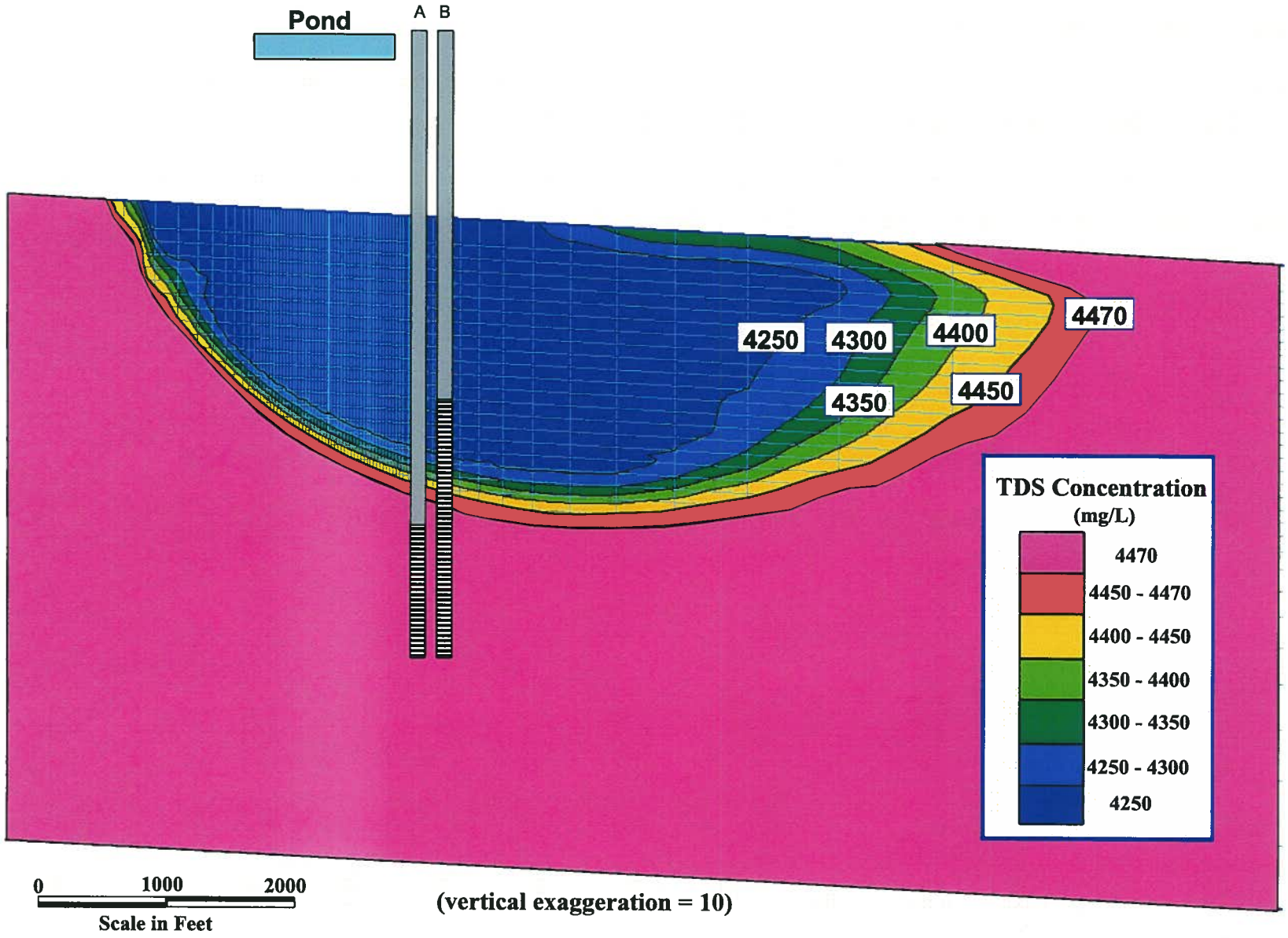




**Infiltration area: 1000 X 300 ft**
**Infiltration rate: 0.154 ft/day**
**Maximum Head:**
**Pond Center: 32.0 ft**
**Pond dg. Edge: 19.5 ft**

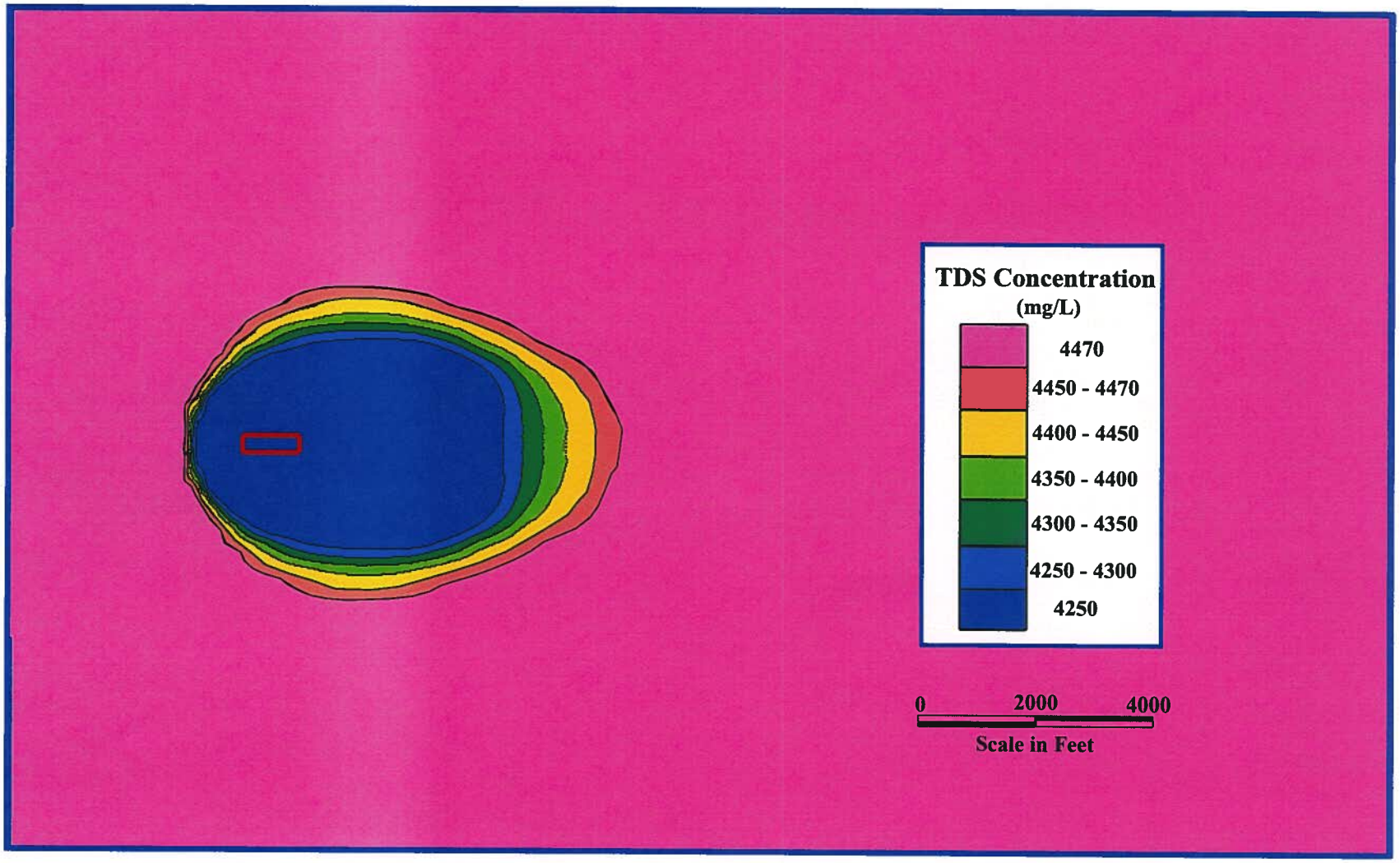
**Plan view simulated head in 3D model**




**Cross-section view contour map of simulated hydraulic head distribution along the pond centerline**

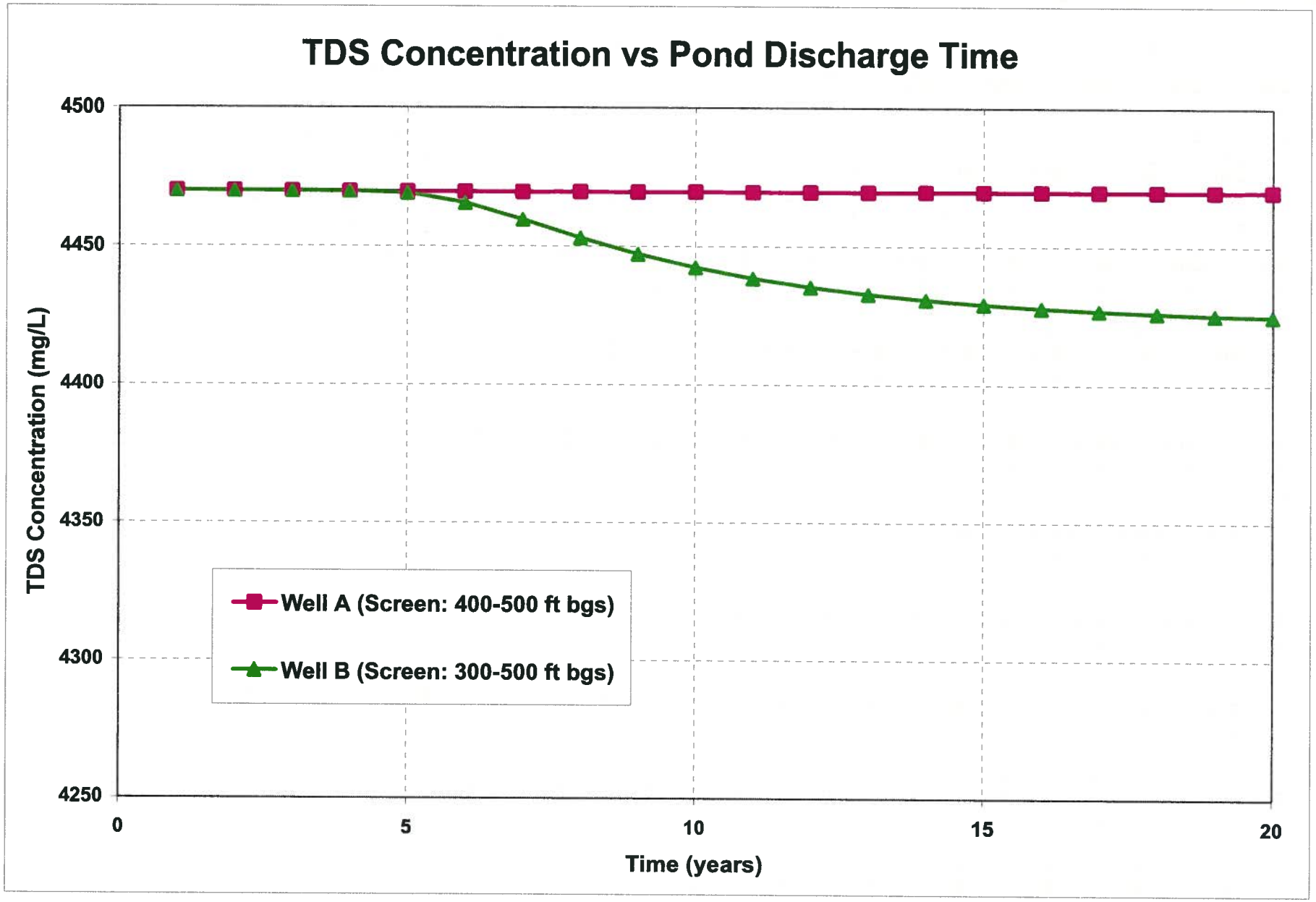



**Cross-section view contour map of simulated TDS concentration (mg/L) along the pond centerline (T=20 years)**




**Plan view contour map of simulated TDS concentration along the pond centerline (T=20 years)**

**(Contour level = 4250, 4300, 4350, 4400, 4450, and 4470 mg/L)**


TDS Concentration vs Pond Discharge Time
TDS Concentration (mg/L)
4500
4450
4400
4350
4300
4250
0
5
10
15
20
Time (years)
Well A (Screen: 400-500 ft bgs)
Well B (Screen: 300-500 ft bgs)