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Application for Prevention of Significant Deterioration Permit for Palmdale Hybrid Power Project

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1.0 Introduction

1.1 Application Overview

The City of Palmdale, California, is proposing to build a hybrid combined-cycle/solar-thermal power plant in the City of Palmdale to the northwest of the Air Force Plant 42/Palmdale Regional Airport. The Project will feature a 2-on-1 combined-cycle configuration with two GE 7FA gas turbines and one steam turbine producing a nominal electrical output of 563 megawatts (MW), of which up to 50 MW is produced from a 251-acre solar thermal collection field. The hybrid power plant will be owned by the City of Palmdale and the development managed by Inland Energy. The Project will be known as the Palmdale Hybrid Power Project (PHPP or Project). The combustion turbine trains will include heat recovery steam generators (HRSG) and will be fueled with natural gas only. In addition to the combustion turbines, the facility will contain ancillary combustion equipment including one natural gas-fired auxiliary boiler, one natural gas-fired heat transfer fluid (HTF) heater, one diesel-fired emergency generator, and one diesel-fired fire water pump engine. The facility will also include a wet mechanical draft cooling tower.

The proposed Project will be located in an area that is designated federal non-attainment for ozone, and attainment or unclassified for nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter (PM10), fine particulate matter (PM2.5), and sulfur dioxide (SO_2). Based on estimates of the facility air emissions, the Project will be a major source with respect to New Source Review (NSR) regulations of oxides of nitrogen (NO_X), particulate matter (PM), PM10, PM2.5 and CO, and thus will trigger Prevention Significant Deterioration (PSD) review for NO_2, CO, PM, PM10, and PM2.5. The Project is a non-major source of SO_2 and volatile organic compounds (VOC). Project emission estimates are compared to PSD applicability thresholds in Table 1-1.

The Project will emit negligible amounts of lead, sulfuric acid (H_2SO_4), hydrogen sulfide (H_2S), Total Reduced Sulfur (TRS), Reduced Sulfur Compounds, and fluorides. Because emissions of these pollutants do not exceed PSD applicability thresholds, they are not discussed in detail in this application; however, emission estimates are presented in Appendix B.

The U.S. Environmental Protection Agency (EPA) administers the PSD program in this area, and the Antelope Valley Air Quality Management District (AVAQMD) manages the local non-attainment NSR program. The Application for Certification (AFC)[1] was submitted to the AVAQMD and the California Energy Commission (CEC) on August 4, 2008. The AFC is a comprehensive application for a variety of permit requirements, including the air operating permit for the AVAQMD. In addition to the AFC, this PSD application is submitted to further address federal permitting requirements.

Project construction is expected to begin in 2010 and be completed in 27 months, so that commercial operation can begin in the summer of 2012. The Project owner and applicant submitting this Application for Prevention of Significant Deterioration Permit is the City of Palmdale, a municipal corporation in the State of California. As required by the PSD regulations, the applicant has conducted a Best Available Control Technology (BACT) evaluation to determine the control requirements for NO_2, CO, PM, PM10, and PM2.5, and has conducted the Class I and Class II air quality impacts analyses.

[1] Application For Certification, Docket No. 08-AFC-9

Table 1-1 Comparison of Project Emissions to PSD Applicability Thresholds

Pollutant	PSD Facility Applicability Level (tpy)	PSD Significant Emission Rate (tpy)	Facility Emissions (tpy)	PSD Applies? (Yes/No)
NO_X	100	40	114.9	Yes
VOC	100	40	40.0	No[1]
CO	100	100	254.6	Yes
PM/PM10/PM2.5[2]	100	25/15/none	148.4/131.8/125.3	Yes
SO_2	100	40	8.9	No

Notes:

tpy – tons per year.

Lead, H_2SO_4, H_2S, TRS, reduced sulfur compounds, and fluorides are all below the PSD Significant Emission Rate. See Appendix B for emissions estimates.

[1] VOC is an ozone precursor. Ozone is a non-attainment pollutant in this area, thus not subject to PSD review.

[2] For most sources, PM, PM10 and PM2.5 emissions are conservatively assumed to be equal to each other. Only the fugitive dust emissions from vehicle use in the solar fields have been calculated for the different size fractions.

1.2 Application Contacts

The following persons can be contacted for information regarding this application:

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1.3 Responsible Official Certification

Based on the information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete.

Signature: _____

Name: Steve Williams

Title: City Manager

1.4 Application Organization

Section 2.0 of this PSD application contains a description of the Project and the various devices that are proposed. Section 3.0 provides a regulatory analysis. An evaluation of the control technology requirements is provided in Section 4.0 with additional BACT information in Appendix A. The emission summary is discussed and presented in Section 5.0, with detailed emissions spreadsheets in Appendix B. Section 6.0 describes the modeling analyses performed for the Class II area in the vicinity of the Project and the Class I areas within 100 kilometers (km), as well as other required analyses. The modeling protocols for the Project were submitted separately in early 2008. A CD with the modeling files is provided as Appendix C. References are listed in Section 7.0, and a list of abbreviations and acronyms is provided as Section 8.0.

2.0 Proposed Project

2.1 Project Overview

The City of Palmdale proposes to construct, own, and operate the PHPP. The PHPP is expected to supply power to the rapidly growing Southern California market. The City has contracted with Inland Energy, Inc. to develop the Project.

The PHPP consists of a hybrid of natural gas-fired combined-cycle generating equipment integrated with solar thermal generating equipment to be developed on a site in the northern portion of the City of Palmdale. The combined-cycle equipment utilizes two natural gas-fired combustion turbine generators (CTGs), two HRSGs, and one steam turbine generator (STG). The solar thermal equipment utilizes arrays of parabolic collectors to collect heat used to generate steam. The combined-cycle equipment is integrated thermally with the solar equipment at the HRSG, and both utilize the single STG to generate power.

The Project will have a nominal electrical output of 570 MW and commercial operation is planned for the summer of 2012. The solar thermal input will provide approximately nine percent of the peak power generated by the Project during the daily periods of highest energy demand. The Southern California Gas Company (SCG) will design and construct the approximately 8.7-mile pipeline in existing street rights-of-way (ROW) within the City of Palmdale to provide natural gas to the Project.

The power plant site, including the solar array, and most linear facilities routes are entirely within the City of Palmdale. A portion of the transmission line is within the City of Palmdale and the remainder is in unincorporated Los Angeles County. Similarly, a small portion of the reclaimed water supply pipeline is in unincorporated Los Angeles County with the remainder in the City of Palmdale. The transmission line and various pipeline easements are either along City-controlled parcels, land owned by the applicable utility (e.g., SCG and Southern California Edison [SCE]), or are on land that the City intends to obtain a utility easement. Figure 2-1 illustrates the location of the power plant site and the associated linear facility routes.

2.2 Location of Facilities

The PHPP address is 950 East Avenue M, Palmdale, California. As shown in Figure 2-1, the Project power plant site is located on an approximately 333-acre parcel west of the northwest corner of Air Force Plant 42, and east of the intersection of Sierra Highway and East Avenue M. The power plant site and 50 acres adjacent to the west that will be used as a construction laydown area are currently vacant and undeveloped land owned by the City of Palmdale.

The proposed interconnection point for the PHPP with the SCE electrical transmission system is at SCE's existing Vincent Substation south of Palmdale. To accommodate the needs of Palmdale's aviation community (Air Force Plant 42 and Los Angeles World Airports), a 35.6-mile-long transmission line route, which extends north and east from the plant site, then south and back to the west is planned. The Project's transmission system will be constructed in two segments. Segment 1 will be a new transmission line and Segment 2 will be a replacement line along an existing SCE ROW.

Reclaimed water for the Project's cooling tower makeup and other industrial uses will be supplied from the City of Palmdale Water Reclamation Plant (PWRP) located south of the plant site through a new 7.4-mile pipeline. The pipeline will be installed in existing city street ROW primarily within the City of Palmdale, although a small portion of the pipeline in the immediate area of the PWRP is in unincorporated Los Angeles County.

The Project's backup cooling water supply will also be reclaimed water. The Antelope Valley recently drafted an Integrated Regional Water Management Plan (AVIRWMP). The AVIRWMP proposes a reclaimed water backbone system, linking the City of Palmdale with the City of Lancaster, both of whose wastewater treatment plants will produce reclaimed water.

The Project will also have relatively short (about a mile) potable water and sanitary wastewater pipelines that will run west and east, respectively, along E Avenue M from the power plant site.

2.3 Generating Facility Description

The PHPP site arrangement and the processes, systems and equipment that constitute the proposed power plant are described in the following sections. Figure 2-2 is an aerial photograph with the simulated PHPP facilities added.

2.3.1 Site Arrangement

Figure 2-3 shows the layout of Project facilities including:

- Power plant site, including power block and approximately 251-acre solar array fields;
- Construction laydown area and a gas metering station;
- Primary and secondary access roads within the site;
- Infiltration basins; and
- Surrounding city streets.

Figure 2-4 is a plot plan/general arrangement of the Project's power block. As shown on Figure 2-4, major components of the Project include:

- Two CTGs, each with a HRSG;
- One STG;
- One wet cooling tower;
- Auxiliary boiler, HTF heater, and fire pump module;
- Water tanks and brine crystallizer facilities;
- A 230-kilovolt (kV) switchyard; and
- An operations building that incorporates control, warehouse, maintenance, and administrative functions.

An elevation drawing of the plant site looking north is provided in Figure 2-5.

2.3.2 Process Description

The power generation process and thermodynamic cycle employed by the Project consists of the following:

- Two CTGs equipped with dry low-NO_X (DLN) combustors and evaporative inlet air coolers,
- Two HRSGs equipped with duct burners,
- One STG, and

- Approximately 251-acre solar thermal array field with a solar steam boiler and associated auxiliary systems and equipment.

A Process Flow Diagram of the facility is shown in Figure 2-6. The CTGs and duct burners are fueled exclusively with pipeline natural gas. The duct burners provide additional heat, which enable the HRSGs to produce more steam in order to obtain peak output from the STG.

During periods when the solar collectors are in use (i.e., daytime when the sun is shining on the site), the solar field will provide heat directly to the HRSGs to produce more steam, which will allow the facility to reduce firing of the duct burners. This design feature enhances the Project's ability to respond to the energy markets by providing additional power during peak demand periods (e.g., hot summer afternoons), while consuming less natural gas fuel.

At full load, each CTG generates approximately 154 MW (gross) at average ambient conditions. Heat from the CTG exhausts is used in the HRSGs to generate steam and to reheat steam. With the CTGs at full load and the duct burners and solar field out-of-service, the HRSGs produce sufficient steam for operation of the STG at an output of 169 MW (gross) at average ambient conditions, which results in an overall plant output of approximately 477 MW (gross) (see Table 2-1).

With the CTGs at full load and the duct burners in-service, the HRSGs produce sufficient steam for operation of the STG at its peaking output of 267 MW (gross) at average ambient conditions, which results in an overall plant gross output of approximately 563 MW (net). At full load solar operation, the heat from the solar field can replace the equivalent of approximately 50 MW of duct firing, thereby improving the Project's overall heat rate, and reducing air emissions.

Table 2-1 Generation Configurations and Output

Configuration	Output
Full Load (average ambient conditions)/No Duct Burners/No Solar	477 MW
Full Load (average ambient conditions)/Full Duct Burners/No Solar	563 MW
Full Load (average ambient conditions)/Partial Duct Burners/Full Solar	563 MW
Full Load (average ambient conditions)/No Duct Burners/Full Solar	527 MW

Overall, annual availability of the PHPP is expected to be in the range of 90 to 95 percent. The plant's capacity factor will depend on the provisions of bilateral power sales contracts, as well as market prices for electricity, ancillary services, and natural gas. The design of the Project provides for operating flexibility (the ability to rapidly startup, shutdown, turn down and provide peaking output), so operations may be readily adapted to changing market conditions. Included in this flexibility is the ability of the Project to startup the combined-cycle system in approximately one-half the time of the industry standard for combined-cycle plants in the United States.

The "Rapid Start Process" (RSP) offered by General Electric Power Systems (GE), the supplier of the Project's combustion equipment, allows for faster starting of the gas turbines by mitigating the restrictions of former HRSG designs. Traditionally, the CTGs are brought to full load slowly to limit thermal stresses in the high-pressure (HP) steam drum of the HRSG due to the exhaust temperature of the CTGs. The new GE RSP design eliminates this restriction by modifying the steam drum design. Additional equipment to

support the RSP includes an auxiliary boiler, which will supply sealing steam and allow startup of the steam turbine shortly after the gas turbines.

2.3.3 Energy Generation Facilities Description

This section describes the major energy generation components of the proposed PHPP including the CTGs, HRSGs, STG, and solar system.

2.3.3.1 Combustion Turbine-Generators (CTG)

Thermal energy is produced in each of the two CTGs through the combustion of natural gas. The thermal energy is then converted into mechanical energy by the CTG turbine that drives the CTG compressor and electric generator. The CTGs proposed for the PHPP employ 'F' technology supplied by GE Power Systems. Each CTG consists of a heavy duty, single shaft, combustion turbine-generator, and associated auxiliary equipment. The CTGs are equipped with DLN combustors designed for natural gas combustion.

The CTGs are equipped with accessories required to provide efficient, safe, and reliable operation, including the following:

- Inlet air filters and online filter cleaning system;
- Evaporative inlet air coolers;
- Online and offline compressor wash system;
- Fire detection and protection system;
- Lubrication oil system including oil coolers and filters;
- Generator coolers;
- Starting system, auxiliary power system, and control system; and
- Metal acoustical enclosures designed for outdoor service.

2.3.3.2 Heat Recovery Steam Generators and Steam Cycle

In the combined-cycle configuration, each CTG will exhaust through a dedicated HRSG. Each of the two trains will consist of one CTG and one HRSG. Both CTG-HRSG trains will feed steam into a common STG, a standard 2-on-1 configuration.

Each HRSG is a horizontal, natural circulation type unit with three pressure levels of steam generation and reheat loop. Super-heated high pressure (HP) steam at 1,800 pounds per square inch gauge (psig) and 1,050 degrees Fahrenheit (°F) is produced in the HRSG and flows to the steam turbine throttle inlet. The exhausted cold reheat steam is mixed with intermediate pressure steam and reintroduced into the HRSG through the reheat loop. The hot reheat steam flows to the intermediate-pressure section of the STG, and then to the low-pressure (LP) section of the STG. LP steam from the HRSG also flows to the LP section of the STG. The STG drives an electric generator. Each HRSG has a 550-million British thermal units per hour (MMBtu/hr) natural gas-fired duct burner.

In the proposed hybrid configuration with the solar thermal component integrated into the PHPP, additional HP steam is produced during daylight hours from heat collected via the solar array. The solar array heats the HTF that is used to produce HP steam in a heat exchanger. This HP steam is introduced into the combined-cycle system via injection into the HP drum of the HRSG. This steam is then superheated in the HRSG superheaters along with the HP steam produced within the HRSG evaporator.

The STG exhaust steam is condensed in the de-aerating surface condenser with water from a multi-cell wet cooling tower. Makeup water to the cooling tower will be tertiary-treated reclaimed water from the PWRP brought to the site by a new pipeline.

As noted earlier, the PHPP is designed with GE's RSP, which will allow the CTG to reach base load more quickly, reducing startup emissions. Since emission rates are higher during startup than during normal steady-state operations, RSP facilitates lower overall emissions per MW-hour produced. The RSP reduces CTG startup rates by more than 50 percent during cold starts, with smaller reductions in startup time and corresponding emissions during warm and hot starts. The RSP does not affect STG startup times.

To facilitate the RSP approach, the HRSG design modified compared to a conventional HRSG design. Typical HRSG designs limit the CTG start rate due to the exhaust temperature heating the steam drum too quickly. This limitation is caused by thermal stress limitations on the HP steam drum due to the shell thickness. To avoid this limitation, a modified drum design is used that allows for thinner wall thickness. This revised design is achieved by elongating the steam drum and reducing its diameter, which leaves the steam drum volume relatively unchanged compared to conventional designs.

2.3.3.3 Auxiliary Boiler

Another limiting factor for startup of combined-cycle equipment is the ability to draw a vacuum on the condenser, which is necessary to commence STG startup. The PHPP will use one 110-MMBtu/hr, natural gas-fired auxiliary boiler to facilitate rapid startup by providing STG sealing steam prior to CTG startup, thereby allowing the condenser vacuum to be established and the condenser be in a condition ready to accept steam as soon as it is available. This also avoids the need to vent considerable steam to the atmosphere while waiting for condenser vacuum to be established following CTG startup.

2.3.3.4 Steam Turbine-Generator (STG)

Steam from the HRSGs is sent to the STG. The steam expands through the STG turbine blades to drive the steam turbine, which in turn drives the generator. The PHPP's STG is a "reheat" type and is equipped with accessories required to provide efficient, safe, and reliable operation, including the following:

- Governor system,
- Steam admission system,
- Gland seal system,
- Lubrication oil system including oil coolers and filters,
- Generator coolers, and
- Metal acoustical enclosures designed for outdoor service.

2.3.3.5 Solar Thermal Field System Description

The collector field is made up of a large field of diurnal, single-axis-tracking parabolic trough solar collectors. The solar field is modular in nature and comprises many parallel rows of solar collectors, normally aligned on a north-south horizontal axis. Each solar collector has a linear parabolic-shaped reflector (referred to as the Heat Collection Element) that focuses the sun's direct beam radiation on a linear receiver located at the focus of the parabola. The collectors track the sun from east to west during the diurnal cycle to ensure that the sun is continuously focused on the linear receiver.

The HTF is heated up to approximately 740°F as it circulates through the receiver and returns to a series of heat exchangers, where the HTF is used to generate HP steam. At the PHPP, these heat exchangers are

located in the power block area. To integrate the solar and combined-cycle Project components, the solar-generated HP steam is injected in the HP steam section of a HRSG where it is superheated.

To accommodate the volumetric change that occurs when heating the HTF to the operating temperature in the solar field, surge (expansion) tanks are required. Nitrogen will be used to provide a blanket on the headspace of the tanks. The nitrogen prevents oxidation or contamination of the HTF by reducing its exposure to atmospheric air and also significantly reduces potential evaporative emissions.

During plant operation, HTF may degrade into substances with high and low boiling points (referred to as “high boilers” and “low boilers”). The low boilers are removed from the process through the ullage system. HTF is removed from the HTF surge tank and “flashed” leaving behind high boilers and residual HTF. The flashed vapors are condensed and collected in the ullage system.

Unlike existing solar energy plants, the PHPP will use a closed vapor system for the HTF expansion tanks. At the existing facilities that utilize similar parabolic trough mirror technology, the HTF expansion tanks are blanketed with nitrogen gas to keep the headspace in the expansion tanks non-explosive. The nitrogen may become saturated with VOC (i.e., the low boilers) as it is in contact with the HTF and any volatile HTF breakdown products. At the existing solar thermal plants, when the HTF heats and expands, the nitrogen gas, which is potentially saturated with VOC, is vented to atmosphere. A recently constructed parabolic trough mirror solar project in Nevada vents these emissions through activated carbon control equipment. With the PHPP system, when the HTF heats and expands, the VOC-saturated nitrogen will be captured, compressed, and stored in a small pressurized tank. When the HTF cools and contracts, the nitrogen is replaced from this pressurized tank. This design serves to conserve nitrogen and completely eliminates VOC emissions from the expansion tanks.

The Project will require periodic vehicle travel over the unpaved portions of the solar field to perform routine maintenance including mirror washing, maintenance inspections and repairs of the piping network, herbicide application and dust suppressant application.

2.3.3.6 HTF Heater

To eliminate the problem of the HTF freezing during cold winter nights, one 40-MMBtu/hr, natural gas-fired HTF heater will be installed and used to ensure system temperature stays above 54°F whenever the solar steam unit is off-line.

2.3.3.7 Emergency Generator

The emergency diesel generator will supply electrical power to the power plant critical services in the event of a total power outage of the switchyard and the plant. The plant critical services will include battery chargers, turning gear, lubricating oil systems, Distributed Control System and Programmable Logic Controller controls and critical lighting. The generator will be standby rated at 2,000 kilowatt (kW), at 480 volts. The emergency diesel generator will be periodically tested to confirm it’s mechanical, electrical and control equipment integrity. The emergency generator system will be synchronized with the normal auxiliary power system from time to time to test its total output power into the system. This emergency diesel engine will operate for a maximum of 50 hours per year for testing and maintenance. Operation of the engine for emergency purposes is unpredictable.

2.3.3.8 Emergency Fire Water Pump

The Project will include an emergency diesel-fired fire water pump rated at approximately 135 kW. This emergency diesel engine will operate for a maximum of 50 hours per year for testing and maintenance. Operation of the engine for emergency purposes is unpredictable.

2.3.4 Plant Auxiliary Systems and Process Descriptions

The following subsections describe the various auxiliary systems associated with the PHPP.

2.3.4.1 Fuel Supply and Use

The CTGs and duct burners are designed to burn natural gas. The fuel requirement for base load operation at average ambient conditions is approximately 69.1 million standard cubic feet per day (MMscfd). The fuel requirement for peaking operation at ambient conditions of 77°F, 40 percent relative humidity (RH) is approximately 87.5 MMscfd without solar, and 78.3 MMscfd with full solar.

The Project will be fueled with natural gas delivered via a new 20-inch gas pipeline to be installed by SCG. Natural gas for the duct burner systems branches off and is regulated to a lower pressure. Safety pressure relief valves are provided downstream of pressure regulation valves. The CTG systems include a natural gas preheater and flow modulation equipment. The duct burner systems also have flow modulation equipment.

2.3.4.2 Cooling Systems

The power plant includes two cooling systems; 1) the steam cycle heat rejection system and 2) the closed cooling water system (equipment cooling), each of which is discussed below.

The cooling system for heat rejection from the steam cycle consists of a surface condenser, circulating water system and a wet cooling tower. The surface condenser receives exhaust steam from the LP section of the STG and condenses it to liquid for return to the HRSGs. The surface condenser is a shell-and-tube heat exchanger with wet, saturated steam condensing on the shell side and circulating water flowing through the tubes to provide cooling.

The circulating water is distributed among multiple cells of the cooling tower, where it cascades downward through each cell and then collects in the cooling tower basin. The mechanical draft cooling tower employs electric motor-driven fans to move air through each cooling tower cell. The cascading circulating water is partially evaporated and the evaporated water is dispersed to the atmosphere as part of the moist air leaving each cooling tower cell. The circulating water is cooled primarily through its partial evaporation. The cooled circulating water is pumped from the cooling tower basin back to the condenser. The cooling tower is equipped with a high-efficiency drift eliminator.

The closed cooling water system is filled with a coolant such as a mixture of glycol and water. This coolant is pumped in a closed loop for the purpose of cooling equipment including the CTG and STG lubrication oil coolers, the CTG and STG generator coolers, the air compressor aftercoolers, the steam cycle sample coolers, etc. The coolant picks up heat from the various equipment items being cooled and then the coolant itself is then cooled by non-contact heat exchange with a branch of the circulating water system.

2.3.4.3 Air Emissions Control and Monitoring

Air emissions from the combustion of natural gas in the CTGs and duct burners are controlled by state-of-the-art systems. Emissions that are controlled include NO_X, VOC, CO, and PM/PM10/PM2.5. Continuous emissions monitoring of NO_X and CO is performed to ensure that the control systems perform correctly and to provide compliance documentation. All emissions values stated in the following subsections are based on parts per million by volume, dry basis (ppmvd) corrected to 15 percent excess oxygen (O_2). A summary of emission rates from the combined-cycle equipment is shown in Table 2-2. A brief description of planned air emissions control methods is provided in the following paragraphs.

Stack emissions of NO_X will be controlled by use of DLN combustors in the CTGs followed by selective catalytic reduction (SCR) in the HRSGs. The DLN combustors control NO_X emissions in the CTG exhausts by

pre-mixing fuel and air immediately prior to combustion. Pre-mixing inhibits NO_X formation by minimizing both the flame temperature and the concentration of oxygen at the flame front.

The SCR process uses aqueous ammonia as a reagent. Stack emissions of ammonia, referred to as 'ammonia slip,' are up to 5 ppmvd. The SCR system includes a catalyst bed located within each HRSG, an ammonia storage system and an ammonia injection system. The catalyst bed is located in a temperature zone of the HRSG where the catalyst is most effective over the range of loads at which the plant will operate. The ammonia injection grid is located upstream of the catalyst bed. The plant ammonia consumption rate is approximately 266 pounds per hour at base load (77ºF, 40 percent RH, duct burners unfired) conditions and 571 pounds per hour at maximum load (18ºF, 60 percent RH, duct burners fired). A 30,000-gallon aqueous ammonia storage tank located on the PHPP site will provide sufficient capacity for more than 14 days of continuous operation.

An oxidation catalyst located within each HRSG controls stack emissions of CO and VOCs. Particulate emissions are controlled by inlet air filtration and by the use of natural gas fuel, which contains essentially zero particulate matter. Stack emissions of PM10 consist primarily of hydrocarbon particles formed during combustion. SO_2 emissions are controlled by the use of natural gas fuel, which contains only trace quantities of sulfur.

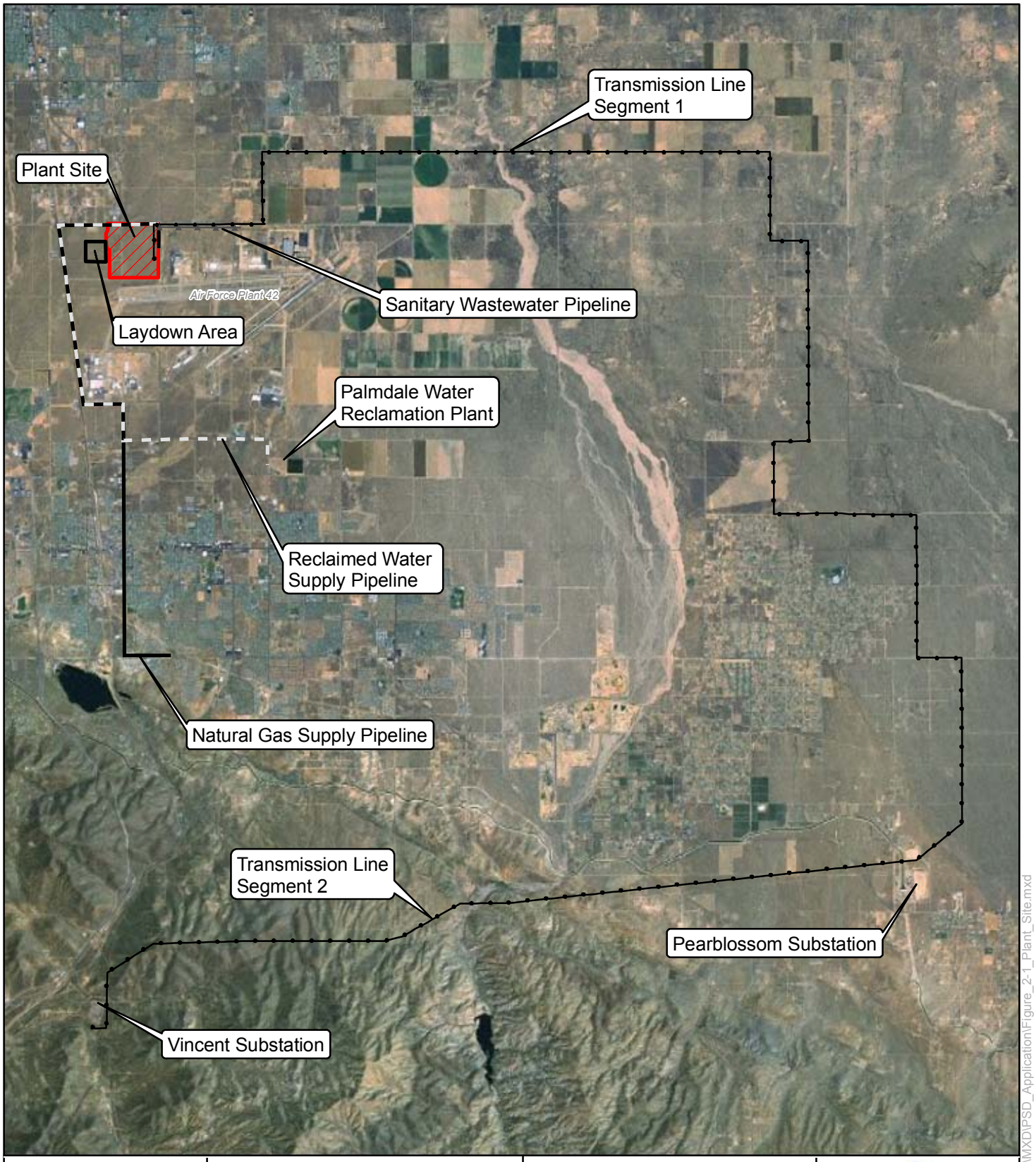
The Project's Continuous Emissions Monitoring System (CEMS) will be in a self enclosed, climate controlled enclosure and will sample, analyze and record NO_X, CO, and O_2 concentrations in the stack exhaust. The CEMS will generate a log of emissions data for compliance documentation and activate an alarm in the plant control room when stack emissions exceed specified limits.

Table 2-2 Combined-Cycle Emission Rates

Pollutant	Load Range % of CGT Base	Ambient Temperature Range ºF	Duct Burner Status	Emission Rate
NO_X Emissions, ppmvd, @ 15 % O_2	50 to 100 55 to 100	18-105 105-112	Off Off	2 ppmvd 2 ppmvd
NO_X Emissions, ppmvd, @ 15 % O_2	Base	18-112	On	2 ppmvd
CO Emissions, ppmvd, Ref. 15 % O_2	50 to 100 55 to 100	18-105 105-112	Off Off	2 ppmvd 2 ppmvd
CO Emissions, ppmvd, Ref. 15 % O_2	Base	18-112	On	3 ppmvd
Total PM10 lb/hr per Stack	50 to 100 55 to 100	18-105 105-112	Off Off	12 lb/hr
Total PM10 lb/hr per Stack	Base	18-112	On	18 lb/hr

2.4 Operating Schedule

The power plant will be operated up to seven days per week, 24 hours per day. When the plant is not operating, personnel will be present as necessary for maintenance, to prepare the plant for startup, and/or for site security.



Map Location

Legend

- Plant Site
- Laydown Area
- Natural Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- Sanitary Wastewater Pipeline
- Transmission Line

N W E S

Palmdale Hybrid Power Project

Figure 2-1
Project Site

1:120,000

0 1 2 Miles

PALMDALE
a place to call home

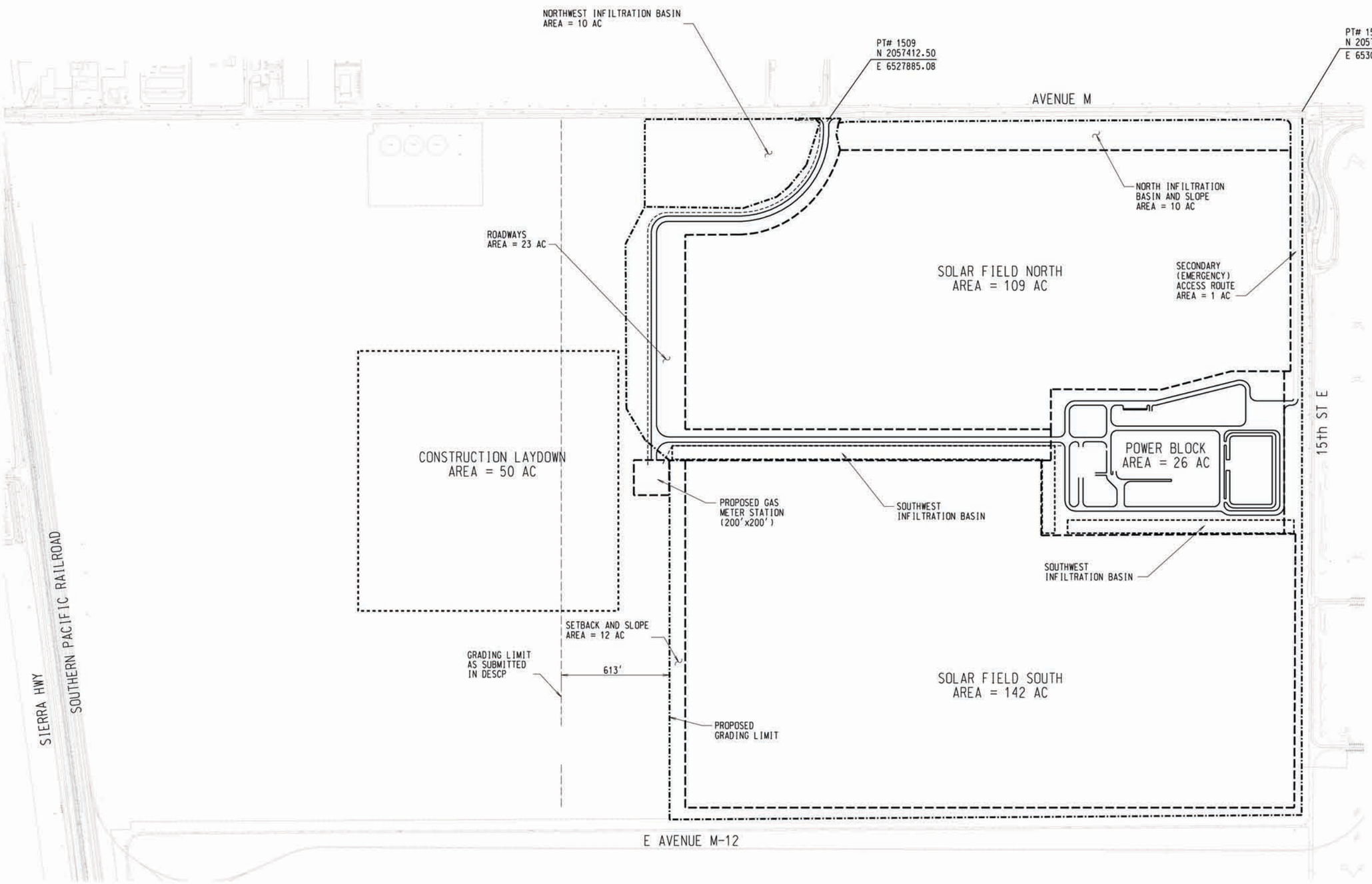
Inland Energy, Inc.

AECOM

Project: 10855-002
Date: March 2009

Y:\Projects\InlandEnergy\Palmdale\MXD\PSD_Application\Figure_2-1_Plant_Site.mxd

Figure 2-2 **Plant Site with Simulated Project Facilities**



NOTES:

1. STACK COORDINATES-

HRSG 1:
STATE PLANE GROUND COORDINATE
N: 2055300.000
E: 6529671.000

GEOGRAPHIC COORDINATE (NAD 83)
LATITUDE: 35 38 23.91803
LONGITUDE: 118 06 22.94693

BASE ELEVATION: 2517

HRSG 2:
STATE PLANE GROUND COORDINATE
N: 2055435.000
E: 6529671.000

GEOGRAPHIC COORDINATE (NAD 83)
LATITUDE: 34 38 25.25346
LONGITUDE: 118 06 22.94864

BASE ELEVATION: 2517

- PRELIMINARY -
NOT FOR CONSTRUCTION

REV	DESCRIPTION	DWN	CHK	APP	DATE
A	ISSUE FOR REVIEW	MTW			02-26-09

Figure 2-3

CITY OF PALMDALE

PALMDALE HYBRID
POWER PROJECT

Kiewit

Kiewit Power
8455 Lenexa Drive
Lenexa, Kansas 66214

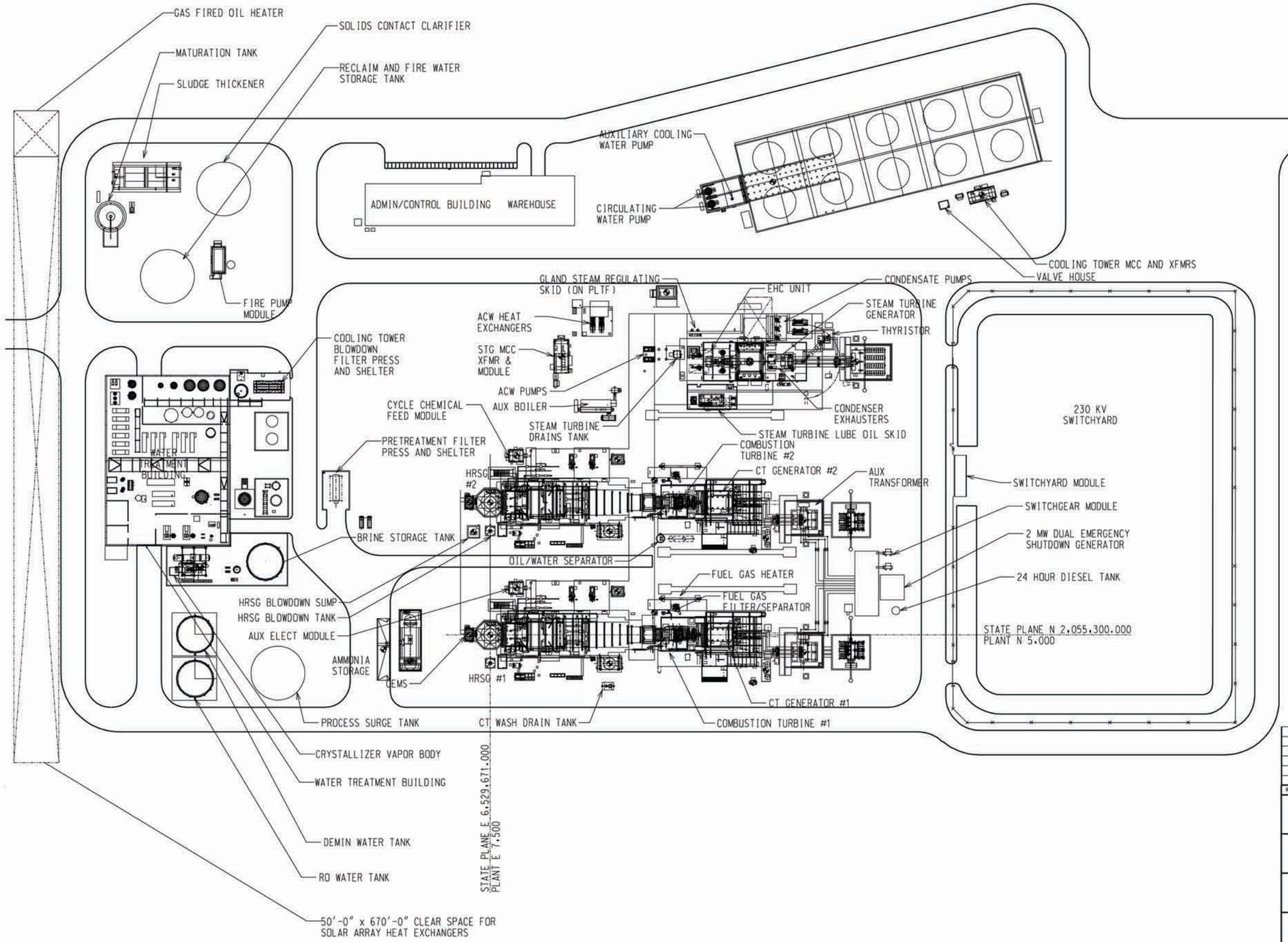
CONCEPTUAL SITE LAYOUT

	by	date
DESIGNED	MDM	01-06-09
DRAWN	MDM	01-06-09
CHECKED		
APPROVED		

DRAWING NUMBER

2007-021-CM-022609

NOTES:
1. IN FINAL DESIGN COOLING TOWERS WILL BE IN LINE WITH PERVAILING WIND CONDITION
2. ADDITIONAL AREA FOR SOLAR HEAT EXCHANGERS IF REQUIRED



REV	DESCRIPTION	DWN	CHK	APP	DATE
F	REMOVED CONFIDENTIAL NOTE	PDW		DJJ	02-26-09
E	ISSUED FOR REVIEW	JAH		SJL	11-13-08
D	REVISED TITLE BLOCK INFORMATION	DAD		SJL	07-24-08
C	ISSUED FOR CEC APPLICATION	DAD		PAP	06-26-08
B	REVISED PLANT LAYOUT	JAL		RRT	06-26-07
A	PRELIMINARY	BDL		RRT	05-23-07

Figure 2.4

CITY OF PALMDALE

PALMDALE HYBRID POWER PROJECT

Kiewit

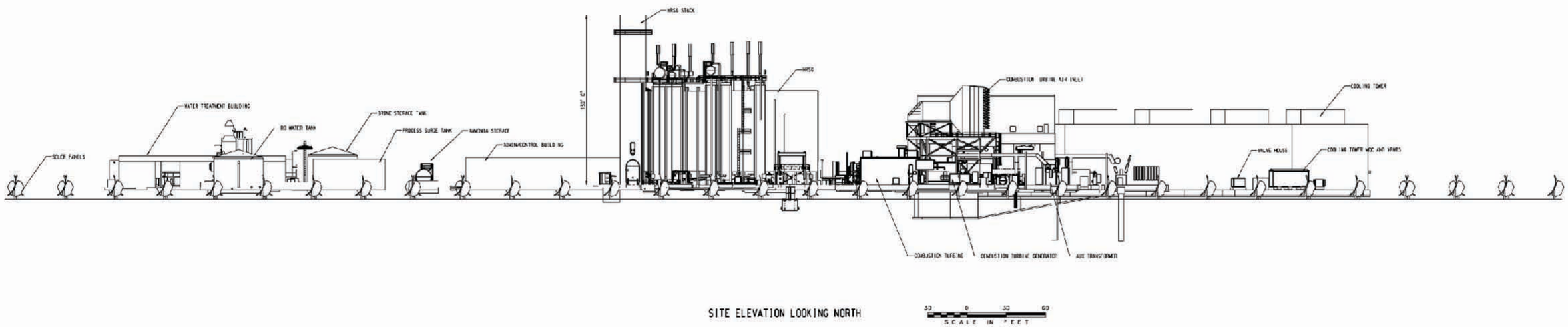
Kiewit Power
8455 Lenexa Drive
Lenexa, Kansas 66214

GENERAL ARRANGMENT
POWER BLOCK

	by	date
DESIGNED	RRT	05-23-07
DRAWN	BDL	05-23-07
CHECKED	---	----
APPROVED	---	----

DRAWING NUMBER

2007-021-PP-001



Palmdale Hybrid Power Project

Figure 2-5
Site Elevation

PALMDALE
a place to call home
Inland Energy, Inc.
AECOM

Project: 10855-002
Date: March 2009

FILENAME:

FILENAME: 10855-002-01B.DWG

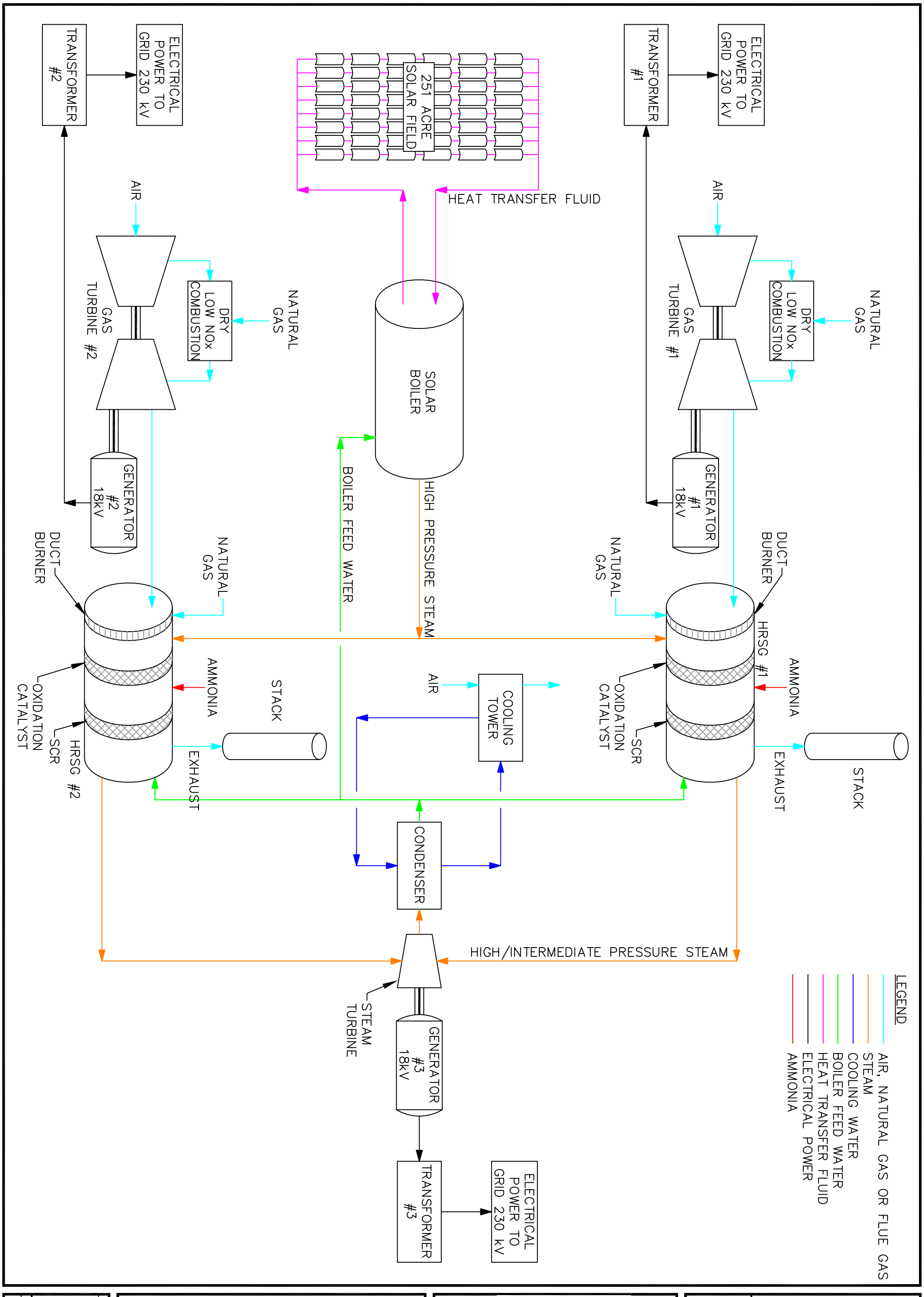


FIGURE NUMBER:	SHEET NUMBER:
2-6	1

PROCESS FLOW DIAGRAM
PALMDALE HYBRID POWER PROJECT

SCALE:	DATE:	PROJECT NUMBER:
NONE	3/30/09	10855-002-040

PALMDALE
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Inland Energy, Inc.
AECOM

DESIGNED BY:	REVISIONS			
B.H.	NO.:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
K.P.B.				
CHECKED BY:				
B.H.				
APPROVED BY:				
X				

3.0 Regulatory Setting

3.1 Ambient Air Quality Standards

The EPA has established National Ambient Air Quality Standards (NAAQS) pursuant to the Clean Air Act (CAA). The NAAQS include both primary and secondary standards for several criteria pollutants. The primary standards are designed to protect human health with an adequate margin of safety. The secondary standards are designed to protect property and ecosystems from effects of air pollution. NAAQS have been established for ozone, CO, NO_2, SO_2, PM10, PM2.5, and lead. Table 3-1 presents the NAAQS. Table 3-2 shows the attainment status for the Project area.

Table 3-1 National Ambient Air Quality Standards

Pollutant	Averaging Time	National Standard [1,2]	
		Primary [3]	Secondary [4]
Ozone	8-hour	0.075 ppm (147 $\mu g/m^3$)	Same
CO	8-hour	9 ppm (10 mg/m^3)	None
	1-hour	35 ppm (40 mg/m^3)	None
NO_2	Annual Average	0.053 ppm (100 $\mu g/m^3$)	Same
SO_2	Annual Average	0.03 ppm (80 $\mu g/m^3$)	None
	24-hour	0.14 ppm (365 $\mu g/m^3$)	None
	3-hour	None	0.5 ppm (1,300 $\mu g/m^3$)
PM10	24-hour	150 $\mu g/m^3$	Same
PM2.5	Annual Mean	15 $\mu g/m^3$	Same
	24-hour	35 $\mu g/m^3$	Same
Lead	Quarterly	1.5 $\mu g/m^3$	Same
	Rolling 3-Month Average	0.15 $\mu g/m^3$	Same

$\mu g/m^3$ = Micrograms per cubic meter.

mg/m^3 = Milligrams per cubic meter.

ppm = parts per million by volume

(1) National standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

(2) Equivalent units given in parentheses are based on a reference temperature of 25ºC and a reference pressure of 760 mm of mercury. All measurements of air quality are to be collected at a reference temperature of 25ºC and a reference pressure of 760 mm of mercury (1,013.2 millibars).

(3) National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the EPA.

(4) National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant Each state must attain the secondary standards within a 'reasonable time' after implementation plan is approved by the EPA.

(5) The annual PM10 NAAQS of 50 $\mu g/m^3$ was revoked by EPA on September 21, 2006. FR Vol. 71 Number 200 10/17/2006.

Table 3-2 Attainment Status for City of Palmdale, Los Angeles County

Pollutant	Federal Status
Ozone	Non-attainment (Severe) for the 8-Hour standard
CO	Unclassified/Attainment
NO_2	Unclassified/Attainment
SO_2	Unclassified
PM10	Unclassified
PM2.5	Unclassified/Attainment
Lead	Attainment

3.2 Federal Rules and Regulations

Various Federal programs have been developed to regulate sources of air pollutants, including stationary, mobile and area sources. These programs include the PSD regulations, the Operating Permits Program under Title V of the CAA Amendments of 1990, New Source Performance Standards (NSPS), codified at 40 Code of Federal Regulations (CFR) 60; National Emission Standards for Hazardous Air Pollutants (NESHAP), which are codified in two parts: 40 CFR 61 and 40 CFR 63, and the Chemical Accident Prevention (i.e., Risk Management Program [RMP]) under Title III of the CAA Amendments of 1990, codified at 40 CFR 68.

The AVAQMD has been delegated authority by the EPA to implement and enforce most Federal requirements that are applicable to the Project, including Title V, NSPS and NESHAP, but not including PSD. The PSD Program is implemented by EPA Region 9. Compliance with the AVAQMD regulations ensures compliance and consistency with the corresponding Federal requirements as well.

The Federal regulations applicable to the project are summarized in Table 3-3. Compliance with the rules is discussed in the sections following the table.

Table 3-3 Summary of Federal Air Quality Regulations Applicable to the PHPP

Regulation	Applicability
Prevention of Significant Deterioration CAA §160-169A, 42 United States Code (USC) §7470-7491, 40 CFR Parts 51 and 52.	Requires PSD review, facility permitting, BACT and increment consumption analysis for significant emissions from new major sources.
CAA, Sections 171 – 193, 42 USC, Section 7501	Requires NSR facility permitting for construction or modification of specified stationary sources. NSR applies to pollutants for which area is designated non-attainment for NAAQS.
CAA, Section 111, 42 USC, Section 7411; 40 CFR Part 60 - NSPS, Subpart A	Establishes the monitoring, reporting and recordkeeping requirements for sources subject to NSPS standards.
CAA, Section 111, 42 USC, Section 7411; 40 CFR Part 60 - NSPS, Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	Establishes emission standards for compression ignition internal combustion engines, including emergency fire water pump engines and emergency electrical generator engines.
CAA, Section 111, 42 USC, Section 7411; 40 CFR Part 60 - NSPS, Subpart KKKK Standards of Performance for Stationary Combustion Turbines	Establishes emission standards for NO_X and SO_X emissions from combustion turbines and duct burners.
CAA, Section 501 (Title V), 42 USC, Section 7661, 40 CFR Part 70	Establishes a comprehensive permit program for major stationary sources.
CAA, Section 401 (Title IV), 42 USC, Section 7651; 40 CFR Part 72 (Acid Rain Program)	Provides emission standards for NO_X and SO_X and other requirements to control acid deposition from power plants.

3.2.1 Prevention of Significant Deterioration

The EPA PSD program applies to a new major facility that will emit 250 tons per year (tpy) or more, or if it is one of the listed PSD source categories in the Federal CAA that has a potential to emit 100 tpy or more of an attainment pollutant. The Project is one of the listed categories (fossil fuel fired steam electric generating facility) and will emit more than 100 tpy of NO_X, CO, and PM/PM10/PM2.5, as was shown in Table 1-1. The PSD requirements, including BACT, air quality impact assessment, and air quality related values (e.g., visibility) analyses are addressed and shown to comply in Sections 4.0, 5.0, and 6.0 of this application. The AVAQMD has not been delegated the authority to implement PSD review for attainment pollutants.

3.2.2 New Source Performance Standards (Part 60)

NSPS are federal standards promulgated for new and modified sources in designated categories codified in 40 CFR Part 60. NSPS are emission standards that are progressively tightened over time in order to achieve on-going air quality improvement without unreasonable economic disruption. The NSPS impose uniform requirements on new and modified sources throughout the nation. These standards are based on the best demonstrated technology (BDT) for emission control. BDT refers to the best system of continuous emissions reduction that has been demonstrated to work in a given industry, considering economic costs and other factors, such as energy use. In other words, a new source of air pollution must install the best control system currently in use within that industry.

The format of the standard can vary from source to source. It can be a numerical emission limit, a design standard, an equipment standard, or a work practice standard. Primary enforcement responsibility of the

NSPS rests with EPA, but this authority can be delegated to the states or local air districts. States can adopt an NSPS or impose limitations of their own, as long as the state requirements are at least as stringent as the federal requirements. The NSPS potentially applicable to the PHPP are summarized below. Enforcement of the NSPS has been delegated to the AVAQMD. They are enforced through AVAQMD Regulation 9.

Subpart A ***General Provisions.*** Any source subject to an applicable standard under 40 CFR Part 60 is also subject to the general provisions of Subpart A. Because the Project is subject to Subparts IIII and KKKK, the requirements of Subpart A will also apply. The Project operator will comply with the applicable notifications, performance testing, recordkeeping and reporting outlined in Subpart A.

Subpart Db **Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units.** The affected facility to which this subpart applies is each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 100 MMBtu/hr. The rule imposes limits on SO_2 emissions for oil- and coal-fired units; limits on PM emissions for units that combust coal, wood or municipal soild waste, alone or in combination with other fuels; and limits on NOx emissions for natural gas-fired units of 0.20 lb/MMBtu.

Subpart Db would apply to the auxiliary boiler because it has a heat input rate exceeding 100 MMBtu/hr. Subpart Db does not limit SO_2 or PM emissions from natural gas–fired units. As the proposed auxiliary boiler will not combust fuels other than natural gas, Subpart Db does not limit PM or SO_2 emissions from this source. Subpart Db limits NOx emissions to 0.20 lb/MMBtu from natural gas-fired units. The BACT-derived NOx emission limit of 0.011 lb/MMBtu is substantially less than the Subpart Db limit; thus the auxiliary boiler will comply with the NSPS requirements.

Subpart IIII ***Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.*** Subpart IIII is applicable to owners and operators of stationary compression ignition (CI) internal combustion engines that commence construction after July 11, 2005. Relevant to the proposed Project, the rule applies to the fire water pump CI engine and to the emergency electrical generator CI engine as follows:

(i) Non-fire, water pump engines manufactured after April 1, 2006;

(ii) Fire water pump engines with less than 30 liters per cylinder manufactured after 2009; or

(iii) Fire water pump engines manufactured as a certified National Fire Protection Association fire water pump engine after July 1, 2006.

For the purpose of this rule, “manufactured” means the date the owner places the order for the equipment. Based on the timeline projected for obtaining approval of the Project, the applicant expects that the engines will be ordered (and thus manufactured) in 2009.

Owners and operators of fire water pump engines with a displacement of less than 30 liters per cylinder must comply with the emission standards listed for all pollutants. For model year 2009 or later 300-horsepower (hp) engines, the limits are 2.6 grams per horsepower-hour (g/hp-hr) for CO, 3.0 g/hp-hr for non-methane hydrocarbons (NMHC) and NO_X combined, and 0.15 g/hp-hr for PM. In model years 2009 through 2011, manufacturers of fire water pump stationary CI engines in this engine power category with a rated speed of greater than 2,650 revolutions per minute may comply with the emission limitations for 2008 model year engines. The Project will install a Tier 3 engine meeting these standards.

Owners and operators of non-fire pump engines must comply with the emission standards listed for all pollutants. For a model year 2006 or later engine with 750 hp or more, the limits are 2.6 g/hp-hr for CO, 4.8 g/hp-hr for NMHC and NO_X combined, and 0.15 g/hp-hr for PM. The Project will install a Tier 2 emergency generator engine meeting these standards.

Subpart KKKK Standards of Performance for Stationary Combustion Turbines. Subpart KKKK places emission limits of NO_X and SO_2 on new combustion turbines. For new combustion turbines firing natural gas with a rated heat input greater than 850 MMBtu/hr, NO_X emissions are limited to 15 ppm at 15 percent O_2 or 54 nanograms per Joule (ng/J) of useful output (0.43 pounds per megawatt-hour [lb/MWh]).

Oxides of sulfur (SO_X) emissions are limited by either of the following compliance options:

1. The operator must not cause to be discharged into the atmosphere from the subject stationary combustion turbine any gases which contain SO_2 in excess of 110 ng/J (0.90 lb/MWh) gross output, or
2. The operator must not burn in the subject stationary combustion turbine any fuel which contains total potential sulfur emissions in excess of 26 ng SO_2/J (0.060 lb SO_2/MMBtu) heat input. If the turbine simultaneously fires multiple fuels, each fuel must meet this requirement.

As described in both Sections 2.0 and 4.0, the Project will use a SCR system to reduce NO_X emissions to 2.0 ppm and pipeline natural gas to limit SO_2 emissions to 0.0006 pounds per MMBtu to meet BACT requirements, which ensures that the Project will satisfy the requirements of Subpart KKKK.

3.2.3 National Emission Standards for Hazardous Air Pollutants (Parts 61 and 63)

There are no Part 61 standards applicable to the facility operations. As discussed in Section 5.0 and shown in the emission calculations in Appendix B, the Project Hazardous Air Pollutant (HAP) emissions are well below the thresholds for the NESHAP programs (i.e., 10 tpy of any single HAP and 25 tpy of all HAP combined) and, hence, 40 CFR Part 63 standards are not applicable to this Project.

3.2.4 Chemical Accident Prevention (Part 68)

The use of 19.5 percent concentration ammonia for the Project exempts the Project from Federal RMP applicability. The facility will be subject to California's Accidental Release Prevention Program for aqueous ammonia storage and use, which is similar to the Federal RMP program.

3.2.5 Title V, Facility Operating Permits (Part 70)

The Project is required to comply with the Federal Operating Permits Program, also known as Title V. As required by AVAQMD rules, the Project will comply with these requirements by submitting a Title V application within 12 months after starting commercial operation of the facility.

3.2.6 Title IV, Acid Rain (Part 72)

The Project is also required to comply with the Acid Rain requirements (Title IV). Since the AVAQMD has received delegation for its Title V permit program, the Applicant will secure a Title V permit that imposes the necessary requirements for compliance with the Title IV Acid Rain provisions from the AVAQMD.

4.0 BACT Determination

The proposed Project is located within the jurisdiction of the AVAQMD, and physically within the Mojave Desert Air Basin. This area is designated as a non-attainment area with respect to ozone and attainment with respect to NO_X, PM10, PM2.5, SO_2, and CO. Therefore, under PSD rules, BACT is required for CO, NO_X, PM, PM10, and PM2.5, since the potential emissions for those pollutants exceed the applicable significant emissions threshold.

This section presents the BACT analysis for the combined-cycle hybrid power plant. The assessment presented herein is a preliminary determination based on the most current data readily available through on-line databases. For the proposed Project, a control technology assessment is required for the following emission sources:

- Combustion turbine and duct burners;
- Auxiliary boiler;
- HTF heater;
- Emergency generator engine;
- Emergency fire water pump engine; and
- Cooling tower.

Consistent with the findings of PSD Environmental Review Board Appeal cases (e.g., Rockgen Energy Center, PSD Appeal No. 99-1 and Tallmadge Generating Station, PSD Appeal No. 02-12), because the PHPP is seeking different NO_x and CO emission limits during startup and shutdown events of the combustion turbines, the BACT review addresses both normal operations and startup/shutdown operations. Different limits during startup and shutdown apply only to the combustion turbines, therefore, the BACT discussion for the other equipment only addresses normal operations.

4.1 Methodology

EPA guidance for a “top-down” BACT analysis requires reviewing the possible control options starting with the best control efficiency. In the course of the BACT analysis, one or more options may be eliminated from consideration because they are demonstrated to be technically infeasible or have unacceptable energy, economic, or environmental impacts on a case-by-case (site-specific) basis. The steps required for a “top-down” BACT review are:

1. Identify available control technologies;
2. Eliminate technically infeasible options;
3. Rank remaining technologies;
4. Evaluate remaining technologies (in terms of economic, energy, and environmental impacts); and
5. Select BACT (the most efficient technology that cannot be rejected for economic, energy, or environmental impact reasons).

Publicly-available information on emission control technologies was reviewed for step one of this analysis. The recently-approved Victorville 2 (VV2) Hybrid Power Project’s control technology assessment was used as a baseline for this assessment due to the similarity of the equipment. Databases reviewed include South Coast Air Quality Management District (SCAQMD) BACT/lowest achievable emission rate (LAER) Guidelines,

EPA's Reasonably Available Control Technology/BACT/LAER Clearinghouse (RBLC), and the recent or pending projects in the CEC database.

A device-specific and pollutant-specific BACT determination is provided in the following subsections. Each BACT determination is made through the five-step process to identify available control technologies, eliminate technically infeasible options, rank and evaluate remaining technologies, and BACT selection.

4.2 BACT Determination for Combustion Turbines and Duct Burners

The proposed combustion turbines will operate in combined-cycle mode. In a combined-cycle configuration, hot exhaust from the CTG is ducted through a HRSG, which is also fired, to produce steam to drive a steam turbine generator. Since the combustion turbine and HRSG are coupled together in a combined-cycle configuration, and exhaust through a single stack, they are considered to be one combustion train for purposes of the evaluation of emissions control.

Permitting activity within the past several years has resulted in lower emission standards for combined-cycle combustion turbines and, therefore, the database review focused only on determinations from 2003 and later. The majority of determinations reviewed are based on exclusively natural gas-fired turbines. The determinations reviewed include combined-cycle turbines with a capacity greater than 100 MW.

4.2.1 BACT Review for NO_X

4.2.1.1 Normal Operations

The technologies employed for NO_X emissions reductions at combined-cycle power facilities are listed below in descending order of effectiveness:

- SCR or EmeraChem (EMx™) and other technologies
- EMx™ System or SCR individually
- Low NO_X combustors
- Water or steam injection

All of the listed technologies are feasible, as they have all been achieved in practice. SCR or EMx™ are seldom used as stand-alone control technologies on a combustion turbine application. The "other technologies" commonly employed include low- NO_X combustors and steam or water injection. The following discussion is focused on a comparison of SCR to EMx™. All other identified control technologies are demonstrated to be less effective, and have been eliminated from further consideration.

As shown in Table A-1 in Appendix A, the CEC has approved, or is expected to approve, several combined-cycle projects at a NO_X emission rate of 2 ppm, including:

- Victorville 2 (VV2) Hybrid Power Project, approved by the CEC in July 2008; NO_X of 2.0 ppm, one-hour average, with SCR technology;
- Roseville Combined-cycle - Roseville Electric, online in 2007; NO_X of 2.0 ppm, one-hour average, with SCR technology; and
- Avenal Energy Center – Avenal Power, LLC, AFC still under review; NO_X of 2.0 ppm, one-hour average with SCR technology.

The limit of 2 ppmv dry, corrected to 15 percent excess O_2, is currently considered to be BACT for NO_X from a natural gas-fired combined-cycle system. At 2 ppm, both EMx™ and SCR technologies are considered equivalent with respect to NO_X control for small (i.e., less than 10 MW) natural gas-fired turbines. To date,

EMx™ has not been achieved in practice for a large combined-cycle power project. EMx™ is almost 2.5 times more expensive than SCR. All similar combined-cycle combustion turbine projects reviewed during the BACT analysis employ SCR for NO_X control (see Appendix A).

EMx™ technology is not achieved in practice for large turbines; it is excessively costly and has not demonstrated to be significantly better than SCR. Therefore, based on the review of current SCR and EMx™ permits, emission limits, and technical feasibility for use in large combustion turbines as proposed for the Project, the applicant recommends SCR as BACT. A NO_X emission limit of 2.0 ppm at 15 percent O_2 and a one-hour averaging time is recommended as BACT under steady-state normal operating conditions. The same aggressive limit is proposed when duct burners are firing in the HRSG.

4.2.1.2 Startup and Shutdown

As noted above, different emission limits are proposed for the combustion turbines during startup and shutdown operating modes. The use of SCR to control NO_X is not technically feasible when the SCR catalyst is outside of the manufacturer's recommended operating temperature range. Outside of these temperatures, ammonia cannot be introduced to control NO_X, since the ammonia will not react with the NO_X completely. Therefore, SCR cannot be used to control NO_X emissions during turbine startup or shutdown when the SCR catalyst temperature is below the minimum operating temperature.

NO_X is emitted in diffusion flame mode in the turbine combustor during the first phases of startup, albeit at low fuel input rates. When turbine load reaches conditions that are predetermined by the turbine control system, the combustors switch to DLN operation, and NO_X emissions are controlled with the DLN combustion system of the turbine. Once conditions reach the minimum temperature at which ammonia injection can be initiated, normal operation of the SCR system is rapidly achieved.

The Project is proposing to permit a gas-fired auxiliary boiler and solar array that will be used to preheat the combined-cycle systems' steam seals and piping, as well as a novel HRSG that is designed to enable faster startups. This technology is referred to by the manufacturer (GE) as RSP, and is expected to reduce the duration of startups compared to conventional combined-cycle units. By shortening the duration of startup times, the RSP technology may be capable of reducing total startup emissions on the order of 50 percent, with smaller reductions in startup time during warm and hot starts.

In order to determine BACT during startup and shutdown conditions, the Applicant reviewed other combined-cycle, natural gas-fired turbine applications. The VV2 Project PSD application addressed BACT for startups and shutdowns, and concluded that the RSP technology represented BACT for GE "F-class" combustion turbines. A review of other similar permits' operating approaches, operating controls, work practices and equipment performance and design did not identify any superior emission rates. Although it is difficult to compare the emission rates expected to be achieved with the RSP approach due to the significant variability of the emission levels permitted for combined-cycle power plants startup and shutdowns during the last decade, the emission levels proposed for PHPP are significantly lower and shorter duration and are the same as the BACT determination for the VV2 Project.

There are no other technically feasible control techniques to further reduce NO_X emissions during startup and shutdown. Mass emission rate limits, in pounds per event, proposed during startup and shutdown, and the specification of GE's RSP technology, therefore, represent BACT for emissions of NO_X during the short-term startup and shutdown events. The following NO_X emission rate limits are proposed for these periods:

Hot/warm Startup:	40 pounds/event per turbine
Cold Startup:	96 pounds/event per turbine
Shutdown:	57 pounds/event per turbine

4.2.2 BACT Review for CO

4.2.2.1 Normal Operations

The technologies employed for CO emissions reductions at combined-cycle power facilities are listed below in descending order of effectiveness:

- Combination of technologies, i.e. oxidation catalyst with good combustion practice
- Oxidation catalyst
- Good combustion practices

All of the listed technologies are feasible, as they have all been achieved in practice.

An oxidation catalyst with good combustion practice will be used as a control technology for this Project. All other identified control technologies are demonstrated to be less effective, and have been eliminated from further consideration.

In the last five years, projects have been permitted in California for CO levels ranging from 2.0 to 4.0 ppm. For example, CO emission limits listed for similar combined-cycle turbines approved or under review in the CEC database include:

- VV2 Project, CEC approved in July 2008; CO of 3.0 ppm, one-hour average;
- San Gabriel Generating Station – Reliant, AFC still under review; CO of 2.0 ppm , one-hour average; and
- Carlsbad Energy Center – NRG, AFC still under review; CO of 2.0 ppm, one-hour average

Several facilities are listed in the RBLC since 2003 with CO permit limits of 2 ppm at 15 percent O_2. Duct burners will emit additional CO, which will increase the uncontrolled emission levels entering the oxidation catalyst. Several projects, including the Duke Energy Arlington Valley Energy Facility in Maricopa County, Arizona and Copper Mountain Power in Clark County, Nevada have CO permit limits of 3.0 ppm when duct firing, and 2.0 ppm when not duct firing.

The following facilities were recently granted permits with proposed CO limits of less than 2 ppm:

- Kleen Energy Systems (RBLC Id-CT-015), 2008; CO of 1.7 ppm, one-hour average with duct firing and CO of 0.9 ppm, one-hour average without duct firing
- CPV Warren (RBLC Id-VA-0304), 2007; CO of 2.5 ppm with power augmentation and duct burner and 1.3 ppm without power augmentation and duct burner

A complete listing of RBLC projects, as well as others, is included in Appendix A.

Although some power projects mentioned above have proposed CO limits of less than 3 ppm, these are recent projects which are either not on-line or which have not yet had the proposed limits verified through performance testing. The systems permitted for 2 ppm CO or less employ oxidation catalyst to control CO. The control performance of the catalyst degrades over the lifetime of the catalyst (typically 5 years), and thus CO emissions tend to increase over time. For the recently permitted projects, it is yet to be determined if these systems will continue the proposed performance to the end of the catalyst's useful life. Therefore, the CO limits of 2 ppm or less is not considered to have been achieved in practice.

Similar to the VV2 Project, this project will be a hybrid plant with GE's RSP technology. Given the uniqueness of this design, the recent VV2 Project CO BACT determination is considered to be the most applicable.

Based on this BACT review, the Project proposes CO BACT emission limits of 2.0 ppmv dry, corrected to 15 percent O_2 over a one-hour averaging time without duct burners, and 3.0 ppmv dry (corrected to 15 percent O_2) over a one-hour averaging time when duct burners are firing. These emission limits will be achieved with use of an oxidation catalyst.

4.2.2.2 Startup and Shutdown

CO emissions during startup and shutdown are controlled to a lesser extent than during normal operation because the oxidation catalyst is below its normal operating temperature range. Similar to the emissions of NO_x discussed above, permits for other combined-cycle, natural gas-fired turbine applications were reviewed in order to determine CO BACT during startup and shutdown conditions. The VV2 Project PSD application addressed BACT for startups and shutdowns, and concluded that the RSP technology represented BACT for GE "F-class" combustion turbines. Except for the VV2 Project, other permits did not contain operating approaches, operating controls, work practices or equipment performance and design representative of BACT. The CO emission levels permitted for combined-cycle power plants during startup and shutdowns are quite variable, but all were found to be significantly higher emissions and longer time duration than those proposed for PHPP. As discussed above, the RSP technology may be capable of reducing total startup CO emissions on the order of 50 percent.

There are no other technically feasible control techniques to further reduce emissions of CO during startup and shutdown. The mass emission rate limits, in pounds per event, proposed to limit CO emissions during startup and shutdown, therefore, represent BACT for this Project. The following CO emission rate limits during these periods are proposed:

Hot/warm Startup:	329 pounds/event per turbine
Cold Startup:	410 pounds/event per turbine
Shutdown:	337 pounds/event per turbine

4.2.3 BACT Review for PM, PM10 and PM2.5

4.2.3.1 Normal Operations

The technologies employed for PM, PM10 and PM2.5 emissions reductions at combined-cycle power facilities are listed below in descending order of effectiveness:

- Combination of technologies
- Public Utilities Commissions-regulated pipeline-quality natural gas fuel
- Low sulfur fuel
- Lube oil vent coalescer
- Air inlet cooler/filter
- Good combustion practices

All of the listed technologies are feasible, as they have all been achieved in practice.

The applicant has proposed the use of the top-ranked technology, a combination of technologies including low sulfur fuel, lube oil vent coalescer, air inlet cooler/filter and good combustion practices for the control of PM, PM10 and PM2.5 emissions. All other identified control technologies (used individually) are demonstrated to be less effective, and have been eliminated from further consideration.

The lowest levels of PM10 emissions listed for similar combined-cycle turbines in the SCAQMD BACT Guidelines include:

- Magnolia Power, Burbank, California, 2004; PM10 of 0.01 grains per standard cubic foot (gr/scf)
- Vernon City Power & Light, Vernon, California, 2004; PM10 of 0.01 gr/scf

The RBLC generally cites the use of pipeline quality natural gas as BACT for PM10 from combined-cycle combustion turbines. The CEC has also indicated the use of pipeline quality natural gas as BACT for the Blythe Energy Project II and the Los Esteros Critical Energy Facility, Phase II, and has imposed hourly emission limits reflecting the capacity of the equipment.

As the equipment and the source of natural gas for the Project is similar to that of the VV2 Hybrid Power Project, similar hourly emission rates are proposed for this Project. The proposed hourly mass emissions limits for two turbines of 12 pounds per hour when the duct burners are off and 18 pounds per hour when the duct burners are on, and the exclusive use of pipeline quality natural gas represent BACT for the proposed combined-cycle turbines.

4.2.3.2 Startup and Shutdown

Since PM, PM10 and PM2.5 emissions generally result from impurities in the natural gas burned or combustion air and do not depend on an emissions control system, the proposed BACT mass limits that govern normal operation also represent BACT for PM, PM10 and PM2.5 emissions during startup and shutdown.

4.3 BACT Determination for Auxiliary Boiler and HTF Heater

The proposed Project will include a 110 MMBtu/hr auxiliary boiler and a 40 MMBtu/hr HTF heater. Both will be fired on pipeline-quality natural gas. The auxiliary boiler will operate a maximum of 500 hours per year, and the HTF heater will operate no more than 1,000 hours per year. The auxiliary boiler is primarily designed to shorten the duration of startups as part of GE's RSP technology; therefore, the boiler itself is part of the control technology designed to minimize emissions during startup of the combustion turbines.

Permitting activity within the past several years has resulted in lower emission standards for boilers and, therefore, the database review was focused only on determinations from 2003 and later.

4.3.1 BACT Review for NO_X

The technologies employed for NO_X emissions reduction are listed below in descending order of effectiveness:

- SCR
- Ultra-low- NO_X burners
- Low- NO_X burners with flue gas recirculation
- Flue gas recirculation
- Good combustion practice and natural gas fuel

SCR was mentioned as an alternative control technology for boilers by the Bay Area Air Quality Management District (BAAQMD) in their BACT guidance document. SCR is known to successfully control NO_X to very low concentrations in large furnaces and boilers, although there is little evidence that this technology has been applied to boilers with the limited duty cycle of the proposed units. One key limitation relative to the technical feasibility of SCR for the proposed auxiliary boiler and HTF heater is that the temperature of the exhaust gas will be below the low end of the proper temperature range for the SCR catalyst. SCR also requires a substantial capital investment for the catalyst bed, additional power for operations (additional blower horsepower is required to overcome the pressure drop in the catalyst bed), and the use of hazardous aqueous

or anhydrous ammonia as the reducing agent. Based on the database review of boilers with similar heat rates, SCR is not used for NO_X control on boilers in the size range of the proposed units, as evidenced by the large number of applications cited that use low-NO_X or ultra-low-NO_X burner technologies. Due to the temperature inconsistency, limited number of hours of steady state operation, higher cost, additional energy requirements, the need to use a hazardous material (ammonia), and lack of evidence that SCR is used on boilers or heaters in the size range of the proposed units, SCR is determined to be infeasible for these devices.

The next most effective NO_X control option is the use of ultra-low-NO_X burners. The auxiliary boiler will be equipped with ultra-low-NO_X burners with a stack NO_X concentration of 9 ppm at three percent O_2 with a recommended averaging period of one hour. The HTF heater will also emit 9 ppm NO_X or less. The use of ultra-low-NO_X burners and the emission limit of 9 ppm represent BACT for the proposed auxiliary boiler and HTF heater.

Because SCR or other external control technology is not proposed for these equipment, it is expected that emissions should be reasonably consistent throughout various loads and operating conditions, and hence different emission limits are not proposed for transient conditions such as startup and shutdown modes.

4.3.2 BACT Review for CO

The technologies employed for CO emissions reduction are listed below in descending order of effectiveness:

- Oxidation catalyst
- Good combustion practices

Oxidation catalysts are known to successfully control CO to very low concentrations in large furnaces and boilers, although there is little evidence that this technology has been applied to boilers or heaters in the size range of the proposed units. Oxidation catalysts are mentioned as an alternative control technology by the BAAQMD in their BACT guidance document for larger combustion sources (i.e., greater than 50 MMBtu/hr). Oxidation catalysts require a substantial capital investment for the catalyst bed, and additional power for operations (additional blower horsepower is required to overcome the pressure drop in the catalyst bed). Based on the database review of process heaters and boilers with similar heat rates, it appears that oxidation catalysts are not used for CO control on boilers or heaters in the size range of the proposed units. Due to the limited hours of operation of the boiler and heater, substantially higher cost, additional energy requirements, and lack of evidence that oxidation catalysts are used on boilers or heaters in this size range, oxidation catalysts are determined to be infeasible for these devices.

The next most effective CO control option is the use of good combustion practices. Good combustion practice is recommended as BACT for this application. A recent BACT analysis for the proposed Reliant San Gabriel Generating Station proposed a CO limit of 25 ppm at three percent O_2 with a 15-minute averaging period. The facility was recently granted a permit (March 2008) but these emissions levels have not been demonstrated through performance testing. Hence these levels are not considered to be achieved in practice.

Based on several recent BACT determinations, 50 ppm at three percent O_2 is recommended as BACT for CO emissions. A one hour averaging period is recommended.

4.3.3 BACT Review for PM, PM10 and PM2.5

The technologies employed for PM, PM10 and PM2.5 emissions reduction are listed below in descending order of effectiveness:

- Pipeline-quality natural gas fuel

- Low-sulfur fuel
- Good combustion practices

The listed technologies are feasible, as they have all been achieved in practice.

PM, PM10 and PM2.5 emissions for both the auxiliary boiler and the HTF heater will be limited through the use of low sulfur pipeline-quality natural gas. BACT for PM, PM10 and PM2.5 will be achieved by the exclusive use of low sulfur pipeline-quality natural gas.

4.4 BACT Determination for Emergency Diesel Generator and Fire Water Pump Engines

The Project will include an emergency diesel generator rated at approximately 2,000 kW and a diesel fire water pump rated at approximately 135 kW. These emergency diesel engines will each operate for a maximum of 50 hours per year for testing. Duration of emergency operation of the engines is unknown.

4.4.1 BACT Review for NO_X and CO

The technologies employed for NO_X and CO emissions control for internal combustion engines are listed below in descending order of effectiveness:

- Catalytic converter
- Oxidation catalyst
- California Airborne Toxic Control Measure (ATCM)-compliant engine
- NSPS-compliant engine

Catalytic converters and oxidation catalysts have been proposed and used on a limited number of diesel engines in California; however, neither has been used on emergency engine installations due to the high cost and limited environmental benefit (due to the low number of hours of operation). Catalytic converters and oxidation catalysts are, therefore, determined to be infeasible for this application.

The remaining feasible control technologies for this device are the NSPS- or ATCM-compliant engine. NSPS, 40 CFR 60 Subpart IIII, was promulgated July 11, 2006 (71 FR 39154) by EPA for stationary diesel engines. Title 17 of the California Code of Regulations (CCR) Section 93115, the California ATCM for Stationary CI Engines, provides standards for new stationary emergency standby diesel-fueled engines. The California emission standards specified in 13 CCR Section 2423 and the PM emission limits specified in 17 CCR Section 93115 are at least as stringent as, or more stringent than, the 40 CFR Subpart IIII standards. Therefore, compliance with the EPA and/or California emission standards and limits constitutes BACT for the emergency diesel generator and fire water pump engines.

The emergency diesel generator engine will meet the EPA Tier 2 limit of 6.4 grams per kilowatt-hour (g/kW-hr) of NO_X plus NMHC for 2006 - 2010 model year diesel engines rated above 560 kW. The fire water pump engine will meet the EPA Tier 3 limit of 4.0 g/kW-hr for NO_X plus NMHC emissions for 2006 through 2010 model year diesel engines rated between 130 and 224 kW. Use of engines that comply with these emission limits, plus an enforceable operating restriction of 50 hours per year for maintenance and testing constitutes BACT for NO_X emissions for both the emergency generator and the fire water pump engines.

The emergency diesel generator engine will meet the EPA Tier 2 limit of 3.5 g/kW-hr of CO for 2006 through 2010 model year diesel engines rated above 560 kW. The fire water pump engine will meet the EPA Tier 3 limit of 3.5 g/kW-hr for CO emissions for 2006 through 2010 model year diesel engines rated between 130 and 224 kW. Use of engines that comply with these emission limits, plus an enforceable operating restriction of 50

hours per year for maintenance and testing constitutes BACT for CO emissions for both the emergency generator and the fire water pump engines.

4.4.2 BACT for PM, PM10 and PM2.5

The technologies employed for PM, PM10 and PM2.5 emissions control for CI engines are listed below in descending order of effectiveness:

- Diesel particulate trap
- California ATCM-compliant engine
- NSPS-compliant engine

Diesel particulate traps have been proposed and used on a limited number of diesel engines; however, they have not been used on emergency engine installations due to the high cost and limited environmental benefit (due to the low number of hours of operation). Diesel particulate traps are, therefore, determined to be infeasible for this application.

An ATCM-compliant engine is recommended as BACT for this application. The California emission limit for emergency engines with operating limits of 31 to 50 hours per year for maintenance and testing is 0.15 grams per brake horsepower-hour (g/bhp-hr). Therefore, compliance with an emission limit of 0.15 g/bhp-hr plus an enforceable operating restriction of 50 hours per year for maintenance and testing constitutes BACT for PM, PM10 and PM2.5 emissions for both the emergency generator and the fire water pump engines.

4.5 BACT Determination for Mechanical Draft Cooling Tower

Criteria pollutant emissions from the cooling tower, and hence the BACT determination, are limited to PM, PM10 and PM2.5.

The PHPP will utilize reclaimed water from the nearby PWRP wastewater treatment facility for steam turbine condenser cooling and will employ a ten-cell evaporative (wet) cooling tower. Wet cooling towers emit trace amounts of solid particulate matter due to release of the dissolved solids (salts) in droplets that escape the mist eliminator at the top of the tower, referred to as cooling tower drift. In theory, these droplets may evaporate (rather than falling back to earth as liquid droplets) to form solid particulate matter. PM, PM10 and PM2.5 are the only criteria pollutants of concern from wet cooling towers. Based on the total dissolved solids (TDS) concentration predicted for operation of the cooling tower, particles larger than PM10 (i.e., PM) will not be formed. It is often assumed that only a portion (e.g., 50 percent) of the TDS in the water will form PM10 and only a portion of the PM10 emissions will be in the PM2.5 size range. However, for this analysis, it was very conservatively assumed that all (100 percent) TDS would form PM/PM10/PM2.5. The remainder of this BACT analysis for the cooling tower will use PM to mean all of the size ranges of particulate emissions from the cooling tower.

Furthermore, there are differences of opinion whether a BACT review should include alternative technologies that would significantly alter the design of the plant. However, during the permitting of VV2, EPA requested that alternative cooling technologies be evaluated in the BACT analysis. Because of the similarities between VV2 and PHPP, this BACT analysis includes an evaluation of the alternative cooling technologies.

Three types of cooling technology approaches are available:

- Wet cooling,
- Dry cooling, and
- Wet-dry hybrid cooling.

Wet Cooling. Wet cooling uses circulating water to condense turbine-generator exhaust steam in a shell and tube heat exchanger (condenser). Cool circulating water enters the tube side of the condenser where it is warmed by the shell-side steam, causing the steam to condense such that condensate pumps may return it to the boiler feed water system. The warm circulating water then travels to a wet mechanical draft cooling tower. The cooling tower dissipates heat through circulating water evaporation and contact with ambient air. Once cooled, the circulating water is returned to the condenser to complete the cooling circuit.

Dry Cooling. Dry cooling technology uses an air cooled condenser (ACC) that cools the steam turbine-generator exhaust steam using a large array of fans that force air over finned tube heat exchangers. The exhaust from the steam turbine flows through a large diameter duct to the ACC where it is condensed inside the tubes through indirect contact with the ambient air. The heat is then rejected directly to the atmosphere.

Wet-Dry Hybrid Cooling. The wet-dry hybrid cooling approach involves the use of a combination of both wet and dry cooling technologies in parallel, and uses all of the equipment involved in both wet and dry cooling. As in a purely wet cooling system, cool water is circulated in a shell and tube heat exchanger to condense the turbine exhaust steam, and then a cooling tower is used to dissipate the heat in the warmed water. As in a purely dry cooling system, an air-cooled condenser uses a large array of fans to force air over finned tube heat exchangers, and the steam is condensed through indirect contact with the ambient air. Hybrid cooling technology divides the cooling function between the wet and dry systems depending on the capabilities of each system under different environmental and operational conditions.

Wet cooling systems have direct emissions of PM due to drift emissions. Because exhaust passing through the tower comes into direct contact with the cooling tower water, some water is entrained. These droplets contain dissolved solids that evaporate and form fine particles. It is estimated that a wet cooling system at the PHPP plant will emit up to 7.1 tpy of PM. Dry cooling systems have no direct PM emissions. However, dry cooling systems increase the back pressure on the steam turbines, and also increase the parasitic load on the power plant. It is estimated by Kiewit (the PHPP engineer) that use of a dry cooling system would reduce the efficiency of the PHPP plant by about 4 percent on a hot day, which would increase stack PM emissions by 4.5 tpy, as well as increasing NO_X and CO by similar amounts, to achieve the same net power output. Because the mechanical draft wet cooling tower emissions of PM are at most 7.1 tpy, a dry cooling tower would not result in a net emission decrease (when accounting for all pollutants) on an equal power output basis.

A wet-dry hybrid cooling system would have the same performance (i.e., energy penalty) as a dry-cooled plant because the ACC portion forces the wet cooling tower portion of the hybrid to operate at the same steam turbine backpressure as a dry cooling system. A hybrid system would also have PM drift emissions when the wet portion of the tower is operating.

Table 4-1 compares the economics of operating wet and dry cooling towers. The capital costs for an ACC are about $2.4 million more for the ACC than for the wet tower, not including the cost of a redesigned steam turbine that would be able to withstand the higher back pressures caused by the ACC. As shown in Table 4-1, the annual cost to operate the wet cooling tower would be about $20 million per year, including capital recovery as well as the cost of water, chemicals, and power needs. Due to the high energy penalty of increasing the steam turbine backpressure, the cost to operate a dry cooling system is estimated to be about $22 million per year.

The capital cost of a wet-dry hybrid system for the PHPP facility would be about $67 million, somewhat more than a dry cooling system since it includes both dry and wet cooling units. The operating costs would depend on the amount of time that the system operates in wet or dry modes. However, because the hybrid cooling system includes the backpressure energy penalty, the operating costs will be similar to the dry cooling system.

Table 4-1 Comparison of Annual Operating Costs for Wet and Dry Cooling

	Wet Cooling Tower	Dry Cooling
Required Power		
Fan Power(e)	1,700 kW	6,530 kW
Circulating Pump Power	2,400 kW	0 kW
Power Loss Due to High Steam Turbine Backpressure	0 kW	536 kW
Water Treatment Power Consumption (Zero Liquid Discharge)	850 kW	<200 kW
Total Net Power Loss Effects	12,798 kW	14,042 kW
Costs		
Direct Capital Cost	$26,000,000	$59,000,000[e]
Water Pipeline Installation [f]	~$1,400,000	$0
Annualized Cost		
Capital Recovery[a]	$1,940,000	$3,680,000
Equivalent Electrical Power Cost[b]	$16,816,500	$18,451,000
Treatment Chemical Addition[c]	$250,000	$0
Makeup Cooling Water[d]	$824,200	~$100,000
Total $/year	**$19,830,700**	**$22,231,000**

Notes:

a) Assumes a 30-year lifetime with a 5.75% interest rate.
b) Assumes the facility operates 8,760 hour/year and a power cost of $0.15/kWh.
c) Assumes that water treatment chemicals would be needed in a wet tower to prevent corrosion, bio-fouling, etc., but would not be needed for an ACC.
d) Estimated at $200/acre-foot and consumption of 4,121 acre-feet per year for wet cooling.
e) Does not include additional costs required for a steam turbine that can be operated at high back pressure.
f) Only includes the less than 2 miles of pipeline needed to connect to the regional backbone system. Dry cooling costs are underestimated since some water is needed even in a dry-cooled plant, which would still require a pipeline.

As noted above, dry cooling could actually increase emissions of all pollutants for an equivalent amount of power produced. However, putting that aside, based on the annualized cost difference between the two options shown in Table 4-1 of over $2.4 million, the cost effectiveness of reducing 7.1 tpy of PM emissions would be about $338,000 per ton. If the size of the dry cooling tower was increased, the power loss would decrease, and the overall annual cost would be expected to decrease. However, the performance of the largest possible dry cooling tower cannot approach the performance of a wet cooling tower. This value is not considered to be cost effective for reducing the small amount of PM emissions that would be released by a wet cooling tower, and hence an ACC is not considered to be BACT for this project. An ACC would also have other environmental impacts, including being more visually intrusive and noisy.

Therefore, BACT for PM from evaporative cooling towers is the use of high efficiency drift eliminators. No other control technology has been identified that could reduce emissions of PM from an evaporative cooling tower beyond levels that can be achieved with state-of-the-art drift eliminators. The Project will install a ten-cell cooling tower with a circulation rate of approximately 130,000 gallons per minute. Drift eliminators will be used to limit the drift rate to 0.0005 percent (based on circulation rate). Use of the drift eliminators with a drift rate of 0.0005 percent constitute BACT for PM emissions from the proposed evaporative cooling tower.

4.6 Summary of BACT Emission Rates

A summary of the BACT emission rates proposed for the Project, based on the above evaluation, are provided in Table 4-2. In addition, different BACT emission rates for NO_x and CO are proposed during startups and shutdowns of the combined-cycle units (see Table 5-3).

Table 4-2 Summary of BACT for the Proposed Project

Source	NO_X	CO	PM/PM10/PM2.5
Combined-Cycle Units (Combustion turbines and HRSGs)	2.0 ppm, at 15% O_2 1-hr average	3.0 ppm, at 15% O_2 1-hr average	Pipeline quality natural gas
Auxiliary Boiler and HTF Heater	9 ppm at 3% O_2 1-hr average	50 ppm at 3% O_2 1-hr average	Pipeline quality natural gas
Emergency diesel generator	6.4 g/kW-hr NO_X + NMHC	3.5 g/kW-hr	0.15 g/bhp-hr
Emergency fire water pump	4.0 g/kW-hr NO_X + NMHC	3.5 g/kW-hr	0.15 g/bhp-hr
Cooling Tower	n/a	n/a	0.0005% drift eliminator

5.0 Emissions

This section discusses and presents the criteria pollutant emissions for the PHPP during normal operations. While only PM10 is called out in the following discussion regarding operation emissions, the emissions of PM, PM10 and PM2.5 are considered to be equivalent for the combustion equipment and cooling tower. This is a conservative assumption. Detailed emission calculations for the Project are provided in Appendix B.

As noted in Section 1.0, the Project will emit minor amounts of SO_2 and VOC, negligible amounts of lead, H_2SO_4, H_2S, TRS, Reduced Sulfur Compounds, and fluorides, and minor quantities of HAP. Because emissions of these pollutants do not exceed PSD applicability thresholds, they are not discussed in detail in this section, however, emission estimates for these pollutants are provided in Appendix B.

5.1 Combustion Turbines and Duct Burners

Emissions from the Project combustion turbine units were based on process information provided by Kiewit Power Engineers, emission guarantees from GE, and a review of source test data from similar equipment for PM10. Annual emissions were calculated for two scenarios: 1) continuous operation of both combustion turbines throughout the year (i.e., no startups, shutdowns or offline periods); and 2) annual operations that include the maximum anticipated number of startups and shutdowns, offline periods prior to each startup, and continuous operation for the rest of the year.

Emissions for continuous operation throughout the year were based on both combustion turbines operating at full load for 8,760 hours per year with 2,000 hours of duct firing in each unit at the average temperature of 64°F. Note that the annual average temperature in the Project area is 78°F; emissions estimates at 64°F will be higher due to the higher air density at 64°F, leading to more conservative impacts analyses.

Annual emissions accounting for startups, shutdowns, and offline periods prior to startups were based on:

- Hot Start and Warm Start - 80 minute startup duration with 260 hot/warm startups per unit per year (total of 346.7 hours per year for hot or warm starts). For each hot or warm start, the turbines are assumed to be offline for an average of 6 hours prior to the startup (total of 1,560 hours per year offline prior to hot or warm starts).
- Cold Start - 110 minute startup duration with 50 cold startups per unit per year (total of 91.7 hours per year for cold starts). For each cold start, the turbines are assumed to be offline for an average of 48 hours (total of 2,400 hours per year offline prior to cold starts).
- Shutdown - 30 minute shutdown duration with 310 shutdowns per unit per year (total of 155 hours per year for shutdowns).
- Continuous Operation with Duct Firing - 2,000 hours per year for each unit.
- Continuous Operation without Duct Firing - 2,207 hours per year for each unit.

Emissions for both cases (i.e., continuous operation and operation with startup and shutdowns), and the higher emissions for the two cases are summarized in Table 5-1. Maximum hourly emissions from the two turbines are shown in Table 5-2. As shown in the table, maximum emissions for NO_X and PM10 occur when there is continuous operation. This is generally always true for PM10 since emissions are a direct result of fuel combustion, which is higher during normal operations than during startup or shutdown. However, it is unusual that NO_X is higher during normal operation than during startup and shutdown. The

Project is unusual in this regard because of the GE RSP option, which reduces the time needed for startup. CO emissions are at their maximum when startups and shutdowns are included, even with the RSP technology since CO emissions are so much higher during startup, before the oxidation catalyst is fully functional.

Table 5-1 Maximum Annual Emissions from TwoCombustion Turbines

Operating Scenario	NO_X (tpy)	CO (tpy)	PM10 (tpy)
Continuous Operation	113.7	77.5	117.1
Operation with Startup/Shutdown and Offline Periods	88.4	252.6	---
Maximum Annual Emissions[1]	**113.7**	**252.6**	**117.1**

[1] "Maximum Annual Emissions" is the largest total in either the first or second line of this table.

Table 5-2 Maximum Hourly[1] Emissions from Two Combustion Turbines

Operating Mode	NO_X (lb/hr)	CO (lb/hr)	PM10 (lb/hr)
Full-Load Operation, without duct firing	27.9	16.4	24.0
Full-Load Operation, with duct firing	33.2	30.3	36.0

lb/hr = pounds per hour

[1] Maximum hourly emissions during normal operations occur at a temperature of 23°F, with both units operating.

Table 5-3 shows the emissions of NO_X, CO and VOC during startup and shutdown, which are expected to be higher than for normal operations. SO_2, PM10, and PM2.5 emissions during startup and shutdown are expected to be lower than for normal continuous operation because these pollutants are emitted in direct proportion to fuel use and fuel use is lower startup and shutdown than during normal operations.

Table 5-3 Startup and Shutdown Emissions (per stack)

Operating Mode	Duration (minutes/ event)	NO_X (lb/event)	CO (lb/event)	VOC (lb/event)
Hot - Warm Start	80	40	329	28
Cold Start	110	96	410	31
Shutdown	30	57	337	29

5.2 Auxiliary Boiler and HTF Heater

The Project will include one natural gas-fired auxiliary boiler in order to facilitate rapid startup of the combustion turbines. It will operate a maximum of 500 hours per year and will have a heat input of 110 MMBtu/hr. NO_X emissions are based on the BACT-determined stack concentration of 9 ppmvd and CO emissions are based on 50 ppmvd, both at three percent excess O_2. PM10 emissions are calculated using an EPA AP-42 emission factor (EPA, 1998). Auxiliary boiler emissions are presented in Table 5-4.

Table 5-4 Maximum Hourly and Annual Auxiliary Boiler Emissions

Pollutant	Hourly Emission Rate (lb/hr)	Annual Emissions (tpy)
NO_X	1.21	0.30
CO	4.05	1.01
PM10	0.82	0.20

The PHPP will also utilize one heater to provide freeze protection for HTF. The HTF heater will operate a maximum of 1,000 hours per year and will have a heat input of 40 MMBtu/hr. NO_X emissions are based on the BACT-determined stack concentration of nine (9) ppmvd and CO emissions are based on 50 ppmvd, both at three percent excess O_2. PM10 emissions were calculated using emission factors from EPA AP-42 (EPA, 1998). HTF heater emissions are presented in Table 5-5.

Table 5-5 Maximum Hourly and Annual HTF Heater Emissions

Pollutant	Hourly Emission Rate (lb/hr)	Annual Emissions (tpy)
NO_X	0.44	0.22
CO	1.47	0.74
PM10	0.30	0.15

5.3 Emergency Diesel Generator and Fire Water Pump Engines

The Project's 2,000-kW emergency diesel generator will operate a maximum of 50 hours per year for maintenance and testing. NO_X and CO emission factors were assumed to be equal to the California Tier 2 emission limits, with the assumption that 95 percent of the emission limit for NO_X plus NMHC is NO_X (C. Moyer, 1998). Emissions from emergency operation of the engine are not estimated. Emergency diesel generator emissions are presented in Table 5-6.

Table 5-6 Maximum Hourly and Annual Emergency Diesel Generator Emissions

Pollutant	Hourly Emission Rate (lb/hr)	Annual Emissions (tpy)
NO_X	26.80	0.67
CO	15.43	0.39
PM10	0.88	0.02

The emergency diesel fire water pump engine will operate a maximum of 50 hours per year for maintenance and testing. NO_X and CO emission factors were assumed to be equal to the California Tier 3 emission limits, with the assumption that 95 percent of the emission limit for NO_X plus NMHC is NO_X. The PM10 emission factor was set equal to the 0.15 g/bhp-hr limit specified in 17 CCR Section 93115. Emissions from emergency operation of the engine are not estimated. Emergency diesel fire water pump engine emissions are presented in Table 5-7.

Table 5-7 Maximum Hourly and Annual Emergency Diesel Fire Water Pump Emissions

Pollutant	Hourly Emission Rate (lb/hr)	Annual Emissions (tpy)
NO_X	1.14	0.03
CO	1.05	0.03
PM10	0.06	0.0015

5.4 Cooling Tower

The Project will install a 10-cell cooling tower equipped with high efficiency drift eliminators. PM emissions were calculated based on the maximum water circulation rate and the maximum anticipated TDS/Total Suspended Solids (TSS) in the water. The reduction due to the drift eliminator was then applied. Emissions are estimated by conservatively assuming 100 percent of the TDS are emitted as PM, PM10 and PM2.5. Very conservative hourly and annual emissions are listed in Table 5-8.

Table 5-8 Maximum Hourly and Annual Cooling Tower PM Emissions

Parameter	Value
Water Circulation Rate	130,000 gpm
Total Liquid Drift	0.0005%
Maximum TDS/TSS of Circulated Water	5,000 ppmw
PM/PM10/PM2.5 Emissions	1.63 lb/hr
PM/PM10/PM2.5 Emissions	7.13 tpy
gpm = gallons per minute ppmw = parts per million by weight	

5.5 Fugitive Dust PM Emissions

The Project will require periodic vehicle travel over the unpaved portions of the solar field to perform routine maintenance including mirror washing, maintenance inspections and repairs of the piping network, herbicide application and dust suppressant application. Criteria pollutant emissions are expected from the combustion of fuels in the vehicles and fugitive PM, PM10 and PM2.5 emissions are expected from vehicle traffic on the unpaved areas in the solar fields. As the project is one of the 28 listed source categories, fugitive emissions are accumulated with stationary source emissions. However, consistent with EPA policy, mobile source emissions (i.e., tailpipe emissions) are not included in the source inventory.

Fugitive PM, PM10 and PM2.5 emissions from vehicles travel on unpaved surfaces are calculated using the equations outlined in EPA AP-42 Section 13.2.2, Unpaved Roads (2006). The daily and annual vehicle miles traveled are estimated based on the following assumptions:

- Mirror washing weekly six months per year and once per month for six months per year;
- Application of soil stabilizers in the solar field quarterly;
- Application of weed killer in the solar field quarterly; and
- Inspection of the solar piping three times per day.

The silt content of the vehicle pathways was assumed to be 11 percent. The average weight of the mirror wash truck, soil stabilizer truck and weed abatement truck was based on the use of a 4,000 gallon capacity water truck. The average weight of a maintenance vehicle was assumed to be three tons. The control efficiency from the routine use of water and soil stabilizers is conservatively assumed to be 50 percent.

Based on these assumptions and the AP-42 calculation methodology, fugitive PM, PM10 and PM2.5 emissions are estimated at 23.80 tons per year, 7.16 tons per year, and 0.72 tons per year, respectively.

5.6 Summary of Project Emissions

Table 5-9 shows the annual potential to emit for the Project for those pollutants that exceed PSD applicability thresholds. The Project will be a major source of NO_X, CO, PM, PM10 and PM2.5. For modeling purposes, PM2.5 was assumed to be equal to PM10 emissions for these sources. As noted earlier, emission calculations for all pollutants are provided in Appendix B.

Table 5-9 Total Annual Potential Emissions, Normal Operation

Source	Emissions (tpy)		
	NOx	**CO**	**PM/PM10/PM2.5**
Combustion turbines/HRSGs	113.7	252.43	117.12
Auxiliary Boiler	0.30	1.01	0.20
HTF Heater	0.22	0.74	0.15
Emergency Generator	0.67	0.39	0.02
Fire Water Pump Engine	0.03	0.03	0.0015
Cooling Tower	n/a	n/a	7.13
Maintenance Vehicles	n/a	n/a	23.8/7.16/0.72[1]
Total	**114.9**	**254.6**	**148.4/131.8/125.3**

[1] Fugitive emission only; as described in text.

6.0 Air Quality Impact Analysis

Under the PSD program, sensitive areas such as national parks and wilderness areas over a certain size have been designated as Class I areas. As such, Class I areas receive additional protection via a variety of air quality analyses and Air Quality Related Values (AQRV). The rest of the U.S. has been designated as Class II areas. The air quality impact assessment (AQIA) for the PHPP has been divided into two parts: 1) the Class II area AQIA and 2) the Class I area AQIA. In addition, other required PSD analyses are presented herein.

6.1 Class II Area Impact Assessment

Air quality modeling during operation was conducted with American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) to demonstrate compliance with the NAAQS and PSD increments in the local (Class II) area. The PHPP includes the following air emission sources that were included in the modeling analysis:

- Two combined-cycle CTG, each with HRSG and duct burners;
- Auxiliary boiler;
- HTF heater;
- Emergency generator engine;
- Fire water pump engine; and
- Cooling tower.

In addition to addressing air quality impacts associated with normal facility operations, modeling was conducted to assess the maximum air quality impacts during startup/shutdown of the combustion turbines.

6.1.1 Methodology

6.1.1.1 Model Selection and Application

A detailed methodology for the Class II area AQIA is documented in the modeling protocol, “Class II Area Dispersion Modeling Protocol for the Proposed Palmdale Hybrid Power Project”. The protocol was submitted to the EPA and U.S. Dept. of Agriculture, Forest Service (USFS) on August 6, 2008. As of this time, no comments have been received on this protocol from these agencies.

The analyses were conducted in accordance with the EPA Guideline on Air Quality Models (GAQM; as incorporated in Appendix W of 40 CFR Part 51; EPA, 2005). The purpose of the Class II AQIA was to demonstrate that emissions of pollutants that trigger PSD review (i.e., NO_2, CO, PM10, PM2.5) comply with the NAAQS and PSD increments. In addition, although NAAQS have been established for PM2.5, Significant Impact Levels (SILs) and PSD increments are not yet finalized by EPA. Currently, EPA interim policy specifies that compliance with the PM10 NAAQS is sufficient to demonstrate compliance for PM2.5. However, as was required by EPA (Pike, 2007) for the VV2 Project, a PM2.5 NAAQS analysis was conducted as documented below.

6.1.1.2 Significance Criteria

EPA has established SILs for AQIA. In accordance with standard modeling procedures for ambient air quality standards compliance analyses, if modeling of PHPP sources alone (proposed CTGs/HRSGs and

ancillary combustion equipment) indicates that the maximum modeled concentrations for a specific pollutant are below the SILs, no further analysis is required for that pollutant. If modeling indicates that the SIL for any pollutant/averaging period is exceeded, then a cumulative modeling study is required to determine the combined impact of the Project sources plus other major nearby background sources for compliance with the NAAQS and PSD increments. The maximum concentrations determined through cumulative modeling are then summed with representative background concentrations to account for non-modeled source contributions for NAAQS compliance. These criteria for the impact analyses are shown in Table 6-1.

Table 6-1 Ambient Air Quality Impact Criteria (µg/m^3)

Pollutant	Averaging Period	PSD Class II SILs	PSD Class II Increments	NAAQS	
				Primary	Secondary
NO_2	Annual	1	25	100	100
CO	1-hour	2,000	--	40,000	NA
	8-hour	500	--	10,000	NA
PM10	24-hour	5	30	150	150
	Annual	1	17	--	--
PM2.5	24-hour	--	--	35	35
	Annual	--	--	15	15
µg/m^3 = micrograms per cubic meter					

6.1.1.3 Model Inputs

The various inputs for the modeling are discussed in this section.

Background Air Quality Data. The background air quality concentrations from the closest air monitoring station in Lancaster during 2005-2007 used in the NAAQS analysis are listed in Table 6-2. The maximum 1-hour and annual NO_2 and annual PM2.5 were monitored in 2005. The maximum 24-hour PM2.5 and 24-hour and annual PM10 concentrations were monitored in 2007, and the maximum 1-hour and 8-hour CO concentrations were monitored in 2006.

Table 6-2 Maximum Concentrations From 2005 – 2007 for Lancaster, CA

Pollutant	Averaging Period	Yearly Monitored Concentration (µg/m^3)		
		2005	2006	2007
NO_2	1-hour	139.2	124.1	120.4
	Annual	28.2	28.2	26.3
CO	1-hour	3,335	3,680	2,875
	8-hour	1,725	1,840	1,495
PM10	24-hour	55	65	86
	Annual	22	23	25
PM2.5 [1]	24-hour	16	13	20
	Annual	8.9	7.4	8

[1] Per the form of the PM2.5 standard, the 24-hour background value used will be the average of the 98th percentile recorded over the three-year period. The data given in the table represent the 98th percentile for the given year. The average over three years is 17 µg/m^3.

Meteorological Data. The AERMOD model (version 07026) was applied with a three-year sequential hourly meteorological data set, Three years of surface observations (2002-2004) from the nearby Palmdale Regional Airport along with concurrent upper air data from Mercury Desert Rock Airport in Mercury, Nevada were used, as required for the dispersion modeling. Note that although 2005-2007 meteorological data were available, these years were not used because of the poor data recovery of the upper air data at Mercury Desert Rock Airport during that period. As discussed in the Class II area modeling protocol, the surface and upper air data were processed with the AERMOD meteorological processor, AERMET (version 06341).

Receptor Grid. A comprehensive Cartesian receptor grid extending to approximately 20 km from the proposed combustion turbine stacks was used in the AERMOD modeling to assess maximum ground-level pollutant concentrations. The 20-km receptor grid was sufficient to resolve the maximum impacts. The Cartesian receptor grid consisted of the following receptor spacing:

- Fence line to 3,000 meters (m) at 100-m intervals
- Beyond 3,000 m to 5,000 m at 200-m intervals
- Beyond 5 km to 10 km at 500-m intervals
- Beyond 10 km to 20 km at 1,000-m intervals

Discrete receptors were placed approximately every 50 m along the plant fence line for increased resolution of impacts along this boundary. Figures that illustrate the receptors are provided in the modeling protocol. Terrain elevations from Digital Elevation Model (DEM) data acquired from United States Geologic Service were processed with AERMAP (version 06341) to develop the receptor terrain elevations and corresponding hill height scale required by AERMOD. All of the DEM files were for Universal Transverse Mercator (UTM) Zone 11 and are referenced to Datum NAD27. The DEM files are included on the modeling archive Compact Disk (Appendix C).

Stack Parameters. Combustion turbine emission rates and flue gas characteristics were derived for a range of ambient temperatures for natural gas fuel for four operating load cases (100 percent with duct

burners, 100 percent without duct burners, 75 percent without duct burners and 50 percent without duct burners) that included variable operating factors such as evaporative cooling and solar energy input (see Appendix B). For the dispersion modeling, a worst-case composite of emissions and stack data were developed for each of the four load cases to simplify and add a measure of conservatism to the analysis. That is, for each load case, the highest emission rate and exhaust parameters that lead to the worst dispersion conditions (i.e., lowest flow rate and temperature) were identified for the range of ambient temperatures and operating factors. Each load case was modeled to determine the highest modeled concentrations for the combustion turbines (i.e., the worst-case). The worst-case combustion turbine stack parameters and emission rates were then used in the modeling for Project sources to determine maximum short-term (≤ 24-hour) impacts. For modeling annual average impacts for the combustion turbines, stack parameters based on 100 percent load with duct firing at ambient temperature of 64°F. As noted earlier, use of the 64°F ambient temperature case is conservative given the annual average temperature for the Project area is 78°F.

The stack parameters and emission rates input to AERMOD for the combustion turbines for normal operations are summarized in Table 6-3. The stack parameters and emissions data for the ancillary equipment are listed in Table 6-4. These stack parameters are based on operation of the ancillary equipment at 100 percent load.

Table 6-3 Stack Parameters and Emissions Data for the Two Combustion Turbines

Parameter		Value				
		North Stack			South Stack	
UTM Coordinate East (m) [1]		398680.2			398679.8	
UTM Coordinate North (m) [1]		3833520.8			3833479.7	
Stack Base Elevation (ft)		2,517			2,517	
Stack Height (ft)		145			145	
Stack Diameter (inches)		216			216	
		Load				
		100% w/DB	**100%**	**75%**	**50%**	**Annual Avg.[2]**
Exit Temperature (°F)		172.9	176.5	166.7	166.9	174.1
Exit Velocity (ft/sec)		62.01	61.98	46.26	39.7	64.9
Pollutant Emissions Per Combustion Turbine (lb/hr)	NO_X	16.60	13.47	10.97	8.73	13.0
	CO	15.16	8.20	6.68	5.31	28.8
	PM10/PM2.5	18	12	12	12	13.4

[1] Coordinates for UTM Zone 11 referenced to Datum NAD27.

[2] Annual average emissions include normal operations as well as startup/shutdown. Exit temperature and velocity are the 100 percent load case at 64° F.

Notes:

m = meters

Ft. = feet

Table 6-4 Stack Parameters and Emissions Data for the Ancillary Equipment

Parameter	Auxiliary Boiler	Emergency Generator	Fire Water Pump	HTF Heater	Cooling Tower [2]
UTM Coordinate East (m)[1]	398719.1	398804.9	398600.4	398540.7	398806.4
UTM Coordinate North (m)[1]	3833555.0	3833493.0	3833592.3	3833636.5	3833629.2
Stack Base Elevation (ft)	2,517	2,517	2,517	2,517	2,517
Stack Height (ft)	60	16	16	30	62.34
Stack Diameter (inches)	36	21.6	5.5	20.9	336
Exit Temperature (^{o}F)	300	761.7	761.7	300	98
Exit Velocity (ft/sec)	67	100	100	74.4	41.4
Short term/Annual Emissions (lb/hr/tpy)					
NO_X	1.21/0.30	26.80/0.67	1.14/0.03	0.44/0.22	--
CO	4.05/1.01	15.43/0.39	1.05/0.03	1.47/0.74	--
PM10/PM2.5	0.82/0.20	0.88/0.022	0.06/0.0015	0.30/0.15	1.63/7.13[3]

1 Coordinates for UTM Zone 11 referenced to Datum NAD27

2 The cooling tower has 10 cells and each was modeled as a single stack. Coordinate provided is the center point of the tower.

3 Cooling tower emissions reflect the entire cooling tower (10 cells).

Notes:

ft/sec = feet per second

6.1.1.4 Good Engineering Practice Analysis

A Good Engineering Practice (GEP) stack height analysis was conducted to evaluate the potential for building downwash. Stacks with heights below GEP are potentially subject to building downwash and require building dimensions to be input to AERMOD. The GEP stack height analysis was conducted using the EPA Building Profile Input Program (BPIP) (version 04274) that performs the GEP calculation for a multi-building complex on a stack-by-stack basis. The stack locations and buildings included in the GEP analysis are shown in Figure 6-1. A summary of the GEP analysis is provided in Table 6-5. The projected combustion turbine stack height of 145 feet (44.2 m) is less than GEP, but is sufficient to demonstrate compliance with air quality standards, as shown below. The stack heights of the ancillary equipment are also less than their respective GEP formula heights and subject to building downwash. Therefore, building dimensions developed by BPIP for all stacks were input to the dispersion model. The BPIP input and output files are provided on the modeling archive in Appendix C.

Table 6-5 Summary of GEP Analysis

Emission Source	Model Source Name	Stack Height (m)	Controlling Buildings or Structures	Building Height (m)	Projected Width (m)	GEP Formula Height (m)
HRSG Stack (North)	HRSG2	44.2	North and South HRSGs	33.53	33.56	83.82
HRSG Stack (South)	HRSG1	44.2	North and South HRSGs	33.53	33.60	83.82
Auxiliary Boiler	AUXBOIL	18.29	North and South HRSGs	33.53	34.51	83.82
Fire Water Pump Module	FIREPMP	4.88	North and South HRSGs	33.53	54.99	83.82
HTF Heater	GASHTR	9.14	Fire Water Pump Housing	12.19	14.97	30.48
Emergency Generator	EMGEN	4.88	South HRSG and South CTG	27.43	27.59	68.58
Cooling Tower	COOL_01–COOL_10	19.0	North and South HRSGs, STG	21.34 – 33.53	30.84 – 58.79	53.34 – 83.82

6.1.1.5 Ozone Limiting Method

The Ozone Limiting Method (OLM) option in AERMOD was used as a refined technique to more accurately model the conversion of NO_X emissions to ambient NO_2 concentrations. The OLM analysis is Tier 3 of the EPA's multi-tiered screening approach for estimating NO_2 sources from point sources as provided in the GAQM. In the OLM analysis, 10 percent of the NO_X emissions from the source are assumed to convert to NO_2 (i.e., fraction associated with thermal conversion) while the remaining fraction of NO_X (90 percent) is converted based on available ambient ozone concentrations. That is, conversion of the remaining 90 percent of NO_X to NO_2 is limited based on the availability of ozone and the remaining converted NO_2 is equivalent to the ambient ozone concentration. These computations are conducted internally in AERMOD on an hourly basis and require representative hourly monitored ozone that is concurrent to the meteorological data used in the modeling. For this analysis, the three concurrent years (2002-2004) of monitored ozone concentrations from the Lancaster Division Street monitoring station were used.

6.1.2 Class II Impacts from Project Normal Operations

The modeling of normal PHPP operations using AERMOD was done in a multi-step process. First, the worst-case impacts for the combustion turbines (based on different load and temperatures) were identified. The detailed results for the combustion turbine load analysis are provided in Appendix B. The following worst-case load conditions were identified for the pollutants and short-term averaging periods:

- 100 percent with duct firing - CO (1-hr and 8-hr); and
- 50 percent - PM10 and PM2.5 (24-hr).

As indicated, modeling of pollutants for annual averages (i.e., annual NO_2) was conducted with 100 percent load with duct firing at 64°F ambient temperature. Because the emergency generator and fire pump will not be operated for more than one hour at a time for testing it was assumed that these two sources will

operated only from 8 am to 9 am in order to model the likely worst-case meteorological conditions (morning stable layer).

In the next modeling step, the worst-case combustion turbine operating parameters and emissions were combined with normal operations of the facility ancillary sources. The maximum air quality impacts due to emissions from the Project sources are summarized in Table 6-6. Table 6-6 lists the maximum modeled concentrations for the Project sources for each year of meteorology. The maxima over the three years modeled is noted and compared to the EPA SILs. The OLM was used to more accurately represent the conversion of NO_X to NO_2 for comparison to the annual NO_2 NAAQS and PSD increment. As shown in Table 6-6, all maximum modeled pollutant concentrations are less than their respective SILs with the exception of 24-hour and annual PM10; the maximum 24-hour PM10 result is 12.7 micrograms per cubic meter (μg/m^3) versus the SIL of 5.0 μg/m^3, and the annual result was 1.1 μg/m^3 compared to the SIL of 1.0 μg/m^3. Therefore, no further analysis was required for NO_2 and CO and compliance with the NAAQS and Class II PSD increments was demonstrated, and cumulative analysis is required for PM10.

Table 6-6 Maximum Modeled Concentrations for PHPP Normal Operations

Pollutant	Averaging Period	Maximum AERMOD Concentration (μg/m^3)			Overall Maximum (μg/m^3)	EPA SIL (μg/m^3)	Class II PSD Increment (μg/m^3)
		2002	2003	2004			
NO_2 [1]	Annual	0.98	0.84	0.84	0.98	1	25
CO	1-hr	369.6	369.2	365.8	369.6	2,000	None
	8-hr	19.2	19.1	20.4	20.4	500	None
PM10	24-hr	12.7	12.3	12.4	12.7	5	30
	Annual	1.1	0.9	0.9	1.1	1	17
PM2.5	24-hr	12.7	12.3	12.4	12.7	None	None
	Annual	1.1	0.9	0.9	1.1	None	None

[1] Modeled NO_2 concentrations as determined with the OLM.

6.1.3 Cumulative Impacts During Operation

As noted above, given the modeled PM10 concentrations for the proposed Project exceed the applicable SILs, a cumulative analysis was conducted to demonstrate compliance with the NAAQS and PSD increments. In addition, a cumulative analysis was also conducted for PM2.5, as discussed above. The 24-hour and annual PM10 impacts that were greater than the SIL due to the Project alone were very limited and occurred along the fence line and extended to 400 m at the farthest point to the east of the Project site. For PM2.5 modeling, PM2.5 emissions were assumed to be equal to PM10 emissions.

To support the cumulative NAAQS analysis, an inventory of background PM10 sources was requested from the AVAQMD. Based on verbal correspondence with Mr. Chris Anderson of the AVAQMD, the only background sources that the agency required be included in the cumulative modeling analysis were the nearby Lockheed Martin Aeronautics and Northrop Grumman facilities, both located at or adjacent to the Air Force Plant 42 and within five miles of the Project site. An initial review of the sources at these facilities showed that there were a large number of individual sources (284), and the vast majority had very low emission rates. Given the large number of sources, to simplify the modeling, the agency was contacted and the following procedure for representing the sources was agreed upon and implemented for the modeling:

- For each facility, all sources that emitted 5 percent or more of the total emissions for each pollutant were included in the model.
- The remaining source emissions were added to the source that emitted the highest percentage of the emissions.
- In the case where two sources had the highest emissions at the facility for a given pollutant, the remaining emissions were added to the source closest to the Project site to be conservative.

This procedure produced a representative mix of source parameters and ensured that criteria pollutant emissions from the two facilities were included in the modeling. Figure 6-2 shows the locations of the two facilities and the sources that were included in the cumulative modeling.

The NAAQS analysis is summarized in Table 6-7 where the maximum modeled concentrations for all sources were summed with the ambient background concentrations for comparison to the NAAQS.

Initial modeling of annual and 24-hour PM10 and PM2.5 showed high impacts from some Lockheed and Northrop sources that were located directly adjacent to model receptors on the Lockheed and Northrop properties. In air dispersion modeling for NAAQS compliance, a source's impact is only required to be determined in "ambient air"; i.e., air that is off that facility's property and, therefore, accessible to the public. Both of these facilities are located within a fenced, secure area that is restricted from public access. Further, because the Lockheed and Northrop sources cannot contribute to modeled concentrations for NAAQS compliance on their own property, two sets of model runs were done for each pollutant and averaging period. In the first model run, all sources were included, but the receptors that fell on Lockheed Martin Aeronautics and Northrop Grumman facility property were removed. The second model run was conducted with the entire receptor grid, but did not include the source causing high impacts on its own property. The maximum impacts given in the table represent the highest value recorded between two sets of runs for each pollutant.

As shown in Table 6-7, the total concentrations comprised of maximum modeled plus maximum background are below the NAAQS for all pollutants. As shown in Table 6-7, the maximum 24-hour and annual PM10 modeled concentrations for all sources are less than the PSD increments of 30 $\mu g/m^3$and 15 $\mu g/m^3$, respectively. Therefore, the modeling demonstrates compliance with the PSD increments and standards.

Table 6-7 NAAQS Cumulative Modeling Results for PHPP Normal Operations

Pollutant	Averaging Period	Concentrations ($\mu g/m^3$)			
		AERMOD Result	Ambient Background [1]	Total [2]	NAAQS
PM10	24-hr[4]	12.9	86	98.9	150
	Annual	1.1	25	26.1	N/A[5]
PM2.5	24-hr	12.9[3]	17	29.9	35
	Annual[4]	1.1[3]	8.9	10.1	15

[1] Highest value from Table 6-1.
[2] Modeled concentration plus ambient background.
[3] PM2.5 Project maximum modeled concentration assumed equal to PM10 concentrations.
[4] See modeling discussion for how these values were determined.
[5] The annual PM10 NAAQS of 50 $\mu g/m^3$ was revoked by EPA on September 21st, 2006. FR Vol. 71 Number 200 10/17/2006.

6.1.4 Impacts from Combustion Turbine Startup/Shutdown

During startup and shutdown of the combustion turbines, emissions of CO will be higher than normal operations. As such, worst-case startup and shutdown conditions were modeled with AERMOD for comparison to the 1-hour and 8-hour CO NAAQS. The stack parameters and emissions data required for modeling short-term startup/shutdown are provided in Table 6-8. The stack exhaust parameters correspond to 20 percent load, assumed to be representative of this operating mode.

Worst-case startup/shutdown emissions for modeling were derived from the emissions data provided in Appendix B. Cold starts, warm starts, hot starts and shutdowns were considered. Based on this analysis, the worst-case or maximum emissions are associated with shutdown events. Because shutdowns only require one-half hour, maximum one-hour emissions are conservatively based on one-half hour at the maximum normal emission rate plus one-half hour in the shutdown mode as shown below:

Maximum CO emissions = (0.5 hrs x 15.16 lb/hr) + 337 lb/event = 344.6 lb/hr per turbine

Table 6-8 Stack Parameters and CO Emissions Data for the CTGs During Startup/Shutdown

Parameter	Value
Exit Temperature (^oF) [1]	173.5
Exit Velocity (ft/sec) [1]	31.76
CO Emissions Per Combustion Turbine (lb/hr)	344.6
[1] Based on 20 percent load.	

The modeling was conducted for the three years of meteorological data and assumed simultaneous operation of all ancillary equipment with the two combustion turbines. The results are summarized in Table 6-9. Ambient concentrations are summed with the maxima modeled over the three years for comparison to the NAAQS. As shown on the table, all modeled concentrations are below the NAAQS.

Table 6-9 Maximum Modeled Concentrations for Project Startup/Shutdown Operations

Pollutant	Averaging Period	Maximum AERMOD Concentration ($\mu g/m^3$)	Background Value ($\mu g/m^3$)	Max Plus Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
CO	1-hour	674.6	3,680	4,354.6	40,000
	8-hour	489.1	1,840	2,329.1	10,000

As with the normal operations modeling, because the emergency generator and fire pump will not be operated for more than one hour at a time during testing, it was assumed that these two sources will operate only from 8 am to 9 am in order to model the likely worst-case meteorological conditions (morning stable layer).

6.2 PSD Class I Analysis

PSD regulations require that facilities within 100 km of a PSD Class I area perform a modeling evaluation of the ambient air quality in terms of Class I PSD Increments and AQRVs. For the PHPP, potential air impacts were addressed at the following Class I areas within 100 km:

- Cucamonga Wilderness Area (WA)
- San Gabriel WA

The USFS is the Federal Land Manager (FLM) for the two Wilderness Areas. Figure 6-3 shows the location of the PHPP relative to the nearest PSD Class I areas.

The detailed methodology for the Class I area impact assessment is documented in the modeling protocol, "PHPP Class I Modeling Protocol". A copy of this protocol was submitted to the EPA and USFS on July 6, 2008. As of this time, no comments have been received on this protocol from these agencies.

The PHPP is located in a federal designated attainment or unclassified area for NO_2, PM10, and PM2.5. The combined cycle units will result in emission increases of NO_2, PM10, and PM2.5 above the PSD thresholds. The PHPP is not a significant source of SO_2 or H_2SO_4. As a result, Class I increment analysis was conducted only for NO_2, PM10 and PM2.5. Although PM2.5 PSD increments have yet to be established for Class I areas, PM2.5 modeled concentrations are provided in this air permit application for informational purposes based on comments received from EPA Region 9 on the VV2 Project.

Regional haze modeling for Cucamonga WA considered the two CTG emissions of H_2SO_4, NO_X, PM10, PM2.5, and SO_2. Visibility impacts due to emissions from the CTG were assessed at San Gabriel WA using VISCREEN. Additionally, a deposition analysis was conducted only for nitrogen compounds which considered primary emissions of NO_X and conversion of NO_X to nitrate and nitric acid. However, combustion turbine emissions of H_2SO_4, NO_X, PM10, PM2.5, and SO_2 were all included in the regional haze analysis for the Class I areas noted above.

A refined modeling assessment of PSD Class I increment consumption, regional haze, and acid deposition was conducted with the CALPUFF model (Version 5.8) and utilized detailed meteorological data prepared with CALMET, the CALPUFF meteorological pre-processor. The modeling approach is based on requirements outlined in the IWAQM Phase II report (EPA, 1998), as well as the FLMs' Air Quality Related Values Workgroup Phase I Report (FLM, 2000). In addition, the modeling methods and procedures will adhere to applicable guidance provided in the CALPUFF Reviewer's Guide (Gebhart, 2005) prepared for the USFS and National Park Service (NPS). These guidance documents are provided for suggested modeling approaches by EPA and the FLMs.

6.2.1 Class I Area Increment Analysis

The Class I increment modeling results for Cucamonga and San Gabriel WA are summarized in Table 6-10. The maximum NO_2 and PM10 concentrations for each area are below the Class I SIL and, therefore, also below the Class I PSD increments. Even though PM2.5 Class I SIL values or PSD increments have yet to be established, the maximum PM2.5 concentrations are shown herein for informational purposes. As shown in Table 6-10, they are below the proposed Class I PSD increments.

Table 6-10 Class I Area PM10, PM2.5, and NO_2 PSD Increment CALPUFF Modeling Result

Class I Area	Pollutant	Averaging Period	2001 ($\mu g/m^3$)	2002 ($\mu g/m^3$)	2003 ($\mu g/m^3$)	Class I SIL ($\mu g/m^3$)	PSD Class I Increment ($\mu g/m^3$)
Cucamonga WA	PM10	24-hr	0.049	0.059	0.055	0.3	8
		Annual	0.003	0.003	0.003	0.2	4
	PM2.5	24-hr	0.051	0.062	0.057	---	---
		Annual	0.003	0.003	0.003	---	---
	NO_2	Annual	0.0010	0.0008	0.0009	0.1	2.5
San Gabriel WA	PM10	24-hr	0.122	0.041	0.112	0.3	8
		Annual	0.004	0.002	0.003	0.2	4
	PM2.5	24-hr	0.127	0.043	0.116	0.3	8
		Annual	0.004	0.003	0.004	0.2	4
	NO_2	Annual	0.0017	0.0005	0.0015	0.1	2.5

6.2.2 Class I Regional Haze Analysis

The Class I regional haze results for Cucamonga WA is summarized in Table 6-11 for the three years modeled. According to the Federal Land Managers' Air Quality Related Values Workgroup (FLAG) guidance (FLM, 2000), when a project-related change in extinction is less than five percent of the background extinction, then the project's regional haze impact is defined by EPA to be insignificant and no further modeling is required to demonstrate no adverse impact. As shown in Table 6-11, the maximum modeled change in extinction (ΔB_{ext}) for all years modeled is less than five percent.

Table 6-11 Class I Area Regional Haze CALPUFF Modeling Results

Class I Area	Maximum % ΔB_{ext}			Significance Threshold (Percent Change in Extinction Coefficient)
	2001	2002	2003	
Cucamonga WA	1.77	2.14	1.92	5

6.2.3 Class I Deposition Analysis

The Class I Area deposition modeling results for Cucamonga and San Gabriel Wilderness Areas are summarized in Table 6-12 for the three years modeled. The maximum modeled deposition rates for all years modeled are below the Class I Area Deposition Analysis Thresholds.

Table 6-12 Class I Area Nitrogen Deposition CALPUFF Modeling Results

Class I Area	Averaging Period	Maximum Modeled Deposition Results (kg/ha/yr)			Class I Area Nitrogen Deposition Analysis Threshold (kg/ha/yr)
		2001	2002	2003	
Cucamonga WA	Annual	4.96E-04	5.21E-04	4.58E-04	5.0E-03
San Gabriel WA	Annual	7.18E-04	3.96E-04	6.07E-04	5.0E-03

6.2.4 VISCREEN Plume Blight Impact Analysis

PSD regulations require an analysis of visibility impairment (i.e., plume blight) at Class I areas within 50 km of a proposed PSD project. San Gabriel WA is located within 50 km of the PHPP. Therefore, an analysis of the potential PHPP visible plume impacts were addressed for this Class I area.

The plume visibility analysis was conducted with the most current version of EPA's screening model VISCREEN to determine if Project emissions will impair visibility in the San Gabriel WA. VISCREEN was applied with the guidance provided in EPA's Workbook for Plume Visual Impact Screening and Analysis (Workbook) (EPA, 1992). As such, the VISCREEN model was applied to estimate two visual impact parameters, plume perceptibility (ΔE) and plume contrast (C_p). Screening-level guidance indicates that values above 2.0 for ΔE and +/- 0.05 for C_p are considered perceptible. The Workbook offers two levels of analyses. A Level 1 screening analysis is the most simplified and conservative approach employing default meteorological data with no site-specific conditions. A Level 2 analysis takes into account representative meteorological data and site-specific conditions such as complex terrain. Initially, the Level 1 analysis was conducted that indicated ΔE and C_p values above the screening thresholds. Therefore, a Level 2 analysis was conducted.

A Level 2 analysis was conducted with the same three years of meteorological data used in the Class II air quality analysis. In addition, per Workbook guidance, the stability class was reduced by one class (less stable) because the terrain elevation differences between the facility (stack-top) location and San Gabriel WA is more than 500 m. The maximum elevation at San Gabriel WA of 2,216 m above mean sea level (amsl) is based on the receptor elevations used for the Class I modeling provided by NPS. The stack-top elevation of the source is 810.2 m amsl. This results in a difference in elevation of 1,405.8 m.

The source data required by VISCREEN are total NO_X emissions (33.20 lb/hr) and particulate emissions (36.00 lb/hr) for the CTGs. Included in the particulate emissions were emissions of elemental carbon (EC) (9.00 lb/hr) and sulfate (SO_4) (0.99 lb/hr) emissions. The speciated PM10 emissions where derived according to procedures referenced in the PHPP Class I modeling protocol and conform to recommendations by the NPS. The NPS guidance specifies that of the total PM10, 25 percent should be considered filterable PM10 and 75 percent should be considered condensable PM10. The filterable PM10 is conservatively assumed to be EC, while the condensable PM10 (minus the primary sulfate) is conservatively assumed to be organic aerosols. It was assumed that all NO_X is present as NO_2. The closest distance from the Project to the San Gabriel WA is 34.57 km.

The 22.5 degree (°) wind direction sectors that would transport emissions from the PHPP toward the San Gabriel WA are 303.75º – 326.25º, 326.25º – 348.75º, and 348.75º – 11.25º as shown in Figure 6-4. Based on this information, and the three years of meteorological data, a table of joint frequency of occurrence of

wind speed, wind direction, and stability class was developed as outlined in the Workbook. The dispersion conditions, defined by wind speed and stability class, were ranked by evaluating the product of σ_y, σ_z, and u, where σ_y and σ_z are the Pasquill-Gifford horizontal and vertical diffusion coefficients for the given stability class and downwind distance (i.e., 34.57 km), and u is the wind speed. The dispersion conditions were then ranked in ascending order according to the value of $\sigma_y\sigma_z u$ as shown in Table 6-13.

According to the Workbook, VISCREEN is to be applied with the worst-case meteorological conditions that have a $\sigma_y\sigma_z u$ product with a cumulative probability of one percent. That is, the dispersion condition is selected such that the sum of all frequencies of occurrence of conditions worse than this condition totals one percent. Note that as recommended by the Workbook, dispersion conditions that result in greater than 12 hours of plume transport time are discounted from the analysis, since it is unlikely that steady-state plume conditions would persist for more than 12 hours.

According to Tables 6-13 through 6-15, the worst-case dispersion conditions with cumulative frequency of one percent are E stability, four meters per second (m/sec) (Sector 303.75º – 326.25º [Table 6-13]) and occur during nighttime hours between 12:00 am and 6:00 am. Therefore, VISCREEN was applied with D stability, 4 m/sec to account for the complex terrain. As discussed previously, the stability class was reduced from E to D (slightly less stable), as recommended by Workbook, for cases when the terrain relief is greater than 500 meters as compared from stack top to elevations in the Class I area. As recommended by the FLAG guidance (FLM, 2000), a visual range of 246 km was used.

The VISCREEN results are summarized in Table 6-16. VISCREEN provides results of plume perceptibility (ΔE) and plume contrast (C_p) for both sky and terrain backgrounds. The results are below the significance criteria and, therefore, indicate that the plume would not be perceptible against a sky or terrain background.

Table 6-13 Dispersion Condition Frequency Analysis – Sector 303.75º – 326.25º

Dispersion Condition		$\sigma_y\sigma_z u$	Transport Time	Frequency By Time of Day				Cumulative Frequency By Time of Day			
Stability Class	Wind Speed (m/sec)	m^3/sec	(hours)	0-6	6-12	12-18	18-24	0-6	6-12	12-18	18-24
F	1	57,980	19	0.335	0.046	0.000	0.319	0.000	0.000	0.000	0.000
F	2	115,960	6	0.289	0.030	0.000	0.213	0.289	0.030	0.000	0.213
E	1	163,359	19	0.030	0.122	0.030	0.122	0.289	0.030	0.000	0.213
F	3	173,940	4	0.502	0.076	0.000	0.578	0.791	0.106	0.000	0.791
E	2	326,718	6	0.015	0.106	0.000	0.046	0.806	0.213	0.000	0.836
D	1	438,694	19	0.076	0.137	0.076	0.046	0.806	0.213	0.000	0.836
E	3	490,077	4	0.091	0.122	0.030	0.152	0.897	0.335	0.030	0.988
E	4	653,437	3	0.122	0.046	0.030	0.304	1.019	0.380	0.061	1.293
E	5	816,796	2	0.061	0.000	0.091	0.228	1.080	0.380	0.152	1.521
D	2	877,389	6	0.030	0.198	0.015	0.000	1.110	0.578	0.167	1.521
D	3	1,316,083	4	0.030	0.228	0.106	0.030	1.141	0.806	0.274	1.551
D	4	1,754,777	3	0.122	0.122	0.106	0.030	1.262	0.928	0.380	1.582
D	5	2,193,472	2	0.046	0.046	0.030	0.030	1.308	0.973	0.411	1.612
D	6	2,632,166	2	0.046	0.061	0.137	0.152	1.353	1.034	0.547	1.764
D	7	3,070,860	1	0.000	0.274	0.213	0.137	1.353	1.308	0.760	1.901
D	8	3,509,554	1	0.030	0.152	0.259	0.015	1.384	1.460	1.019	1.916

Notes:
m/sec = meters per second
m^3/sec = cubic meters/second

Table 6-14 Dispersion Condition Frequency Analysis – Sector 326.25º – 348.75º

Dispersion Condition		$\sigma_y\sigma_z u$	Transport Time	Frequency By Time of Day				Cumulative Frequency By Time of Day			
Stability Class	Wind Speed (m/sec)	m^3/sec	(hours)	0-6	6-12	12-18	18-24	0-6	6-12	12-18	18-24
F	1	57980	19	0.182	0.061	0.015	0.137	0.000	0.000	0.000	0.000
F	2	115960	6	0.182	0.030	0.000	0.167	0.182	0.030	0.000	0.167
E	1	163359	19	0.000	0.030	0.046	0.015	0.182	0.030	0.000	0.167
F	3	173940	4	0.289	0.030	0.015	0.304	0.471	0.061	0.015	0.471
E	2	326718	6	0.000	0.091	0.061	0.015	0.471	0.152	0.076	0.487
D	1	438694	19	0.000	0.137	0.122	0.000	0.471	0.152	0.076	0.487
E	3	490077	4	0.000	0.076	0.106	0.015	0.471	0.228	0.182	0.502
E	4	653437	3	0.061	0.015	0.061	0.137	0.532	0.243	0.243	0.639
E	5	816796	2	0.015	0.000	0.000	0.061	0.547	0.243	0.243	0.700
D	2	877389	6	0.030	0.122	0.076	0.015	0.578	0.365	0.319	0.715
D	3	1316083	4	0.046	0.395	0.167	0.015	0.623	0.760	0.487	0.730
D	4	1754777	3	0.061	0.091	0.030	0.000	0.684	0.852	0.517	0.730
D	5	2193472	2	0.000	0.030	0.000	0.000	0.684	0.882	0.517	0.730
D	6	2632166	2	0.000	0.015	0.046	0.015	0.684	0.897	0.563	0.745
D	7	3070860	1	0.000	0.015	0.015	0.000	0.684	0.912	0.578	0.745
D	8	3509555	1	0.000	0.030	0.030	0.000	0.684	0.943	0.608	0.745

Table 6-15 Dispersion Condition Frequency Analysis – Sector 348.75º – 11.25º

Dispersion Condition		$\sigma_y\sigma_z u$	Transport Time	Frequency By Time of Day				Cumulative Frequency By Time of Day			
Stability Class	Wind Speed (m/sec)	m^3/sec	(hours)	0-6	6-12	12-18	18-24	0-6	6-12	12-18	18-24
F	1	57980	19	0.137	0.030	0.030	0.091	0.000	0.000	0.000	0.000
F	2	115960	6	0.091	0.030	0.015	0.030	0.091	0.030	0.015	0.030
E	1	163359	19	0.000	0.046	0.046	0.046	0.091	0.030	0.015	0.030
F	3	173940	4	0.198	0.030	0.030	0.243	0.289	0.061	0.046	0.274
E	2	326718	6	0.000	0.015	0.046	0.000	0.289	0.076	0.091	0.274
D	1	438694	19	0.000	0.076	0.030	0.015	0.289	0.076	0.091	0.274
E	3	490077	4	0.015	0.046	0.182	0.061	0.304	0.122	0.274	0.335
E	4	653437	3	0.000	0.000	0.015	0.046	0.304	0.122	0.289	0.380
E	5	816796	2	0.015	0.000	0.015	0.015	0.319	0.122	0.304	0.395
D	2	877389	6	0.030	0.243	0.046	0.000	0.350	0.365	0.350	0.395
D	3	1316083	4	0.076	0.289	0.243	0.061	0.426	0.654	0.593	0.456
D	4	1754777	3	0.015	0.076	0.091	0.015	0.441	0.730	0.684	0.471
D	5	2193472	2	0.000	0.030	0.061	0.015	0.441	0.760	0.745	0.487
D	6	2632166	2	0.000	0.061	0.000	0.000	0.441	0.821	0.745	0.487
D	7	3070860	1	0.000	0.000	0.000	0.000	0.441	0.821	0.745	0.487
D	8	3509555	1	0.000	0.000	0.015	0.000	0.441	0.821	0.760	0.487

Table 6-16 VISCREEN Model Results

Background	Distance	Plume Perceptibility (ΔE)			Plume Contrast (C_p)		
		VISCREEN[1]		Criteria	VISCREEN[1]		Criteria
		Theta 10	Theta 140		Theta 10	Theta 140	
Sky	47.4	0.135	0.261	2.00	0.001	-0.009[2]	0.05
Terrain	34.6	0.806	0.072	2.00	0.005	0.001	0.05

[1] VISCREEN results are provided for the two VISCREEN default worst-case theta angles. The two theta angles represent the sun being in front of the observer (theta = 10 degrees) or behind the observer (theta = 140 degrees).

[2] A negative C_p means the plume has a darker contrast than the background sky.

6.3 Other Related PSD Analyses

PSD regulations also require that projects conduct analyses to determine the impacts on vegetation and soils, and also from secondary emissions due to growth in the area.

6.3.1 Vegetation and Soils

The Project site is in an area consisting of desert and desert shrub-land. Criteria for evaluating impacts on soils and vegetation are provided in EPA's “A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils and Animals” (EPA, 1980). Table 6-17 lists the EPA suggested criteria for the gaseous pollutants emitted directly from the proposed Project. These criteria are established for sensitive vegetation and crops exposed to the effects of the gaseous pollutants through direct exposure. Adverse impacts on soil systems result more readily from the secondary effects of these pollutants' impacts on the stability of the soil system. These impacts could include increased soil temperature and moisture stress and/or increased runoff and erosion resulting from damage to vegetative cover. In Table 6-17, the total modeled air concentrations for the proposed Project plus ambient background concentrations are compared to these criteria to evaluate impacts on both soils and vegetation. All total concentrations are well below the significance criteria. Therefore, the potential for adverse impacts to either soils or vegetation is negligible.

6.3.2 Growth Analysis

PSD requires an assessment of the secondary impacts from applicable projects. There will be minimal associated growth expected during Project construction due to the relatively short-term (29 months) duration and the existence of a large construction labor force in the southern California region. Additionally, no long-term growth (i.e., general commercial, residential, industrial or other secondary growth in the area) is expected during Project operations due to the small labor force (36 employees) that will be required to operate this Project. Therefore, no analysis of secondary impacts from associated growth is needed for this Project.

Table 6-17 Soils and Vegetation Analysis

Pollutant	Averaging Period	AERMOD Predicted Concentrations (mg/m^3)				Background Value ($\mu g/m^3$)	Max Plus Background ($\mu g/m^3$)	Significance Level for Impacts to Soil and Vegetation ($\mu g/m^3$)
		2002	2003	2004	Max.			
CO	1-week[1]	19.2	19.1	20.4	20.4	1,840.00	1,860.4	1,800,000
NO_2	4-hour[2]	280.5	203.0	207.7	280.5	139.19	419.7	3,760
	8-hour[2]	280.5	203.0	207.7	280.5	139.19	419.7	3,760
	1-month[2]	280.5	203.0	207.7	280.5	139.19	419.7	564
	Annual	1.0	0.8	0.8	1.0	28.2	29.2	94

Short-term numbers based on maximum concentration, annual concentrations are highest annual average concentration.

[1] Used 8-hour CO runs for this period.

[2] Used 1-hour NO_X runs for these periods.

6.4 Other Required Analysis

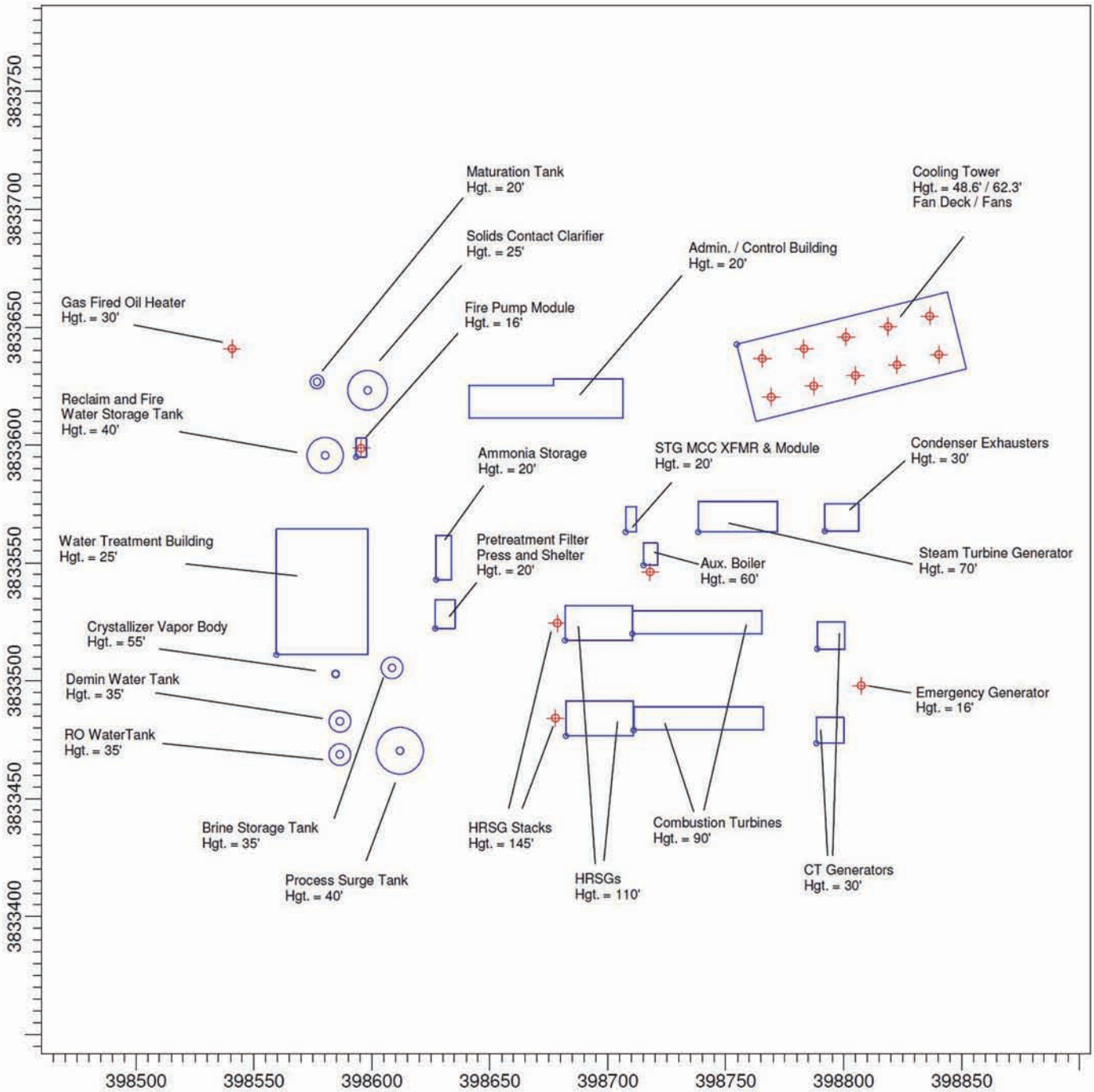
Pursuant to EPA Region 9 guidance (EPA, 2007), additional environmental analysis should be submitted with the PSD application, if available. Additional analyses are discussed below.

6.4.1 Additional Environmental Documents

As discussed in the introduction, an AFC was prepared for the PHPP that was submitted to the CEC on August 4, 2008. The Commission accepted the AFC as complete and "data adequate" on October 8, 2008. The AFC and associated CEC project documents are available electronically on the CEC website at: http://www.energy.ca.gov/sitingcases/palmdale/index.html. The CEC process will entail a very thorough environmental review of all aspects of the Project.

6.4.2 Endangered Species

AMEC Earth & Environmental, Inc. prepared a Biological Assessment (BA) for the development of the proposed PHPP to assist the United States Fish and Wildlife Service and the EPA in satisfying their consultation responsibilities under Section 7 of the federal Endangered Species Act. The BA is provided to EPA under separate cover along with this PSD Application.



Map Location

Not to Scale

Palmdale Hybrid Power Project

Figure 6-1

Buildings Evaluated in GEP Analysis

PALMDALE
a place to call home

Inland Energy, Inc.

AECOM

Project: 10855-002
Date: March 2009

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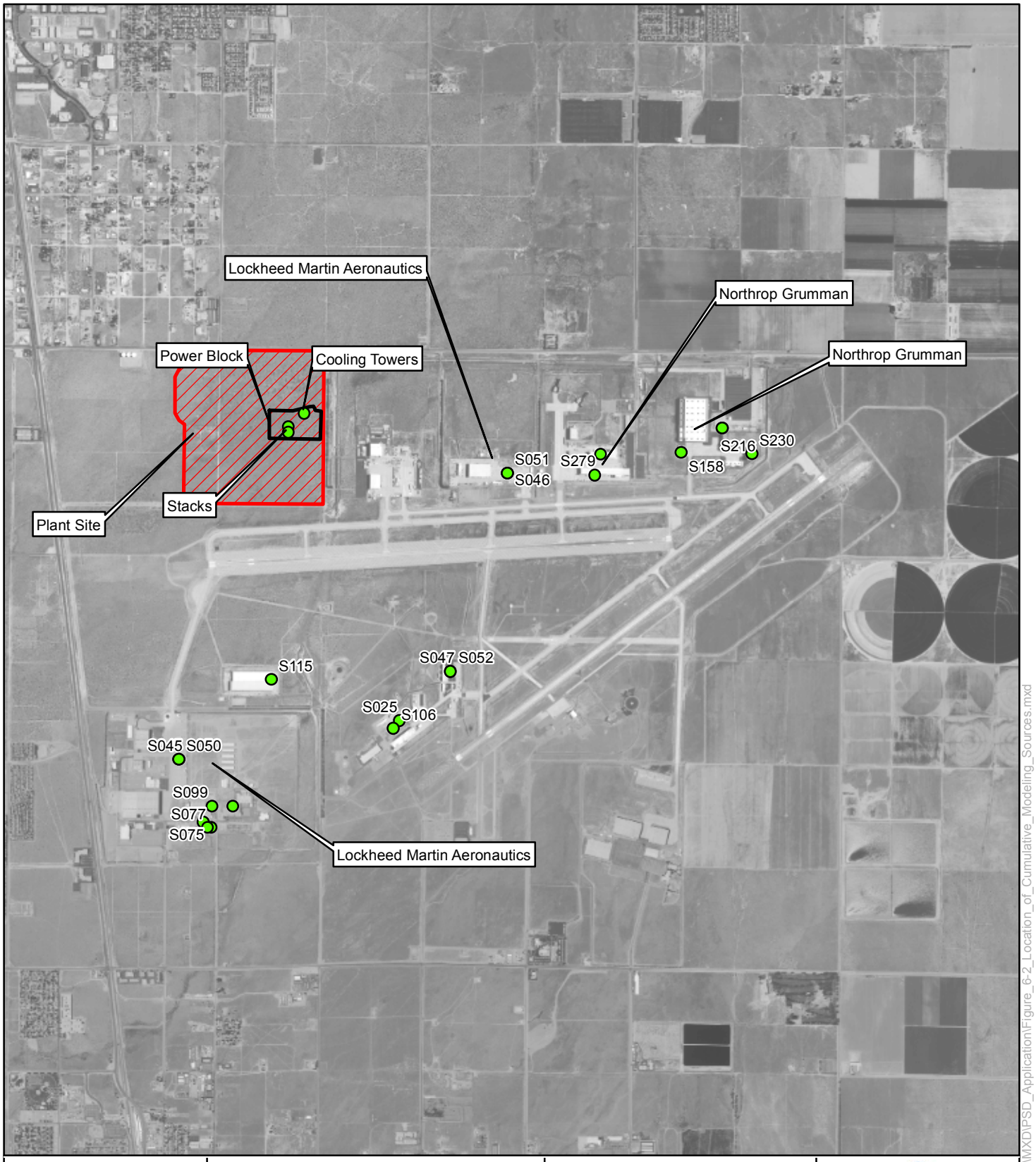

Map Location

Legend

- Plant Site
- Power_Block
- Cumulative Modeling Sources

N
W E
S

0 1,750 3,500 7,000 Feet

Palmdale Hybrid Power Project

Figure 6-2
Location of Cumulative Modeling Sources

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Date: March 2009

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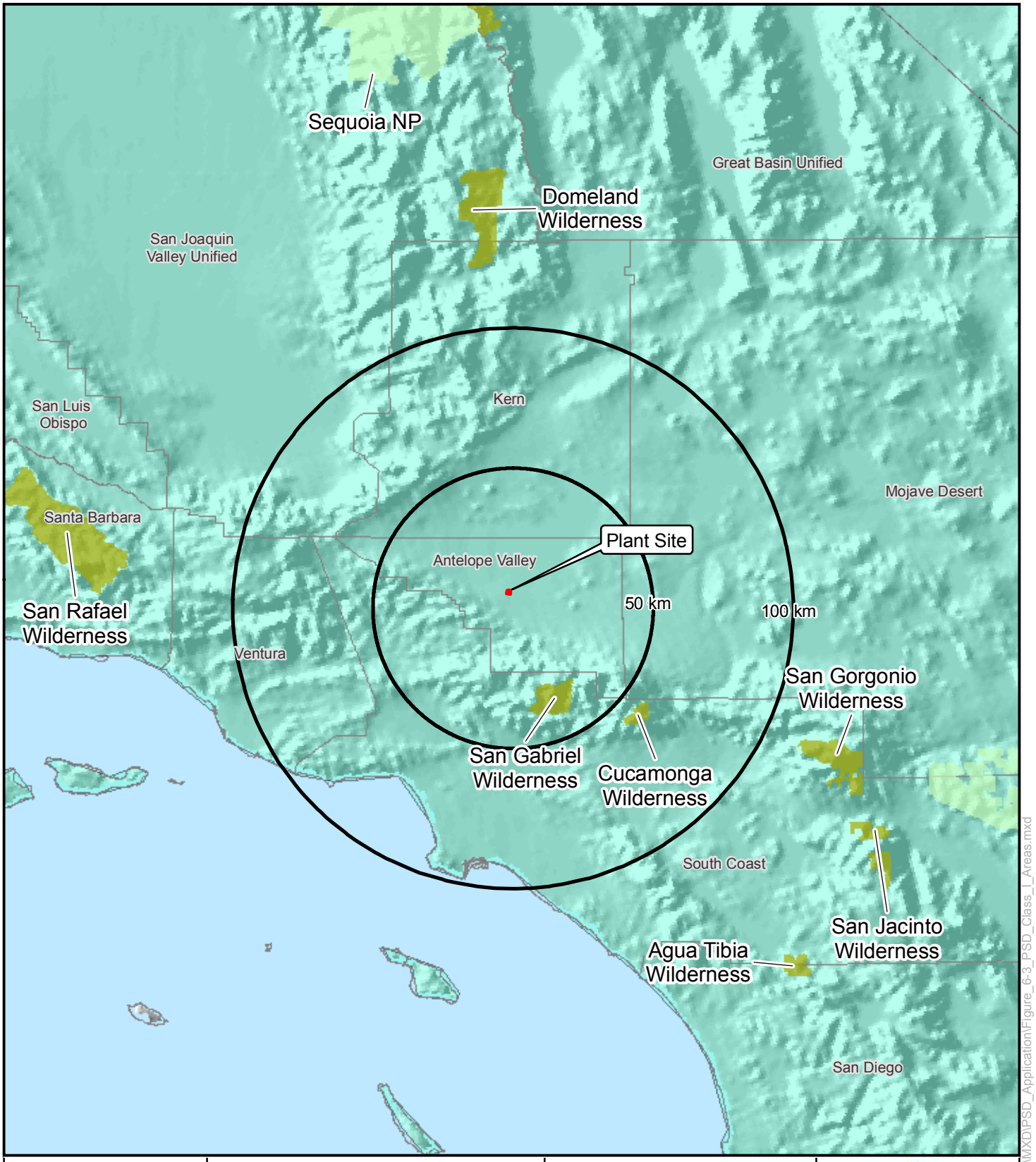

Map Location

Legend

- Plant Site
- 100 km Radius
- NPS Class I Areas
- USFS Class I Areas
- Air District Boundary

1 inch = 30 miles

0 15 30 60 Miles

Palmdale Hybrid Power Project

Figure 6-3
Location of Project Site in Relation to Nearby PSD Class I Areas

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Date: March 2009

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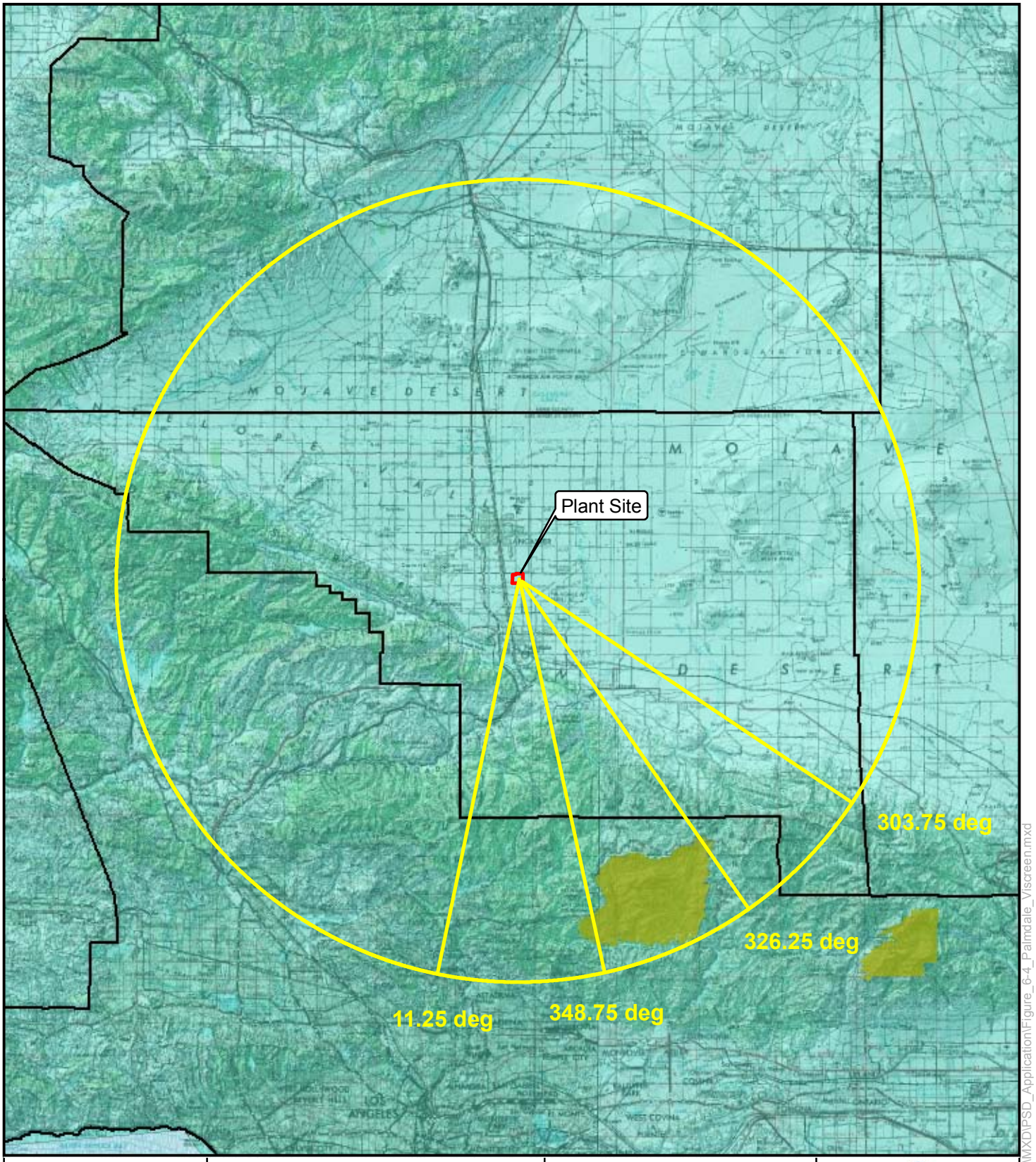

Map Location

Legend

- Plant Site
- USFS Class I Areas
- Air District Boundary

Degrees Show Direction of Winds Blowing From Source to Class I Area

N W E S

1 inch = 10 miles

0 5 10 20 Miles

Palmdale Hybrid Power Project

Figure 6-4
22.5 Degree Wind Direction Sectors Encompassing San Gabriel WA

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Project: 10855-002
Date: March 2009

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8.0 Acronyms and Abbreviations

ACC	Air Cooled Condenser
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Amsl	Above mean sea level
AQIA	Air Quality Impact Assessment
AQRV	Air Quality Related Values
ATCM	California Airborne Toxic Control Measure
AVAQMD	Antelope Valley Air Quality Management District
AVIRWMP	Antelope Valley Integrated Regional Water Management Plan
BA	Biological Assessment
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
BDT	Best Demonstrated Technology
BPIP	EPA Building Profile Input Program
CAA	Clean Air Act
CCR	California Code of Regulations
CEC	California Energy Commission
CEMS	Continuous Emissions Monitoring System
CFR	Code of Federal Regulations
CI	Compression Ignition
CO	Carbon Monoxide
C_p	Plume contrast
CTG	Combustion Turbine Generators
DEM	Digital Elevation Model
DLN	Dry Low- NO_X
EC	Elemental Carbon
EMx™	EmeraChem NOx Control System (formerly SCONOx)
EPA	U.S. Environmental Protection Agency
°F	Degree Fahrenheit
FLAG	Federal Land Managers' Air Quality Related Values Workgroup
FLM	Federal Land Manager
Ft	Feet
g/bhp-hr	Grams per brake horsepower-hour
g/kW-hr	Grams per kilowatt-hour
GAQM	Guideline on Air Quality Models
GE	General Electric Power Systems
GEP	Good Engineering Practice

gr/scf	Grains per standard cubic foot
H_2S	Hydrogen sulfide
H_2SO_4	Sulfuric acid
HAP	Hazardous Air Pollutants
HP	High pressure
Hp	Horsepower
Hr	Hour
HRSG	Heat Recovery Steam Generator
HTF	Heat Transfer Fluid
kg/ha/yr	Kilograms per Hectare per year
Km	Kilometers
kW	Kilowatt
kWh	Kilowatt hour
LAER	Lowest Achievable Emission Rate
LAWA	Los Angeles World Airports
lb/hr	Pounds per hour
lb/MWh	Pounds per megawatt-hour
LP	low pressure
M	Meter
m^3	Cubic meter
m/sec	Meters per second
mg/m^3	Milligrams per cubic meter
MMBtu	Million British Thermal Units
MMBtu/hr	Million British Thermal Units per hour
MMscfd	Million standard cubic feet per day
MW	Megawatts
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
ng/J	Nanograms per Joule
NMHC	Non-methane hydrocarbons
NO_2	Nitrogen dioxide
NO_X	Oxides of Nitrogen
NPS	National Park Service
NSPS	New Source Performance Standards
NSR	New Source Review
O_2	Oxygen
OLM	Ozone Limiting Method
PHPP or Project	Palmdale Hybrid Power Project
PM	Particulate matter

PM10	Respirable particulate matter
PM2.5	Fine particulate matter
ppm	Parts per million by volume
Ppmvd	Parts per million by volume, dry basis
PSD	Prevention Significant Deterioration
PWRP	Palmdale Water Reclamation Plant
RBLC	Reasonably Available Control Technology/BACT/LAER Clearinghouse
RH	Relative Humidity
RMP	Risk Management Program
ROW	Right-of-Way
RSP	Rapid Start Process
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCG	Southern California Gas Company
SCR	Selective catalytic reduction
SEGS	Solar Electric Generating System
SIL	Significant Impact Level
SO_2	Sulfur dioxide
SO_4	Sulfate
SO_X	Oxides of sulfur
STG	Steam Turbine Generator
TDS	Total Dissolved Solids
Tpy	Tons per year
TRS	Total Reduced Sulfur
TSS	Total Suspended Solids
USC	United States Code
USFS	United States Forest Service
USGS	United States Geologic Service
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
VV2 Project	Victorville 2 Hybrid Power Project
WA	Wilderness Area
Workbook	EPA's Workbook for Plume Visual Impact Screening and Analysis
ΔE	Plume perceptibility
$\mu g/m^3$	micrograms per cubic meter

Appendix A

Control Technology Listings

Table A-1
CEC Siting Cases: Natural Gas Fired, Combined-Cycle Combustion Turbines > 100 MW; 2002 - 2008

PROJECTS	DOCKET NUMBER	CAPACITY (MW)	LOCATION / STATUS	NOx	CO	VOC	PM10	SO2	NH3
BLYTHE II COMBINED CYCLE -- BLYTHE ENERGY LLC	02-AFC-1	520	RIVERSIDE CO./ APPROVED	2.0 PPMVD, 3-HR AVG	4.0 PPMVD, 24-HR AVG	2.0 PPMV	6.0 LB/HR	FUEL SULFUR CONTENT OF 0.5 GRAINS/100 SCF	5 PPMVD, 24-HR AVG
DONALD VON RAESFELD POWER PLANT PROJECT	02-AFC-3	147	SANTA CLARA CO./ OPERATIONAL	2.0 PPMV, 1-HR AVG	4.0 PPMV, 3-HR AVG	2.0 PPMV, 3-HR AVG	3.0 LB/HR AT BASE LOAD AND 4.3 LB/HR WITH DUCT FIRING	0.41 LB/HR	10 PPMVD, 3-HR AVG
WALNUT ENERGY CENTER -- TURLOCK IRRIGATION DISTRICT	02-AFC-4	250	STANISLAUS CO./ OPERATIONAL	2.0 PPM, 1-HR AVG	4.0 PPM, 3-HR AVG	1.4 PPM, 3-HR AVG	7.0 LB/HR	1.05 LB/HR	10 PPMVD, 24-HR
ROSEVILLE COMBINED CYCLE - ROSEVILLE ELECTRIC	03-AFC-1	160	PLACER CO./ OPERATIONAL	2.0 PPM, 1-HR AVG	4.0 PPM, 3-HR AVG	2.0 PPM	PIPELINE QUALITY NATURAL GAS	PIPELINE QUALITY NATURAL GAS	5 PPMVD, 24-HR AVG
EIF PANOCHE - ENERGY INVESTORS FUND	06-AFC-5	400	FRESNO CO./ UNDER CONSTRUCTION	2.5 PPM, 1-HR AVG	6.0 PPMVD, 3-HR AVG	2.0 PPM	6.0 LB/HR	2.51 LB/HR WITH FUEL SULFUR CONTENT OF 1.0 GRAINS/100 SCF	10 PPMVD, 24-HR AVG
COLUSA GENERATING STATION - E&L WESTCOAST	06-AFC-9	660	COLUSA CO./ UNDER CONSTRUCTION	2.0 PPM, 3-HR AVG	3.0 PPMVD, 3-HR AVG	2.0 PPM	12.9 LB/HR AT BASE LOAD AND 20.1 LB/HR WITH DUCT FIRING	FUEL SULFUR CONTENT OF 1.0 GRAINS/100 SCF	5 PPMVD
VICTORVILLE 2 HYBRID POWER PROJECT - CITY OF VICTORVILLE (563 MW NAT. GAS, 50 MW SOLAR)	07-AFC-1	563	SAN BERNARDINO CO./ APPROVED	2.0 PPM, 1-HR AVG	3.0 PPM, 1-HR AVG	2.0 PPM, 1-HR AVG	12 LB/HR AT BASE LOAD, 18 LB/HR WITH DUCT FIRING	FUEL SULFUR CONTENT OF 0.2 GRAINS/100 SCF, ANNUAL AVG	5 PPM, 1-HR AVG
SAN GABRIEL GENERATING STATION - RELIANT	07-AFC-2	696	SAN BERNARDINO CO./ UNDER REVIEW (PDOC 3/08)	2.0 PPM, 1-HR AVG	2.0 PPM, 1-HR AVG	2.0 PPM, 1-HR AVG	PIPELINE QUALITY NATURAL GAS	PIPELINE QUALITY NATURAL GAS	5 PPM, 1-HR AVG
CARLSBAD ENERGY CENTER - NRG	07-AFC-6	558	SAN DIEGO CO./ UNDER REVIEW (PSA 12/08)	2.0 PPM, 1-HR AVG	2.0 PPM, 1-HR AVG	2.0 PPM, 1-HR AVG	PIPELINE QUALITY NATURAL GAS, 9.5 LB/HR	FUEL SULFUR CONTENT OF 0.75 GRAINS/100 SCF	5 PPM
AVENAL ENERGY - AVENAL POWER CENTER LLC	08-AFC-1	600	KINGS CO./ UNDER REVIEW (PSA 2/09)	2.0 PPMVD, 1-HR AVG	2.0 PPMVD, 3-HR AVG	2.0 PPMVD, 3-HR AVG	9.8 LB/HR AT BASE LOAD AND 11.8 LB/HR WITH DUCT FIRING	0.36 GRAINS/100 SCF	10 PPMVD, 1-HR AVG

Table A-2
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NO_X

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	SIERRA PACIFIC POWER COMPANY	NV	2 - NATURAL GAS FIRED COMBINED CYCLE COMBUSTION TURBINE GENERATORS WITH HRSG"S AND DUCT BURNERS. 2 - NATURAL GAS FIRED FUEL PREHEATERS. 1 - NATURAL GAS FIRED AUXILIARY BOILER	TURBINE, COMBINED CYCLE COMBUSTION #1 of 2 WITH HRSG AND DUCT BURNER	15.21	NATURAL GAS	306	MW	2	PPMVD, 15% O2	
*OR-0041	WANAPA ENERGY CENTER	DIAMOND WANAPA I, L.P.	OR	A 1,200 MW NATURAL GAS-FIRED COMBINED CYCLE COMBUSTION TURBINE PROJECT EMPLOYING A WATER-COOLED STEAM CONDENSING SYSTEM. FOUR COMBUSTION TURBINES, FOUR HEAT RECOVERY STEAM GENERATORS, TWO STEAM TURBINES, AND TWO COOLING TOWERS EMPLOYED.	COMBUSTION TURBINE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	2384.1	MMBTU/H	2	PPMVD, 15% O2	
FL-0263	FPL TURKEY POINT POWER PLANT	FLORIDA POWER AND LIGHT	FL	THE PROPOSED A "4 ON 1" COMBINED CYCLE UNIT 5, WHICH WILL CONSIST OF FOUR GE MODEL FA GAS TURBINES (170 MW EACH), FOUR HEAT RECOVERY STEAM GENERATORS, A SINGLE STEAM TURBINE-ELECTRICAL GENERATOR (470 MW), AND A MECHANICAL DRAFT COOLING TOWER. NEW COMBINED CYCLE UNIT 5 WILL HAVE A TOTAL GENERATING CAPACITY OF APPROXIMATELY 1150 MW. THE EXISTING TURKEY POINT FOSSIL PLANT CURRENTLY CONSISTS OF TWO FOSSIL FUEL-FIRED STEAM ELECTRICAL GENERATING UNITS AND FIVE BLACK START DIESEL FIRED PEAKING GENERATORS. FOSSIL FUEL-FIRED STEAM ELECTRIC GENERATING UNITS 1 AND 2 (440 MW EACH) BEGAN OPERATION IN 1967 AND 1968, RESPECTIVELY.	170 MW COMBUSTION TURBINE, 4 UNITS	15.21	NATURAL GAS	170	MW	2	PPMVD, 15% O2	
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	AZ	COMBINED CYCLE GAS-FIRED ELECTRICITY GENERATING STATION	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - GE7FA TURBINES OPTION	15.21	NATURAL GAS	170	MW	2	PPMVD, 15% O2	
VA-0291	CPV WARREN LLC	CPV WARREN LLC	VA	COMBINED CYCLE POWER GENERATION	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	1717	MMBTU/H	2	PPMVD, 15% O2	
NV-0037	COPPER MOUNTAIN POWER	SEMPRA ENERGY RESOURCES	NV	A 600 MW COMBINED CYCLE ELECTRICAL GENERATION FACILITY CONSISTING OF TWO COMBUSTION TURBINE GENERATORS WITH HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR, AND ONE AUXILIARY BOILER.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	600	MW	2	PPMVD, 15% O2	3 HR

Table A-2
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NO_X

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
NV-0038	IVANPAH ENERGY CENTER, L.P.	IVANPAH ENERGY CENTER, L.P.	NV	A 500 MW ELECTRICAL GENERATING PLANT CONSISTING OF TWO COMBUSTION TURBINE GENERATORS, TWO HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR. THE PROPOSED PLANT IS SURROUNDED BY UNOCCUPIED LAND FOR A DISTANCE OF AT LEAST TWO MILES IN ALL DIRECTIONS. THE UN-IMPROVED ACCESS ROAD TO THE PROPOSED PLANT SITE IS ABOUT 1.6 MILES IN LENGTH.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	500	MW	2	PPMVD, 15% O2	1 HR
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	DUKE ENERGY ARLINGTON VALLEY	AZ	POWER PLANT	TURBINE, COMBINED CYCLE & DUCT BURNER	15.21	NATURAL GAS	325	MW	2	PPMVD, 15% O2	
*AZ-0049	LA PAZ GENERATING FACILITY	ALLEGHENY ENERGY SUPPLY LLC	AZ	NATURAL GAS FIRED, COMBINED CYCLE GENERATING STATION	GE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	15.21	NATURAL GAS	1040	MW	2	PPMVD, 15% O2	3 HR
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO MUNICIPAL UTILITY DISTRICT	CA	COMBUSTION GAS TURBINE GE 7FA	GAS TURBINES, (2)	15.21	NATURAL GAS	1611	MMBTU/H	2	PPMVD, 15% O2	
CA-1096	VERNON CITY LIGHT & POWER	VERNON CITY LIGHT & POWER	CA		GAS TURBINE: COMBINED CYCLE < 50 MW	15.21	NATURAL GAS	43	MW GAS TURBINE, 55 MW STEAM TURBINE	2	PPMVD, 15% O2	
CA-1097	MAGNOLIA POWER PROJECT, SCPPA	MAGNOLIA POWER PROJECT, SCPPA	CA		GAS TURBINE: COMBINED CYCLE >= 50 MW	15.21	NATURAL GAS	181	NET MW (GAS TURBINE W/STEAM INJECTION)	2	PPMVD, 15% O2	3 HR
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	SUMAS ENERGY 2 GENERATION FACILITY	WA		TURBINES, COMBINED CYCLE, (2)	15.21	NATURAL GAS	660	MW	2	PPMVD, 15% O2	
AZ-0039	SALT RIVER PROJECT/SANTAN GEN. PLANT	SALT RIVER PROJECT/SANTAN GEN. PLANT	AZ	POWER PLANT	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	175	MW	2	PPMVD, 15% O2	
not listed	ROSEVILLE ENERGY PARK	ROSEVILLE ELECTRIC	CA	160 MW, NATURAL GAS-FIRED, COMBINED-CYCLE GENERATING FACILITY LOCATED WEST OF DOWNTOWN ROSEVILLE, IN PLACER COUNTY. IT WILL HAVE TWO GE LM6000 PC SPRINT OR ALSTOM GTX100 CTGs, EQUIPPED WITH WATER INJECTION (LM6000) OR DRY LOW-NOx COMBUSTERS (GTX100), TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENSERS AND A MECHANICAL DRAFT COOLING TOWER	TURBINE, COMBINED CYCLE, NATURAL GAS & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	160	MW	2	PPMVD	1 HR

Table A-2
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NO_X

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
not listed	EL CENTRO UNIT 3 REPOWER PROJECT	IMPERIAL IRRIGATION DISTRICT	CA	128 MW, NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY WITHIN CURRENT EL CENTRO GENERATING STATION, IN IMPERIAL COUNTY. IT WILL ADD A GE 7EA CTG WITH DRY LOW NOX COMBUSTERS AND ONE HRSG WITH DUCT BURNER TO EXISTING FACILITY	TURBINE, COMBINED CYCLE, NATURAL GAS & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	128	MW	2	PPMVD	1 HR
not listed	BLYTHE ENERGY PROJECT, PHASE II	CAITHNESS BLYTHE II, LLC	CA	520 MW NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY ADJACENT TO BLYTHE ENERGY PROJECT PHASE I. IT WILL HAVE TWO SEIMENS WESTINGHOUSE CGTS WITH DRY LOW-NOX COMBUSTERS, TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE, NATURAL GAS & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	520	MW	2	PPMVD	1 HR
not listed	LOS ESTEROS CRITICAL ENERGY FACILITY, PHASE II	LOS ESTEROS CRITICAL ENERGY FACILITY, LLC	CA	CONVERSION OF EXISTING 180 MW SIMPLE-CYCLE POWER PLANT TO A 320 MW COMBINED-CYCLE PLANT WITH ADDITION OF FOUR HRSGs WITH DUCT BURNERS, STEAM TURBINE, CONDENSERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE, NATURAL GAS & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	320	MW	2	PPMVD	1 HR
UT-0066	CURRANT CREEK	PACIFICORP	UT	POWER GENERATION PLANT WITH TWO NATURAL GAS COMBINED CYCLE TURBINES	NATURAL GAS FIRED TURBINES AND HEAT RECOVERY STEAM GENERATORS	15.21	NATURAL GAS			2.25	PPMVD, 15% O2	3 HR
FL-0265	HINES POWER BLOCK 4	PROGRESS ENERGY	FL	COMBINED CYCLE POWER PLANT. THIS IS THE 4TH BLOCK OF POWER ADDED, MAKING THE TOTAL GENERATING CAPACITY OF THE FACILITY APPROXIMATELY 2090 MW.	COMBINED CYCLE TURBINE	15.21	NATURAL GAS	530	MW	2.5	PPMVD, 15% O2	
MI-0366	BERRIEN ENERGY, LLC	BERRIEN ENERGY, LLC	MI	ELECTRIC POWER GENERATING FACILITY.	3 COMBUSTION TURBINES AND DUCT BURNERS	15.21	NATURAL GAS	1584	MMBTU/H	2.5	PPMVD, 15% O2	
VA-0289	DUKE ENERGY WYTHE, LLC	DUKE ENERGY WYTHE, LLC	VA	POWER PLANT	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	170	MW	2.5	PPMVD, 15% O2	
OR-0039	COB ENERGY FACILITY, LLC	Peoples Energy Resources	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER (4)	15.21	NATURAL GAS	1150	MW	2.5	PPMVD, 15% O2	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	1973	MMBTU/H	2.5	PPMVD, 15% O2	
FL-0256	HINES ENERGY COMPLEX, POWER BLOCK 3	PROGRESS ENERGY FLORIDA	FL	POWER PLANT	COMBUSTION TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	1830	MMBTU/H	2.5	PPMVD, 15% O2	
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	SAVANNAH ELECTRIC AND POWER CO	GA	ELECTRIC GENERATING FACILITY	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	140	MW	2.5	PPMVD, 15% O2	

Table A-2
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NO_X

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
FL-0244	FPL MARTIN PLANT	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYCLE WITH DUCT BURNER (4)	15.21	NATURAL GAS	170	MW	2.5	PPMVD, 15% O2	
FL-0245	FPL MANATEE PLANT - UNIT 3	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	170	MW	2.5	PPMVD, 15% O2	24 HR
WY-0061	BLACK HILLS CORP./NEIL SIMPSON TWO	BLACK HILLS CORP.	WY	STEAM ELECTRIC GENERATING PLANT	TURBINE, COMBINED CYCLE, & DUCT BURNER	15.21	NATURAL GAS	40	MW	2.5	PPMVD, 15% O2	
OR-0040	KLAMATH GENERATION, LLC	KLAMATH GENERATION, LLC	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER (2)	15.21	NATURAL GAS	480	MW	2.5	PPMVD, 15% O2	
WA-0291	WALLULA POWER PLANT	WALLULA GENERATION, LLC	WA	WALLULA GENERATION, LLC, PROPOSES TO CONSTRUCT AND OPERATE A 1,300 MW COMBINED CYCLE ELECTRIC POWER PLANT. THE PROJECT WILL CONSIST OF TWO INDEPENDENT POWER BLOCKS WITH CRITICAL BACK-UP SYSTEMS TO MAINTAIN OVERALL PLANT RELIABILITY AND AVAILABILITY.	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	1300	MW	2.5	PPMVD, 15% O2	
MN-0053	FAIRBAULT ENERGY PARK	MN MUNICIPAL POWER AGENCY	MN	LARGE COMBUSTION TURBINE ELECTRIC POWER PLANT - INITIAL OPERATION IN SIMPLE CYCLE AND CONVERSION TO COMBINED CYCLE IN THE FUTURE.	TURBINE, COMBINED CYCLE (1)	15.21	NATURAL GAS	1876	MMBTU/H	3	PPMVD, 15% O2	3 HR
MI-0357	KALKASKA GENERATING, INC	KALKASKA GENERATING LLC	MI	ELECTRICAL POWER PRODUCTION FACILITY.	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	605	MW	3	PPMVD, 15% O2	
MI-0361	SOUTH SHORE POWER LLC	SOUTH SHORE POWER LLC	MI	ELECTRIC POWER GENERATING FACILITY.	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	172	MW	3	PPMVD, 15% O2	
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	CALPINE CORP.	CO	NATURAL GAS-FIRED, COMBINED-CYCLE COMBUSTION TURBINES.	COMBINED-CYCLE TURBINE	15.21	NATURAL GAS	300	MW	3	PPMVD, 15% O2	
NC-0101	FORSYTH ENERGY PLANT	FORSYTH ENERGY PROJECTS, LLC	NC	THREE COMBINED-CYCLE COMBUSTION TURBINE GENERATORS, EACH WITH A HEAT RECOVERY STEAM GENERATORS (HRSG) ALONG WITH NATURAL GAS-FIRED DUCT BURNERS TO MEET PEAK DEMAND. THE STEAM GENERATED THROUGH THE THREE HRSGS WILL DRIVE A STEAM TURBINE. THE ENTIRE PLANT WILL BE CAPABLE OF GENERATING A NOMINAL POWER OUTPUT OF 812 MEGAWATTS.	TURBINE, COMBINED CYCLE (3)	15.21	NATURAL GAS	1844.3	MMBTU/H	3	PPMVD, 15% O2	
LA-0192	CRESCENT CITY POWER	CRESCENT CITY POWER, LLC	LA	NEW 600 MW NATURAL GAS-FIRED COMBINED CYCLE POWER PLANT	GAS TURBINES - 187 MW (2)	15.21		2006	MMBTU/H	3	PPM	Annual
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA)	15.21	NATURAL GAS	172	MW	3	PPM @ 15% O2	3 HR

Table A-2
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NO_X

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GENERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVE GROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE, 2 EACH	15.21	NATURAL GAS	1916	MMBTU/H	3	PPMVD, 15% O2	
TX-0374	CHOCOLATE BAYOU PLANT	BP AMOCO CHEMICAL CO	TX	THE PROJECT WILL CONSIST OF TWO DUAL SHAFT GAS-FIRED ELECTRIC GENERATING TURBINES EACH RATED AT APPROX. 35 MW (BASE LOAD), EACH TURBINE WILL HAVE A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH 312 MMBTU/H DUCT BURNERS. GREEN POWER UNIT ONE WILL BE CAPABLE OF PRODUCING AN ESTIMATED NOMINAL 70 MW OF ELECTRICITY.	(2) COGENERATION TRAINS 2 & 3, GT-2 & 3	15.21	NATURAL GAS	70	MW, TOTAL	3.5	PPMVD, 15% O2	
MI-0365	MIRANT WYANDOTTE LLC	MIRANT WYANDOTTE LLC	MI	COMBINED CYCLE POWER PLANT.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	2200	MMBTU/H	3.5	PPMVD, 15% O2	
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC		MS	THREE GE COMBINE CYCLE TURBINED RATED @ 230 MEGAWATTS EACH WITH SCR FOR POLLUTION CONTROL	EMISSION POINT GEN. ELEC. COMBUST. TURBINE (3)	15.21	NATURAL GAS	230	MW	3.5	PPMVD, 15% O2	
*NE-0023	BEATRICE POWER STATION	NEBRASKA PUBLIC POWER DISTRICT	NE	PERMIT TO CONSTRUCT: 2-NG TURBINES, 250 MW TOTAL AND ONE AUX. BOILER, 73 MMBTU/HR, OIL FIRED	2-COMBUSTION TURBINES W/ DUCT BURNER	15.21	NATURAL GAS	250	MW	3.5	PPMVD, 15% O2	
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA),	15.21	NATURAL GAS	170	MW	3.5	PPMVD, 15% O2	
OK-0096	REDBUD POWER PLANT	REDBUD ENERGY LP	OK	ELECTRICITY GENERATION	COMBUSTION TURBINE AND DUCT BURNERS	15.21	NATURAL GAS	1832	MMBTU/H	3.5	PPMVD, 15% O2	
NE-0017	BEATRICE POWER STATION	NEBRASKA PUBLIC POWER DISTRICT	NE	ELECTRIC GENERATING FACILITY	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	80	MW	3.5	PPMVD, 15% O2	24 HR
OK-0090	DUKE ENERGY STEPHENS, LLC STEPHENS ENERGY	DUKE ENERGY	OK	MERCHANT POWER PLANT - NOMINAL TOTAL OF 620 MW.	TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	1701	MMBTU/H	3.5	PPMVD, 15% O2	
NV-0033	EL DORADO ENERGY, LLC	EL DORADO ENERGY, LLC	NV	THE FACILITY CONSIST OF TWO COMBUSTION TURBINE GENERATORS (CTGS) TWO HEAT RECOVERY STEAM GENERATORS (HRSGS) AND ONE STEAM TURBINE GENERATOR. THE FACILITY IS LOCATED IN AN ATTAINMENT AREA FOR ALL CRITERIA AIR POLLUTANTS. INSIGNIFICANT EMISSION UNITS INCLUDE A 140 HP EMERGENCY FIRE -WATER PUMP AND A WET SURFACE AIR COOLER.	COMBUSTION TURBINE, COMBINED CYCLE & COGEN(2)	15.21	NATURAL GAS	475	MW	3.7	PPMVD, 15% O2	

Table A-2
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NO_X

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
MI-0363	BLUEWATER ENERGY CENTER LLC	BLUEWATER ENERGY CENTER LLC	MI	COMBINED CYCLE ELECTRIC GENERATING POWER PLANT.	TURBINE, COMBINED CYCLE (3)	15.21	NATURAL GAS	180	MW	4.5	PPMVD, 15% O2	
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GENERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVEGROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE 2 EACH	15.21	NATURAL GAS	1827	MMBTU/H	5.5	PPMVD, 15% O2	
MI-0362	MIDLAND COGENERATION (MCV)	MIDLAND COGENERATION VENTURE LIMITED PARTNERSHIP	MI	COGENERATION FACILITY TO PRODUCE STEAM AND ELECTRICITY.	TURBINE, COMBINED CYCLE (1)	15.21	NATURAL GAS	984	MMBTU/H	25	PPMVD, 15% O2	
MI-0362	MIDLAND COGENERATION (MCV)	MIDLAND COGENERATION VENTURE LIMITED PARTNERSHIP	MI	COGENERATION FACILITY TO PRODUCE STEAM AND ELECTRICITY.	TURBINE, COMBINED CYCLE (11)	15.21	NATURAL GAS	984	MMBTU/H	42	PPMVD, 15% O2	

Table A-3
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for CO

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
VA-0291	CPV WARREN LLC	CPV WARREN LLC	VA	COMBINED CYCLE POWER GENERATION	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	1717	MMBTU/ HR	1.3	PPMVD, 15% O_2	
VA-0291	CPV WARREN LLC	CPV WARREN LLC	VA	COMBINED CYCLE POWER GENERATION	TURBINE, COMBINED CYCLE AND DUCT BURNER (2)	15.21	NATURAL GAS	1717	MMBTU/ HR	1.8	PPMVD, 15% O_2	
*OR-0041	WANAPA ENERGY CENTER	DIAMOND WANAPA I, L.P.	OR	A 1,200 MW NATURAL GAS-FIRED COMBINED CYCLE COMBUSTION TURBINE PROJECT EMPLOYING A WATER-COOLED STEAM CONDENSING SYSTEM. FOUR COMBUSTION TURBINES, FOUR HEAT RECOVERY STEAM GENERATORS, TWO STEAM TURBINES, AND TWO COOLING TOWERS EMPLOYED.	COMBUSTION TURBINE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	2384.1	MMBTU/ HR	2	PPMVD, 15% O_2	
MI-0366	BERRIEN ENERGY, LLC	BERRIEN ENERGY, LLC	MI	ELECTRIC POWER GENERATING FACILITY.	3 COMBUSTION TURBINES AND DUCT BURNERS	15.21	NATURAL GAS	1584	MMBTU/ HR	2	PPMVD, 15% O_2	
OR-0039	COB ENERGY FACILITY, LLC	Peoples Energy Resources	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER (4)	15.21	NATURAL GAS	1150	MW	2	PPMVD, 15% O_2	
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	DUKE ENERGY ARLINGTON VALLEY	AZ	POWER PLANT	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	325	MW	2	PPMVD, 15% O_2	
CA-1096	VERNON CITY LIGHT & POWER	VERNON CITY LIGHT & POWER	CA		GAS TURBINE: COMBINED CYCLE < 50 MW	15.21	NATURAL GAS	43	MW GAS TURBINE, 55 MW STEAM TURBINE	2	PPMVD, 15% O_2	
CA-1097	MAGNOLIA POWER PROJECT, SCPPA	MAGNOLIA POWER PROJECT, SCPPA	CA		GAS TURBINE: COMBINED CYCLE >= 50 MW	15.21	NATURAL GAS	181	NET MW (GAS TURBINE W/STEAM INJECTION)	2	PPMVD, 15% O_2	
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	SAVANNAH ELECTRIC AND POWER CO	GA	ELECTRIC GENERATING FACILITY	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	140	MW	2	PPMVD, 15% O_2	
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	SUMAS ENERGY 2 GENERATION FACILITY	WA		TURBINES, COMBINED CYCLE, (2)	15.21	NATURAL GAS	660	MW	2	PPMVD, 15% O_2	
WA-0291	WALLULA POWER PLANT	WALLULA GENERATION, LLC	WA	WALLULA GENERATION, LLC, PROPOSES TO CONSTRUCT AND OPERATE A 1,300 MW COMBINED CYCLE ELECTRIC POWER PLANT. THE PROJECT WILL CONSIST OF TWO INDEPENDENT POWER BLOCKS WITH CRITICAL BACK-UP SYSTEMS TO MAINTAIN OVERALL PLANT RELIABILITY AND AVAILABILITY.	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	1300	MW	2	PPMVD, 15% O_2	

Table A-3
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for CO

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	CALPINE CORP.	CO	NATURAL GAS-FIRED, COMBINED-CYCLE COMBUSTION TURBINES.	COMBINED-CYCLE TURBINE	15.21	NATURAL GAS	300	MW	3	PPMVD, 15% O_2	
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	AZ	COMBINED CYCLE GAS-FIRED ELECTRICITY GENERATING STATION	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - GE7FA TURBINES OPTION	15.21	NATURAL GAS	170	MW	3	PPMVD, 15% O_2	
UT-0066	CURRANT CREEK	PACIFICORP	UT	POWER GENERATION PLANT WITH TWO NATURAL GAS COMBINED CYCLE TURBINES	TURBINES AND HEAT RECOVERY STEAM GENERATORS	15.21	NATURAL GAS			3	PPMVD, 15% O_2	3 HR
NV-0037	COPPER MOUNTAIN POWER	SEMPRA ENERGY RESOURCES	NV	A 600 MW COMBINED CYCLE ELECTRICAL GENERATION FACILITY CONSISTING OF TWO COMBUSTION TURBINE GENERATORS WITH HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR, AND ONE AUXILIARY BOILER.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	600	MW	3	PPMVD, 15% O_2	
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	DUKE ENERGY ARLINGTON VALLEY	AZ	POWER PLANT	TURBINE, COMBINED CYCLE & DUCT BURNER	15.21	NATURAL GAS	325	MW	3	PPMVD, 15% O_2	
*AZ-0049	LA PAZ GENERATING FACILITY	ALLEGHENY ENERGY SUPPLY LLC	AZ	NATURAL GAS FIRED, COMBINED CYCLE GENERATING STATION	GE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	15.21	NATURAL GAS	1040	MW	3	PPMVD, 15% O_2	3 HR
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	SIERRA PACIFIC POWER COMPANY	NV	2 - NATURAL GAS FIRED COMBINED CYCLE COMBUSTION TURBINE GENERATORS WITH HRSG"S AND DUCT BURNERS. 2 - NATURAL GAS FIRED FUEL PREHEATERS. 1 - NATURAL GAS FIRED AUXILIARY BOILER	TURBINE, COMBINED CYCLE COMBUSTION WITH HRSG AND DUCT BURNER (2)	15.21	NATURAL GAS	306	MW	3.5	PPMVD, 15% O_2	
NV-0033	EL DORADO ENERGY, LLC	EL DORADO ENERGY, LLC	NV	THE FACILITY CONSIST OF TWO COMBUSTION TURBINE GENERATORS (CTGS) TWO HEAT RECOVERY STEAM GENERATORS (HRSGS) AND ONE STEAM TURBINE GENERATOR. THE FACILITY IS LOCATED IN AN ATTAINMENT AREA FOR ALL CRITERIA AIR POLLUTANTS. INSIGNIFICAN EMISSION UNITS INCLUDE A 140 HP EMERGENCY FIRE -WATER PUMP AND A WET SURFACE AIR COOLER.	COMBUSTION TURBINE, COMBINED CYCLE & COGEN(2)	15.21	NATURAL GAS	475	MW	3.5	PPMVD, 15% O_2	
MI-0365	MIRANT WYANDOTTE LLC	MIRANT WYANDOTTE LLC	MI	COMBINED CYCLE POWER PLANT.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	2200	MMBTU/ HR	3.8	PPMVD, 15% O_2	

Table A-3
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for CO

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
LA-0192	CRESCENT CITY POWER	CRESENT CITY POWER, LLC	LA	NEW 600 MW NATURAL GAS-FIRED COMBINED CYCLE POWER PLANT	GAS TURBINES - 187 MW (2)	15.21		2006	MMBTU/ HR	4	PPMVD, 15% O_2	ANNUAL
NV-0038	IVANPAH ENERGY CENTER, L.P.	IVANPAH ENERGY CENTER, L.P.	NV	A 500 MW ELECTRICAL GENERATING PLANT CONSISTING OF TWO COMBUSTION TURBINE GENERATORS, TWO HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR. THE PROPOSED PLANT IS SURROUNDED BY UNOCCUPIED LAND FOR A DISTANCE OF AT LEAST TWO MILES IN ALL DIRECTIONS. THE UN-IMPROVED ACCESS ROAD TO THE PROPOSED PLANT SITE IS ABOUT 1.6 MILES IN LENGTH.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	500	MW	4	PPMVD, 15% O_2	1 HR
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GNERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVE GROUN OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE, 2 EACH	15.21	NATURAL GAS	1916	MMBTU/ HR	4	PPMVD, 15% O_2	
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO MUNICIPAL UTILITY DISTRICT	CA	COMBUSTION GAS TURBINE GE 7FA	GAS TURBINES (2)	15.21	NATURAL GAS	1611	MMBTU/ HR	4	PPMVD, 15% O_2	
MI-0361	SOUTH SHORE POWER LLC	SOUTH SHORE POWER LLC	MI	ELECTRIC POWER GENERATING FACILITY.	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	172	MW	4	PPMVD, 15% O_2	
not listed	ROSEVILLE ENERGY PARK	ROSEVILLE ELECTRIC	CA	160 MW, NATURAL GAS-FIRED, COMBINED-CYCLE GENERATING FACILITY LOCATED WEST OF DOWNTOWN ROSEVILLE, IN PLACER COUNTY. IT WILL HAVE TWO GE LM6000 PC SPRINT OR ALSTOM GTX100 CTGs, EQUIPPED WITH WATER INJECTION (LM6000) OR DRY LOW-NOx COMBUSTERS (GTX100), TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENSERS AND A MECHANICAL DRAFT COOLING TOWER	TURBINE, COMBINED CYCLE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	160	MW	4	PPMVD	1 HR
not listed	EL CENTRO UNIT 3 REPOWER PROJECT	IMPERIAL IRRIGATION DISTRICT	CA	128 MW, NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY WITHIN CURRENT EL CENTRO GENERATING STATION, IN IMPERIAL COUNTY. IT WILL ADD A GE 7EA CTG WITH DRY LOW NOX COMBUSTERS AND ONE HRSG WITH DUCT BURNER TO EXISTING FACILITY	TURBINE, COMBINED CYCLE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	128	MW	4	PPMVD	1 HR

Table A-3
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for CO

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
not listed	BLYTHE ENERGY PROJECT, PHASE II	CAITHNESS BLYTHE II, LLC	CA	520 MW NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY ADJACENT TO BLYTHE ENERGY PROJECT PHASE I. IT WILL HAVE TWO SEIMENS WESTINGHOUSE CGTS WITH DRY LOW-NOX COMBUSTERS, TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENSERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	520	MW	4	PPMVD	1 hr
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GENERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVEGROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE 2 EACH	15.21	NATURAL GAS	1827	MMBTU/ HR	4.8	PPMVD, 15% O_2	
OR-0040	KLAMATH GENERATION, LLC	KLAMATH GENERATION, LLC	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER (2)	15.21	NATURAL GAS	480	MW	5	PPMVD, 15% O_2	
MI-0357	KALKASKA GENERATING, INC	KALKASKA GENERATING LLC	MI	ELECTRICAL POWER PRODUCTION FACILITY.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	605	MW	5	PPMVD, 15% O_2	
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	172	MW	6	PPMVD, 15% O_2	24 HR
FL-0245	FPL MANATEE PLANT - UNIT 3	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	170	MW	7.4	PPMVD, 15% O_2	
FL-0263	FPL TURKEY POINT POWER PLANT	FLORIDA POWER AND LIGHT	FL	THE PROPOSED A "4 ON 1" COMBINED CYCLE UNIT 5, WHICH WILL CONSIST OF FOUR GE MODEL FA GAS TURBINES (170 MW EACH), FOUR HEAT RECOVERY STEAM GENERATORS, A SINGLE STEAM TURBINE-ELECTRICAL GENERATOR (470 MW), AND A MECHANICAL DRAFT COOLING TOWER. NEW COMBINED CYCLE UNIT 5 WILL HAVE A TOTAL GENERATING CAPACITY OF APPROXIMATELY 1150 MW. THE EXISTING TURKEY POINT FOSSIL PLANT CURRENTLY CONSISTS OF TWO FOSSIL FUEL-FIRED STEAM ELECTRICAL GENERATING UNITS AND FIVE BLACK START DIESEL FIRED PEAKING GENERATORS. FOSSIL FUEL-FIRED STEAM ELECTRIC GENERATING UNITS 1 AND 2 (440 MW EACH) BEGAN OPERATION IN 1967 AND 1968, RESPECTIVELY.	170 MW COMBUSTION TURBINE, 4 UNITS	15.21	NATURAL GAS	170	MW	7.6	PPMVD, 15% O_2	

Table A-3
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for CO

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
FL-0265	HINES POWER BLOCK 4	PROGRESS ENERGY	FL	COMBINED CYCLE POWER PLANT. THIS IS THE 4TH BLOCK OF POWER ADDED, MAKING THE TOTAL GENERATING CAPACITY OF THE FACILITY APPROXIMATELY 2090 MW.	COMBINED CYCLE TURBINE	15.21	NATURAL GAS	530	MW	8	PPMVD, 15% O_2	
MI-0363	BLUEWATER ENERGY CENTER LLC	BLUEWATER ENERGY CENTER LLC	MI	COMBINED CYCLE ELECTRIC GENERATING POWER PLANT.	TURBINE, COMBINED CYCLE, (3)	15.21	NATURAL GAS	180	MW	8	PPMVD, 15% O_2	
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	172	MW	9	PPMVD, 15% O_2	24 HR
VA-0289	DUKE ENERGY WYTHE, LLC	DUKE ENERGY WYTHE, LLC	VA	POWER PLANT	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	170	MW	9	PPMVD, 15% O_2	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	1973	MMBTU/ HR	9	PPMVD, 15% O_2	
CEC DECISION PENDING	LOS ESTEROS CRITICAL ENERGY FACILITY, PHASE II	LOS ESTEROS CRITICAL ENERGY FACILITY, LLC	CA	CONVERSION OF EXISTING 180 MW SIMPLE-CYCLE POWER PLANT TO A 320 MW COMBINED-CYCLE PLANT IN SANTA CLARA COUNTY WITH ADDITION OF FOUR HRSGs WITH DUCT BURNERS, STEAM TURBINE, CONDENSERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	320	MW	9	PPMVD	1 HR
MN-0053	FAIRBAULT ENERGY PARK	MN MUNICIPAL POWER AGENCY	MN	LARGE COMBUSTION TURBINE ELECTRIC POWER PLANT - INITIAL OPERATION IN SIMPLE CYCLE AND CONVERSION TO COMBINED CYCLE IN THE FUTURE.	TURBINE, COMBINED CYCLE (1)	15.21	NATURAL GAS	1876	MMBTU/ HR	10	PPMVD, 15% O_2	3 HR
FL-0256	HINES ENERGY COMPLEX, POWER BLOCK 3	PROGRESS ENERGY FLORIDA	FL	POWER PLANT	COMBUSTION TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	1830	MMBTU/ HR	10	PPMVD, 15% O_2	
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	170	MW	10	PPMVD, 15% O_2	
FL-0244	FPL MARTIN PLANT	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYLE (4)	15.21	NATURAL GAS	170	MW	10	PPMVD, 15% O_2	
OK-0090	DUKE ENERGY STEPHENS, LLC STEPHENS ENERGY	DUKE ENERGY	OK	MERCHANT POWER PLANT - NOMINAL TOTAL OF 620 MW.	TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	1701	MMBTU/ HR	10	PPMVD, 15% O_2	

Table A-3
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for CO

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
NC-0101	FORSYTH ENERGY PLANT	FORSYTH ENERGY PROJECTS, LLC	NC	THREE COMBINED-CYCLE COMBUSTION TURBINE GENERATORS, EACH WITH A HEAT RECOVERY STEAM GENERATORS (HRSG) ALONG WITH NATURAL GAS-FIRED DUCT BURNERS TO MEET PEAK DEMAND. THE STEAM GENERATED THROUGH THE THREE HRSGS WILL DRIVE A STEAM TURBINE. THE ENTIRE PLANT WILL BE CAPABLE OF GENERATING A NOMINAL POWER OUTPUT OF 812 MEGAWATTS.	TURBINE, COMBINED CYCLE (3)	15.21	NATURAL GAS	1844.3	MMBTU/ HR	11.6	PPMVD, 15% O_2	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	1973	MMBTU/ HR	12	PPMVD, 15% O_2	
MI-0362	MIDLAND COGENERATION (MCV)	MIDLAND COGENERATION VENTURE LIMITED PARTNERSHIP	MI	COGENERATION FACILITY TO PRODUCE STEAM AND ELECTRICITY.	TURBINE, COMBINED CYCLE (11)	15.21	NATURAL GAS	984	MMBTU/ HR	12	PPMVD, 15% O_2	
MI-0362	MIDLAND COGENERATION (MCV)	MIDLAND COGENERATION VENTURE LIMITED PARTNERSHIP	MI	COGENERATION FACILITY TO PRODUCE STEAM AND ELECTRICITY.	TURBINE, COMBINED CYCLE (1)	15.21	NATURAL GAS	984	MMBTU/ HR	12	PPMVD, 15% O_2	
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	170	MW	14	PPMVD, 15% O_2	
VA-0289	DUKE ENERGY WYTHE, LLC	DUKE ENERGY WYTHE, LLC	VA	POWER PLANT	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	170	MW	14.6	PPMVD, 15% O_2	
OK-0096	REDBUD POWER PLANT	REDBUD ENERGY LP	OK	ELECTRICITY GENERATION	COMBUSTION TURBINE AND DUCT BURNERS	15.21	NATURAL GAS	1832	MMBTU/ HR	17.2	PPMVD, 15% O_2	
MN-0060	HIGH BRIDGE GENERATING PLANT	NORTHERN STATES POWER CO. DBA XCEL ENERGY	MN	EXISTING COAL-FIRED ELECTRIC UTILITY THAT WILL BE REPLACED BY NEW TWIN NATURAL GAS-FIRED COMBINED CYCLE COMBUSTION TURBINE.	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS ONLY	330	MW	18	PPMVD, 15% O_2	
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC		MS	THREE GE COMBINED CYCLE TURBINED RATED @ 230 MEGAWATTS EACH WITH SCR FOR POLLUTION CONTROL	EMISSION POINT GE COMBUSTION TURBINE (3)	15.21	NATURAL GAS	230	MW	18	PPMVD, 15% O_2	

Table A-3
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for CO

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
TX-0374	CHOCOLATE BAYOU PLANT	BP AMOCO CHEMICAL CO	TX	THE PROJECT WILL CONSIST OF TWO DUAL SHAFT GAS-FIRED ELECTRIC GENERATING TURBINES EACH RATED AT APPROX. 35 MW (BASE LOAD), EACH TURBINE WILL HAVE A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH 312 MMBTU/H DUCT BURNERS. GREEN POWER UNIT ONE WILL BE CAPABLE OF PRODUCING AN ESTIMATED NOMINAL 70 MW OF ELECTRICITY.	(2) COGENERATION TRAINS 2 & 3, GT-2 & 3	15.21	NAT GAS	70	MW, TOTAL	24.4	PPMVD, 15% O_2	ANNUAL
NC-0101	FORSYTH ENERGY PLANT	FORSYTH ENERGY PROJECTS, LLC	NC	THREE COMBINED-CYCLE COMBUSTION TURBINE GENERATORS, EACH WITH A HEAT RECOVERY STEAM GENERATORS (HRSG) ALONG WITH NATURAL GAS-FIRED DUCT BURNERS TO MEET PEAK DEMAND. THE STEAM GENERATED THROUGH THE THREE HRSGS WILL DRIVE A STEAM TURBINE. THE ENTIRE PLANT WILL BE CAPABLE OF GENERATING A NOMINAL POWER OUTPUT OF 812 MEGAWATTS.	TURBINE & DUCT BURNER, COMBINED CYCLE, (3)	15.21	NATURAL GAS	1844.3	MMBTU/ HR	25.9	PPMVD, 15% O_2	
WY-0061	BLACK HILLS CORP./NEIL SIMPSON TWO	BLACK HILLS CORP.	WY	STEAM ELECTRIC GENERATING PLANT	TURBINE, COMBINED CYCLE, & DUCT BURNER	15.21	NATURAL GAS	40	MW	37.2	PPMVD, 15% O_2	
*LA-0224	ARSENAL HILL POWER PLANT	SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)	LA	2 COMBUSTION TURBINE GENERATOR (CTG)/DUCT BURNER	COMBUSTION TURBINE GENERATOR (CTG)/DUCT BURNERLOW-NOx BURNER (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	15.21	NATURAL GAS	2110	MMBTU/ HR	10	PPMVD, 15% O_2	ANNUAL AVERAGE
*CT-0151	KLEEN ENERGY SYSTEMS, LLC	KLEEN ENERGY SYSTEMS, LLC	CT	2 SIEMENS SGT6-5000F CTG WITH DUCT BURNER	2 SIEMENS SGT6-5000F CTG WITH DUCT BURNER, LNB, SCR, OXIDATION CATALYST (OC)	15.21	NATURAL GAS	CTG: 2136, DUCT BURNER: 445	MMBTU/ HR	1.7 W/ DUCT BURNER, 0.9 W/O DUCT BURNER	PPMVD, 15% O_2	1-HR
*VA-0304	CPV WARREN	CPV WARREN	VA	2 GE MODEL 7FA COMBINED CYCLE CTG EACH RATED AT 180,000 KW	2 GE MODEL 7FA COMBINED CYCLE CTG EACH RATED AT 180,000 KW, LEAN PREMIX DRY LOW-NOx COMBUSTION, SCR, OC, GOOD COMBUSTION PRACTICES.	15.21	NATURAL GAS	1717	MMBTU/ HR	2.5 W/ POWER AUGMENTATION AND DUCT BURNER, 1.3 W/O POWER AUGMENTATION, 1.8 W/ POWER AUGMENTATION AND W/O DUCT BURNER	PPMVD	

Table A-3
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for CO

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	STD EMISS LIMIT	STD UNIT LIMIT	STD LIMIT AVG TIME CONDITION
OK-0117	PSO SOUTHWESTERN POWER PLT	PUBLIC SERVICE CO OF OKLAHOMA	OK		DLN, COMBUSTION CONTROL, USE OF LOW ASH FUEL (NATURAL GAS) AND EFFICIENT COMBUSTION	15.21	NATURAL GAS			25	PPMVD, 15% O_2	
OK-0115	LAWTON ENERGY COGEN FACILITY	ENERGETIX	OK	CTG AND DUCT BURNER	CTG AND DUCT BURNER, SCR W/ DRY LNB	15.21	NATURAL GAS			16.38	PPMVD, 15% O_2	
*TX-0497	INEOS CHOCOLATE BAYOU FACILITY	INEOS USA LLC	TX	GAS FIRED TURBINES WITH DUCT BURNERS	GAS FIRED TURBINES WITH DUCT BURNERS, SCR	15.21	NATURAL GAS	35-CTG, 312-DUCT BURN-ERS	MW-TURBINES, MMBTU/HR - DUCT BURNERS	15	PPMVD	
MN-0066	NORTHERN STATES POWER CO. DBA XCEL ENERGY - RIVERSIDE PLANT	NORTHERN STATES POWER CO. DBA XCEL ENERGY	MN	2 COMBUSTION TURBINE	2 CTG, GOOD COMBUSTION PRACTICES	15.21	NATURAL GAS	1885	MMBTU/ HR	10	PPMVD, 15% O_2	3-HR
*NY-0095	CAITHNESS BELLPORT ENERGY CENTER	CAITHNESS BELLPORT, LLC	NY	COMBINED CYCLE WITH DUCT FIRING UP TO 494 MMBTU/H	COMBINED CYCLE WITH DUCT FIRING UP TO 494 MMBTU/H, SCR, OXIDATION CATALYST	15.21	NATURAL GAS	2221	MMBTU/ HR	2	PPMVD, 15% O_2	
*WA-0328	BP CHERRY POINT COGENERATION PROJECT	BP WEST COAST PRODUCTS, LLC	WA	3 CT & HSRG UNITS. EACH CT OF 1614 MMBTU/HR. EACH HRSG DUCT BURNER FIRING RATE OF 105 MMBTU/HR.	3 CTG & HSRG UNITS. EACH CTG OF 1614 MMBTU/HR. EACH HRSG DUCT BURNER FIRING RATE OF 105 MMBTU/HR., LEAN PRE-MIX DLN, SCR, OC	15.21	NATURAL GAS	174	MW	14.1	PPMVD, 15% O_2	24-HR

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	CALPINE CORP.	CO	NATURAL GAS-FIRED, COMBINED-CYCLE COMBUSTION TURBINES.	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	15.21	NATURAL GAS	300	MW	0.0029	LB/MMBTU	
VA-0291	CPV WARREN LLC	CPV WARREN LLC	VA	COMBINED CYCLE POWER GENERATION	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	1717	MMBTU/ HR	0.7	PPMVD	
VA-0291	CPV WARREN LLC	CPV WARREN LLC	VA	COMBINED CYCLE POWER GENERATION	TURBINE, COMBINED CYCLE AND DUCT BURNER (2)	15.21	NATURAL GAS	1717	MMBTU/ HR	1	PPMVD	
MN-0053	FAIRBAULT ENERGY PARK	MN MUNICIPAL POWER AGENCY	MN	LARGE COMBUSTION TURBINE ELECTRIC POWER PLANT - INITIAL OPERATION IN SIMPLE CYCLE AND CONVERSION TO COMBINED CYCLE IN THE FUTURE.	TURBINE, COMBINED CYCLE (1)	15.21	NATURAL GAS	1876	MMBTU/ HR	1	PPMVD, 15% O_2	3 HR
not listed	BLYTHE ENERGY PROJECT, PHASE II	CAITHNESS BLYTHE II, LLC	CA	520 MW NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY ADJACENT TO BLYTHE ENERGY PROJECT PHASE I. IT WILL HAVE TWO SEIMENS WESTINGHOUSE CGTS WITH DRY LOW-NOX COMBUSTERS, TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE, & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	520	MW	1	PPMVD	1 HR

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
FL-0263	FPL TURKEY POINT POWER PLANT	FLORIDA POWER AND LIGHT	FL	THE PROPOSED A "4 ON 1" COMBINED CYCLE UNIT 5, WHICH WILL CONSIST OF FOUR GE MODEL FA GAS TURBINES (170 MW EACH), FOUR HEAT RECOVERY STEAM GENERATORS, A SINGLE STEAM TURBINE-ELECTRICAL GENERATOR (470 MW), AND A MECHANICAL DRAFT COOLING TOWER. NEW COMBINED CYCLE UNIT 5 WILL HAVE A TOTAL GENERATING CAPACITY OF APPROXIMATELY 1150 MW. THE EXISTING TURKEY POINT FOSSIL PLANT CURRENTLY CONSISTS OF TWO FOSSIL FUEL-FIRED STEAM ELECTRICAL GENERATING UNITS AND FIVE BLACK START DIESEL FIRED PEAKING GENERATORS. FOSSIL FUEL-FIRED STEAM ELECTRIC GENERATING UNITS 1 AND 2 (440 MW EACH) BEGAN OPERATION IN 1967 AND 1968, RESPECTIVELY.	170 MW COMBUSTION TURBINE, 4 UNITS	15.21	NATURAL GAS	170	MW	1.3	PPMVD, 15% O_2	
FL-0244	FPL MARTIN PLANT	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	170	MW	1.3	PPMVD, 15% O_2	
FL-0245	FPL MANATEE PLANT - UNIT 3	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	170	MW	1.3	PPMVD, 15% O_2	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	1973	MMBTU/ HR	1.4	PPM	
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO MUNICIPAL UTILITY DISTRICT	CA	COMBUSTION GAS TURBINE GE 7FA	GAS TURBINES, (2)	15.21	NATURAL GAS	1611	MMBTU/ HR	1.4	PPMVD, 15% O_2	

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
not listed	ROSEVILLE ENERGY PARK	ROSEVILLE ELECTRIC	CA	160 MW, NATURAL GAS-FIRED, COMBINED-CYCLE GENERATING FACILITY LOCATED WEST OF DOWNTOWN ROSEVILLE, IN PLACER COUNTY. IT WILL HAVE TWO GE LM6000 PC SPRINT OR ALSTOM GTX100 CTGs, EQUIPPED WITH WATER INJECTION (LM6000) OR DRY LOW-NOx COMBUSTERS (GTX100), TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENSERS AND A MECHANICAL DRAFT COOLING TOWER	TURBINE, COMBINED CYCLE, & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	160	MW	2	PPMVD	1 HR
not listed	EL CENTRO UNIT 3 REPOWER PROJECT	IMPERIAL IRRIGATION DISTRICT	CA	128 MW, NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY WITHIN CURRENT EL CENTRO GENERATING STATION, IN IMPERIAL COUNTY. IT WILL ADD A GE 7EA CTG WITH DRY LOW NOX COMBUSTERS AND ONE HRSG WITH DUCT BURNER TO EXISTING FACILITY	TURBINE, COMBINED CYCLE, & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	128	MW	2	PPMVD	1 HR
not listed	LOS ESTEROS CRITICAL ENERGY FACILITY, PHASE II	LOS ESTEROS CRITICAL ENERGY FACILITY, LLC	CA	CONVERSION OF EXISTING 180 MW SIMPLE-CYCLE POWER PLANT TO A 320 MW COMBINED-CYCLE PLANT WITH ADDITION OF FOUR HRSGs WITH DUCT BURNERS, STEAM TURBINE, CONDENSERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE, & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	320	MW	2	PPMVD	1 HR
MN-0060	HIGH BRIDGE GENERATING PLANT	NORTHERN STATES POWER CO. DBA XCEL ENERGY	MN	EXISTING COAL-FIRED ELECTRIC UTILITY THAT WILL BE REPLACED BY NEW TWIN NATURAL GAS-FIRED COMBINED CYCLE COMBUSTION TURBINE.	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS ONLY	330	MEGA WATTS	2	PPMVD, 15% O_2	

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
FL-0256	HINES ENERGY COMPLEX, POWER BLOCK 3	PROGRESS ENERGY FLORIDA	FL	POWER PLANT	COMBUSTION TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	1830	MMBTU/ HR	2	PPMVD, 15% O_2	
CA-1096	VERNON CITY LIGHT & POWER	VERNON CITY LIGHT & POWER	CA		GAS TURBINE: COMBINED CYCLE < 50 MW	15.21	NATURAL GAS	43	MW GAS TURBINE, 55 MW STEAM TURBINE	2	PPMVD, 15% O_2	1 HR
CA-1097	MAGNOLIA POWER PROJECT, SCPPA	MAGNOLIA POWER PROJECT, SCPPA	CA		GAS TURBINE: COMBINED CYCLE >= 50 MW	15.21	NATURAL GAS	181	NET MW (GAS TURBINE W/STEAM INJECTION)	2	PPMVD, 15% O_2	1 HR
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	SAVANNAH ELECTRIC AND POWER CO	GA	ELECTRIC GENERATING FACILITY	TURBINE, COMBINED CYCLE, NATURAL GAS (4)	15.21	NATURAL GAS	140	MW	2	PPMVD, 15% O_2	
NV-0038	IVANPAH ENERGY CENTER, L.P.	IVANPAH ENERGY CENTER, L.P.	NV	A 500 MW ELECTRICAL GENERATING PLANT CONSISTING OF TWO COMBUSTION TURBINE GENERATORS, TWO HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR. THE PROPOSED PLANT IS SURROUNDED BY UNOCCUPIED LAND FOR A DISTANCE OF AT LEAST TWO MILES IN ALL DIRECTIONS. THE UN-IMPROVED ACCESS ROAD TO THE PROPOSED PLANT SITE IS ABOUT 1.6 MILES IN LENGTH.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	500	MW	2.3	PPMVD	
LA-0192	CRESCENT CITY POWER	CRESCENT CITY POWER, LLC	LA	NEW 600 MW NATURAL GAS-FIRED COMBINED CYCLE POWER PLANT	GAS TURBINES - 187 MW (2)	15.21		2006	MMBTU/ HR	2.8	LB/HR	1 HR

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	AZ	COMBINED CYCLE GAS-FIRED ELECTRICITY GENERATING STATION	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS GE7FA TURBINES OPTION	15.21	NATURAL GAS	170	MW	3	PPMVD, 15% O_2	3 HR
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	AZ	COMBINED CYCLE GAS-FIRED ELECTRICITY GENERATING STATION	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS SW501F TURBINES OPTION	15.21	NATURAL GAS	180	MW	3	PPMVD, 15% O_2	3 HR
VA-0289	DUKE ENERGY WYTHE, LLC	DUKE ENERGY WYTHE, LLC	VA	POWER PLANT	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	170	MW	3	LB/HR	
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	170	MW	3	LB/HR	
MI-0366	BERRIEN ENERGY, LLC	BERRIEN ENERGY, LLC	MI	ELECTRIC POWER GENERATING FACILITY.	3 COMBUSTION TURBINES AND DUCT BURNERS	15.21	NATURAL GAS	1584	MMBTU/ HR	3.2	LB/HR	
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	172	MW	3.2	LB/HR	
MI-0357	KALKASKA GENERATING, INC	KALKASKA GENERATING LLC	MI	ELECTRICAL POWER PRODUCTION FACILITY.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	605	MW	3.5	PPM	
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC		MS	THREE GE COMBINE CYCLE TURBINED RATED @ 230 MEGAWATTS EACH WITH SCR FOR POLLUTION CONTROL	EMISSION POINT GEN. ELEC. COMBUST. TURBINE (3)	15.21	NATURAL GAS	230	MW	3.64	PPMVD, 15% O_2	3 HR

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	SIERRA PACIFIC POWER COMPANY	NV	2 - NATURAL GAS FIRED COMBINED CYCLE COMBUSTION TURBINE GENERATORS WITH HRSG"S AND DUCT BURNERS. 2 - NATURAL GAS FIRED FUEL PREHEATERS. 1 - NATURAL GAS FIRED AUXILIARY BOILER	TURBINE, COMBINED CYCLE COMBUSTION WITH HRSG AND DUCT BURNER (2)	15.21	NATURAL GAS	306	MW	4	PPMVD, 15% O_2	3 HR
NV-0037	COPPER MOUNTAIN POWER	SEMPRA ENERGY RESOURCES	NV	A 600 MW COMBINED CYCLE ELECTRICAL GENERATION FACILITY CONSISTING OF TWO COMBUSTION TURBINE GENERATORS WITH HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR, AND ONE AUXILIARY BOILER.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	600	MW	4	PPMVD	3 HR
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	1973	MMBTU/ HR	4	PPM	
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	DUKE ENERGY ARLINGTON VALLEY	AZ	POWER PLANT	TURBINE, COMBINED CYCLE & DUCT BURNER	15.21	NATURAL GAS	325	MW	4	PPM	3 HR
FL-0244	FPL MARTIN PLANT	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYCLE WITH DUCT BURNER	15.21	NATURAL GAS	170	MW	4	PPMVD, 15% O_2	
AZ-0039	SALT RIVER PROJECT/SANTA N GEN. PLANT	SALT RIVER PROJECT/SAN TAN GEN. PLANT	AZ	POWER PLANT	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	175	MW	4	PPMVD, 15% O_2	3 HR
*AZ-0049	LA PAZ GENERATING FACILITY	ALLEGHENY ENERGY SUPPLY LLC	AZ	NATURAL GAS FIRED, COMBINED CYCLE GENERATING STATION	GE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	15.21	NATURAL GAS	1040	MW	4.5	PPMVD	3 HR

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
WA-0291	WALLULA POWER PLANT	WALLULA GENERATION, LLC	WA	WALLULA GENERATION, LLC, PROPOSES TO CONSTRUCT AND OPERATE A 1,300 MW COMBINED CYCLE ELECTRIC POWER PLANT. THE PROJECT WILL CONSIST OF TWO INDEPENDENT POWER BLOCKS WITH CRITICAL BACK-UP SYSTEMS TO MAINTAIN OVERALL PLANT RELIABILITY AND AVAILABILITY.	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	1300	MW	5	PPMVD, 15% O_2	1 HR
NV-0033	EL DORADO ENERGY, LLC	EL DORADO ENERGY, LLC	NV	THE FACILITY CONSIST OF TWO COMBUSTION TURBINE GENERATORS (CTGS) TWO HEAT RECOVERY STEAM GENERATORS (HRSGS) AND ONE STEAM TURBINE GENERATOR. THE FACILITY IS LOCATED IN AN ATTAINMENT AREA FOR ALL CRITERIA AIR POLLUTANTS. INSIGNIFICANT EMISSION UNITS INCLUDE A 140 HP EMERGENCY FIRE - WATER PUMP AND A WET SURFACE AIR COOLER.	COMBUSTION TURBINE, COMBINED CYCLE & COGEN (2)	15.21	NATURAL GAS	475	MW	5.2	LB/HR	
NC-0101	FORSYTH ENERGY PLANT	FORSYTH ENERGY PROJECTS, LLC	NC	THREE COMBINED-CYCLE COMBUSTION TURBINE GENERATORS, EACH WITH A HEAT RECOVERY STEAM GENERATORS (HRSG) ALONG WITH NATURAL GAS-FIRED DUCT BURNERS TO MEET PEAK DEMAND. THE STEAM GENERATED THROUGH THE THREE HRSGS WILL DRIVE A STEAM TURBINE. THE ENTIRE PLANT WILL BE CAPABLE OF GENERATING A NOMINAL POWER OUTPUT OF 812 MEGAWATTS.	TURBINE & DUCT BURNER, COMBINED CYCLE (3)	15.21	NATURAL GAS	1844.3	MMBTU/ HR	5.7	PPMVD, 15% O_2	

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
TX-0374	CHOCOLATE BAYOU PLANT	BP AMOCO CHEMICAL CO	TX	THE PROJECT WILL CONSIST OF TWO DUAL SHAFT GAS-FIRED ELECTRIC GENERATING TURBINES EACH RATED AT APPROX. 35 MW (BASE LOAD), EACH TURBINE WILL HAVE A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH 312 MMBTU/H DUCT BURNERS.	(2) COGENERATION TRAINS 2 & 3, GT-2 & 3	15.21	NAT GAS	70	MW, TOTAL	6.14	LB/HR	
OR-0039	COB ENERGY FACILITY, LLC	PEOPLES ENERGY RESOURCES	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS, (4)	15.21	NATURAL GAS	1150	MW	7.1	LB/HR	3 HR
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GENERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVEGROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE 2 EACH	15.21	NATURAL GAS	1827	MMBTU/ HR	7.1	PPMVD, 15% O_2	3 hr
OR-0040	KLAMATH GENERATION, LLC	KLAMATH GENERATION, LLC	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER (2)	15.21	NATURAL GAS	480	MW	7.2	LB/HR	3 hr
MI-0361	SOUTH SHORE POWER LLC	SOUTH SHORE POWER LLC	MI	ELECTRIC POWER GENERATING FACILITY.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	172	MW	7.3	LB/HR	
MI-0365	MIRANT WYANDOTTE LLC	MIRANT WYANDOTTE LLC	MI	COMBINED CYCLE POWER PLANT.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	2200	MMBTU/ HR	10	PPM	
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	170	MW	19.6	LB/HR	

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	172	MW	20.4	LB/HR	
VA-0289	DUKE ENERGY WYTHE, LLC	DUKE ENERGY WYTHE, LLC	VA	POWER PLANT	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	170	MW	21	LB/HR	
MI-0363	BLUEWATER ENERGY CENTER LLC	BLUEWATER ENERGY CENTER LLC	MI	COMBINED CYCLE ELECTRIC GENERATING POWER PLANT.	TURBINE, COMBINED CYCLE (3)	15.21	NATURAL GAS	180	MW	28	LB/HR	
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GENERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVEGROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE, 2 EACH	15.21	NATURAL GAS	1916	MMBTU/ HR	34	PPMVD, 15% O_2	3 HR
OK-0090	DUKE ENERGY STEPHENS, LLC STEPHENS ENERGY	DUKE ENERGY	OK	MERCHANT POWER PLANT - NOMINAL TOTAL OF 620 MW.	TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	1701	MMBTU/H	45.6	LB/HR	
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	SUMAS ENERGY 2 GENERATION FACILITY	WA		TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	660	MW	420	LB/D	
*LA-0224	ARSENAL HILL POWER PLANT	SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)	LA	2 COMBUSTION TURBINE GENERATOR (CTG)/DUCT BURNER	COMBUSTION TURBINE GENERATOR (CTG)/DUCT BURNERLOW-NOx BURNER (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	15.21	NATURAL GAS	2110	MMBTU/HR	4.9	PPMVD, 15% O_2	ANNUAL AVERAGE

Table A-4
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for VOC

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
*CT-0151	KLEEN ENERGY SYSTEMS, LLC	KLEEN ENERGY SYSTEMS, LLC	CT	2 SIEMENS SGT6-5000F CTG WITH DUCT BURNER	2 SIEMENS SGT6-5000F CTG WITH DUCT BURNER, LNB, SCR, OXIDATION CATALYST (OC)	15.21	NATURAL GAS	CTG: 2136, DUCT BURNER : 445	MMBTU/ HR	10.8-W DUCT BURNER, 10.0-W/O DUCT BURNER	LB/HR	
*VA-0304	CPV WARREN	CPV WARREN	VA	2 GE MODEL 7FA COMBINED CYCLE CTG EACH RATED AT 180,000 KW	2 GE MODEL 7FA COMBINED CYCLE CTG EACH RATED AT 180,000 KW, LEAN PREMIX DRY LOW-NOx COMBUSTION, SCR, OC, GOOD COMBUSTION PRACTICES	15.21	NATURAL GAS	1717	MMBTU/HR	1.0-W DUCT BURNER, 1.4 W DUCT BURNER AND POWER AUGMENTATION , 0.7 W/O DUCT BURNER	PPMVD	
*TX-0497	INEOS CHOCOLATE BAYOU FACILITY	INEOS USA LLC	TX	GAS FIRED TURBINES WITH DUCT BURNERS	GAS FIRED TURBINES WITH DUCT BURNERS, SCR	15.21	NATURAL GAS	35- CTG, 312-DUCT BURN-ERS	MW-TURBINES, MMBTU/HR - DUCT BURNERS	6.14	LB/HR	
MN-0066	NORTHERN STATES POWER CO. DBA XCEL ENERGY - RIVERSIDE PLANT	NORTHERN STATES POWER CO. DBA XCEL ENERGY	MN	2 COMBUSTION TURBINE	2 CTG GOOD COMBUSTION PRACTICES	15.21	NATURAL GAS	1885	MMBTU/HR	4.6	PPMVD, 15% O_2	3-HR

Table A-5
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for PM/PM10

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	POLLUTANT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
WA-0291	WALLULA POWER PLANT	WALLULA GENERATION, LLC	WA	WALLULA GENERATION, LLC, PROPOSES TO CONSTRUCT AND OPERATE A 1,300 MW COMBINED CYCLE ELECTRIC POWER PLANT. THE PROJECT WILL CONSIST OF TWO INDEPENDENT POWER BLOCKS WITH CRITICAL BACK-UP SYSTEMS TO MAINTAIN OVERALL PLANT RELIABILITY AND AVAILABILITY.	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	1300	MW	PM10	0.0029	GR/DSCF	1 HR
OR-0040	KLAMATH GENERATION, LLC	KLAMATH GENERATION, LLC	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER (2)	15.21	NATURAL GAS	480	MW	PM10	0.0042	LB/MMBTU	8 HR
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	CALPINE CORP.	CO	NATURAL GAS-FIRED, COMBINED-CYCLE COMBUSTION TURBINES.	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	15.21	NATURAL GAS	300	MW	PM10	0.0074	LB/MMBTU	
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GENERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVEGROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE, 2 EACH	15.21	NATURAL GAS	1916	MMBTU/ HR	PM	0.009	LB/MMBTU	3 HR
GA-0105	MCINTOSH COMBINED CYCLE FACILITY	SAVANNAH ELECTRIC AND POWER CO	GA	ELECTRIC GENERATING FACILITY	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	140	MW	PM	0.009	LB/MMBTU	
MN-0053	FAIRBAULT ENERGY PARK	MN MUNICIPAL POWER AGENCY	MN	LARGE COMBUSTION TURBINE ELECTRIC POWER PLANT - INITIAL OPERATION IN SIMPLE CYCLE AND CONVERSION TO COMBINED CYCLE IN THE FUTURE.	TURBINE, COMBINED CYCLE (1)	15.21	NATURAL GAS	1876	MMBTU/ HR	PM	0.01	LB/MMBTU	3 HR
CA-1096	VERNON CITY LIGHT & POWER	VERNON CITY LIGHT & POWER	CA		GAS TURBINE: COMBINED CYCLE < 50 MW	15.21	NATURAL GAS	43	MW GAS TURBINE, 55 MW STEAM TURBINE	PM	0.01	G/SCF	
CA-1097	MAGNOLIA POWER PROJECT, SCPPA	MAGNOLIA POWER PROJECT, SCPPA	CA		GAS TURBINE: COMBINED CYCLE >= 50 MW	15.21	NATURAL GAS	181	NET MW (GAS TURBINE W/STEAM INJECTION)	PM	0.01	G/SCF	

Table A-5
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for PM/PM10

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	POLLUTANT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
AZ-0039	SALT RIVER PROJECT/SANTA N GEN. PLANT	SALT RIVER PROJECT/SANTAN GEN. PLANT	AZ	POWER PLANT	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	175	MW	PM10	0.01	LB/MMBTU	3 HR
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	SIERRA PACIFIC POWER COMPANY	NV	2 - NATURAL GAS FIRED COMBINED CYCLE COMBUSTION TURBINE GENERATORS WITH HRSG"S AND DUCT BURNERS. 2 - NATURAL GAS FIRED FUEL PREHEATERS. 1 - NATURAL GAS FIRED AUXILIARY BOILER	TURBINE, COMBINED CYCLE COMBUSTION WITH HRSG AND DUCT BURNER (2)	15.21	NATURAL GAS	306	MW	PM10	0.011	LB/MMBTU	3 HR
OK-0096	REDBUD POWER PLANT	REDBUD ENERGY LP	OK	ELECTRICITY GENERATION	COMBUSTION TURBINE AND DUCT BURNERS	15.21	NATURAL GAS	1832	MMBTU/ HR	PM	0.012	LB/MMBTU	
VA-0291	CPV WARREN LLC	CPV WARREN LLC	VA	COMBINED CYCLE POWER GENERATION	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	1717	MMBTU/ HR	PM10	0.013	LB/MMBTU	
OK-0090	DUKE ENERGY STEPHENS, LLC STEPHENS ENERGY	DUKE ENERGY	OK	MERCHANT POWER PLANT - NOMINAL TOTAL OF 620 MW.	TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	1701	MMBTU/ HR	PM10	0.015	LB/MMBTU	
NC-0101	FORSYTH ENERGY PLANT	FORSYTH ENERGY PROJECTS, LLC	NC	THREE COMBINED-CYCLE COMBUSTION TURBINE GENERATORS, EACH WITH A HEAT RECOVERY STEAM GENERATORS (HRSG) ALONG WITH NATURAL GAS-FIRED DUCT BURNERS TO MEET PEAK DEMAND. THE STEAM GENERATED THROUGH THE THREE HRSGS WILL DRIVE A STEAM TURBINE. THE ENTIRE PLANT WILL BE CAPABLE OF GENERATING A NOMINAL POWER OUTPUT OF 812 MEGAWATTS.	TURBINE, COMBINED CYCLE, NATURAL GAS, (3)	15.21	NATURAL GAS	1844.3	MMBTU/ HR	PM10	0.019	LB/MMBTU	3 HR
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GNERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVEGROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE 2 EACH	15.21	NATURAL GAS	1827	MMBTU/ HR	PM	0.057	LB/MMBTU	3 HR

Table A-5
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for PM/PM10

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	POLLUTANT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GNERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVE GROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE 2 EACH	15.21	NATURAL GAS	1827	MMBTU/ HR	PM10	0.057	LB/MMBTU	3 HR
UT-0066	CURRANT CREEK	PACIFICORP	UT	POWER GENERATION PLANT WITH TWO NATURAL GAS COMBINED CYCLE TURBINES	TURBINES AND HEAT RECOVERY STEAM GENERATORS	15.21	NATURAL GAS			PM10	0.066	LB/MMBTU	18 HR
MI-0365	MIRANT WYANDOTTE LLC	MIRANT WYANDOTTE LLC	MI	COMBINED CYCLE POWER PLANT.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	2200	MMBTU/ HR	PM10	5.6	MG/CM	
not listed	LOS ESTEROS CRITICAL ENERGY FACILITY, PHASE II	LOS ESTEROS CRITICAL ENERGY FACILITY, LLC	CA	CONVERSION OF EXISTING 180 MW SIMPLE-CYCLE POWER PLANT TO A 320 MW COMBINED-CYCLE PLANT WITH ADDITION OF FOUR HRSGs WITH DUCT BURNERS, STEAM TURBINE, CONDENSERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	320	MW	PM10	2.5	LB/ HR	
not listed	BLYTHE ENERGY PROJECT, PHASE II	CAITHNESS BLYTHE II, LLC	CA	520 MW NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY ADJACENT TO BLYTHE ENERGY PROJECT PHASE I. IT WILL HAVE TWO SEIMENS WESTINGHOUSE CGTS WITH DRY LOW-NOX COMBUSTERS, TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENSERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	520	MW	PM10	6	LB/ HR	
LA-0191	MICHOUD ELECTRIC GENERATING PLANT	ENTERGY NEW ORLEANS, INC.	LA	EXISTING POWER PLANT COMPRISED OF 3 BOILERS CAPABLE OF FIRING NATURAL GAS & NO. 6 FUEL OIL. PROJECT INVOLVES ADDITION OF A 498 MW COMBINED CYCLE OPERATION CONSISTING OF 2 TURBINES AND SUPPLEMENTARY FIRED HRSGS (DUCT BURNERS). DURING PHASE I OF THE PROJECT, THE TURBINES WILL BE OPERATED IN SIMPLE CYCLE MODE.	COMBUSTION GAS TURBINES 4 & 5 (COMBINED CYCLE)	15.21		1595	MM BTU/ HR ea.	PM10	7.85	LB/HR	1 hr

Table A-5
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for PM/PM10

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	POLLUTANT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
NV-0033	EL DORADO ENERGY, LLC	EL DORADO ENERGY, LLC	NV	THE FACILITY CONSIST OF TWO COMBUSTION TURBINE GENERATORS (CTGS) TWO HEAT RECOVERY STEAM GENERATORS (HRSGS) AND ONE STEAM TURBINE GENERATOR. THE FACILITY IS LOCATED IN AN ATTAINMENT AREA FOR ALL CRITERIA AIR POLLUTANTS. INSIGNIFICANT EMISSION UNITS INCLUDE A 140 HP EMERGENCY FIRE -WATER PUMP AND A WET SURFACE AIR COOLER.	COMBUSTION TURBINE, COMBINED CYCLE & COGEN (2)	15.21	NATURAL GAS	475	MW	PM10	9	LB/ HR	
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO MUNICIPAL UTILITY DISTRICT	CA	COMBUSTION GAS TURBINE GE 7FA	GAS TURBINES (2)	15.21	NATURAL GAS	1611	MMBTU/ HR	PM10	9	LB/ HR	
FL-0265	HINES POWER BLOCK 4	PROGRESS ENERGY	FL	COMBINED CYCLE POWER PLANT. THIS IS THE 4TH BLOCK OF POWER ADDED, MAKING THE TOTAL GENERATING CAPACITY OF THE FACILITY APPROXIMATELY 2090 MW.	COMBINED CYCLE TURBINE	15.21	NATURAL GAS	530	MW	PM10	10	% OPACITY	6 MIN BLOCK AVG
TX-0374	CHOCOLATE BAYOU PLANT	BP AMOCO CHEMICAL CO	TX	THE PROJECT WILL CONSIST OF TWO DUAL SHAFT GAS-FIRED ELECTRIC GENERATING TURBINES EACH RATED AT APPROX. 35 MW (BASE LOAD), EACH TURBINE WILL HAVE A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH 312 MMBTU/H DUCT BURNERS. GREEN POWER UNIT ONE WILL BE CAPABLE OF PRODUCING AN ESTIMATED NOMINAL 70 MW OF ELECTRICITY.	(2) COGENERATION TRAINS 2 & 3, GT-2 & 3	15.21	NAT GAS	70	MW, TOTAL	PM10	10.03	LB/ HR	
*NE-0023	BEATRICE POWER STATION	NEBRASKA PUBLIC POWER DISTRICT	NE	PERMIT TO CONSTRUCT: 2-NG TURBINES, 250 MW TOTAL AND ONE AUX. BOILER, 73 MMBTU/HR, OIL FIRED	2-COMBUSTION TURBINES W/ DUCT BURNER	15.21	NATURAL GAS	250	MW	PM	10.8	LB/ HR	
NE-0017	BEATRICE POWER STATION	NEBRASKA PUBLIC POWER DISTRICT	NE	ELECTRIC GENERATING FACILITY	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	80	MW	PM	10.8	LB/ HR	
NV-0038	IVANPAH ENERGY CENTER, L.P.	IVANPAH ENERGY CENTER, L.P.	NV	A 500 MW ELECTRICAL GENERATING PLANT CONSISTING OF TWO COMBUSTION TURBINE GENERATORS, TWO HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR. THE PROPOSED PLANT IS SURROUNDED BY UNOCCUPIED LAND FOR A DISTANCE OF AT LEAST TWO MILES IN ALL DIRECTIONS. THE UN-IMPROVED ACCESS ROAD TO THE PROPOSED PLANT SITE IS ABOUT 1.6 MILES IN LENGTH.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	500	MW	PM10	11.25	LB/ HR	

Table A-5
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for PM/PM10

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	POLLUTANT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
OR-0039	COB ENERGY FACILITY, LLC	Peoples Energy Resources	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER (4)	15.21	NATURAL GAS	1150	MW	PM10	14	LB/ HR	
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	172	MW	PM10	15	LB/ HR	
MD-0032	DICKERSON	MIRANT MID-ATLANTIC, LLC	MD	PROJECT IS TO CONVERT EXISTING SIMPLE CYCLE CTS TO COMBINED CYCLE OPERATION, WITH INSTALLATION OF HRSGS AND STEAM TURBINE; AND CONSTRUCTION OF A NEW SIMILAR COMBINED CYCLE UNIT, PERMIT INCLUDES LIMITS FOR BOTH COMBINED AND SIMPLE CYCLE OPERATION AND WITH AND WITHOUT DUCT FIRING	UNIT 5 -GE FRAME 7F COMB. TURBINES W/ HRSG - NG CC	15.21	NATURAL GAS	196	MW	PM10	15	LB/ HR	3 HR
VA-0289	DUKE ENERGY WYTHE, LLC	DUKE ENERGY WYTHE, LLC	VA	POWER PLANT	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	170	MW	PM10	17.5	LB/ HR	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	1973	MMBTU/ HR	PM	18	LB/ HR	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	1973	MMBTU/ HR	PM10	18	LB/ HR	
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	DUKE ENERGY ARLINGTON VALLEY	AZ	POWER PLANT	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	325	MW	PM10	18	LB/ HR	
MI-0366	BERRIEN ENERGY, LLC	BERRIEN ENERGY, LLC	MI	ELECTRIC POWER GENERATING FACILITY.	3 COMBUSTION TURBINES AND DUCT BURNERS	15.21	NATURAL GAS	1584	MMBTU/ HR	PM10	19	LB/ HR	
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	170	MW	PM10	19	LB/ HR	
MI-0363	BLUEWATER ENERGY CENTER LLC	BLUEWATER ENERGY CENTER LLC	MI	COMBINED CYCLE ELECTRIC GENERATING POWER PLANT.	TURBINE, COMBINED CYCLE, (3)	15.21	NATURAL GAS	180	MW	PM10	19.6	LB/ HR	
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC		MS	THREE GE COMBINE CYCLE TURBINED RATED @ 230 MEGAWATTS EACH WITH SCR FOR POLLUTION CONTROL	EMISSION POINT GEN. ELEC. COMBUST. TURBINE (3)	15.21	NATURAL GAS	230	MW	PM10	20.59	LB/ HR	

Table A-5
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for PM/PM10

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	POLLUTANT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
NV-0037	COPPER MOUNTAIN POWER	SEMPRA ENERGY RESOURCES	NV	A 600 MW COMBINED CYCLE ELECTRICAL GENERATION FACILITY CONSISTING OF TWO COMBUSTION TURBINE GENERATORS WITH HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR, AND ONE AUXILIARY BOILER.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	600	MW	PM10	21.3	LB/ HR	
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	172	MW	PM10	23.3	LB/ HR	
VA-0289	DUKE ENERGY WYTHE, LLC	DUKE ENERGY WYTHE, LLC	VA	POWER PLANT	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	170	MW	PM10	23.7	LB/ HR	
MI-0361	SOUTH SHORE POWER LLC	SOUTH SHORE POWER LLC	MI	ELECTRIC POWER GENERATING FACILITY.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	172	MW	PM10	24	LB/ HR	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	1973	MMBTU/ HR	PM	24.7	LB/ HR	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	1973	MMBTU/ HR	PM10	24.7	LB/ HR	
AZ-0043	DUKE ENERGY ARLINGTON VALLEY (AVEFII)	DUKE ENERGY ARLINGTON VALLEY	AZ	POWER PLANT	TURBINE, COMBINED CYCLE & DUCT BURNER	15.21	NATURAL GAS	325	MW	PM10	25	LB/ HR	
MD-0032	DICKERSON	MIRANT MID-ATLANTIC, LLC	MD	PROJECT IS TO CONVERT EXISTING SIMPLE CYCLE CTS TO COMBINED CYCLE OPERATION, WITH INSTALLATION OF HRSGS AND STEAM TURBINE; AND CONSTRUCTION OF A NEW SIMILAR COMBINED CYCLE UNIT, PERMIT INCLUDES LIMITS FOR BOTH COMBINED AND SIMPLE CYCLE OPERATION AND WITH AND WITHOUT DUCT FIRING	UNIT 4 -GE FRAME 7F COMB. TURBINES W/ HRSG - NG CC	15.21	NATURAL GAS	196	MW	PM10	26	LB/ HR	3 HR
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	170	MW	PM10	28	LB/ HR	

Table A-5
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for PM/PM10

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY STATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	POLLUTANT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
LA-0192	CRESCENT CITY POWER	CRESCENT CITY POWER, LLC	LA	NEW 600 MW NATURAL GAS-FIRED COMBINED CYCLE POWER PLANT	GAS TURBINES - 187 MW (2)	15.21		2006	MMBTU/ HR	PM10	29.4	LB/ HR	1 HR
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	AZ	COMBINED CYCLE GAS-FIRED ELECTRICITY GENERATING STATION	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - GE7FA TURBINES OPTION	15.21	NATURAL GAS	170	MW	PM10	29.8	LB/ HR	3 HR
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	AZ	COMBINED CYCLE GAS-FIRED ELECTRICITY GENERATING STATION	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - SW501F TURBINES OPTION	15.21	NATURAL GAS	180	MW	PM10	33.1	LB/ HR	3 HR
MI-0357	KALKASKA GENERATING, INC	KALKASKA GENERATING LLC	MI	ELECTRICAL POWER PRODUCTION FACILITY.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	605	MW	PM10	38	LB/ HR	
*AZ-0049	LA PAZ GENERATING FACILITY	ALLEGHENY ENERGY SUPPLY LLC	AZ	NATURAL GAS FIRED, COMBINED CYCLE GENERATING STATION	GE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	15.21	NATURAL GAS	1040	MW	PM10	45.5	LB/ HR	
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	SUMAS ENERGY 2 GENERATION FACILITY	WA		TURBINES, COMBINED CYCLE, (2)	15.21	NATURAL GAS	660	MW	PM, Filterable	194	LB/D	
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	SUMAS ENERGY 2 GENERATION FACILITY	WA		TURBINES, COMBINED CYCLE, (2)	15.21	NATURAL GAS	660	MW	PM	377	LB/D	

Table A-6
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for SO_2

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITYSTATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
NC-0101	FORSYTH ENERGY PLANT	FORSYTH ENERGY PROJECTS, LLC	NC	THREE COMBINED-CYCLE COMBUSTION TURBINE GENERATORS, EACH WITH A HEAT RECOVERY STEAM GENERATORS (HRSG) ALONG WITH NATURAL GAS-FIRED DUCT BURNERS TO MEET PEAK DEMAND. THE STEAM GENERATED THROUGH THE THREE HRSGS WILL DRIVE A STEAM TURBINE. THE ENTIRE PLANT WILL BE CAPABLE OF GENERATING A NOMINAL POWER OUTPUT OF 812 MEGAWATTS.	TURBINE, COMBINED CYCLE, NATURAL GAS (3)	15.21	NATURAL GAS	1844.3	MMBTU/ HR	0.0006	LB/ MMBTU	3 HR
NC-0101	FORSYTH ENERGY PLANT	FORSYTH ENERGY PROJECTS, LLC	NC	THREE COMBINED-CYCLE COMBUSTION TURBINE GENERATORS, EACH WITH A HEAT RECOVERY STEAM GENERATORS (HRSG) ALONG WITH NATURAL GAS-FIRED DUCT BURNERS TO MEET PEAK DEMAND. THE STEAM GENERATED THROUGH THE THREE HRSGS WILL DRIVE A STEAM TURBINE. THE ENTIRE PLANT WILL BE CAPABLE OF GENERATING A NOMINAL POWER OUTPUT OF 812 MEGAWATTS.	TURBINE & DUCT BURNER, COMBINED CYCLE (3)	15.21	NATURAL GAS	1844.3	MMBTU/ HR	0.0006	LB/ MMBTU	3 HR
*AZ-0049	LA PAZ GENERATING FACILITY	ALLEGHENY ENERGY SUPPLY LLC	AZ	NATURAL GAS FIRED, COMBINED CYCLE GENERATING STATION	GE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS	15.21	NATURAL GAS	1040	MW	0.0021	LB/ MMBTU	3 HR
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	AZ	COMBINED CYCLE GAS-FIRED ELECTRICITY GENERATING STATION	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - GE7FA TURBINES OPTION	15.21	NATURAL GAS	170	MW	0.0023	LB/ MMBTU	3 HR
AZ-0047	WELLTON MOHAWK GENERATING STATION	DOME VALLEY ENERGY PARTNERS	AZ	COMBINED CYCLE GAS-FIRED ELECTRICITY GENERATING STATION	COMBUSTION TURBINE GENERATORS AND HEAT RECOVERY STEAM GENERATORS - SW501F TURBINES OPTION	15.21	NATURAL GAS	180	MW	0.0023	LB/ MMBTU	3 HR
OK-0096	REDBUD POWER PLANT	REDBUD ENERGY LP	OK	ELECTRICITY GENERATION	COMBUSTION TURBINE AND DUCT BURNERS	15.21	NATURAL GAS	1832	MMBTU/ HR	0.003	LB/ MMBTU	
OK-0090	DUKE ENERGY STEPHENS, LLC STEPHENS ENERGY	DUKE ENERGY	OK	MERCHANT POWER PLANT - NOMINAL TOTAL OF 620 MW.	TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	1701	MMBTU/ HR	0.006	LB/ MMBTU	

Table A-6
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for SO_2

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITYSTATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GNERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVE GROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE 2 EACH	15.21	NATURAL GAS	1827	MMBTU/ HR	0.05	% SULFUR BY WT.	INSTANTANEOUS
MI-0362	MIDLAND COGENERATION (MCV)	MIDLAND COGENERATION VENTURE LIMITED PARTNERSHIP	MI	COGENERATION FACILITY TO PRODUCE STEAM AND ELECTRICITY.	TURBINE, COMBINED CYCLE, (11)	15.21	NATURAL GAS	984	MMBTU/ HR	0.2	GR/100 SCF	
MI-0361	SOUTH SHORE POWER LLC	SOUTH SHORE POWER LLC	MI	ELECTRIC POWER GENERATING FACILITY.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	172	MW	0.2	GR/100 SCF	
WA-0291	WALLULA POWER PLANT	WALLULA GENERATION, LLC	WA	WALLULA GENERATION, LLC, PROPOSES TO CONSTRUCT AND OPERATE A 1,300 MW COMBINED CYCLE ELECTRIC POWER PLANT. THE PROJECT WILL CONSIST OF TWO INDEPENDENT POWER BLOCKS WITH CRITICAL BACK-UP SYSTEMS TO MAINTAIN OVERALL PLANT RELIABILITY AND AVAILABILITY.	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	1300	MW	0.35	PPMVD, 15% O2	1 HR
not listed	BLYTHE ENERGY PROJECT, PHASE II	CAITHNESS BLYTHE II, LLC	CA	520 MW NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY ADJACENT TO BLYTHE ENERGY PROJECT PHASE I. IT WILL HAVE TWO SEIMENS WESTINGHOUSE CGTS WITH DRY LOW-NOX COMBUSTERS, TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE & GAS & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	520	MW	0.5	GR/100 CF GAS	
MN-0053	FAIRBAULT ENERGY PARK	MN MUNICIPAL POWER AGENCY	MN	LARGE COMBUSTION TURBINE ELECTRIC POWER PLANT - INITIAL OPERATION IN SIMPLE CYCLE AND CONVERSION TO COMBINED CYCLE IN THE FUTURE.	TURBINE, COMBINED CYCLE (1)	15.21	NATURAL GAS	1876	MMBTU/ HR	0.8	GR/SCF	ANNUAL
MN-0054	MANKATO ENERGY CENTER		MN	COMBINED CYCLE GAS TURBINE ELECTRIC POWER PLANT. TWO IDENTICAL GE FRAME F7A GAS TURBINES EACH WITH HRSG W/DUCT BURNERS FEEDING STEAM TO COMMON STEAM TURBINES. PRIMARY FUEL IS NG, NO. 2 VERY LOW SULFUR DISTILLATE OIL FOR BACKUP. ALSO, AUX. BOILER, DIESEL EMERGENCY GNERATOR, DIESEL FIRE PUMP, AND 900,000 GAL ABOVEGROUND OIL STORAGE TANK.	COMBUSTION TURBINE, LARGE, 2 EACH	15.21	NATURAL GAS	1916	MMBTU/ HR	0.8	GR/100SCF	ANNUAL
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	SUMAS ENERGY 2 GENERATION FACILITY	WA		TURBINES, COMBINED CYCLE, (2)	15.21	NATURAL GAS	660	MW	1	PPMVD	1 HR
CA-0997	SACRAMENTO MUNICIPAL UTILITY DISTRICT	SACRAMENTO MUNICIPAL UTILITY DISTRICT	CA	COMBUSTION GAS TURBINE GE 7FA	GAS TURBINES (2)	15.21	NATURAL GAS	1611	MMBTU/ HR	1	GR/100 SCF	

Table A-6
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for SO_2

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITYSTATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
NV-0033	EL DORADO ENERGY, LLC	EL DORADO ENERGY, LLC	NV	THE FACILITY CONSIST OF TWO COMBUSTION TURBINE GENERATORS (CTGS) TWO HEAT RECOVERY STEAM GENERATORS (HRSGS) AND ONE STEAM TURBINE GENERATOR. THE FACILITY IS LOCATED IN AN ATTAINMENT AREA FOR ALL CRITERIA AIR POLLUTANTS. INSIGNIFICANT EMISSION UNITS INCLUDE A 140 HP EMERGENCY FIRE -WATER PUMP AND A WET SURFACE AIR COOLER.	COMBUSTION TURBINE, COMBINED CYCLE & COGEN(2)	15.21	NATURAL GAS	475	MW	1.03	LB/HR	
MS-0073	RELIANT ENERGY CHOCTAW COUNTY, LLC		MS	THREE GE COMBINE CYCLE TURBINED RATED @ 230 MEGAWATTS EACH WITH SCR FOR POLLUTION CONTROL	EMISSION POINT GEN. ELEC COMB TURBINES	15.21		230	MW	1.38	LB/HR	
NV-0038	IVANPAH ENERGY CENTER, L.P.	IVANPAH ENERGY CENTER, L.P.	NV	A 500 MW ELECTRICAL GENERATING PLANT CONSISTING OF TWO COMBUSTION TURBINE GENERATORS, TWO HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR. THE PROPOSED PLANT IS SURROUNDED BY UNOCCUPIED LAND FOR A DISTANCE OF AT LEAST TWO MILES IN ALL DIRECTIONS. THE UN-IMPROVED ACCESS ROAD TO THE PROPOSED PLANT SITE IS ABOUT 1.6 MILES IN LENGTH.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	500	MW	1.55	LB/HR	
VA-0289	DUKE ENERGY WYTHE, LLC	DUKE ENERGY WYTHE, LLC	VA	POWER PLANT	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	170	MW	1.74	LB/HR	
FL-0265	HINES POWER BLOCK 4	PROGRESS ENERGY	FL	COMBINED CYCLE POWER PLANT. THIS IS THE 4TH BLOCK OF POWER ADDED, MAKING THE TOTAL GENERATING CAPACITY OF THE FACILITY APPROXIMATELY 2090 MW.	COMBINED CYCLE TURBINE	15.21	NATURAL GAS	530	MW	2	GR/100 CF GAS	
FL-0263	FPL TURKEY POINT POWER PLANT	FLORIDA POWER AND LIGHT	FL	THE PROPOSED A "4 ON 1" COMBINED CYCLE UNIT 5, WHICH WILL CONSIST OF FOUR GE MODEL FA GAS TURBINES (170 MW EACH), FOUR HEAT RECOVERY STEAM GENERATORS, A SINGLE STEAM TURBINE-ELECTRICAL GENERATOR (470 MW), AND A MECHANICAL DRAFT COOLING TOWER. NEW COMBINED CYCLE UNIT 5 WILL HAVE A TOTAL GENERATING CAPACITY OF APPROXIMATELY 1150 MW. THE EXISTING TURKEY POINT FOSSIL PLANT CURRENTLY CONSISTS OF TWO FOSSIL FUEL-FIRED STEAM ELECTRICAL GENERATING UNITS AND FIVE BLACK START DIESEL FIRED PEAKING GENERATORS. FOSSIL FUEL-FIRED STEAM ELECTRIC GENERATING UNITS 1 AND 2 (440 MW EACH) BEGAN OPERATION IN 1967 AND 1968, RESPECTIVELY.	170 MW COMBUSTION TURBINE, 4 UNITS	15.21	NATURAL GAS	170	MW	2	GR/100 SCF GAS	
FL-0245	FPL MANATEE PLANT - UNIT 3	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	170	MW	2	GR/100 SCF	
VA-0289	DUKE ENERGY WYTHE, LLC	DUKE ENERGY WYTHE, LLC	VA	POWER PLANT	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	170	MW	2.08	LB/HR	

Table A-6
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for SO_2

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITYSTATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
NV-0037	COPPER MOUNTAIN POWER	SEMPRA ENERGY RESOURCES	NV	A 600 MW COMBINED CYCLE ELECTRICAL GENERATION FACILITY CONSISTING OF TWO COMBUSTION TURBINE GENERATORS WITH HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR, AND ONE AUXILIARY BOILER.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	600	MW	5.1	LB/HR	
MI-0357	KALKASKA GENERATING, INC	KALKASKA GENERATING LLC	MI	ELECTRICAL POWER PRODUCTION FACILITY.	TURBINE, COMBINED CYCLE (2)	15.21	NATURAL GAS	605	MW	5.2	LB/HR	
LA-0192	CRESCENT CITY POWER	CRESCENT CITY POWER, LLC	LA	NEW 600 MW NATURAL GAS-FIRED COMBINED CYCLE POWER PLANT	GAS TURBINES - 187 MW (2)	15.21		2006	MMBTU/ HR	10.1	LB/HR	1 HR
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	172	MW	11	LB/HR	
MD-0032	DICKERSON	MIRANT MID-ATLANTIC, LLC	MD	PROJECT IS TO CONVERT EXISTING SIMPLE CYCLE CTS TO COMBINED CYCLE OPERATION, WITH INSTALLATION OF HRSGS AND STEAM TURBINE; AND CONSTRUCTION OF A NEW SIMILAR COMBINED CYCLE UNIT, PERMIT INCLUDES LIMITS FOR BOTH COMBINED AND SIMPLE CYCLE OPERATION AND WITH AND WITHOUT DUCT FIRING	UNIT 4 -GE FRAME 7F COMB. TURBINES W/ HRSG - NG CC	15.21	NATURAL GAS	196	MW	11	LB/HR	3 HR
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	170	MW	11.2	LB/HR	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER	15.21	NATURAL GAS	1973	MMBTU/ HR	11.3	LB/HR	
VA-0287	JAMES CITY ENERGY PARK	JAMES CITY ENERGY PARK LLC	VA	POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	1973	MMBTU/ HR	11.4	LB/HR	
MD-0032	DICKERSON	MIRANT MID-ATLANTIC, LLC	MD	PROJECT IS TO CONVERT EXISTING SIMPLE CYCLE CTS TO COMBINED CYCLE OPERATION, WITH INSTALLATION OF HRSGS AND STEAM TURBINE; AND CONSTRUCTION OF A NEW SIMILAR COMBINED CYCLE UNIT, PERMIT INCLUDES LIMITS FOR BOTH COMBINED AND SIMPLE CYCLE OPERATION AND WITH AND WITHOUT DUCT FIRING	UNIT 5 -GE FRAME 7F COMB. TURBINES W/ HRSG - NG CC	15.21	NATURAL GAS	196	MW	12	LB/HR	3 HR
TX-0374	CHOCOLATE BAYOU PLANT	BP AMOCO CHEMICAL CO	TX	THE PROJECT WILL CONSIST OF TWO DUAL SHAFT GAS-FIRED ELECTRIC GENERATING TURBINES EACH RATED AT APPROX. 35 MW (BASE LOAD), EACH TURBINE WILL HAVE A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH 312 MMBTU/H DUCT BURNERS. GREEN POWER UNIT ONE WILL BE CAPABLE OF PRODUCING AN ESTIMATED NOMINAL 70 MW OF ELECTRICITY.	(2) COGENERATION TRAINS 2 & 3, GT-2 & 3	15.21	NAT GAS	70	MW, TOTAL	12.66	LB/HR	
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	172	MW	14.4	LB/HR	

Table A-6
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for SO_2

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITYSTATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	170	MW	14.5	LB/HR	
MI-0365	MIRANT WYANDOTTE LLC	MIRANT WYANDOTTE LLC	MI	COMBINED CYCLE POWER PLANT.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	2200	MMBTU/ HR	53.4	TPY	
MI-0363	BLUEWATER ENERGY CENTER LLC	BLUEWATER ENERGY CENTER LLC	MI	COMBINED CYCLE ELECTRIC GENERATING POWER PLANT.	TURBINE, COMBINED CYCLE, (3)	15.21	NATURAL GAS	180	MW	177	TPY	

Table A-7
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NH_3

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITYSTATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
MI-0361	SOUTH SHORE POWER LLC	SOUTH SHORE POWER LLC	MI	ELECTRIC POWER GENERATING FACILITY.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	172	MW	3.3	T/YR	
*OR-0041	WANAPA ENERGY CENTER	DIAMOND WANAPA I, L.P.	OR	A 1,200 MW NATURAL GAS-FIRED COMBINED CYCLE COMBUSTION TURBINE PROJECT EMPLOYING A WATER-COOLED STEAM CONDENSING SYSTEM. FOUR COMBUSTION TURBINES, FOUR HEAT RECOVERY STEAM GENERATORS, TWO STEAM TURBINES, AND TWO COOLING TOWERS EMPLOYED.	COMBUSTION TURBINE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	2384.1	MMBTU/ HR	5	PPMVD, 15% O2	3 HR
FL-0263	FPL TURKEY POINT POWER PLANT	FLORIDA POWER AND LIGHT	FL	THE PROPOSED A "4 ON 1" COMBINED CYCLE UNIT 5, WHICH WILL CONSIST OF FOUR GE MODEL FA GAS TURBINES (170 MW EACH), FOUR HEAT RECOVERY STEAM GENERATORS, A SINGLE STEAM TURBINE-ELECTRICAL GENERATOR (470 MW), AND A MECHANICAL DRAFT COOLING TOWER. NEW COMBINED CYCLE UNIT 5 WILL HAVE A TOTAL GENERATING CAPACITY OF APPROXIMATELY 1150 MW. THE EXISTING TURKEY POINT FOSSIL PLANT CURRENTLY CONSISTS OF TWO FOSSIL FUEL-FIRED STEAM ELECTRICAL GENERATING UNITS AND FIVE BLACK START DIESEL FIRED PEAKING GENERATORS. FOSSIL FUEL-FIRED STEAM ELECTRIC GENERATING UNITS 1 AND 2 (440 MW EACH) BEGAN OPERATION IN 1967 AND 1968, RESPECTIVELY.	170 MW COMBUSTION TURBINE, 4 UNITS	15.21	NATURAL GAS	170	MW	5	PPMVD, 15% O2	
*WA-0328	BP CHERRY POINT COGENERATION PROJECT	BP WEST COAST PRODUCTS, LLC	WA	720 MW NATURAL GAS-FIRED COMBINED CYCLE COMBUSTION TURBINE COGENERATION FACILITY ADJACENT TO BP CHERRY POINT PETROLEUM REFINERY. THE FACILITY WILL EMPLOY THREE COMBUSTION TURBINES AND HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE, AND A WATER-COOLED STEAM CONDENSING SYSTEM WITH ONE COOLING TOWER.	GE 7FA COMBUSTION TURBINE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	174	MW	5	PPMVD	3 HR
OR-0039	COB ENERGY FACILITY, LLC	Peoples Energy Resources	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER (4)	15.21	NATURAL GAS	1150	MW	5	PPMVD, 15% O2	3 HR
FL-0256	HINES ENERGY COMPLEX, POWER BLOCK 3	PROGRESS ENERGY FLORIDA	FL	POWER PLANT	COMBUSTION TURBINES, COMBINED CYCLE (2)	15.21	NATURAL GAS	1830	MMBTU/ HR	5	PPMVD, 15% O2	

Table A-7
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NH_3

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITYSTATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
CA-1096	VERNON CITY LIGHT & POWER	VERNON CITY LIGHT & POWER	CA		GAS TURBINE: COMBINED CYCLE < 50 MW	15.21	NATURAL GAS	43	MW GAS TURBINE, 55 MW STEAM TURBINE	5	PPMVD, 15% O2	1 HR
CA-1097	MAGNOLIA POWER PROJECT, SCPPA	MAGNOLIA POWER PROJECT, SCPPA	CA		GAS TURBINE: COMBINED CYCLE >= 50 MW	15.21	NATURAL GAS	181	NET MW (GAS TURBINE W/STEAM INJECTION)	5	PPMVD, 15% O2	1 HR
WA-0315	SUMAS ENERGY 2 GENERATION FACILITY	SUMAS ENERGY 2 GENERATION FACILITY	WA		TURBINES, COMBINED CYCLE, (2)	15.21	NATURAL GAS	660	MW	5	PPMVD	1 HR
FL-0244	FPL MARTIN PLANT	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	170	MW	5	PPMVD, 15% O2	
FL-0245	FPL MANATEE PLANT - UNIT 3	FLORIDA POWER & LIGHT	FL	EXISTING POWER PLANT	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	170	MW	5	PPMVD, 15% O2	
WA-0291	WALLULA POWER PLANT	WALLULA GENERATION, LLC	WA	WALLULA GENERATION, LLC, PROPOSES TO CONSTRUCT AND OPERATE A 1,300 MW COMBINED CYCLE ELECTRIC POWER PLANT. THE PROJECT WILL CONSIST OF TWO INDEPENDENT POWER BLOCKS WITH CRITICAL BACK-UP SYSTEMS TO MAINTAIN OVERALL PLANT RELIABILITY AND AVAILABILITY.	TURBINE, COMBINED CYCLE (4)	15.21	NATURAL GAS	1300	MW	5	PPMVD, 15% O2	24 HR
not listed	EL CENTRO UNIT 3 REPOWER PROJECT	IMPERIAL IRRIGATION DISTRICT	CA	128 MW, NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY WITHIN CURRENT EL CENTRO GENERATING STATION, IN IMPERIAL COUNTY. IT WILL ADD A GE 7EA CTG WITH DRY LOW NOX COMBUSTERS AND ONE HRSG WITH DUCT BURNER TO EXISTING FACILITY	TURBINE, COMBINED CYCLE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	128	MW	5	PPMVD	1 HR
TX-0374	CHOCOLATE BAYOU PLANT	BP AMOCO CHEMICAL CO	TX	THE PROJECT WILL CONSIST OF TWO DUAL SHAFT GAS-FIRED ELECTRIC GENERATING TURBINES EACH RATED AT APPROX. 35 MW (BASE LOAD), EACH TURBINE WILL HAVE A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH 312 MMBTU/H DUCT BURNERS. GREEN POWER UNIT ONE WILL BE CAPABLE OF PRODUCING AN ESTIMATED NOMINAL 70 MW OF ELECTRICITY.	(2) COGENERATION TRAINS 2 & 3, GT-2 & 3	15.21	NAT GAS	70	MW, TOTAL	8.45	LB/HR	

Table A-7
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NH_3

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITYSTATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
not listed	ROSEVILLE ENERGY PARK	ROSEVILLE ELECTRIC	CA	160 MW, NATURAL GAS-FIRED, COMBINED-CYCLE GENERATING FACILITY LOCATED WEST OF DOWNTOWN ROSEVILLE, IN PLACER COUNTY. IT WILL HAVE TWO GE LM6000 PC SPRINT OR ALSTOM GTX100 CTGs, EQUIPPED WITH WATER INJECTION (LM6000) OR DRY LOW-NOx COMBUSTERS (GTX100), TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENSERS AND A MECHANICAL DRAFT COOLING TOWER	TURBINE, COMBINED CYCLE & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	160	MW	10	PPMVD	1 HR
not listed	BLYTHE ENERGY PROJECT, PHASE II	CAITHNESS BLYTHE II, LLC	CA	520 MW NATURAL GAS-FIRED COMBINED-CYCLE GENERATING FACILITY ADJACENT TO BLYTHE ENERGY PROJECT PHASE I. IT WILL HAVE TWO SEIMENS WESTINGHOUSE CGTS WITH DRY LOW-NOX COMBUSTERS, TWO HRSGs WITH DUCT BURNERS, ONE STEAM TURBINE, CONDENSERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	520	MW	10	PPMVD	1 HR
not listed	LOS ESTEROS CRITICAL ENERGY FACILITY, PHASE II	LOS ESTEROS CRITICAL ENERGY FACILITY, LLC	CA	CONVERSION OF EXISTING 180 MW SIMPLE-CYCLE POWER PLANT TO A 320 MW COMBINED-CYCLE PLANT WITH ADDITION OF FOUR HRSGs WITH DUCT BURNERS, STEAM TURBINE, CONDENSERS AND A COOLING TOWER	TURBINE, COMBINED CYCLE, NATURAL GAS & HEAT RECOVERY STEAM GENERATOR	15.21	NATURAL GAS	320	MW	10	PPMVD	1 HR
MI-0366	BERRIEN ENERGY, LLC	BERRIEN ENERGY, LLC	MI	ELECTRIC POWER GENERATING FACILITY.	3 COMBUSTION TURBINES AND DUCT BURNERS	15.21	NATURAL GAS	1584	MMBTU/ HR	10	PPM	
NV-0033	EL DORADO ENERGY, LLC	EL DORADO ENERGY, LLC	NV	THE FACILITY CONSIST OF TWO COMBUSTION TURBINE GENERATORS (CTGS) TWO HEAT RECOVERY STEAM GENERATORS (HRSGS) AND ONE STEAM TURBINE GENERATOR. THE FACILITY IS LOCATED IN AN ATTAINMENT AREA FOR ALL CRITERIA AIR POLLUTANTS. INSIGNIFICANT EMISSION UNITS INCLUDE A 140 HP EMERGENCY FIRE -WATER PUMP AND A WET SURFACE AIR COOLER.	COMBUSTION TURBINE, COMBINED CYCLE & COGEN (2)	15.21	NATURAL GAS	475	MW	10	PPMVD, 15% O2	
NV-0037	COPPER MOUNTAIN POWER	SEMPRA ENERGY RESOURCES	NV	A 600 MW COMBINED CYCLE ELECTRICAL GENERATION FACILITY CONSISTING OF TWO COMBUSTION TURBINE GENERATORS WITH HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR, AND ONE AUXILIARY BOILER.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	600	MW	10	PPMVD	3 HR

Table A-7
RBLC Database Natural Gas Fired, Combined-Cycle Combustion Turbines > 25 MW 1/1/2003 - 7/15/2008, Emission Limits for NH_3

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITYSTATE	FACILITY DESCRIPTION	PROCESS NAME	PROC TYPE	FUEL	THRU PUT	THRU PUT UNIT	EMIS LIMIT1	EMIS LIMIT1 UNIT	EMIS LIMIT1 AVG TIME CONDITION
NV-0038	IVANPAH ENERGY CENTER, L.P.	IVANPAH ENERGY CENTER, L.P.	NV	A 500 MW ELECTRICAL GENERATING PLANT CONSISTING OF TWO COMBUSTION TURBINE GENERATORS, TWO HEAT RECOVERY STEAM GENERATORS, ONE STEAM TURBINE GENERATOR. THE PROPOSED PLANT IS SURROUNDED BY UNOCCUPIED LAND FOR A DISTANCE OF AT LEAST TWO MILES IN ALL DIRECTIONS. THE UN-IMPROVED ACCESS ROAD TO THE PROPOSED PLANT SITE IS ABOUT 1.6 MILES IN LENGTH.	LARGE COMBUSTION TURBINES, COMBINED CYCLE & COGENERATION	15.21	NATURAL GAS	500	MW	10	PPMVD	1 HR
OR-0040	KLAMATH GENERATION, LLC	KLAMATH GENERATION, LLC	OR	POWER GENERATION FACILITY	TURBINE, COMBINED CYCLE, DUCT BURNER, NAT GAS (2)	15.21	NATURAL GAS	480	MW	10	PPMVD, 15% O2	3 HR
MI-0357	KALKASKA GENERATING, INC	KALKASKA GENERATING LLC	MI	ELECTRICAL POWER PRODUCTION FACILITY.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	605	MW	10	PPM	
MI-0365	MIRANT WYANDOTTE LLC	MIRANT WYANDOTTE LLC	MI	COMBINED CYCLE POWER PLANT.	TURBINE, COMBINED CYCLE, (2)	15.21	NATURAL GAS	2200	MMBTU/ HR	10	PPM	
MI-0363	BLUEWATER ENERGY CENTER LLC	BLUEWATER ENERGY CENTER LLC	MI	COMBINED CYCLE ELECTRIC GENERATING POWER PLANT.	TURBINE, COMBINED CYCLE, (3)	15.21	NATURAL GAS	180	MW	10	PPMVD	
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	170	MW	26.6	LB/HR	
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS OFF	15.21	NATURAL GAS	172	MW	28	LB/HR	
OH-0254	DUKE ENERGY WASHINGTON COUNTY LLC	DUKE ENERGY NORTH AMERICA	OH	TWO 170 MW NATURAL GAS-FIRED COMBUSTION TURBINES, COMBINED CYCLE	TURBINES (2) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	170	MW	34.6	LB/HR	
OH-0252	DUKE ENERGY HANGING ROCK ENERGY FACILITY	DUKE ENERGY HANGING ROCK, LLC	OH	FOUR NATURAL GAS (NG) FIRED COMBUSTION TURBINES, WITH DUCT BURNERS; COMBINED CYCLE, EACH 172 MW	TURBINES (4) (MODEL GE 7FA), DUCT BURNERS ON	15.21	NATURAL GAS	172	MW	37.8	LB/HR	

Appendix B

PHPP PSD Air Emissions Calculations

Prepared for:
City of Palmdale
Palmdale Hybrid Power Project

Appendix B
PHPP PSD Air Emissions Calculations

AECOM Environment
March 2009
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Prepared for:
City of Palmdale
Palmdale Hybrid Power Project

Appendix B
PHPP PSD Air Emissions Calculations

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AECOM

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Attachment A Emissions Tables

1.0 Introduction

This appendix contains a description of the emissions calculated for the Palmdale Hybrid Power Project (PHPP or Project).

Emissions of Prevention of Significant Deterioration (PSD) pollutants – oxides of nitrogen (NOx), sulfur oxides[1] (SO_2), carbon monoxide (CO), particulate matter (PM/PM10/PM2.5), volatile organic compounds (VOC), lead (Pb), hydrogen sulfide (H_2S), and sulfuric acid (H_2SO_4) - are expected from the operation of the proposed project equipment. Emissions are estimated for normal operations for the project equipment, including:

- Two GE 7FA combustion turbines with duct-fired heat recovery steam generators (HRSGs). Both the combustion turbines and duct burners will only burn natural gas. Maximum heat input rates are 1,736 million British thermal units per hour (MMBtu/hr) for each turbine and 424 MMBtu/hr for each fired HRSG. Emissions from combustion turbines and duct burners are discussed in Section 2;
- One 110-MMBtu/hr natural gas fired auxiliary boiler (Section 3);
- One 40-MMBtu/hr heat transfer fluid (HTF) auxiliary heater fired only with natural gas (Section 3);
- One – 2,683-horsepower (hp) emergency diesel generator that will burn ultra-low-sulfur diesel fuel (Section 4);
- One 182-hp fire water pump diesel engine that will burn ultra low-sulfur-diesel fuel (Section 4);
- One 10-cell cooling tower (Section 5) and
- Fugitive emissions from on-site vehicle travel (i.e., mirror wash and maintenance vehicles for the solar array) (Section 6).

Emissions of the non-criteria pollutants total reduced sulfur (TRS) and reduced sulfur compounds are not estimated independently for this analysis. TRS and reduced sulfur compounds are both assumed to be equal to H_2S emissions.

Emissions of fluorides are not estimated and are assumed to be zero because no emission factors for fluorides applicable to natural gas and diesel combustion were identified in a review of U.S. Environmental Protection Agency (EPA) publications relevant to the Project operations. Also, fluorides are not known to be present in the subject processes.

A summary of the PSD criteria and non-criteria emissions is provided in Section 7.0.

As recommended in EPA Region IX PSD application guidance, Hazardous Air Pollutant (HAP) emissions are estimated and reported. HAP emission estimates are presented for each of the emission units in Section 8.

References are provided in Section 9. Tables containing the estimated emissions from each source during operation of the PHPP are provided in Attachment A.

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[1] Because these emission calculations are intended to support a PSD applicability analysis, all sulfur oxides are assumed to be sulfur dioxide.

2.0 Combustion Turbine and Duct Burner Emissions

Emissions for the combustion turbines were based on process information provided by Kiewit Power Engineers, emission guarantees from GE, and a review of stack test data for PM10. Annual emissions for continuous operation as well as startup and shutdown emissions were calculated based on the following two operating scenarios:

- Continuous Operation
  - Combustion turbines at full load for 8,760 hours per year including 6,760 hours per year without duct firing and 2,000 hours per year per HRSG with duct firing. Based on emissions at 100 percent load and turbine performance at the annual average temperature of 64°F.
- Maximum Startups and Shutdowns
  - Hot Start and Warm Start – 80 minute startup duration with 260 hot/warm startups per unit per year. For each hot or warm start, the turbines are offline for an average of 6 hours.
  - Cold Start – 110 minute startup duration with 50 cold starts per unit per year. For each cold start the turbines are offline for an average of 48 hours.
  - Shutdown – 310 shutdowns per unit per year with duration of 30 minutes each.
- Under these conditions, it is estimated that the units will be offline for 3,960 hours per year.

Maximum emissions of each pollutant from the above operating scenarios were used for subsequent assessment. The emission calculation methodology and assumptions used to calculate emissions for the combustion turbines and duct burners are provided in the following sections. Note that the tables in Attachment A contain emissions information for the combustion turbines and duct burners that were prepared by Kiewit Power Engineers using a turbine performance model, GE Power Island (Model Revision: GC561-062008-1). While the maximum annual emissions are meant to represent the potential to emit for PHPP, the assumptions used for calculations are not proposed as emissions limits.

2.1 NOx, CO and VOC Emissions During Continuous Mode

Emissions of NO_X, CO, and VOC are estimated based on pollutant concentration in the stack discharge. The volumetric stack flow rate is determined using the "F-factor" (i.e., the volume of exhaust gas from the combustion of 1.0 MMBtu of natural gas) of 8,710 standard cubic feet per MMBtu (scf/MMBtu) taken from 40 Code of Federal Regulations (CFR) Part 60, Appendix A-7, Method 20, with the appropriate correction for oxygen (O_2) content. The volumetric flow is used to convert the proposed Best Available Control Technology (BACT)[2] limit from units of parts per million by volume on dry basis (ppmvd) to an emission factor in units of pounds per MMBtu (lb/MMBtu). The emission factor is calculated using Equation 2-1:

$$EF \text{ (pounds per MMBtu [lb/MMBtu])} = (ppmvd/10^6) \times (\text{F-factor}) \times (O_2 \text{ Corr}) \times (MW/MV) \quad \text{(Eq. 2-1)}$$

Where: EF = emission factor (lb/MMBtu)

ppmvd = concentration of the pollutant in the stack

F-factor = volume of exhaust gas from the combustion of 1.0 MMBtu of natural gas
= 8,710 scf/MMBtu

[2] The "BACT" limit identified herein refers to the emission limit proposed in the control technology assessment in Section 4 of the PSD Permit Application.

O_2 Corr = Correction for excess O_2 content: (20.9/[20.9 - %O_2])

MW = Molecular weight of species
(NO_X = 46 pounds per mole [lb/mole], CO = 28 lb/mole, VOC as methane = 16 lb/mole)

MV = Molar volume of gas at standard conditions (386.8 dry standard cubic feet per mole [dscf/mole])

Emissions are calculated based on Equation 2-2:

Emissions (pounds per hour [lb/hr]) = (EF) x (heat rate of device [MMBtu/hr]) (Eq. 2-2)

MMBtu/hr = MMBtu per hour

Emission calculations for continuous operation mode of the turbines at different loads are presented in Attachment A, Table 1. Annual emissions for normal operating conditions without any startups and shutdowns are based on 6,760 hours per year of operation at full load without duct burning and 2,000 hours with duct burning. Annual emissions for normal operating conditions with startups and shutdowns are based on 2,207 hours per year of operation at full load without duct burning and 2,000 hours with duct burning. Emissions during startup and shutdown mode are estimated as described in Section 2.7. Emissions during startup and shutdown mode are presented in Table 2. Table 3 presents a comparison of emissions from the turbines during continuous operation with emissions during startup and shutdown.

2.2 SO_2 Emissions During Continuous Mode

BACT proposed for SO_2 emissions is the use of natural gas fuel with a sulfur content of 0.2 grains per 100 scf of natural gas. Hourly emissions are calculated according to Equation 2-3:

Emissions (pounds per hour [lb/hr]) = (S x (MW_{SO2}/MW_S) x heat rate) / (HHV x 7,000 grains per pound [gr/lb]) (Eq. 2-3)

Where: S = Sulfur content of fuel = 0.2 grains per 100 scf

MW_{SO2} = Molecular weight of SO_2 = 64 lb/mole

MW_S = Molecular weight of sulfur = 32 lb/mole

Heat rate = Heat rate of turbine when duct burners unfired (MMBtu/hr)
= Heat rate of turbine + heat rate of duct burners when fired (MMBtu/hr)

HHV = Higher heating value of the fuel (1,024 British thermal unit per standard cubic foot [Btu/scf])

SO_2 emission calculations for continuous operation mode of the turbines at different loads are presented in Table 1. Annual emissions for normal operating conditions without any startups and shutdowns are based on 6,760 hours per year of operation at full load without duct burning and 2,000 hours with duct burning. There will be negligible SO_2 emissions during startup and shutdown mode as these emissions occur due to combustion of fuel. Table 3 presents a comparison of emissions from the turbines during continuous operation with emissions during startup and shutdown.

2.3 PM, PM10 and PM2.5 Emissions During Continuous Mode

BACT proposed for PM10 emissions is the use of natural gas fuel and good combustion practice. Per the proposed BACT limit, PM10 emissions from the turbine will be limited to 12 pounds per hour without duct burner firing and 18 pounds per hour with duct burner firing, under all operating conditions. The PM and PM2.5 emissions are assumed to equal the calculated PM10 emissions.

PM10 emissions for continuous operation mode of the turbines at different loads are presented in Table 1. Annual emissions for normal operating conditions without any startups and shutdowns are based on 6,760 hours per year of operation at full load without duct burner firing and 2,000 hours with duct burner firing. There will be negligible PM10 emissions during startup and shutdown mode as these emissions occur due to combustion of fuel. Table 3 presents a comparison of emissions from the turbines during continuous operation with emissions during startup and shutdown.

2.4 Sulfuric Acid Emissions During Continuous Mode

H_2SO_4 mist or aerosols are formed in combustion process stacks by oxidation of SO_2 to Sulfur trioxide (SO_3) and the reaction of the resulting SO_3 with moisture present in the stack gases to form H_2SO_4. The following assumptions were made in developing the emission estimates:

- 100 percent oxidation of TRS in the fuel gas to SO_2 during combustion (consistent with the assumptions regarding SO_2 emissions),
- 25 percent of SO_2 is oxidized to SO_3, and
- 100 percent of SO_3 formed is converted to H_2SO_4.

EPA guidance (EPA, 1998a) reports that SO_3 comprises from one to three percent of the total SO_2 emitted from fossil fuel combustion. Since the flue gas is routed through an oxidation catalyst to control CO emissions, the oxidation of SO_2 to SO_3 will be higher than three percent. The assumption of oxidation of 25 percent SO_2 to SO_3 for the combustion turbines was based on process information provided by Kiewit Power Engineers and emission guarantees from GE. Annual H_2SO_4 emission rate is calculated using the corresponding annual SO_2 emission rate. Equation 2-4 is used for calculating H_2SO_4 emissions from combustion turbines.

$$\text{Emissions (lb/hr)} = (P \times E_{SO2} \times MW_{H2SO4}) / (100 \times MW_{SO2}) \qquad \text{(Eq. 2-4)}$$

Where: P = % of SO_2 oxidized to SO_3 (dimensionless)

E_{SO2} = Emissions of SO_2 (lb/hr)

MW = Molecular weight (H_2SO_4 = 98.07 lb/mole, SO_2 = 64.06 lb/mole).

Sulfuric acid emissions for continuous operation mode of the turbines at different loads are presented in Table 1.

2.5 H_2S Emissions During Continuous Mode

H_2S emissions from fuel combustion will occur if the TRS in the fuel gas is not fully oxidized during the combustion process. H_2S emissions calculations are dependant on the combustion efficiency. For these emission estimates, the combustion efficiency is assumed to be 99.8 percent. Therefore, 0.2 percent of TRS is emitted as H_2S. This is a conservative assumption and will yield higher H_2S estimates as the TRS not oxidized in the combustion turbine will be oxidized while the flue gas is routed through an oxidation catalyst.

Equation 2-5 is used for estimating H_2S emissions from combustion turbines.

$$\text{Emissions (lb/hr)} = (1-\eta) \times (S) \times (MW_{H2S}/MW_S) \times (\text{heat rate}) / (\text{HHV} \times 7{,}000 \text{ gr/lb}) \qquad \text{(Eq. 2-5)}$$

Where: η = Combustion efficiency (99.8 percent)

S = Sulfur content of fuel = 0.2 grains per 100 scf

MW_{H2S} = Molecular weight of H_2S = 34 lb/mole

MW_S = Molecular weight of sulfur = 32 lb/mole

Heat rate = Heat rate of turbine when duct burners unfired (MMBtu/hr)
= Heat rate of turbine + heat rate of duct burners when fired (MMBtu/hr)

HHV = Higher heating value of the fuel (1,024 Btu/scf)

H_2S emissions from combustion turbines are presented in Table 3.

2.6 Pb Emissions

Emissions of Pb are not estimated and assumed to be zero because no emission factors for Pb applicable to natural gas combustion in turbines were identified in a review of EPA and other relevant publications.

2.7 Emissions During Startup and Shutdown Mode and Malfunction

Emissions during startup and shutdown mode were estimated for NO_X, CO and VOC based on test data provided by the turbine manufacturer. The emissions in pounds per hour were estimated by dividing the manufacturer guaranteed emission limits (pounds of pollutant per startup or shutdown event) with the duration of each startup or shutdown event (hours/event). The number of such events and their duration is given in Section 2. SO_2, PM10, PM2.5, and H_2SO_4 emissions during startup and shutdown are expected to be lower than for normal continuous operation because these pollutants are emitted in direct proportion to fuel use and fuel combustion is lower during startup and shutdown than during normal operations. H_2S emissions are estimated by assuming a combustion efficiency of 99.98 percent in Equation 2-5.

Emissions during startup and shutdown mode are presented in Table 2. Table 3 presents a comparison of emissions from the turbines during continuous operation with emissions during startup and shutdown.

Emission control devices operate efficiently under a particular range of operational parameters. Malfunctions of process units or emission control devices results in higher emissions, causing the process units to be quickly shutdown to prevent the emissions from exceeding the permitted limits and prevent non-compliance with permit conditions. Although emissions due to malfunctions are high for a very short period, the average emissions on an annual basis are negligible and are therefore not included in Potential to Emit (PTE) estimates for this application.

3.0 Auxiliary Boiler and HTF Heater Emissions

The emission calculation methodologies for the auxiliary boiler and HTF heater are similar, as they are both natural gas-fired combustion devices that employ ultra-low-NO_X burners for emissions control. The assumptions made regarding boiler operation used as the basis for emission calculations include:

- One 110-MMBtu per hour auxiliary boiler;
- One 40-MMBtu per hour HTF heater;
- Natural gas will be the only fuel used by the boiler and heater;
- Boiler and heater will be equipped with ultra-low-NO_X burners;
- Operation of the auxiliary boiler is limited to 500 hours per year;
- Operation of the HTF heater is limited to 1,000 hours per year; and
- The PM and PM2.5 emissions are assumed to equal the calculated PM10 emissions.

The emission factors used for the emission estimates for all pollutants are based on the BACT analysis. Auxiliary boiler emission factors and emission estimates are presented in Table 4, and HTF heater emission factors and emission estimates are presented in Table 5.

3.1 NOx and CO Emissions

Emissions of NO_X and CO are estimated based on pollutant concentrations in the stack discharge determined in the BACT analysis. NO_X emissions are based on 9 ppmvd and CO emissions are based on 50 ppmvd, both measured at three percent excess oxygen. The volumetric stack flow rate is determined using the "F-factor" of 8,710 scf/MMBtu taken from 40 CFR Part 60, Appendix A-7, Method 20, with the appropriate correction for O_2 content. The volumetric flow is used to convert the proposed BACT limit from units of ppmvd to an emission factor in units of lb/MMBtu. The emission factor is calculated using Equation 2-1. Emissions are calculated based on Equation 2-2. Calculations are presented in Tables 4 and 5 for the auxiliary boiler and the HTF heater, respectively.

3.2 PM, PM10, PM2.5 and VOC Emissions

PM, PM10, and VOC emissions were calculated using emission factors from AP-42 Chapter 1 External Combustion Sources, Section 1.4 Natural Gas Combustion, Table 1.4-2 (EPA, 1998b). Emissions are calculated according to Equation 2-2. Calculations are presented in Tables 4 and 5 for the auxiliary boiler and the HTF heater respectively.

3.3 SO_2 Emissions

BACT proposed for SO_2 emissions is the use of natural gas fuel and good combustion practice. SO_2 emission estimates are based on 0.2 grains of sulfur per 100 scf of natural gas. Hourly emissions are calculated according to Equation 2-3. Calculations are presented in Tables 4 and 5 for the auxiliary boiler and HTF heater respectively.

3.4 Sulfuric Acid Emissions

As described in Section 2.4, H_2SO_4 mist or aerosols are formed in combustion process stacks by the oxidation of SO_2 to SO_3 and the reaction of the resulting SO_3 with the moisture present in the stack gases to form H_2SO_4. The following assumptions were made in developing the emission estimates for boilers and heaters:

- 100 percent of TRS in the fuel gas is oxidized to SO_2 during combustion (consistent with the assumptions regarding SO_2 emissions),
- 3 percent of SO_2 is oxidized to SO_3 for combustion units,
- 100 percent of SO_3 formed is converted to H_2SO_4.

The oxidization of SO_2 to SO_3 is based on EPA guidance (EPA, 1998a) reports that SO_3 comprises from one to three percent of the total SO_2 emitted from fossil fuel combustion. In the absence of source test data for SO_3 or H_2SO_4, three percent conversion to SO_3 is assumed for this emission estimate to ensure that emissions are not underestimated. Annual H_2SO_4 emission rate is calculated using the corresponding annual SO_2 emission rate. Equation 2-4 is used for calculating H_2SO_4 emissions from boilers and heater. Calculations are presented in Tables 4 and 5 for the auxiliary boiler and the HTF heater, respectively.

3.5 H_2S Emissions

As described in Section 2.5, H_2S emissions for heaters and boilers are calculated by assuming combustion efficiency of 99.8 percent. Therefore, 0.2 percent of TRS is emitted as H_2S. Equation 2-5 is used for estimating H_2S emissions from natural gas fired boilers and heaters. Calculations are presented in Tables 4 and 5 for the auxiliary boiler and the HTF heater, respectively.

3.6 Pb Emissions

The emission factor for Pb of 0.0005 pounds per million standard cubic feet (lb/MMscf) for natural gas combustion is obtained from AP-42 (EPA, 1998b). The emission factor is converted to units of lb/MMBtu using Equation 3-1 and the HHV of natural gas. Emissions are calculated according to Equation 2-2.

EF (lb/MMBtu) = EF' (lb/MMscf) / HHV (Eq. 3-1)

Where: EF = AP-42 emission factor (lb/MMBtu)

EF' = AP-42 emission factor = 0.0005 lb/MMscf

HHV = Higher heating value of natural gas (Btu/scf)

Calculations are presented in **Tables 4 and 5** for the auxiliary boiler and the HTF heater, respectively.

4.0 Emergency Diesel-Fired Engines Emissions

The assumptions made regarding emergency engine operation used as the basis for emission calculations include:

- One 135- kilowatt (kW) diesel-fired, 2009 model year Tier 3 engine (fire water pump);
- One 2-megawatt (MW) diesel-fired engine, 2009 model year Tier 2 engine (generator engine);
- The calculations assume the use of ultra-low sulfur (15 parts per million weight [ppmw]) diesel fuel;
- Maximum annual hours of operation for diesel generator are 50 hours per year for testing and maintenance use;
- Maximum annual hours of operation for fire water pump are 50 hours per year for testing and maintenance use; and
- 100 percent of the PM emissions are PM2.5 and PM10.

The emergency diesel generator will have an output of 2 MW. Emission factors, shown in Table 6, were obtained from a similar Caterpillar generator and comply with EPA Tier 2 engine emission requirements. SO_2 emissions were calculated using a fuel sulfur content of 0.0015 weight percent (15 ppmw). Emergency diesel generator emissions are presented in Table 6.

The emergency diesel fire water pump engine will have an output of 135 kW. Emission factors, shown in Table 7, were obtained from a similar Caterpillar engine and comply with EPA Tier 3 engine emission requirements. SO_2 emissions were calculated using a fuel sulfur content of 15 ppmw.

Under the New Source Performance Standard (NSPS) Subpart IIII, the emission limit for NO_X is combined with non-methane hydrocarbons (NMHC). For these emission estimates, the NO_X fraction is assumed to be 95 percent of the combined emissions, and the balance NMHC (Carl Moyer, 2003). NMHC is assumed to be equivalent to VOC.

4.1 NOx, CO, VOC, PM, PM10 and PM 2.5 Emissions

Hourly emissions are calculated using Equation 4-1. Annual emissions are based on up to 50 hours per year for diesel generator and fire water pump, respectively. Tables 6 and 7 present the emissions from the emergency generator and fire water pump engines, respectively.

Emissions (lb/hr) = EF" (grams per horsepower-hour [g/hp-hr]) x Engine Capacity (hp)/453.6 grams per pound (g/lb) (Eq. 4-1)

Where: EF" = Emission Factor (g/hp-hr)

4.2 SO_2 Emissions

SO_2 emissions are based on fuel use and a fuel sulfur content of 15 ppmw. Fuel consumption is estimated based on the EPA default fuel consumption rate of 7,000 Btu/hp-hr (EPA, 1996a). The emission factor for SO_2 emissions is calculated using Equation 4-2 (EPA, 1996b):

EF (lb/MMBtu) = 1.01 x S (Eq. 4-2)

Where: EF = Emission Factor

S = Sulfur content of diesel fuel (percent) = 0.0015 percent

Hourly emissions are calculated according to Equation 4-3:

Emissions (lb/hr) = EF (lb/MMBtu) x Engine Input (MMBtu/hr) (Eq. 4-3)

Tables 6 and 7 present the emissions from the diesel generator and fire water pump engines, respectively.

4.3 Sulfuric Acid Emissions

The mechanism of formation of H_2SO_4 mist from fuel combustion in diesel engines is similar to that described in Section 2.4 for turbines and in Section 3.4 for heaters and boilers. Annual H_2SO_4 emission rate is calculated using the corresponding annual SO_2 emission rate and Equation 2-4. The assumptions made in developing the emission estimates for diesel engines are similar to those made for estimating emissions from the heater and boiler in Section 3.4. Calculations are presented in Tables 6 and 7 for the diesel generator and fire water pump engines, respectively.

4.4 H_2S Emissions

H_2S emissions from diesel engines are calculated by assuming combustion efficiency, which for these emission estimates is assumed to be 99.8 percent. Therefore, 0.2 percent of TRS is emitted as H_2S. Equation 4-4, which is very similar to Equation 2.5, is used for estimating H_2S emissions from diesel engines. Calculations are presented in Tables 6 and 7 for the diesel generator and fire water pump engines, respectively.

Emissions (lb/hr) = $(1- \eta) \times (S) \times (MW_{H2S}/MW_S) \times$ (heat rate) / HV (Eq. 4-4)

Where:

S	=	Sulfur content of diesel fuel (percent) = 0.0015 percent
MW_{H2S}	=	Molecular weight of H_2S = 34 lb/mole
MW_S	=	Molecular weight of Sulfur = 32 lb/mole
Heat rate	=	Heat rate of diesel engine (MMBtu/hr)
HV	=	Heating value of the diesel fuel (19,300 British thermal units per pound)
η	=	Combustion efficiency (99.8 percent)

4.5 Pb Emissions

The emission factor of 9×10^{-6} lb/MMBtu for Pb emissions from diesel engines is obtained from BACT determination for similar equipment from some recent permits. Emissions are calculated according to Equation 2-2. Calculations are presented in Tables 6 and 7 for the diesel generator and fire water pump engines, respectively.

5.0 Cooling Tower Emissions

The cooling tower is not expected to emit NOx, SO_2, Pb or CO as no combustion occurs in this process. H_2SO_4, Pb, and fluorides are not found in the makeup water for the cooling tower; thus, there will not be emissions of H_2SO_4, Pb, or fluorides. Emissions from the cooling tower will include PM, PM10 and VOC emissions, and they are discussed in the following sections.

5.1 PM, PM10 and PM 2.5 Emissions

Because wet cooling towers provide direct contact between the cooling water and the air passing through the tower, some of the liquid water may be entrained in the air stream and carried out of the tower as "drift" droplets. PM emissions are generated when the drift droplets evaporate and leave fine particulate matter formed by crystallization of dissolved solids. Dissolved solids found in cooling tower drift can consist of mineral matter, chemicals for corrosion inhibition, etc. As described in EPA AP-42, Section 13.4, Wet Cooling Towers (EPA, 1995), particulate matter emissions are calculated by multiplying the total liquid drift factor by the Total Dissolved Solids (TDS) fraction in the circulating water. PM emissions are estimated assuming that once the water evaporates, all of the solid particles are within the PM10 size range. TDS data for the cooling tower are estimated by multiplying the TDS data for the makeup water by the cooling tower cycles of concentration. Hourly PM emissions are calculated according to Equation 5-1:

$$\text{Emissions (lb/hr)} = \text{WCR} \times 60 \text{ min/hr} \times (\text{DF}) \times \rho \times \text{TDS} \qquad \text{(Eq. 5-1)}$$

Where: WCR = Water Circulation Rate (gallons per minute)

DF = Drift fraction (dimensionless)

ρ = Density of water (pounds per gallon [lb/gal])

TDS = Total Dissolved Solids, ppm (lb/10^6 lb water)

The assumptions made regarding cooling tower operation used as the basis for emission calculations include:

- Circulation rate of 130,000 gallons per minute;
- Cooling tower circulating water will contain a maximum of 5,000 milligrams per liter (mg/L) (equivalent to 5,000 ppm) TDS;
- The TDS concentration in makeup water is assumed to be 531 mg/L (equivalent to 5,000 ppm);
- The cooling tower will be equipped with a drift eliminator with drift losses of less than or equal to 0.0005 percent based on circulation flow rate; and
- The PM and PM2.5 emissions are assumed to equal the calculated PM10 emissions.

Daily emissions are calculated based on the maximum daily operating schedule of 24 hours per day. Annual emissions are calculated assuming continuous operation 8,760 hours per year. Cooling tower PM emissions are presented in Table 8.

5.2 VOC Emissions

The cooling tower in PHPP will utilize reclaimed water from the nearby wastewater treatment plant as makeup water. Organic compounds dissolved in the treated wastewater will be released at the cooling tower as VOC emissions. These emissions are estimated using **Equation 5-2**.

Emissions (lb/hr) = MR x 60 min/hr x 3.785 liters per gallon (L/gal) x C x 1lb / 453.6 g x 1g / 10^6 µg x VF (Eq. 5-2)

Where: MR = Make-up water rate, (gallons per minute)

C = VOC concentration, (micrograms per liter [µg/L])

VF = Volatilization fraction (assumed to be one)

In addition, the cooling tower will be a source for chloroform emissions from the application of sodium hypochlorite as a biocide for cooling tower maintenance. Biocide usage is estimated by the engineering contractor based on experience with similar applications. Chloroform emissions are estimated using **Equation 5-3**.

Emissions (lb/hr) = EF x biocide usage (gallons per hour) x ρ x C x ME (Eq. 5-3)

Where: EF = Emission Factor of chloroform (pounds of chloroform per pounds of chlorine)

ρ = Density of sodium hypochlorite (lb/gal)

C = Concentration of hypochlorite (percent)

ME = Molar Equivalent (moles of chlorine per mole of sodium hypochlorite)

The emission factor is taken from study contracted by ARB for sources of chloroform in the South Coast Air Basin (Rogozen et al., 1998).

Cooling tower VOC emissions are presented in Table 9.

6.0 Vehicle Fugitive Dust Emissions

The facility will require periodic vehicle travel over the unpaved portions of the solar field to perform routine maintenance, including mirror washing, maintenance inspections and repairs of the piping network, herbicide application, and dust suppressant application. Criteria pollutant emissions are expected from the combustion of fuels in the vehicles, and fugitive PM, PM10 and PM2.5 emissions are expected from vehicle traffic in the solar fields. The PSD program required the inclusion of fugitive emissions for certain source categories. Therefore, only fugitive PM, PM10 and PM2.5 emissions from entrained unpaved road dust due to vehicle travel are considered for this application, and tail pipe emissions are not included in PTE estimates for PSD applications. Fugitive vehicle emissions are shown in Table 10.

Vehicles traveling on unpaved surfaces generate fugitive PM, PM10 and PM2.5 emissions. **Equation 6-1** is used to estimate these emissions:

$$\text{Emissions (lb)} = EF_U \times VMT_U \qquad \text{(Eq. 6-2)}$$

Where: EF_U = Controlled emission factor for vehicle travel on unpaved surfaces (lb/mi)

VMT_U = Distance traveled on unpaved surfaces (miles)

The controlled emission factors were calculated from **Equation 6-2**:

$$EF_U\,(\text{lb/mi}) = k\,(s/12)^a \times (W/3)^b \times (1\text{-}CE/100) \qquad \text{(Eq. 6-3)}$$

Where: k = Particle size multiplier

= 4.9 for PM30 (used for PM)

= 1.5 for PM10

= 0.15 for PM2.5

a = 0.7 for PM30 (used for PM)

= 0.9 for PM10 and PM2.5

s = Surface silt content (percent)

W = Average vehicle weight (tons)

CE = Control efficiency from the application of soil stabilizers (percent)

Source: (EPA, 2006)

The silt content was assumed to be 11 percent, which is the conservative default value for unpaved roads from the Mojave Desert (MDAQMD) and Antelope Valley Air Quality Management District (AVAQMD) Emissions Inventory Guidance for Mineral Handling and Processing Industries (MDAQMD, 2000). The average weight of the mirror wash truck, soil stabilizer truck and weed abatement truck was assumed to be 13.5 tons, which is the average of a five-ton empty and a 22-ton full water truck (4,000 gallon capacity). The average weight of a maintenance vehicle was assumed to be three tons. The control efficiency from the routine use of water and soil stabilizers is conservatively assumed to be 50 percent. The daily and annual vehicle miles traveled are estimated based on the following assumptions:

- Mirror washing weekly six months per year and once per month for six months per year;
- Application of soil stabilizers in the solar field quarterly;

- Application of weed killer in the solar field quarterly; and
- Inspection of the solar piping three times per day.

Note that application of soil stabilizers is likely to only be needed in the first year or two of operation. After that, experience at existing solar facilities in the Mojave Desert shows that the soil becomes compacted and use of stabilizers is no longer needed.

7.0 Summary of Operational Emissions

A summary of the PSD-regulated pollutant emissions for PHPP are provided below. Emissions for each source type are provided in Attachment A.

Table S
Maximum Annual Emission Summary - All Sources

Source	NO_x	CO	VOC	PM	PM10	PM2.5	SO_2	Pb	H_2SO_4	H_2S
	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
Gas Turbines	113.70	252.43	39.64	117.12	117.12	117.12	8.83	0.00	3.38	0.01
Auxiliary Boiler	0.30	1.01	0.15	0.20	0.20	0.20	0.02	1.3E-05	7.4E-04	1.6E-05
HTF Heater	0.22	0.74	0.11	0.15	0.15	0.15	0.01	9.8E-06	5.4E-04	1.2E-05
Emergency Generator	0.67	0.39	0.04	0.02	0.02	0.02	0.0003	1.8E-06	1.4E-05	3.2E-07
Fire Water Pump	0.03	0.03	0.00	0.00	0.00	0.0015	0.00005	3.0E-07	2.3E-06	5.5E-08
Cooling Tower	n/a	n/a	0.06	7.13	7.13	7.13	n/a	n/a	n/a	n/a
Maintenance Vehicle	n/a	n/a	n/a	23.80	7.16	0.72	n/a	n/a	n/a	n/a
Totals	**114.9**	**254.6**	**40.0**	**148.4**	**131.8**	**125.3**	**8.9**	**0.0**	**3.4**	**0.0**

PSD Applicability Threshold	100	100	100	100	100	n/a[2]	100	0.6	7	10
Exceed Threshold? (Yes/No)	Yes	Yes	n/a[1]	Yes	Yes	n/a	No	No	No	No

Notes / Assumptions
1. VOC is an ozone precursor. The Project area is non-attainment for ozone, thus VOC is not subject to PSD review.
2. A PSD significance threshold has not been established for PM2.5.

8.0 Hazardous Air Pollutant Emissions

HAP emissions are estimated for normal operations for the combustion turbines and duct burners, auxiliary boiler, HTF heater, emergency fire water pump and emergency generator engines, and the cooling tower.

8.1 Combustion Turbine and Duct Burner HAP Emission Calculations

Emissions of HAP from the combustion turbines and duct burners are estimated based on EPA AP-42 emission factors for natural gas combustion in stationary gas turbines (EPA, 2000).

For each pollutant, maximum hourly emissions are calculated according to Equation 8-1. Annual emissions are calculated by multiplying the hourly emission rate by the maximum annual hours of operation. The emission factors and calculated emissions are shown in Table 12.

Emissions (lb/hr) = (EF/HHV) x (heat rate of device [MMBtu/hr]) (Eq. 8-1)

Where: EF = Emission Factor (lb/MMscf gas combusted)

HHV = Higher heating value of the fuel (1,024 Btu/scf)

The PHPP will employ an oxidation catalyst to control emissions of CO and VOCs. An oxidation catalyst will also control HAP emissions. Documentation exists that demonstrates that an oxidation catalyst will control formaldehyde emissions by at least 90 percent (EPA, 2002). Since the control efficiency for the other HAPs are not as well documented, only formaldehyde emissions were assumed to be controlled by the oxidation catalyst. This assumption is very conservative.

8.2 Auxiliary Boiler and HTF Heater HAP Emission Calculations

Emissions of HAP from the boilers are estimated based on EPA AP-42 emission factors for natural gas combustion (EPA, 1998b).

For each pollutant, maximum hourly emissions are calculated according to Equation 8-1. Annual emissions are calculated by multiplying the hourly emission rate by the maximum annual hours of operation. The emission factors and calculated emissions are shown in Tables 13 and 14 for the auxiliary boiler and the HTF heater, respectively.

8.3 Emergency Engine HAP Emission Calculations

Equation 8-2 presented below is used to calculate emissions from diesel engines. HAP emission factors from AP-42 are applied directly to calculate HAP emissions.

Emissions (lb/hr) = (EF) x (AR) (Eq. 8-2)

Where: EF = Emission Factor (lb/hp-hr or lb/MMBtu)

AR = Activity Rate (power output fuel input per engine)

Calculations of emergency engine HAP emissions are provided in Table 15 of Attachment A.

8.4 Cooling Tower HAP Emissions

The PHPP proposes to use a wet cooling tower for power plant cooling. Water for cooling tower makeup will be supplied from a reclaimed water supply. Low levels of toxic metals and organics were identified in

the reclaimed water. Non-volatile HAP emissions are calculated according to Equation 8-3 and volatile HAP emissions are calculated according to Equation 8-4.

Emissions (lb/hr) = (WCR x 60 min/hr x 3.785 L/gal x HAP x 1g / 10^6 μg x DF x CC) / (453.6 g/lb) (Eq. 8-3)

Where: WCR = Water circulation rate (gallons per minute)

DF = Drift Fraction (dimensionless)

HAP = HAP concentration in makeup water (μg/L)

CC = Factor for cycles of concentration = 5,000/531 (9.4 conc. cycles)

Emissions(lb/hr)= MR x 60 min/hr x 3.785 liters/gal x HAP x VF / (10^6 μg/g x 453.6 g/lb) (Eq. 8-4)

Where: MR = Make up water rate (gallons per minute)

HAP = HAP concentration (μg/L)

VF = Volatilization Fraction (assumed to be one)

In addition, the cooling tower will be a source for chloroform emissions from the application of sodium hypochlorite as a biocide for cooling tower maintenance. Biocide usage is estimated by the engineering contractor based on experience with similar applications. Chloroform emissions are estimated using Equation 8-5.

Emissions(lb/hr)= EF x biocide usage (gallons per hour) x ρ x C x ME (Eq. 8-5)

Where: EF = Emission Factor of chloroform (lb of chloroform per lb of chlorine)

ρ = Density of sodium hypochlorite (lb/gal)

C = Concentration of hypochlorite (percent)

ME = Molar Equivalent (moles of chlorine per mole of sodium hypochlorite)

The emission factor is taken from a study contracted by ARB for sources of chloroform in the South Coast Air Basin (Rogozen et.al., 1998). HAP emissions are provided in Table 16.

8.5 Summary of HAP Emissions

Operational HAP emissions for the Project are shown in Table H. The largest single HAP is toluene, at 3.7 tons per year (tpy). All HAP combined equal a total of 10.8 tpy. Since these levels are below the 10/25 tpy major source thresholds, the PHPP is not a major source of HAP. Note, only formaldehyde was assumed to be controlled by the oxidation catalyst, and hence the emissions of other HAP are significantly over estimated.

Table H
Hazardous Air Pollutant Emission Estimates - Summary of All Operational Sources

Pollutant	CAS Number	Emissions (total) (lb/hr)	(lb/yr)	(tpy)
1,3-Butadiene	106990	1.70E-03	1.49E+01	7.46E-03
Acetaldehyde	75070	1.59E-01	1.39E+03	8.61E-01
Acrolein	107028	2.58E-02	2.22E+02	2.57E-01
Arsenic	7440382	2.94E-06	8.18E-03	4.09E-06
Benzene	71432	4.86E-02	4.17E+02	2.09E-01
Benzo(a)anthracene	56553	3.01E-04	2.64E+00	1.32E-03
Benzo(a)pyrene	50328	1.85E-04	1.62E+00	8.11E-04
Benzo(b)fluoranthene	205992	1.51E-04	1.32E+00	6.59E-04
Benzo(k)fluoranthene	207089	1.47E-04	1.28E+00	6.42E-04
Beryllium	7440417	1.07E-06	9.41E-03	4.71E-06
Chloroform	67663	3.30E-05	4.21E-02	2.10E-05
Chrysene	218019	3.36E-04	2.94E+00	1.47E-03
Cyanide compounds	1073	8.03E-09	4.69E-05	2.34E-08
Dibenz(a,h)anthracene	53703	3.13E-04	2.74E+00	1.37E-03
Ethylbenzene	100414	1.28E-01	1.11E+03	9.28E-01
Formaldehyde	50000	2.83E-01	2.47E+03	1.90E+00
Hexane	110543	6.76E-04	1.81E-01	2.48E-01
Indeno(1,2,3-cd)pyrene	193395	3.13E-04	2.74E+00	1.37E-03
Naphthalene	91203	5.23E-03	4.52E+01	3.87E-02
p-Dichlorobenzene	106467	5.90E-06	1.73E-02	8.63E-06
PAHs (excluding naphthalene)	1151	5.88E-05	1.57E-02	2.16E-02
Perchloroethylene (tetrachloroethene)	127184	2.60E-08	2.27E-04	1.14E-07
Phenol	108952	9.44E-08	8.27E-04	4.13E-07
Propylene Oxide	75569	1.15E-01	1.01E+03	5.03E-01
Selenium	7782492	2.94E-06	1.36E-02	6.82E-06
Toluene	108883	5.19E-01	4.51E+03	3.69E+00
Trichloroethylene	79016	1.18E-09	1.03E-05	5.17E-09
Xylenes (mixed xylenes)	1330207	2.57E-01	2.22E+03	2.17E+00
Grand Total		**1.54**	**13,423.6**	**10.8**

9.0 References

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Attachment A – Emissions Tables

Table 1 Emissions from Gas Turbine at Different Loads

											NOx (per turbine)				CO (per turbine)						VOC (per turbine)				SO_2 (per turbine)			H_2SO_4	PM10
Case Name	Case No.	Ambient temp., F	Relative humidity	CT Operating	Combustion Turbine Load	Duct Burner Fired/Unfired	Solar	Evap. Cooling	CTG Heat Input (HHV) (total: both turbines)	Duct Burner Heat Input (HHV) (total: both DBs)	NOx	NOx	NOx Reduction Required	NOx	CO	CO	CO permit limit	CO Reduction Required	CO	CO emissions at permit limit	VOC	VOC	VOC Reduction Required	VOC	SO_2	SO_2	SO_2	H_2SO_4	PM10 (front & back)
								CTG Inlet Air Cooler	MMBtu/h	MMBtu/h	ppmvd@15% O_2	ppmvd@15% O_2	%	lb/h as NO2	ppmvd@15% O_2	ppmvd@15% O_2	ppmvd@15% O_2	%	lb/h	lb/hr	ppmvd@15% O_2	ppmvd@15% O_2	%	lb/h as CH4	ppmvd@15% O_2	ppmvd@15% O_2	lb/h	lb/hr	lb/h
Case PB-1	PB23UN	23	92%	2	100%	Unfired	No Solar	Cooler Off	3,718.36	0.00	9.0	2.0	77.8%	13.47	7.5	3.0	2.0	59.9%	12.3	8.20	1.3	2.0	none	4.7	0.112	0.112	1.05	0.400	12.0
Case PB-2	PB59UN	59	60%	2	100%	Unfired	No Solar	Cooler On	3,530.74	0.00	9.0	2.0	77.8%	12.79	7.4	3.0	2.0	59.5%	11.7	7.78	1.3	2.0	none	4.5	0.112	0.112	0.99	0.380	12.0
Case PB-3	PB64UN	64	40%	2	100%	Unfired	No Solar	Cooler On	3,527.74	0.00	9.0	2.0	77.8%	12.77	7.4	3.0	2.0	59.5%	11.7	7.78	1.3	2.0	none	4.5	0.112	0.112	0.99	0.380	12.0
Case PB-4	PB98UN	98	17%	2	100%	Unfired	No Solar	Cooler On	3,394.04	0.00	9.0	2.0	77.8%	12.29	7.4	3.0	2.0	59.2%	11.2	7.48	1.3	2.0	none	4.3	0.112	0.112	0.95	0.365	12.0
Case PB-5	PB108UN	108	13%	2	100%	Unfired	No Solar	Cooler On	3,360.48	0.00	9.0	2.0	77.8%	12.17	7.3	3.0	2.0	59.1%	11.1	7.41	1.3	2.0	none	4.2	0.112	0.112	0.95	0.362	12.0
Case PB-6	PB23US	23	92%	2	100%	Unfired	Max Solar	Cooler Off	3,718.36	0.00	9.0	2.0	77.8%	13.47	7.5	3.0	2.0	59.9%	12.3	8.20	1.3	2.0	none	4.7	0.112	0.112	1.05	0.400	12.0
Case PB-7	PB59US	59	60%	2	100%	Unfired	Max Solar	Cooler On	3,530.74	0.00	9.0	2.0	77.8%	12.79	7.4	3.0	2.0	59.5%	11.7	7.78	1.3	2.0	none	4.5	0.112	0.112	0.99	0.380	12.0
Case PB-8	PB64US	64	40%	2	100%	Unfired	Max Solar	Cooler On	3,527.74	0.00	9.0	2.0	77.8%	12.77	7.4	3.0	2.0	59.5%	11.7	7.78	1.3	2.0	none	4.5	0.112	0.112	0.99	0.380	12.0
Case PB-9	PB98US	98	17%	2	100%	Unfired	Max Solar	Cooler On	3,394.04	0.00	9.0	2.0	77.8%	12.29	7.4	3.0	2.0	59.2%	11.2	7.48	1.3	2.0	none	4.3	0.112	0.112	0.95	0.365	12.0
Case PB-10	PB108US	108	13%	2	100%	Unfired	Max Solar	Cooler On	3,360.48	0.00	9.0	2.0	77.8%	12.17	7.3	3.0	2.0	59.1%	11.1	7.41	1.3	2.0	none	4.2	0.112	0.112	0.95	0.362	12.0
Case PB-11	PB23FS	23	92%	2	100%	Fired	Max Solar	Cooler Off	3,718.36	244.39	9.8	2.0	79.6%	14.35	9.8	4.0	3.0	59.2%	17.5	13.10	1.7	2.0	none	5.0	0.105	0.112	1.11	0.427	18.0
Case PB-12	PB59FS	59	60%	2	100%	Fired	Max Solar	Cooler On	3,530.74	247.68	9.9	2.0	79.7%	13.68	9.9	4.0	3.0	59.6%	16.7	12.49	1.7	2.0	none	4.8	0.104	0.112	1.06	0.407	18.0
Case PB-13	PB64FS	64	40%	2	100%	Fired	Max Solar	Cooler On	3,527.74	248.29	9.9	2.0	79.7%	13.67	9.9	4.0	3.0	59.6%	16.6	12.48	1.7	2.0	none	4.8	0.104	0.112	1.06	0.406	18.0
Case PB-14	PB98FS	98	17%	2	100%	Fired	Max Solar	Cooler On	3,394.04	256.78	9.9	2.0	79.8%	13.21	10.0	4.0	3.0	60.1%	16.1	12.07	1.7	2.0	none	4.6	0.104	0.112	1.03	0.393	18.0
Case PB-15	PB108FS	108	13%	2	100%	Fired	Max Solar	Cooler On	3,360.48	258.69	9.9	2.0	79.9%	13.10	10.1	4.0	3.0	60.3%	16.0	11.96	1.7	2.0	none	4.6	0.104	0.112	1.02	0.390	18.0
Case PB-16	PB23FN	23	92%	2	100%	Fired	No Solar	Cooler Off	3,718.36	870.03	11.5	2.0	82.6%	16.60	14.7	4.0	3.0	72.7%	20.2	15.16	2.5	2.0	20.8%	5.8	0.091	0.112	1.29	0.494	18.0
Case PB-17	PB59FN	59	60%	2	100%	Fired	No Solar	Cooler On	3,530.74	901.38	11.7	2.0	82.9%	16.03	15.1	4.0	3.0	73.6%	19.5	14.64	2.6	2.0	23.6%	5.6	0.089	0.112	1.25	0.477	18.0
Case PB-18	PB64FN	64	40%	2	100%	Fired	No Solar	Cooler On	3,527.74	903.59	11.7	2.0	82.9%	16.03	15.2	4.0	3.0	73.6%	19.5	14.64	2.6	2.0	23.7%	5.6	0.089	0.112	1.25	0.477	18.0
Case PB-19	PB98FN	98	17%	2	100%	Fired	No Solar	Cooler On	3,394.04	953.83	11.9	2.0	83.2%	15.72	15.7	4.0	3.0	74.5%	19.1	14.36	2.7	2.0	26.6%	5.5	0.087	0.112	1.22	0.468	18.0
Case PB-20	PB108FN	108	13%	2	100%	Fired	No Solar	Cooler On	3,360.48	960.29	11.9	2.0	83.2%	15.62	15.8	4.0	3.0	74.7%	19.0	14.27	2.7	2.0	27.1%	5.4	0.087	0.112	1.22	0.465	18.0
Case PB-21	PB23UN_1x100	23	92%	1	100%	Unfired	No Solar	Cooler Off	1,859.18	0.00	9.0	2.0	77.8%	13.47	7.5	3.0	2.0	59.9%	12.3	8.20	1.3	2.0	none	4.7	0.112	0.112	1.05	0.400	12.0
Case PB-22	PB59UN_1x100	59	60%	1	100%	Unfired	No Solar	Cooler On	1,765.37	0.00	9.0	2.0	77.8%	12.79	7.4	3.0	2.0	59.5%	11.7	7.78	1.3	2.0	none	4.5	0.112	0.112	0.99	0.380	12.0
Case PB-23	PB64UN_1x100	64	40%	1	100%	Unfired	No Solar	Cooler On	1,763.87	0.00	9.0	2.0	77.8%	12.77	7.4	3.0	2.0	59.5%	11.7	7.78	1.3	2.0	none	4.5	0.112	0.112	0.99	0.380	12.0
Case PB-24	PB98UN_1x100	98	17%	1	100%	Unfired	No Solar	Cooler On	1,697.02	0.00	9.0	2.0	77.8%	12.29	7.4	3.0	2.0	59.2%	11.2	7.48	1.3	2.0	none	4.3	0.112	0.112	0.95	0.365	12.0
Case PB-25	PB108UN_1x100	108	13%	1	100%	Unfired	No Solar	Cooler On	1,680.24	0.00	9.0	2.0	77.8%	12.17	7.3	3.0	2.0	59.1%	11.1	7.41	1.3	2.0	none	4.2	0.112	0.112	0.95	0.362	12.0
Case PB-26	PB23US_1x100	23	92%	1	100%	Unfired	Max Solar	Cooler Off	1,859.18	0.00	9.0	2.0	77.8%	13.47	7.5	3.0	2.0	59.9%	12.3	8.20	1.3	2.0	none	4.7	0.112	0.112	1.05	0.400	12.0
Case PB-27	PB59US_1x100	59	60%	1	100%	Unfired	Max Solar	Cooler On	1,765.37	0.00	9.0	2.0	77.8%	12.79	7.4	3.0	2.0	59.5%	11.7	7.78	1.3	2.0	none	4.5	0.112	0.112	0.99	0.380	12.0
Case PB-28	PB64US_1x100	64	40%	1	100%	Unfired	Max Solar	Cooler On	1,763.87	0.00	9.0	2.0	77.8%	12.77	7.4	3.0	2.0	59.5%	11.7	7.78	1.3	2.0	none	4.5	0.112	0.112	0.99	0.380	12.0
Case PB-29	PB98US_1x100	98	17%	1	100%	Unfired	Max Solar	Cooler On	1,697.02	0.00	9.0	2.0	77.8%	12.29	7.4	3.0	2.0	59.2%	11.2	7.48	1.3	2.0	none	4.3	0.112	0.112	0.95	0.365	12.0
Case PB-30	PB108US_1x100	108	13%	1	100%	Unfired	Max Solar	Cooler On	1,680.24	0.00	9.0	2.0	77.8%	12.17	7.3	3.0	2.0	59.1%	11.1	7.41	1.3	2.0	none	4.2	0.112	0.112	0.95	0.362	12.0
Case PB-31	PB23FS_1x100	23	92%	1	100%	Fired	Max Solar	Cooler Off	1,859.18	277.25	10.7	2.0	81.3%	15.46	12.4	4.0	3.0	67.7%	18.8	14.12	2.1	2.0	5.9%	5.4	0.097	0.112	1.20	0.460	18.0
Case PB-32	PB59FS_1x100	59	60%	1	100%	Fired	Max Solar	Cooler On	1,765.37	277.25	10.8	2.0	81.5%	14.78	12.6	4.0	3.0	68.2%	18.0	13.50	2.2	2.0	7.6%	5.2	0.096	0.112	1.15	0.440	18.0
Case PB-33	PB64FS_1x100	64	40%	1	100%	Fired	Max Solar	Cooler On	1,763.87	277.25	10.8	2.0	81.5%	14.77	12.6	4.0	3.0	68.2%	18.0	13.49	2.2	2.0	7.6%	5.2	0.096	0.112	1.15	0.439	18.0
Case PB-34	PB98FS_1x100	98	17%	1	100%	Fired	Max Solar	Cooler On	1,697.02	277.25	10.8	2.0	81.6%	14.29	12.7	4.0	3.0	68.5%	17.4	13.05	2.2	2.0	9.0%	5.0	0.096	0.112	1.11	0.425	18.0
Case PB-35	PB108FS_1x100	108	13%	1	100%	Fired	Max Solar	Cooler On	1,680.24	277.25	10.9	2.0	81.6%	14.16	12.7	4.0	3.0	68.6%	17.2	12.94	2.2	2.0	9.3%	4.9	0.096	0.112	1.10	0.421	18.0
Case PB-36	PB23FN_1x100	23	92%	1	100%	Fired	No Solar	Cooler Off	1,859.18	521.23	11.9	2.0	83.2%	17.22	15.8	4.0	3.0	74.7%	21.0	15.72	2.7	2.0	26.5%	6.0	0.087	0.112	1.34	0.512	18.0
Case PB-37	PB59FN_1x100	59	60%	1	100%	Fired	No Solar	Cooler On	1,765.37	521.23	12.0	2.0	83.3%	16.54	16.1	4.0	3.0	75.1%	20.1	15.10	2.8	2.0	28.1%	5.8	0.086	0.112	1.29	0.492	18.0
Case PB-38	PB64FN_1x100	64	40%	1	100%	Fired	No Solar	Cooler On	1,763.87	521.23	12.0	2.0	83.3%	16.53	16.1	4.0	3.0	75.1%	20.1	15.09	2.8	2.0	28.1%	5.8	0.086	0.112	1.29	0.492	18.0
Case PB-39	PB98FN_1x100	98	17%	1	100%	Fired	No Solar	Cooler On	1,697.02	521.23	12.1	2.0	83.5%	16.04	16.3	4.0	3.0	75.5%	19.5	14.65	2.8	2.0	29.3%	5.6	0.085	0.112	1.25	0.478	18.0
Case PB-40	PB108FN_1x100	108	13%	1	100%	Fired	No Solar	Cooler On	1,680.24	521.23	12.1	2.0	83.5%	15.92	16.4	4.0	3.0	75.6%	19.4	14.54	2.8	2.0	29.6%	5.6	0.085	0.112	1.24	0.474	18.0
Case PB-41	PB23UN_2x75	23	92%	2	75%	Unfired	No Solar	Cooler Off	3,028.45	0.00	9.0	2.0	77.8%	10.97	7.3	3.0	2.0	58.7%	10.0	6.68	1.2	2.0	none	3.8	0.112	0.112	0.85	0.326	12.0
Case PB-42	PB59UN_2x75	59	60%	2	75%	Unfired	No Solar	Cooler Off	2,848.27	0.00	9.0	2.0	77.8%	10.31	7.3	3.0	2.0	59.0%	9.4	6.28	1.2	2.0	none	3.6	0.112	0.112	0.80	0.307	12.0
Case PB-43	PB64UN_2x75	64	40%	2	75%	Unfired	No Solar	Cooler Off	2,823.23	0.00	9.0	2.0	77.8%	10.22	7.3	3.0	2.0	59.1%	9.3	6.22	1.2	2.0	none	3.6	0.112	0.112	0.79	0.304	12.0
Case PB-44	PB98UN_2x75	98	17%	2	75%	Unfired	No Solar	Cooler Off	2,622.45	0.00	9.0	2.0	77.8%	9.50	7.3	3.0	2.0	59.2%	8.7	5.78	1.2	2.0	none	3.3	0.112	0.112	0.74	0.282	12.0
Case PB-45	PB108UN_2x75	108	13%	2	75%	Unfired	No Solar	Cooler Off	2,553.39	0.00	9.0	2.0	77.8%	9.25	7.4	3.0	2.0	59.5%	8.4	5.63	1.3	2.0	none	3.2	0.112	0.112	0.72	0.275	12.0
Case PB-46	PB23US_2x75	23	92%	2	75%	Unfired	Max Solar	Cooler Off	3,028.45	0.00	9.0	2.0	77.8%	10.97	7.3	3.0	2.0	58.7%	10.0	6.68	1.2	2.0	none	3.8	0.112	0.112	0.85	0.326	12.0
Case PB-47	PB59US_2x75	59	60%	2	75%	Unfired	Max Solar	Cooler Off	2,848.27	0.00	9.0	2.0	77.8%	10.31	7.3	3.0	2.0	59.0%	9.4	6.28	1.2	2.0	none	3.6	0.112	0.112	0.80	0.307	12.0
Case PB-48	PB64US_2x75	64	40%	2	75%	Unfired	Max Solar	Cooler Off	2,823.23	0.00	9.0	2.0	77.8%	10.22	7.3	3.0	2.0	59.1%	9.3	6.22	1.2	2.0	none	3.6	0.112	0.112	0.79	0.304	12.0
Case PB-49	PB98US_2x75	98	17%	2	75%	Unfired	Max Solar	Cooler Off	2,622.45	0.00	9.0	2.0	77.8%	9.50	7.3	3.0	2.0	59.2%	8.7	5.78	1.2	2.0	none	3.3	0.112	0.112	0.74	0.282	12.0
Case PB-50	PB108US_2x75	108	13%	2	75%	Unfired	Max Solar	Cooler Off	2,553.39	0.00	9.0	2.0	77.8%	9.25	7.4	3.0	2.0	59.5%	8.4	5.63	1.3	2.0	none	3.2	0.112	0.112	0.72	0.275	12.0
Case PB-51	PB23UN_1x75	23	92%	1	75%	Unfired	No Solar	Cooler Off	1,514.23	0.00	9.0	2.0	77.8%	10.97	7.3	3.0	2.0	58.7%	10.0	6.68	1.2	2.0	none	3.8	0.112	0.112	0.85	0.326	12.0
Case PB-52	PB59UN_1x75	59	60%	1	75%	Unfired	No Solar	Cooler Off	1,424.13	0.00	9.0	2.0	77.8%	10.31	7.3	3.0	2.0	59.0%	9.4	6.28	1.2	2.0	none	3.6	0.112	0.112	0.80	0.307	12.0
Case PB-53	PB64UN_1x75	64	40%	1	75%	Unfired	No Solar	Cooler Off	1,411.61	0.00	9.0	2.0	77.8%	10.22	7.3	3.0	2.0	59.1%	9.3	6.22	1.2	2.0	none	3.6	0.112	0.112	0.79	0.304	12.0
Case PB-54	PB98UN_1x75	98	17%	1	75%	Unfired	No Solar	Cooler Off	1,311.22	0.00	9.0	2.0	77.8%	9.50	7.3	3.0	2.0	59.2%	8.7	5.78	1.2	2.0	none	3.3	0.112	0.112	0.74	0.282	12.0
Case PB-55	PB108UN_1x75	108	13%	1	75%	Unfired	No Solar	Cooler Off	1,276.70	0.00	9.0	2.0	77.8%	9.25	7.4	3.0	2.0	59.5%	8.4	5.63	1.3	2.0	none	3.2	0.112	0.112	0.72	0.275	12.0
Case PB-56	PB23US_1x75	23	92%	1	75%	Unfired	Max Solar	Cooler Off	1,514.23	0.00	9.0	2.0	77.8%	10.97	7.3	3.0	2.0	58.7%	10.0	6.68	1.2	2.0	none	3.8	0.112	0.112	0.85	0.326	12.0
Case PB-57	PB59US_1x75	59	60%	1	75%	Unfired	Max Solar	Cooler Off	1,424.13	0.00	9.0	2.0	77.8%	10.31	7.3	3.0	2.0	59.0%	9.4	6.28	1.2	2.0	none	3.6	0.112	0.112	0.80	0.307	12.0
Case PB-58	PB64US_1x75	64	40%	1	75%	Unfired	Max Solar	Cooler Off	1,411.61	0.00	9.0	2.0	77.8%	10.22	7.3	3.0	2.0	59.1%	9.3	6.22	1.2	2.0	none	3.6	0.112	0.112	0.79	0.304	12.0
Case PB-59	PB98US_1x75	98	17%	1	75%	Unfired	Max Solar	Cooler Off	1,311.22	0.00	9.0	2.0	77.8%	9.50	7.3	3.0	2.0	59.2%	8.7	5.78	1.2	2.0	none	3.3	0.112	0.112	0.74	0.282	12.0
Case PB-60	PB108US_1x75	108	13%	1	75%	Unfired	Max Solar	Cooler Off	1,276.70	0.00	9.0	2.0	77.8%	9.25	7.4	3.0	2.0	59.5%	8.4	5.63	1.3	2.0	none	3.2	0.112	0.112	0.72	0.275	12.0

Table 1 Emissions from Gas Turbine at Different Loads

											NOx (per turbine)				CO (per turbine)						VOC (per turbine)				SO_2 (per turbine)			H_2SO_4	PM10
Case Name	Case No.	Ambient temp., F	Relative humidity	CT Operating	Combustion Turbine Load	Duct Burner Fired/Unfired	Solar	Evap. Cooling	CTG Heat Input (HHV) (total: both turbines)	Duct Burner Heat Input (HHV) (total: both DBs)	NOx	NOx	NOx Reduction Required	NOx	CO	CO	CO permit limit	CO Reduction Required	CO	CO emissions at permit limit	VOC	VOC	VOC Reduction Required	VOC	SO_2	SO_2	SO_2	H_2SO_4	PM10 (front & back)
								CTG Inlet Air Cooler	MMBtu/h	MMBtu/h	ppmvd@15% O_2	ppmvd@15% O_2	%	lb/h as NO2	ppmvd@15% O_2	ppmvd@15% O_2	ppmvd@15% O_2	%	lb/h	lb/hr	ppmvd@15% O_2	ppmvd@15% O_2	%	lb/h as CH4	ppmvd@15% O_2	ppmvd@15% O_2	lb/h	lb/hr	lb/h
Case PB-61	PB23UN_2x50	23	92%	2	50%	Unfired	No Solar	Cooler Off	2,409.64	0.00	9.0	2.0	77.8%	8.73	7.4	3.0	2.0	59.7%	8.0	5.31	1.3	2.0	none	3.0	0.112	0.112	0.68	0.259	12.0
Case PB-62	PB59UN_2x50	59	60%	2	50%	Unfired	No Solar	Cooler Off	2,273.74	0.00	9.0	2.0	77.8%	8.24	7.6	3.0	2.0	60.6%	7.5	5.01	1.3	2.0	none	2.9	0.112	0.112	0.64	0.245	12.0
Case PB-63	PB64UN_2x50	64	40%	2	50%	Unfired	No Solar	Cooler Off	2,250.98	0.00	9.0	2.0	77.8%	8.15	7.7	3.0	2.0	60.9%	7.4	4.96	1.3	2.0	none	2.8	0.112	0.112	0.63	0.242	12.0
Case PB-64	PB98UN_2x50	98	17%	2	50%	Unfired	No Solar	Cooler Off	2,072.70	0.00	9.0	2.0	77.8%	7.51	8.0	3.0	2.0	62.5%	6.9	4.57	1.4	2.0	none	2.6	0.112	0.112	0.58	0.223	12.0
Case PB-65	PB108UN_2x50	108	13%	2	50%	Unfired	No Solar	Cooler Off	2,009.37	0.00	9.0	2.0	77.8%	7.28	8.1	3.0	2.0	63.1%	6.6	4.43	1.4	2.0	none	2.5	0.111	0.111	0.57	0.216	12.0
Case PB-66	PB23US_2x50	23	92%	2	50%	Unfired	Max Solar	Cooler Off	2,409.64	0.00	9.0	2.0	77.8%	8.73	7.4	3.0	2.0	59.7%	8.0	5.31	1.3	2.0	none	3.0	0.112	0.112	0.68	0.259	12.0
Case PB-67	PB59US_2x50	59	60%	2	50%	Unfired	Max Solar	Cooler Off	2,273.74	0.00	9.0	2.0	77.8%	8.24	7.6	3.0	2.0	60.6%	7.5	5.01	1.3	2.0	none	2.9	0.112	0.112	0.64	0.245	12.0
Case PB-68	PB64US_2x50	64	40%	2	50%	Unfired	Max Solar	Cooler Off	2,250.98	0.00	9.0	2.0	77.8%	8.15	7.7	3.0	2.0	60.9%	7.4	4.96	1.3	2.0	none	2.8	0.112	0.112	0.63	0.242	12.0
Case PB-69	PB98US_2x50	98	17%	2	50%	Unfired	Max Solar	Cooler Off	2,072.70	0.00	9.0	2.0	77.8%	7.51	8.0	3.0	2.0	62.5%	6.9	4.57	1.4	2.0	none	2.6	0.112	0.112	0.58	0.223	12.0
Case PB-70	PB108US_2x50	108	13%	2	50%	Unfired	Max Solar	Cooler Off	2,009.37	0.00	9.0	2.0	77.8%	7.28	8.1	3.0	2.0	63.1%	6.6	4.43	1.4	2.0	none	2.5	0.111	0.111	0.57	0.216	12.0
Case PB-71	PB23UN_1x50	23	92%	1	50%	Unfired	No Solar	Cooler Off	1,204.82	0.00	9.0	2.0	77.8%	8.73	7.4	3.0	2.0	59.7%	8.0	5.31	1.3	2.0	none	3.0	0.112	0.112	0.68	0.259	12.0
Case PB-72	PB59UN_1x50	59	60%	1	50%	Unfired	No Solar	Cooler Off	1,136.87	0.00	9.0	2.0	77.8%	8.24	7.6	3.0	2.0	60.6%	7.5	5.01	1.3	2.0	none	2.9	0.112	0.112	0.64	0.245	12.0
Case PB-73	PB64UN_1x50	64	40%	1	50%	Unfired	No Solar	Cooler Off	1,125.49	0.00	9.0	2.0	77.8%	8.15	7.7	3.0	2.0	60.9%	7.4	4.96	1.3	2.0	none	2.8	0.112	0.112	0.63	0.242	12.0
Case PB-74	PB98UN_1x50	98	17%	1	50%	Unfired	No Solar	Cooler Off	1,036.35	0.00	9.0	2.0	77.8%	7.51	8.0	3.0	2.0	62.5%	6.9	4.57	1.4	2.0	none	2.6	0.112	0.112	0.58	0.223	12.0
Case PB-75	PB108UN_1x50	108	13%	1	50%	Unfired	No Solar	Cooler Off	1,004.69	0.00	9.0	2.0	77.8%	7.28	8.1	3.0	2.0	63.1%	6.6	4.43	1.4	2.0	none	2.5	0.111	0.111	0.57	0.216	12.0
Case PB-76	PB23US_1x50	23	92%	1	50%	Unfired	Max Solar	Cooler Off	1,204.82	0.00	9.0	2.0	77.8%	8.73	7.4	3.0	2.0	59.7%	8.0	5.31	1.3	2.0	none	3.0	0.112	0.112	0.68	0.259	12.0
Case PB-77	PB59US_1x50	59	60%	1	50%	Unfired	Max Solar	Cooler Off	1,136.87	0.00	9.0	2.0	77.8%	8.24	7.6	3.0	2.0	60.6%	7.5	5.01	1.3	2.0	none	2.9	0.112	0.112	0.64	0.245	12.0
Case PB-78	PB64US_1x50	64	40%	1	50%	Unfired	Max Solar	Cooler Off	1,125.49	0.00	9.0	2.0	77.8%	8.15	7.7	3.0	2.0	60.9%	7.4	4.96	1.3	2.0	none	2.8	0.112	0.112	0.63	0.242	12.0
Case PB-79	PB98US_1x50	98	17%	1	50%	Unfired	Max Solar	Cooler Off	1,036.35	0.00	9.0	2.0	77.8%	7.51	8.0	3.0	2.0	62.5%	6.9	4.57	1.4	2.0	none	2.6	0.112	0.112	0.58	0.223	12.0
Case PB-80	PB108US_1x50	108	13%	1	50%	Unfired	Max Solar	Cooler Off	1,004.69	0.00	9.0	2.0	77.8%	7.28	8.1	3.0	2.0	63.1%	6.6	4.43	1.4	2.0	none	2.5	0.111	0.111	0.57	0.216	12.0

Table 2 Maximum Annual Emissions with Startups and Shutdowns

Operating Mode	Number of Events/yr	Duration (SU/SD)		Offline		NO_x	CO	VOC
		hr/event	hr/yr	hr/event	hr/yr	lb/stack	lb/stack	lb/stack
hot / warm start	260	1.3	347	6	1,560	40	329	28
cold start	50	1.8	92	48	2,400	96	410	31
shutdown	310	0.5	155	n/a	n/a	57	337	29
TOTALS			**593**		**3,960**			

Operating Mode	NO_x			
	hr/yr	lb/hr/turbine	Both Turbines total lb/hr	Both Turbines total tpy
without duct burning	2,180	12.8	25.5	27.8
with duct burning	2,000	13.7	27.3	27.3
	events/yr	**lb/event**	**total lb/event**	
hot / warm start	260	40.0	80.0	10.4
cold start	50	96.0	192.0	4.8
shutdown	310	57.0	114.0	17.7
TOTALS				**88**

Operating Mode	CO			
	hr/yr	lb/hr/turbine	Both Turbines total lb/hr	Both Turbines total tpy
without duct burning	2,180	7.8	15.6	17.0
with duct burning	2,000	12.5	25.0	25.0
	events/yr	**lb/event**	**total lb/event**	
hot / warm start	260	329	658	85.5
cold start	50	410	820	20.5
shutdown	310	337	674	104.5
TOTALS				**252**

Table 2 Maximum Annual Emissions with Startups and Shutdowns

Operating Mode	VOC			
	hr/yr	lb/hr/turbine	Both Turbines total lb/hr	Both Turbines total tpy
without duct burning	2,180	4.5	8.9	9.7
with duct burning	2,000	4.8	9.5	9.5
	events/yr	**lb/event**	**total lb/event**	
hot / warm start	260	28	56.0	7.3
cold start	50	31	62.0	1.6
shutdown	310	29	58.0	9.0
TOTALS				**37.1**

Operating Mode	H_2S			
	hr/yr	lb/hr/turbine	Both Turbines total lb/hr	Both Turbines total tpy
without duct burning	2,207	1.05E-03	2.09E-03	2.31E-03
with duct burning	2,000	1.12E-03	2.24E-03	2.24E-03
hot / warm start	347	0.0001	0.0002	0.0000
cold start	92	0.0001	0.0002	0.0000
shutdown	155	0.0001	0.0002	0.0000
TOTALS	**4,800**	**0.00**	**0.00**	**0.00**

Notes / Assumptions

Combustion Efficiency	99.98%	Start-up and Shut down
Sulfur Content of fuel	0.2	gr/100scf
	0.002	gr/scf
Molecular Weight of Sulfur	32	lb/mole
Molecular Weight of H2S	34	lb/mole
Heat Rate	1,763.87	MMBtu/hr/turbin without duct firing
HHV	1024	Btu/scf

NOx, CO, and VOC lb/stack emission rates are based on GE guarantees

Table 3 Comparison of Emissions for Continuous Operation to Emissions with Startups and Shutdowns

Continuous Operation Emissions (100% load, 64 F, 8,760 hr/yr)	Operating hours/yr per turbine	NO_x	NO_x	CO	CO	VOC	VOC	PM10	PM10	PM2.5	PM2.5	SO_2	SO_2	H_2SO_4	H_2SO_4	H_2S	H_2S
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Without duct burning	6,760	25.5	86.4	15.6	52.6	8.9	30.1	24.0	81.1	24.0	81.1	2.0	6.7	0.8	2.6	2.1E-03	7.1E-03
With duct burning	2,000	27.3	27.3	25.0	25.0	9.5	9.5	36.0	36.0	36.0	36.0	2.1	2.1	0.8	0.8	2.2E-03	2.2E-03
Total	8,760		**113.7**		**77.5**		**39.6**		**117.1**		**117.1**		**8.8**		**3.4**		**0.01**
Emissions with Start-up/Shutdown (includes normal operations and offline period associated with SU/SD)			**88.1**		**252.4**		**37.1**		**n/a**		**n/a**		**n/a**		**n/a**		**0.0**
Maximum Annual Emissions			**113.7**		**252.4**		**39.6**		**117.1**		**117.1**		**8.8**		**3.4**		**0.01**

Notes / Assumptions

		Average Discharge (ug/L)	
Combustion Efficiency	99.80%		
Sulfur Content of fuel	0.2	gr/100scf	
	0.002	gr/scf	
Molecular Weight of Sulfur	32	lb/mole	
Molecular Weight of H2S	34	lb/mole	
Heat Rate	3,527.74	MMBtu/hr	without duct
	3,776.03	MMBtu/hr	with duct firing
HHV	1024	Btu/scf	

PM10 and PM2.5 assumed to be equal to PM

Table 4 Emissions from Natural Gas Fired Auxiliary Boiler

Pollutant	Emission Factor [2] ($lb/10^6$ scf)	Emission Factor [2] (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (tpy)
NO_x [1]	---	0.0110	1.21	0.30
VOC	5.50	0.0054	0.59	0.15
CO	---	0.0368	4.05	1.01
SO_2	0.60	0.0006	0.06	0.02
PM	7.60	0.0074	0.82	0.20
PM10 [6]	7.60	0.0074	0.82	0.20
PM2.5 [6]	7.60	0.0074	0.82	0.20
Lead	5.00E-04	4.88E-07	5.37E-05	0.00
H_2SO_4 [3,5]	---	---	2.96E-03	0.00
H_2S [4]	---	5.93E-07	6.52E-05	0.00

Notes / Assumptions

Maximum annual operation	500	hr/yr
Boiler Heat Input	110	MMBtu/hr
Heating Value NG	1,024	Btu/scf
CO Emission limit	50	ppmv
Molecular Weight CO	28	lb/lb-mol
Molar volume	387	dscf/lb-mol
F-factor	8,710	scf/MMbtu
Combustion Efficiency	99.80%	
Sulfur Content of fuel	0.20%	gr/100scf
	0.00%	gr/scf
Molecular Weight of Sulfur	32	lb/mole
Molecular Weight of H_2S	34	lb/mole

1. Assumes 9 ppmvd NO_x at 3% O_2 with low NO_x burners.
2. From AP42 - Table 1.4-1 and Table 1.4-2
3. 3% of Sulfur Dioxide is oxidized to Sulfur Trioxide in the stacks and 100% of the Sulfur Trioxide formed is converted to Sulfuric Acid.
4. Auxiliary Boiler converts 99.8% of TRS to SO_2, rest is emitted as H_2S
5. EPA Emergency Planning and Community Right-To-Know Act - Section 313 Guidance for Reporting Sulfuric Acid
6. PM10 and PM2.5 are assume to be equal to PM

Table 5 Emissions from Natural Gas Fired HTF Heater

Pollutant	Emission Factor [2] ($lb/10^6$ scf)	Emission Factor [2] (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (tpy)
NO_x [1]	---	0.0110	0.44	0.22
VOC	5.5	0.0054	0.21	0.11
CO	---	0.0368	1.47	0.74
SO_2	0.6	0.0006	0.02	0.01
PM	7.6	0.0074	0.30	0.15
PM10 [6]	7.6	0.0074	0.30	0.15
PM2.5 [6]	7.6	0.0074	0.30	0.15
Lead	5.00E-04	4.88E-07	1.95E-05	0.00
H_2SO_4 [3,5]	---	---	1.08E-03	0.00
H_2S [4]	---	5.93E-07	0.00	0.00

Notes / Assumptions

Maximum annual operation	1,000	hr/yr
Boiler Heat Input	40.00	MMBtu/hr
Heating Value NG	1,024	Btu/scf
F-factor	8,710	scf/MMBtu
CO Emission limit	50	ppmv
Molecular Weight CO	28	lb/lb-mol
Molar volume	387	dscf/lb-mol
Combustion Efficiency	99.80%	
Sulfur Content of fuel	0.20%	gr/100scf
	0.00%	gr/scf
Molecular Weight of Sulfur	32	lb/mole
Molecular Weight of H_2S	34	lb/mole

1. Assumes 9 ppmvd NO_x at 3% O_2 with low NO_x burners.
2. From AP42 - Table 1.4-1 and Table 1.4-2
3. 3% of Sulfur Dioxide is oxidized to Sulfur Trioxide in the stacks and 100% of the Sulfur Trioxide formed is converted to Sulfuric Acid.
4. HTF heater converts 99.8% of TRS to SO_2, rest is emitted as H_2S
5. EPA Emergency Planning and Community Right-To-Know Act - Section 313 Guidance for Reporting Sulfuric Acid
6. PM10 and PM2.5 is assumed to be equal to PM

Table 6 Emissions from Emergency Diesel Generator

Pollutant	Emission Factor	Units	Hourly Emissions			Annual Emissions	
			(lb/hr)	(g/hp-hr)	(g/s)	(tpy)	(g/s)
NO_x	6.4	g/kW-hr	26.80	4.53	3.38	0.67	0.019
VOC	6.4	g/kW-hr	1.41	0.24	0.18	0.04	0.001
CO	3.5	g/kW-hr	15.43	2.61	1.94	0.39	0.011
SO_2 [1]	0.0015	lb/MMBtu	0.029	0.005	0.0037	7.4E-04	2.1E-05
PM	0.2	g/kW-hr	0.88	0.15	0.11	0.02	6.3E-04
PM10	0.2	g/kW-hr	0.88	0.15	0.11	0.02	6.3E-04
PM2.5	0.2	g/kW-hr	0.88	0.15	0.11	0.02	6.3E-04
Lead [2]	9.E-06	lb/MMBtu	1.8E-04	3.0E-05	2.2E-05	4.4E-06	1.3E-07
H_2SO_4 [3,4]	---	---	1.4E-03	2.3E-04	1.7E-04	3.4E-05	9.7E-07
H_2S [5,6]	1.7.E-06	lb/MMBtu	3.2E-05	5.4E-06	4.0E-06	8.0E-07	2.3E-08

Notes / Assumptions

Diesel engine output:	2,681	hp	2.0	MW
Diesel engine output:	6.82	MMBtu/hr		
Diesel engine input:	19.45	MMBtu/hr	Vendor data	
Maximum Annual Hours of Operation for Testing:	50	hours/year		
Molecular Weight of Sulfur	32	lb/mole		
Molecular Weight of H_2S	34	lb/mole		
Heating Value of diesel	19,300	Btu/lb		
Sulfur Content of Fuel	0.0015	%		

1. The emission factor for SO_2 is 1.01 times the sulfur content of the fuel. AP-42 Table 3.4-1 (10/96)
2. Emissions factors for lead similar to BACT for recent permits (Desert Rock Project). Remaining from Caterpillar.

3. 3% of Sulfur Dioxide is oxidized to Sulfur Trioxide in the stacks and 100% of the Sulfur Trioxide formed is converted to Sulfuric Acid.
4. EPA Emergency Planning and Community Right-To-Know Act - Section 313 Guidance for Reporting Sulfuric Acid
5. HTF heater converts 99.8% of TRS to SO_2, rest is emitted as H_2S
6. Combustion Efficiency 99.80%
7. PM10 and PM2.5 are assumed to be equal to PM

Table 7 Emissions from Firewater Pump Diesel Engine

Pollutant	Emission Factor	Units	Hourly Emissions			Annual Emissions	
			(lb/hr)	(g/hp-hr)	(g/s)	(tpy)	(g/s)
NO_x	4	g/kW-hr	1.14	2.83	0.14	0.03	0.001
VOC	4	g/kW-hr	0.06	0.15	0.01	0.00	0.000
CO	3.5	g/kW-hr	1.05	2.61	0.13	0.03	0.001
SO_2 [1]	0.0015	lb/MMBtu	0.002	0.005	0.0003	5.0E-05	1.4E-06
PM	0.2	g/kW-hr	0.06	0.15	0.01	0.0015	4.3E-05
PM10	0.2	g/kW-hr	0.06	0.15	0.01	0.0015	4.3E-05
PM2.5	0.2	g/kW-hr	0.06	0.15	0.01	0.0015	4.3E-05
Lead [2]	9.E-06	lb/MMBtu	1.2E-05	3.0E-05	1.5E-06	3.0E-07	8.5E-09
H_2SO_4 [3,4]	---	---	9.2E-05	2.3E-04	1.2E-05	2.3E-06	6.6E-08
H_2S [5,6]	1.65E-06	lb/MMBtu	2.2E-06	5.4E-06	2.7E-07	5.5E-08	1.6E-09

Notes / Assumptions

Diesel engine output:	182	hp	1.341 hp/kW
Diesel engine output:	0.46	MMBtu/hr	1hp = 2544 Btu/hr
Diesel engine input:	1.32	MMBtu/hr	
Maximum Annual Hours of Operation for Testing:	50	hours/year	
Molecular Weight of Sulfur	32	lb/mole	
Molecular Weight of H_2S	34	lb/mole	
Heating Value of diesel	19,300	Btu/lb	
Sulfur Content of Fuel	0.0015	%	

1. The emission factor for SO_2 is 1.01 times the sulfur content of the fuel. AP-42 Table 3.4-1 (10/96)
2. Emissions factors for lead similar to BACT for recent permits (Desert Rock Project). Remaining from Caterpillar.
3. 3% of Sulfur Dioxide is oxidized to Sulfur Trioxide in the stacks and 100% of the Sulfur Trioxide formed is converted to Sulfuric Acid.
4. EPA Emergency Planning and Community Right-To-Know Act - Section 313 Guidance for Reporting Sulfuric Acid
5. HTF heater converts 99.8% of TRS to SO_2, rest is emitted as H_2S
6. Combustion Efficiency 99.80%
7. PM10 and PM2.5 are assumed to be equal to PM

Table 8 Cooling Tower Particulate Matter Emissions Estimates

Parameter	Units	Value
Water Circulation Rate	gpm	130,000
Total Liquid Drift	(%)	0.00050
Maximum TDS of Circulated Water	(ppmw)	5,000
TDS in make-up water[2]	(ppmw)	531
Emission Rate - Total Cooling Tower		
PM	lb/hr	1.63
	tpy	7.13
PM10	lb/hr	1.63
	tpy	7.13
PM2.5	lb/hr	1.63
	tpy	7.13

Notes / Assumptions

Rates calculated as follows:
E lb/hr = Water Circulation Rate gpm * 60 min/hr * Drift % / 100 * 8.3453 lb/gal * TDS lb PM / 1,000,000 lb water
E ton/yr = E lb/hr * 8,760 hr/yr * ton/2,000 lb

1. PM Emission Rate = based on EPA AP-42, Section 13.4 Wet Cooling Towers, Table 13.4-1, modified to design

2. Assuming a reclaimed water TDS of 531 ppm the cooling tower cycles of concentration will be between 4 and 8.

3. PM2.5 and PM10 are assumed to be equal to PM

Table 9 Cooling Tower VOC Emission Estimates

Substance	CAS Number	Reported Discharge [1]		Emissions (per unit)		Emissions (total)	
		Average Discharge (ug/L)	Maximum Discharge (ug/L)	Max Hourly (lb/hr/unit)	Annual (lb/yr/unit)	Max Hourly (lb/hr)	Annual (lb/yr)
Emission Rate for Volatile Compounds:							
p-Dichlorobenzene	106467	8.34E-04	2.50E-03	5.900E-07	1.73E-03	5.90E-06	1.73E-02
Chloroform	67663	2.04E-03	1.40E-02	1.386E-03	1.21E+01	1.39E-02	1.21E+02
Perchloroethylene {tetrachloroethene}	127184	1.10E-05	1.10E-05	2.596E-09	2.27E-05	2.60E-08	2.27E-04
Trichloroethylene	79016	5.00E-07	5.00E-07	1.180E-10	1.03E-06	1.18E-09	1.03E-05
Toluene	108883	7.78E-04	7.78E-04	1.836E-07	1.61E-03	1.84E-06	1.61E-02
Xylenes (mixed xylenes)	1330207	7.60E-04	7.60E-04	1.794E-07	1.57E-03	1.79E-06	1.57E-02
Phenol	108952	4.00E-05	4.00E-05	9.440E-09	8.27E-05	9.44E-08	8.27E-04
Total (tpy)							**6.06E-02**

Chloroform Emissions due to Biocide Usage:

Item	Value
Emission Factor (lb chloroform/lb chlorine added)[3]	0.0034
Sodium Hypochlorite Solution Use (gal/month)	2,500
Sodium Hypochlorite Density (lb/gal)	10
Sodium Hypochlorite Solution Concentration (%)	12.5%
lb Chlorine Equivalent/lb Sodium Hypochlorite	0.95
Chloroform Emissions (lb/yr)	121.1
Chloroform Emissions (lb/hr)	1.38E-02

Notes / Assumptions

Cooling Tower Recirculation Rate:	130,000	gpm
Drift Eliminator Efficiency:	0.00050%	
Drift:	3.3	lbs/hr (E lb/hr = Water Circulation Rate gpm * 60 min/hr * Drift % / 100 * 8.3453 lb/gal)
Cooling Tower Cylces of Concentration:	9.4	
Cooling Tower Makeup Rate	4,714	gpm

Emission Rate for Volatile Compounds: ER (lb/hr) = Makeup rate (gal/min) * 60 min/hr * 3.785 liters/gal * HAP conc (ug/liter) * 1lb / 453.6 g * 1g / 10^6 ug * Volatilization Fraction (assumed to be one)

1. Based on water quality data obtained from the Victor Valley Water Reclamation Authority for 2004 and 2005.
2. Ten cooling tower stacks (units) modeled.

Table 10 Maintenance Vehicle Fugitive PM, PM10 and PM2.5 Emissions

Vehicle	Distance		Daily Emissions			Annual Emissions		
	(Miles/yr)	(Miles/day)	PM (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM (tpy)	PM10 (tpy)	PM2.5 (tpy)
Mirror Wash Truck	600	4.8	21.77	6.55	0.65	1.36	0.41	0.04
Maintenance Vehicles	19200	76.8	177.04	53.26	5.33	22.13	6.66	0.67
Weed Abatement	68	40	181.43	54.58	5.46	0.15	0.05	0.00
Soil Stabilizer Application	68	40	181.43	54.58	5.46	0.15	0.05	0.00
Total			561.68	168.98	16.90	23.80	7.16	0.72

Fugitive Dust Emission Factors

Vehicle Use	Vehicle Type	Vehicle Weight (tons)	Emission Factors		
			PM (lb/mi)	PM10 (lb/mi)	PM2.5 (lb/mi)
Mirror Wash Truck	Water Trucks, Freightliner 4000 gallon	13.5	4.54	1.36	0.14
Maintenance Vehicles	On-Site 3/4 Ton Pick-Up, Ford	3	2.31	0.69	0.07
Weed Abatement	Water Trucks, Freightliner 4000 gallon	13.5	4.54	1.36	0.14
Soil Stabilizer Application	Water Trucks, Freightliner 4000 gallon	13.5	4.54	1.36	0.14

Notes / Assumptions

$EF = k\,(s/12)^a\,(W/3)^b\,(1-CE/100)$

k =	4.9	Particle size multiplier for PM-30, used for PM
	1.5	Particle size multiplier for PM10
	0.15	Particle size multiplier for PM2.5
a =	0.7	for PM-30, used for PM
	0.9	for PM10 and PM2.5
b =	0.45	for PM, PM10 and PM2.5
s = surface silt content =	11%	Default conservative silt content from MDAQMD guidance
W = mean vehicle weight		
CE =	50%	Based on quarterly application of dust suppressant

Vehicle weights for the mirror wash, weed abatement and soil stabilizer application trucks is the average of a full truck and an empty truck.

Emissions [pounds] = Emission factor [pounds/mile] x Vehicle miles traveled [miles]

The daily and annual VMT are estimated based on the following assumptions:
Mirror washing weekly six months per year and once per month for six months per year;
Application of soil stabilizers in the solar field quarterly;
Application of weed killer in the solar field quarterly; and
Inspection of the solar piping three times per day.
There is approximately 18 miles of piping in the solar field.

Table 11 Hazardous Air Pollutant Emission Estimates - Operational Turbines

Substance	CAS Number	Emission Factor (lbs/MMBtu)	Emission Factor (lb/MMscf)	Gas Input (MMscf/hr)	Emissions (each)			Emissions (total)		
					(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
Acetaldehyde	75070	4.00E-05	4.08E-02	1.94	7.93E-02	6.94E+02	3.47E-01	1.59E-01	1.39E+03	6.94E-01
Acrolein	107028	6.40E-06	6.53E-03	1.94	1.27E-02	1.11E+02	5.55E-02	2.54E-02	2.22E+02	1.11E-01
Benzene	71432	1.20E-05	1.22E-02	1.94	2.38E-02	2.08E+02	1.04E-01	4.76E-02	4.17E+02	2.08E-01
1,3-Butadiene	106990	4.30E-07	4.39E-04	1.94	8.52E-04	7.46E+00	3.73E-03	1.70E-03	1.49E+01	7.46E-03
Ethylbenzene	100414	3.20E-05	3.26E-02	1.94	6.34E-02	5.55E+02	2.78E-01	1.27E-01	1.11E+03	5.55E-01
Formaldehyde (2)	50000	7.10E-05	7.24E-02	1.94	1.41E-01	1.23E+03	6.16E-01	2.81E-01	2.46E+03	1.23E+00
Naphthalene	91203	1.30E-06	1.33E-03	1.94	2.58E-03	2.26E+01	1.13E-02	5.15E-03	4.51E+01	2.26E-02
Benzo(a)anthracene (3)	56553		7.75E-05	1.94	1.50E-04	1.32E+00	6.59E-04	3.01E-04	2.64E+00	1.32E-03
Benzo(a)pyrene (3)	50328		4.76E-05	1.94	9.26E-05	8.11E-01	4.05E-04	1.85E-04	1.62E+00	8.11E-04
Benzo(b)fluoranthene (3)	205992		3.87E-05	1.94	7.52E-05	6.59E-01	3.30E-04	1.50E-04	1.32E+00	6.59E-04
Benzo(k)fluoranthene (3)	207089		3.77E-05	1.94	7.32E-05	6.42E-01	3.21E-04	1.46E-04	1.28E+00	6.42E-04
Chrysene (3)	218019		8.64E-05	1.94	1.68E-04	1.47E+00	7.35E-04	3.36E-04	2.94E+00	1.47E-03
Dibenz(a,h)anthracene (3)	53703		8.06E-05	1.94	1.56E-04	1.37E+00	6.85E-04	3.13E-04	2.74E+00	1.37E-03
Indeno(1,2,3-cd)pyrene (3)	193395		8.06E-05	1.94	1.56E-04	1.37E+00	6.85E-04	3.13E-04	2.74E+00	1.37E-03
Propylene Oxide	75569	2.90E-05	2.96E-02	1.94	5.75E-02	5.03E+02	2.52E-01	1.15E-01	1.01E+03	5.03E-01
Toluene	108883	1.30E-04	1.33E-01	1.94	2.58E-01	2.26E+03	1.13E+00	5.15E-01	4.51E+03	2.26E+00
Xylene (Total)	1330207	6.40E-05	6.53E-02	1.94	1.27E-01	1.11E+03	5.55E-01	2.54E-01	2.22E+03	1.11E+00

Notes / Assumptions

PB-11	23 F/92%RH	
Turbines + Duct Burners (max solar)	2	total
Operating Schedule	8,760	hours/year
Gas Heat Content	1,020	MMBtu/MMscf
CTG Heat Input:	3,718	MMBtu/hr (HHV Total)
DB Heat Input:	244	MMBtu/hr (HHV Total)
Total Heat Input:	3,963	MMBtu/hr (Total)

Hourly Natural Gas Fuel Rate		
Turbine	1.82	MMscf/hour
Duct Burner	0.12	MMscf/hour
Turbine + Duct Burner	1.94	MMscf/hour
Annual Natural Gas Fuel Rate		
Turbine	15,967	MMBtu/year
Duct Burner	1,049	MMscf/year
Turbine + Duct Burner	17,017	MMscf/year

1. Emission factors are from AP-42 Section, Table 3.1-3 Emission factors for HAP's from natural gas-fired stationary gas turbines
2. Formaldehyde AP-42 emission factor adjusted for 90% emissions control usinig oxidation catalyst (ref.)
3. Unspeciated PAH (polycyclic aromatic hydrocarbon) emissions based on AP-42 composite emission factor of 2.20E-06 lbs/MMBtu. PAH speciation profile derived from California Air Toxics Emission Factors (CATEF) database for natural gas-fired turbine engines

Table 12 Hazardous Air Pollutant Emission Estimates - Natural Gas Fired Auxiliary Boiler

Substance	CAS Number	Emission Factor [1] (lbs/MMscf)	Max Hourly Emissions (lb/hr)	Annual Emissions	
				(lb/yr)	(tpy)
Benzene	71432	0.0058	6.25E-04	0.31275	1.56E-04
Formaldehyde	50000	0.0123	1.33E-03	0.00033	6.63E-01
PAH's (excluding naphthalene) [(2)]	1151	0.0004	4.31E-05	0.00001	2.16E-02
Naphthalene	91203	0.0003	3.24E-05	0.00001	1.62E-02
Acetaldehyde	75070	0.0031	3.34E-04	0.00008	1.67E-01
Acrolein	107028	0.0027	2.91E-04	0.00007	1.46E-01
Toluene	108883	0.0265	2.86E-03	0.00071	1.43E+00
Xylenes	1330207	0.0197	2.12E-03	0.00053	1.06E+00
Ethyl benzene	100414	0.0069	7.44E-04	0.00019	3.72E-01
Hexane	110543	0.0046	4.96E-04	0.00012	2.48E-01

Notes / Assumptions

Maximum Heat Rate:	110	MMBtu/Hr
Maximum Annual Hours of Operation:	500	hours/year
Heat Value:	1,020	Btu/scf

1. Emission factors based on Ventura County Air Pollution Control District, AB2588 Combustion Emission Factors for Natural Gas Fired External Combustion Equipment 10-100 MMBtu/Hr, May 2001

2. Unspeciated PAH (polycyclic aromatic hydrocarbon) emissions based on composite emission factor. Benzo(a)pyrene or B(a)P was modeled as the surrogate carcinogen for all PAH emissions, as indicated by the CAS number shown. Since the (B(a)P) surrogate

Table 13 Hazardous Air Pollutant Emission Estimates - Natural Gas Fired HTF Heater

Substance	CAS Number	Emission Factor [1] (lb/MMscf)	Max Hourly Emissions (lb/hr)	Annual Emissions	
				(lb/yr)	(tpy)
Benzene	71432	0.0058	2.27E-04	2.27E-01	1.14E-04
Formaldehyde	50000	0.0123	4.82E-04	4.82E-01	2.41E-04
PAH's (excluding naphthalene) [(2)]	1151	0.0004	1.57E-05	1.57E-02	7.84E-06
Naphthalene	91203	0.0003	1.18E-05	1.18E-02	5.88E-06
Acetaldehyde	75070	0.0031	1.22E-04	1.22E-01	6.08E-05
Acrolein	107028	0.0027	1.06E-04	1.06E-01	5.29E-05
Toluene	108883	0.0265	1.04E-03	1.04E+00	5.20E-04
Xylenes	1330207	0.0197	7.73E-04	7.73E-01	3.86E-04
Ethyl benzene	100414	0.0069	2.71E-04	2.71E-01	1.35E-04
Hexane	110543	0.0046	1.80E-04	1.80E-01	9.02E-05

Notes / Assumptions

Maximum Heat Rate:	40	MMBtu/Hr
Maximum Annual Hours of Operation:	1,000	hours/year
Heat Value:	1,020	Btu/scf

1. Emission factors based on Ventura County Air Pollution Control District, AB2588 Combustion Emission Factors for Natural Gas Fired External Combustion Equipment 10-100 MMBtu/Hr, May 2001

2. Unspeciated PAH (polycyclic aromatic hydrocarbon) emissions based on composite emission factor. Benzo(a)pyrene or B(a)P was modeled as the surrogate carcinogen for all PAH emissions, as indicated by the CAS number shown. Since the (B(a)P) surrogate

Table 14 Hazardous Air Pollutant Emission Estimates - Emergency Engines

Pollutant	CAS	Emission Factor (lb/MMBtu)	Generator Emissions lb/hr	Generator Emissions tpy	Fire Water Pump Emissions lb/hr	Fire Water Pump Emissions tpy	Emergency Engine Total lbs/yr	Emergency Engine Total tpy
Benzene	71432	7.76E-04	1.51E-02	3.02E-01	1.02E-03	5.12E-02	1.77E-04	3.53E-01
Toluene	108883	2.81E-04	5.46E-03	1.09E-01	3.71E-04	1.85E-02	6.39E-05	1.28E-01
Xylenes	1330207	1.93E-04	3.75E-03	7.51E-02	2.55E-04	1.27E-02	4.39E-05	8.78E-02
Formaldehyde	50000	7.89E-05	1.53E-03	3.07E-02	1.04E-04	5.21E-03	1.79E-05	3.59E-02
Acetaldehyde	75070	2.52E-05	4.90E-04	9.80E-03	3.33E-05	1.66E-03	5.73E-06	1.15E-02
Acrolein	107028	7.88E-06	1.53E-04	3.06E-03	1.04E-05	5.20E-04	1.79E-06	3.58E-03
Napthalene	91203	1.30E-04	2.53E-03	5.06E-02	1.72E-04	8.58E-03	2.96E-05	5.91E-02
Acenaphthylene	208968	9.23E-06	1.79E-04	3.59E-03	1.22E-05	6.09E-04	2.10E-06	4.20E-03
Acenaphthene	83329	4.68E-06	9.10E-05	1.82E-03	6.18E-06	3.09E-04	1.06E-06	2.13E-03
Fluorene	86737	1.28E-05	2.49E-04	4.98E-03	1.69E-05	8.45E-04	2.91E-06	5.82E-03
Phenanthrene	85018	4.08E-05	7.93E-04	1.59E-02	5.39E-05	2.69E-03	9.28E-06	1.86E-02
Anthracene	120127	1.23E-06	2.39E-05	4.78E-04	1.62E-06	8.12E-05	2.80E-07	5.60E-04
Fluoranthene	206440	4.03E-06	7.84E-05	1.57E-03	5.32E-06	2.66E-04	9.17E-07	1.83E-03
Pyrene	129000	3.71E-06	7.21E-05	1.44E-03	4.90E-06	2.45E-04	8.44E-07	1.69E-03
Benz(a)anthracene	56553	6.22E-07	1.21E-05	2.42E-04	8.21E-07	4.11E-05	1.41E-07	2.83E-04
Chrysene	218019	1.53E-06	2.98E-05	5.95E-04	2.02E-06	1.01E-04	3.48E-07	6.96E-04
Benzo(b)fluoranthene	205992	1.11E-06	2.16E-05	4.32E-04	1.47E-06	7.33E-05	2.52E-07	5.05E-04
Benzo(k)fluoranthene	207089	2.18E-07	4.24E-06	8.48E-05	2.88E-07	1.44E-05	4.96E-08	9.92E-05
Benzo(a)pyrene	50328	2.57E-07	5.00E-06	1.00E-04	3.39E-07	1.70E-05	5.85E-08	1.17E-04
Indeno(1,2,3-cd)pyrene	193395	4.14E-07	8.05E-06	1.61E-04	5.47E-07	2.73E-05	9.42E-08	1.88E-04
Dibenz(a,h)anthracene	53703	3.46E-07	6.73E-06	1.35E-04	4.57E-07	2.28E-05	7.87E-08	1.57E-04
Benzo(g,h,i)perylene	191242	5.56E-07	1.08E-05	2.16E-04	7.34E-07	3.67E-05	1.26E-07	2.53E-04
TOTAL PAH (POM)		2.12E-04	4.12E-03	8.25E-02	2.80E-04	1.40E-02	4.82E-05	9.64E-02
Total HAPS				**6.94E-01**		**1.18E-01**	**4.06E-04**	**8.12E-01**

Notes / Assumptions

Emergency Generator Engine

Engine output:	2,681	hp	2.0	MW
Engine output:	6.82	MMBtu/hr		
Engine input:	19.45	MMBtu/hr	Vendor data	
Maximum Annual Hours of Operation:	20	hours/year		

Fire Water Pump Engine

Engine output:	182	hp	1.341 hp/kW
Engine output:	0.463	MMBtu/hr	1hp = 2544 Btu/hr
Engine input:	1	MMBtu/hr	
Maximum Annual Hours of Operation:	50	hours/year	

Table 15 Hazardous Air Pollutant Emission Estimates - Cooling Towers

Substance	CAS Number	Reported Discharge [1]		Emissions (per unit)		Emissions (total)		
		Average Dischange (ug/l)	Maximum Discharge (ug/l)	Max Hourly (lb/hr/unit)	Annual (lb/yr/unit)	Max Hourly (lb/hr)	Annual (lb/yr)	Annual (tpy)
Emission Rate for Non-Volatile Compounds:								
Arsenic	7440382	6.98E-03	2.20E-02	2.943E-07	8.18E-04	2.94E-06	8.18E-03	4.09E-06
Beryllium	7440417	8.03E-03	8.03E-03	1.075E-07	9.41E-04	1.07E-06	9.41E-03	4.71E-06
Cyanide compounds	1073	4.00E-05	6.00E-05	8.027E-10	4.69E-06	8.03E-09	4.69E-05	2.34E-08
Selenium	7782492	1.16E-02	2.20E-02	2.943E-07	1.36E-03	2.94E-06	1.36E-02	6.82E-06
Emission Rate for Volatile Compounds:								
p-Dichlorobenzene	106467	8.34E-04	2.50E-03	5.900E-07	1.73E-03	5.90E-06	1.73E-02	8.63E-06
Chloroform	67663	2.04E-03	1.40E-02	3.304E-06	4.21E-03	3.30E-05	4.21E-02	2.10E-05
Perchloroethylene {tetrachloroethen	127184	1.10E-05	1.10E-05	2.596E-09	2.27E-05	2.60E-08	2.27E-04	1.14E-07
Trichloroethylene	79016	5.00E-07	5.00E-07	1.180E-10	1.03E-06	1.18E-09	1.03E-05	5.17E-09
Toluene	108883	7.78E-04	7.78E-04	1.836E-07	1.61E-03	1.84E-06	1.61E-02	8.04E-06
Xylenes (mixed xylenes)	1330207	7.60E-04	7.60E-04	1.794E-07	1.57E-03	1.79E-06	1.57E-02	7.86E-06
Phenol	108952	4.00E-05	4.00E-05	9.440E-09	8.27E-05	9.44E-08	8.27E-04	4.13E-07

Notes / Assumptions

Cooling Tower Recirculation Rate:	130,000	gpm
Drift Eliminator Efficiency:	0.0005	%
Drift:	325.5	lb/hr (E lb/hr = Water Circulation Rate gpm * 60 min/hr * Drift % / 100 * 8.3453 lb/gal)
Cooling Tower Cylces of Concentration:	5	dimensionless
Cooling Tower Makeup Rate	4,714	gpm

Emission Rate for Non-Volatile Compounds: 1g / 10^6 ug * Drift Fraction * 4000/973 (5 conc cycles)
Emission Rate for Volatile Compounds: 10^6 ug * Volatilization Fraction (assumed to be one)

1. Based on water quality data obtained from the Victor Valley Water Reclamation Authority for 2004 and 2005.

Appendix C

Modeling Archive

PALMDALE HYBRID POWER PROJECT

DRAFT

BIOLOGICAL ASSESSMENT
LOS ANGELES COUNTY, CALIFORNIA

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March 2009
AMEC Project No. 6554000247

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PALMDALE HYBRID POWER PROJECT
Biological Assessment

1.0 INTRODUCTION

AMEC Earth & Environmental, Inc. (AMEC) prepared this Biological Assessment (BA) for the development of the proposed Palmdale Hybrid Power Project (PHPP or Project) to assist the U.S. Fish and Wildlife Service (FWS) and the U.S. Environmental Protection Agency (EPA) in satisfying their consultation responsibilities under Section 7 of the federal Endangered Species Act (ESA). EPA will be consulting with FWS on issuance of a federal Clean Air Act Prevention of Significant Deterioration (PSD) permit for the Project.

2.0 PROJECT LOCATION AND DESCRIPTION

2.1 Project Location

The City of Palmdale (City) is located in the High Desert region of Los Angeles County, approximately 60 freeway miles north of downtown Los Angeles (Figure 1). It is separated from Los Angeles by the San Gabriel Mountain range. Palmdale is one of two incorporated cities and several unincorporated communities within the Antelope Valley. The City is bordered by the City of Lancaster and the unincorporated community of Quartz Hill to the north; the unincorporated communities of Lake Los Angeles and Littlerock to the east; the unincorporated community of Acton to the south; and the unincorporated community of Leona Valley to the west. The City of Palmdale Planning Area encompasses approximately 174 square miles within a transitional area between the foothills of the San Gabriel and Sierra Pelona Mountains and the Mojave Desert to the north and east (City of Palmdale 1993).

In general, the Planning Area slopes from south to north-northeast, with surface and subsurface flows trending away from the foothills to Rosamond Dry Lake. The major watercourses flowing through Palmdale are Amargosa Creek, Anaverde Creek, Little Rock Wash, and Big Rock Wash. While foothill areas within and adjacent to the City contain significant slopes, a majority of the Planning Area is relatively flat. The climate of Palmdale and the Antelope Valley is dominated by the region's Pacific high-pressure system, which contributes to the area's hot, dry summers and relatively mild winters (City of Palmdale 1993).

The native plants and wildlife of the Antelope Valley have adapted to the arid climate and quick-draining, sandy soils. Development, however, has resulted in replacement of the existing desert species with landscaping materials not native to the region that require regular watering to survive. Development has also blocked access to and eliminated foraging and nesting areas, and introduced air and water pollution that can adversely affect habitat quality. Past development patterns have created habitat "islands," isolating populations of species and thereby reducing their local long-term viability (City of Palmdale 1993).

The Project consists of six components (with quadrangle and Township Range Section (TRS) data below):

1. Power Plant Site and Construction Laydown Area:
   - USGS 7.5' Quadrangle: Lancaster East
   - T6N, R12W, S 1-2

2. Transmission Line
   - USGS 7.5' Quadrangles: Lancaster East, Alpine Butte, Littlerock, Palmdale, Pacifico Mountain
   - T5N, R10W; R11W, S 19-24, 29-30; R12W, S 23-24, 26-27;
   - T6N, R10W, S 4-5, 9, 16, 20-21, 23, 26-29, 35; R11W, S 6; R12W, S 1;
   - T7N, R10W, S 29, 31-33; R11W, S 29, 31-36; R12W, S 36

3. Reclaimed Water Pipeline
   - USGS 7.5' Quadrangles: Lancaster West, Lancaster East, Palmdale
   - T6N, R11W, S 17-20; R12W, S 1-2, 11, 13-14, 24

4. Natural Gas Supply Pipeline
   - USGS 7.5' Quadrangles: Lancaster West, Lancaster East, Palmdale
   - T5N, R12W, S 2
   - T6N, R12W, S 1-2, 11, 13-14, 23-26, 35-36

5. Sanitary Wastewater Pipeline
   - USGS 7.5' Quadrangle: Lancaster East
   - T6N, R11W, S 6
   - T6N, R12W, S 1

6. Potable Water Pipeline
   - USGS 7.5' Quadrangles: Lancaster East
   - T6N, R12W, S 1-2

2.2 Project Description

The City proposes to construct, own, and operate the Project, a nominal 570-megawatt (MW) hybrid combined-cycle and solar thermal electrical generation facility, and has contracted with Inland Energy, Inc. to develop the Project. The Project is located in the City of Palmdale and unincorporated areas of Los Angeles County, California (the power plant site and most linear facilities are within the City; portions of the transmission line route are within unincorporated areas). The Project includes a 333-acre power plant site, including both a power block and a solar array, 50-acre construction laydown area, 35.6-mile transmission line, 7.4-mile reclaimed water pipeline, 8.7-mile natural gas supply pipeline, 1-mile sanitary wastewater pipeline, and 0.5-mile potable water pipeline (Figure 1). Throughout this report, the term "Project Site" refers to all Project elements in the aggregate (power plant site and all linear facilities); "linear facilities" refers to the various Project pipelines and the transmission line in the aggregate; all other references are to the specific Project component being addressed ("power plant site" or "plant site," "transmission line," "reclaimed water pipeline," "natural gas supply pipeline," "sanitary wastewater pipeline," and "potable water pipeline").

Commencement of construction is planned for late 2009, with commercial operation commencing in summer of 2012. The PHPP will use a zero liquid discharge (ZLD) design (no

evaporation ponds), and no off-site industrial liquid waste discharge will occur. Cooling water blowdown from the Project will be processed on-site in a brine crystallizer to solid waste and disposed at a permitted off-site disposal facility. The Project is expected to supply power to the rapidly growing southern California market, with the solar thermal input providing approximately 10 percent of the peak power generated by the plant during the time of day with the highest energy demand.

2.2.1 Power Plant

The power plant consists of a hybrid of natural gas-fired combined-cycle generating equipment integrated with solar thermal generating equipment, to be developed on an approximately 333-acre site in the northern portion of the City. The combined-cycle equipment utilizes two natural gas-fired combustion turbine generators (CTG), two heat recovery steam generators (HRSG), and one steam turbine generator (STG). The solar thermal equipment utilizes arrays of parabolic collectors to heat a high-temperature working fluid. The heat transfer fluid (HTF) is used to boil water to generate steam. The combined-cycle equipment is integrated thermally with the solar equipment at the HRSG and both utilize the single STG that is part of the Project. The solar energy will be generated using parabolic trough mirror technology and will be designed to provide up to 50 MW of the PHPP's nominal 570 MW capacity. The Project will permanently impact the entire 333-acre power plant site.

2.2.2 Construction Laydown Area

Although the construction laydown area will only be used during construction, it is considered to permanently impact 50 acres west of the power plant site. This area would be used for storing Project-related equipment; parking, staging, and maintenance of construction heavy equipment and personnel vehicles; and assembling power plant components.

2.2.3 Linear Facilities

The proposed Project will require the construction and installation of five linear utility features: (1) transmission line, (2) reclaimed water pipeline, (3) natural gas supply pipeline, (4) sanitary wastewater pipeline, and (5) potable water pipeline.

2.2.3.1 Transmission Line

The Project proposes to connect the power plant with the Southern California Edison (SCE) electrical transmission system at SCE's existing Vincent Substation, approximately 11 miles south-southwest of the proposed power plant site. To accommodate the needs of Palmdale's aviation community (Air Force Plant 42 and Los Angeles [LA] World Airports), a transmission line route approximately 35.6 miles long is planned that extends north and east from the power plant site, then south and back to the west. The Project's transmission system will be constructed in two segments, as briefly summarized below.

- Segment 1. Transmission line segment 1 involves the construction of approximately 23.7 miles of 230-kilovolt (kV) transmission line in new and existing right-of-ways (ROWs) between the power plant site and SCE's Pearblossom Substation. The route extends northward and eastward from the power plant site, then southward and finally back to the southwest.

- Segment 2. Transmission line segment 2 is a system reliability upgrade that includes increasing transmission capacity and expansion of the existing Vincent Substation. A new single-circuit 230 kV line will be installed on new 230 kV towers parallel to existing lines in an existing 11.9-mile transmission ROW extending westward from the Pearblossom Substation to the Vincent Substation.

Permanent disturbance areas for the transmission line include pole footprints, access roads, laydown areas, and other Project-related facilities. The Project is anticipated to permanently impact approximately 8.6 acres along the transmission line.

2.2.3.2 Reclaimed Water Pipeline

Reclaimed water for the Project cooling tower makeup and other industrial uses will be supplied from the City of Palmdale Water Reclamation Plant (PWRP). The City will design and construct an approximately 7.4-mile, 14-inch pipeline from the PWRP to the power plant site in existing City street ROWs. No new disturbance is anticipated.

The Project's backup cooling water supply will be reclaimed water. The Antelope Valley recently drafted an Integrated Regional Water Management Plan (AVIRWMP). The AVIRWMP shows a proposed reclaimed water backbone system, linking the PWRP with the City of Lancaster's plant, with both wastewater treatment plants producing reclaimed water. In the event of an outage in the PWRP's reclaimed water production system, the Lancaster plant can provide a source of reclaimed water to serve as a backup for the Project's cooling water supply. The backbone system is already a separate planned project and no additional pipelines other than those already planned for PHPP will be needed to connect the PHPP with the backbone system based on the route shown in the AVIRWMP.

2.2.3.3 Natural Gas Supply Pipeline

The Project's combustion turbines, startup boiler, and HTF heater will be fueled with natural gas delivered via a new 20-inch natural gas pipeline. The Southern California Gas Company (SCG) will design and construct the approximately 8.7-mile pipeline in existing City street ROWs. The pipeline will originate at the SCG facility on East Avenue S and terminate at the power plant site. No new disturbance is anticipated.

2.2.3.4 Sanitary Wastewater Pipeline

Sanitary wastewater will be disposed through an existing Los Angeles County Sanitation District 12-inch sanitary wastewater pipeline. The sanitary wastewater pipeline will extend east from the power plant site along Avenue M. It will be approximately 1 mile long and will be constructed in existing City street ROWs. No new disturbance is anticipated.

2.2.3.5 Potable Water Pipeline

Potable water will be obtained from the Los Angeles County Waterworks District 40, which has an existing potable water line along E Avenue M that currently terminates a short distance west of the power plant site's northern border. The potable water pipeline will be located within the power plant site, then extend west along Avenue M for approximately 0.5 miles. The portion of the pipeline along Avenue M will be constructed in existing City street ROWs. No new disturbance outside of the power plant site is anticipated.

3.0 METHODS

3.1 Literature Review

A literature review was conducted to identify federally listed biological resources known from the vicinity of the Project site. For the purpose of assessing the occurrence potential of federally listed biological resources, vicinity in this context is defined as areas within 10 miles of the Project site. The literature review included:

- California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB) version 3.1.0 RAREFIND application (CDFG 2008). This review included all elements within the following USGS 7.5' Quadrangles: Lancaster West, Lancaster East, Alpine Butte, Hi Vista, Ritter Ridge, Palmdale, Littlerock, Lovejoy Buttes, Acton, Pacifico Mountain, Juniper Hills, and Valyermo.
- California Native Plant Society's (CNPS) *Rare and Endangered Vascular Plants of California* (2008).
- Other biological surveys from the general vicinity (*i.e.,* Eremico Biological Services [2006], California State University (CSU) Stanislaus [2006]) and species accounts incorporated into the West Mojave Plan (BLM 2006).
- Los Angeles County (2007) and City of Palmdale (1993) General Plans.
- Pertinent documents from the AMEC library.

3.2 Field Surveys

Field surveys included a general biological resource and habitat assessment and inventory in addition to focused surveys for special-status plant species, desert tortoise (*Gopherus agassizii*), burrowing owl (*Athene cunicularia*), Mohave ground squirrel (*Spermophilus mohavensis*), and arroyo toad (*Bufo californicus*). Field surveys were conducted in 2006, 2008, and 2009. These surveys are summarized below.

Surveys in 2006 and 2008 for desert tortoise, burrowing owl, and special-status plants followed accepted protocols (FWS 1992; California Burrowing Owl Consortium [CBOC] 1993 and CDFG 1995; CDFG 2000 and CNPS 2001). The surveys were conducted concurrently and involved transects spaced no more than 30 feet apart covering 100 percent of all Project Site areas involving proposed ground disturbance (power plant site, construction laydown area, and linear ROWs). In 2008, Buffer Zone transects were spaced 100 feet apart out to 500 feet from the edge of the Project Site. Zone of Influence (ZOI) transects were also walked around all of these areas, where possible, at 100, 300, 500 feet (these three ZOI transects were conducted concurrently with Buffer Zone transects), 1,200, and 2,400 feet. Additional ZOI transects were walked around the power plant site only at 3,960 and 5,280 feet, as required by CEC (2007) guidelines. A general habitat assessment, where possible, was also conducted at 1,000 feet from linear facilities. See Figure 2 for the survey areas. Mohave ground squirrel (MGS) trapping surveys were not conducted in 2008, but a general habitat assessment of the Project Site was performed.

The 2008 focused surveys were conducted April 1 to 26, 2008 by AMEC Biologists Matt Amalong, Nathan Moorhatch, and Heather Rothbard and biological sub-consultants Nathan Mudry, Steve Ferrand, Jim Boone, Alex Heindl, and Dennis Strong (see Appendix 1 for qualifications). Dr. Phil Leitner conducted a habitat assessment for Mohave ground squirrel in July 2008.

The 2006 focused surveys for special-status plant species, desert tortoise, burrowing owl burrows, and jurisdictional waters were conducted on the power plant site only by AMEC Biologists John Green, Dave Kajtaniak, and Daryl Trumbo and biological sub-consultant Ted Rado. All flora and fauna detected (*e.g.*, through direct observation, vocalizations, presence of scat, tracks, and/or bones) were recorded. MGS protocol trapping (CDFG 2003) also was conducted in 2006, on the plant site only, by Eremico Biological Services (Eremico) and CSU, Stanislaus Endangered Species Recovery Program (ESRP). Special-status biological resources observed were plotted by using handheld Global Positioning Systems (GPS) equipment and later transferred to a Geographic Information System (GIS) ESRI ArcView 9.1 format. Unknown species of plants were collected and identified by Andrew C. Sanders, Botanist and Herbarium Collection Curator for the University of California at Riverside (UCR). Plant communities were described in accordance with Robert F. Holland's (1986) *Descriptions of the Terrestrial Natural Communities of California* and mapped.

Three portions of the transmission line route (along 105th Street from Avenue M-4 to Avenue P; along Lone Oak Road; the entry to Vincent Substation) were changed after field surveys were conducted; therefore, these portions were not surveyed (approximately 5 miles total). However, a cursory field survey identified the habitat communities along the revised routes to be very similar to surveyed areas, so species composition is expected to be similar. These segments will be surveyed in April 2009.

Habitat suitability for arroyo toads changed in Little Rock Creek with the emergence of flowing water in early 2009. Breeding season arroyo toad surveys will be conducted from March to July 2009 where transmission line segment 2 crosses Little Rock Creek.

3.2.1 Biological Resource and Habitat Assessment

The 2008 general biological resource and habitat assessment and inventory of the Project Site was conducted concurrently with the focused surveys.

3.2.2 Special-Status Plants Focused Survey

Focused surveys for special-status plant species were conducted in May/June 2006 throughout the power plant site, and April 2008 throughout the power plant site and linear ROWs (concurrently with the desert tortoise and burrowing owl surveys). None of the special-status plant species is federally listed.

Surveys were conducted during appropriate flowering periods for the annual and herbaceous perennial species (*i.e.*, early to mid-spring); cacti and shrubs were detectable during all field surveys. Various segments of the transmission line, reclaimed water pipeline, and natural gas supply pipeline were not surveyed due to lack of habitat (*e.g.*, developed, agricultural), inaccessible/fenced areas (*e.g.*, Air Force Plant 42, LA World Airports), and/or precipitous terrain (*e.g.*, mountainous portion of transmission line segment 2) (Figure 2).

3.2.3 Desert Tortoise Focused Survey

Focused surveys for desert tortoise were conducted in May/June 2006 throughout the power plant site and ZOI transects, and April 2008 throughout the power plant site, linear ROWs, and ZOIs (concurrently with the plant and burrowing owl surveys). All desert tortoise sign (*i.e.*, live tortoises, burrows, scat, carcasses and fragments thereof) was documented on appropriate survey forms (Desert Tortoise Handbook 1992), photographed with a digital camera and mapped using handheld GPS equipment. Desert woodrat (*Neotoma lepida*) middens and animal burrows of various kinds (*e.g.*, desert tortoise, kit fox (*Vulpes macrotis*), coyote (*Canis latrans*), and California ground squirrel (*Spermophilus beecheyi*), etc.) were carefully inspected for presence of desert tortoises and/or their sign.

Various segments of the transmission line, reclaimed water pipeline, and natural gas supply pipeline were not surveyed in 2008 due to lack of habitat (*e.g.*, developed, agricultural), inaccessible/fenced areas (*e.g.*, Air Force Plant 42, LA World Airports), and/or precipitous terrain (*e.g.*, mountainous portion of transmission line Segment 2) (Figure 2).

3.2.4 Burrowing Owl Survey

A burrowing owl habitat assessment and surveys for burrowing owl were conducted in May/June and August 2006 throughout the power plant site and 500-foot Buffer Zones, and April and August 2008 and January 2009 throughout the power plant site, linear ROWs, and 500-foot Buffer Zones (concurrently with the desert tortoise and plant surveys). Various segments of the transmission line, reclaimed water pipeline, and natural gas supply pipeline were not surveyed due to lack of habitat (*e.g.*, developed, agricultural), inaccessible/fenced areas (*e.g.*, Air Force Plant 42, LA World Airports), and/or precipitous terrain (*e.g.*, mountainous portion of transmission line segment 2) (Figure 2).

3.2.4.1 Burrowing Owl Habitat Assessment

The Project Site and 500-foot Buffer Zone (where possible and appropriate based on habitat) were surveyed in 2008 (and the power plant site was surveyed in 2006) to assess the presence or potential presence of burrowing owls and/or suitable habitat (conducted concurrently with desert tortoise and plant surveys). Pedestrian survey transects were spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines was no more than 100 feet and was reduced to account for differences in terrain, vegetation density, and ground surface visibility.

3.2.4.2 Focused Burrowing Owl Burrow Survey

A focused burrow survey to detect natural burrows or suitable man-made structures was conducted concurrently with the burrowing owl habitat assessment as well as the desert tortoise and plant surveys in 2006 and 2008. Biologists walked areas of suitable habitat while searching for burrowing owls, potential and active burrows, and owl sign such as feathers, pellets, and prey items. The 500-foot Buffer Zone was surveyed to identify burrows and owls outside of the Project Site boundaries that might be impacted by factors such as noise and vibration created by heavy equipment during project construction. Transects were spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines was no more than 100 feet and was reduced to account for differences in terrain, vegetation density, and ground surface visibility. The location of all suitable burrowing owl

habitat, potential owl burrows, burrowing owl sign, and any owls observed were recorded and mapped.

3.2.4.3 Focused Burrowing Owl Survey

Focused nesting season burrowing owl surveys were conducted on four separate days in August 2006 (power plant site only) and August 2008 (entire Project Site). Focused winter season burrowing owl surveys were conducted on four separate days in January 2009 (entire Project Site). All areas of suitable habitat were surveyed each day. Surveys were conducted in the morning one hour before sunrise to two hours after sunrise. Binoculars were used to scan all suitable habitat, locations of mapped burrows, and potential perch locations. Surveys were conducted from fixed points and provided 100 percent visual coverage of the suitable habitat areas within the Project Site. Surveys were conducted during weather conducive to observing owls outside their burrows.

3.2.5 Mohave Ground Squirrel Trapping and Habitat Assessment

Trapping surveys for MGS were conducted on the power plant site in 2006 by Eremico and CSU, Stanislaus ESRP. A habitat assessment was conducted of the Project Site by a well-known MGS expert, Dr. Phil Leitner, in July 2008. Detailed methods can be found in the respective reports in Appendix 2.

3.2.6 Arroyo Toad Focused Surveys

The biological resource and habitat assessment conducted in 2008 did not identify the Little Rock Creek crossing (transmission line segment 2) as suitable arroyo toad habitat because (1) there was no flowing water present; (2) it is over 1 mile downstream from a 1970 CNDDB record; and (3) it is over 3 miles downstream from a 2001 CNDDB record. However, flowing water was observed in March 2009 while conducting follow-up surveys for some minor transmission line pole location changes. This recent development has created potentially suitable arroyo toad habitat downstream of known populations, so focused surveys are warranted. Breeding season surveys will be conducted between March 15 and July 1 and will follow accepted protocols (FWS 1999).

4.0 RESULTS

4.1 General Topography

The power plant site, transmission line segment 1, reclaimed water pipeline, potable water pipeline, natural gas supply pipeline, and sanitary sewer pipeline are in primarily flat (approximately 2,500 to 3,000 feet above mean sea level [AMSL]) terrain. The transmission line segment 2 leaves the West Mojave Desert basin and enters the foothills of the San Gabriel Mountain range (approximately 3,000 to 4,200 feet AMSL). The overall highest elevation of all the site features combined is approximately 4,200 feet AMSL, located near the southwestern terminus of the transmission line before the tie-in to the Vincent Substation. The lowest elevation is approximately 2,490 feet AMSL, located at the northeast corner of the power plant site.

4.2 Habitat Communities

The biological composition of the Palmdale area presents a transition zone from montane and chaparral plant communities to communities more commonly found in the Mojave Desert. The results of the 2008 general biological field assessment indicate that nine vegetation communities occur throughout the various areas of the Project Site. These include:

- Mojave Creosote Bush Scrub
- Joshua Tree Woodland
- Rabbitbrush Scrub
- Desert Saltbush Scrub
- Mojavean Juniper Scrub
- Mojave Riparian Forest
- Mojave Desert Wash Scrub
- Agricultural Land (active and fallow) and Orchards
- Urban and Disturbed/Developed Land

The three dominant vegetation communities on the power plant site are Mojave Creosote Bush Scrub, Joshua Tree Woodland, and Rabbitbrush Scrub. Figure 3 illustrates the general vegetation communities on the Project Site within a 1-mile radius of the power plant site and within a 1,000-foot radius of the Project's linear features. Photographs in Appendix 3 illustrate these vegetation types. These communities are summarized separately below.

4.2.1 Mojave Creosote Bush Scrub

Mojave creosote bush scrub (Holland 1986) is the dominant plant community below 3,000 or 4,000 feet in the southwestern region of the United States. It is extensive from the Death Valley region southward across the Mojave Desert to the little San Bernardino Mountains, eastward to northwestern Arizona and southern Nevada. This plant community is generally composed of widely-spaced shrubs of approximately 2 to 10 feet in height with bare ground between, and it typically intergrades with Joshua tree woodland and other desert scrub communities. This community is dominated by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Other common plant species present throughout this community within the Project site include Nevada joint fir (*Ephedra nevadensis*), spiny hop-sage (*Grayia spinosa*), cheesebush (*Ambrosia* (=*Hymenoclea*) *salsola*), winter fat (*Krascheninnikovia lanata*), and Joshua tree (*Yucca brevifolia*). Plant growth generally occurs during late winter and early spring months, when annual precipitation is sufficient. Many species of ephemeral herbs may flower in late March and April if the winter rains are sufficient.

Mojave creosote bush scrub is one of the three dominant vegetation communities of the power plant site, found primarily in the southeastern portion. Along the northern portion of the transmission line, it is found in small concentrations until becoming dominant in the southeastern portions. It is not found along the other linear facilities.

4.2.2 Joshua Tree Woodland

Joshua tree woodland (Holland 1986) is an open woodland with Joshua trees usually as the only arborescent species and numerous shrub species. This community is present on the desert slopes of the Southern Sierra Nevada, Tehachapi, and Transverse Ranges of Inyo, Kern, Los Angeles, San Bernardino, and northern Riverside counties from 2,500 to 5,000 feet elevation. It reaches eastward across the Mojave Desert to southwestern Utah, mostly on the slopes of mountains and mesas. In the vicinity of the Project Site, this community is dominated by *Yucca* spp., evergreen shrubs (*Juniperus* spp.), semideciduous shrubs (*Eriogonum* spp., *Tetradymia* spp.), semisucculents (*Lycium* spp.), and succulents (*Opuntia* spp.). It typically intergrades with Mojave creosote bush scrub at lower elevations and Mojavean pinyon-juniper woodland at higher elevations. The main growing season is spring, with most growth limited by cold in winter and drought in summer and fall. Many species of ephemeral herbs may germinate following sufficient late fall or winter rains and flower in mid-spring.

Joshua tree woodland is one of the three dominant vegetation communities of the power plant site, stretching diagonally from the northeast portion to the southwest portion. Although Joshua trees are present throughout the linear facilities, this habitat community is only dominant in a few areas.

4.2.3 Rabbitbrush Scrub

Rabbitbrush scrub (Holland 1986) is a disturbance-maintained community (fire, grazing, drainage, soil tilling). This community is found in the Great Basin and western margin of the Mojave Desert, reaching west across the Sierra-Cascade Axis into the drainages of Kern, Feather, and Pit Rivers. It is dominated by rubber rabbitbrush (*Chrysothamnus nauseosus*), usually about 3 feet tall, with fairly evenly spaced gray shrubs flowering in late summer or fall.

Rabbitbrush scrub is one of the three dominant vegetation communities of the power plant site, found in the northwest portion. It is only found in a couple of locations along the transmission line, but is much more abundant in the areas adjacent to the reclaimed water pipeline and natural gas supply pipeline.

4.2.4 Desert Saltbush Scrub

Desert saltbush scrub (Holland 1986) is characterized by low-growing, grayish, microphyllous shrubs and the presence of some succulent species. This community is widely scattered on margins of dry lake beds in the Colorado, Mojave, and Great Basin deserts. Although the percent cover is typically low, with much bare ground exposed between the widely spaced shrubs, densely vegetated areas are also present. Although a variety of saltbush (*Atriplex* spp.) species can be present, this vegetation community is often dominated by a single saltbush species. The dominant saltbush species on site included four-winged saltbush (*Atriplex canescens*) and allscale (*Atriplex polycarpa*).

Desert saltbush scrub is not present on the power plant site, reclaimed water pipeline, or natural gas supply pipeline. However, it is dominant along the northern and eastern portions of the transmission line.

4.2.5 Mojavean Juniper Scrub

Mojavean juniper scrub (Holland 1986) is a low, open woodland community that is dominated by California juniper. This community is restricted to the southern Sierra Nevada, the Tehachapi Mountains, and the desert slopes of the Transverse and Peninsular ranges. Other species that are common within this community include Joshua tree, rabbitbrush, and Nevada joint fir.

Mojavean juniper scrub is only found along the southwestern portion of the transmission line, once the Project enters the foothills of the San Gabriel Mountain range. One other isolated community occurs adjacent to the southern end of the natural gas supply pipeline.

4.2.6 Mojave Riparian Forest

Mojave riparian forest (Holland 1986) is characterized by a relatively open forest community that occurs along the larger rivers and streams in the Mojave Desert. Unlike forest communities exhibiting a more closed canopy, a dense, shrubby understory is able to become established in this community, which adds to both its species diversity and structural composition. The trees within this community are generally less than approximately 82 feet in height and consist of Fremont cottonwood (*Populus fremontii*), which is the dominant species, Goodding's black willow (*Salix gooddingii*), red willow (*Salix laevigata*), California sycamore (*Plantanus racemosa*), Arizona ash (*Fraxinus valutina*), and white alder (*Alnus rhombifolia*). Shrubs and variable surface vegetation provide a ground cover ranging from continuous to infrequent and consist of California rose (*Rosa californica*), cocklebur (*Xanthium strumarium*), mulefat (*Baccharis salicifolia*) and cattail (*Typha latifolia*) in the wetter areas. Some areas within this plant community are dominated by relatively homogenous stands of Fremont cottonwood. These areas often exhibit very little understory.

One small patch of Mojave riparian forest occurs along the transmission line, just west of where it crosses Little Rock Wash. Several cottonwood trees are present along with standing water; however, they are not located within the area to be disturbed

4.2.7 Mojave Desert Wash Scrub

Mojave Desert wash scrub (Holland 1986) is characterized by a low, remarkably diverse scrub, but lacking the conspicuous microphyllous trees of desert dry wash woodland. This community is found throughout the Mojave Desert, typically occurring in the sandy bottoms of wide canyons; incised arroyos of upper bajadas; and within braided, shallow washes of the lower bajadas, usually below 5,000 feet.

Two areas of Mojave Desert wash scrub are crossed by the transmission line (one on segment 1 and one on segment 2). Both areas are part of the Little Rock Wash Significant Ecological Area (SEA). These areas will be spanned by the transmission line (segment 2 will be a replacement of existing transmission line poles that pass through this area, and hence no additional poles or other facilities beyond what currently exists will be located within the SEA).

4.2.8 Agricultural Land and Orchards

Agricultural land (Holland 1986) may be defined broadly as land used primarily for production of food and fiber. This type occurs throughout California, but is most widespread in and

adjacent to the Great Central Valley and to a lesser extent in coastal plains and valleys. Orchards in California are typically open, single-species tree-dominated habitats, with an open understory.

Active and fallow agricultural lands are present along the northern portion of the transmission line. Abandoned (fallow) agricultural fields and overgrazed desert scrub areas support ruderal (weedy) plant species. The orchards present along Pearblossom Highway are pear orchards enclosed by chain-link fencing.

4.2.9 Urban and Disturbed/Developed Land

Urban land (Holland 1986) comprises areas of intensive use with much of the land covered by structures. Included in this category are cities, transportation, power, and communications facilities, and areas such as those occupied by mills, shopping centers, industrial, commercial, and residential complexes, and institutions that in some instances may be isolated from urban areas.

Disturbed/developed lands are generally characterized as those areas that are either devoid of vegetation as a result of site grading, or developed or occupied with structures and/or landscaped with non-native ornamental plants or shade trees. In general, these areas are so heavily disturbed that native and non-native vegetation cannot become established. Examples of disturbed/developed areas include paved and unpaved roads, graded or cleared areas, driveways, parking areas, houses, cement foundations, and existing structures.

Disturbed areas/developed lands are present throughout various areas of the Project Site. These areas include paved and unpaved roads, as well as developed areas supporting structures, and recently graded areas. Vegetative cover of these areas varies from being entirely void of vegetation to having moderate ornamental landscaping. Garbage dumping is evident in some of these areas and storage of various types of property (*e.g.*, vehicles, scrap wood, appliances, furniture) occurs on others. The power plant site is bounded by East Avenue M to the north, Sierra Highway and railroad tracks (raised on berm) to the west, and Air Force Plant 42, an approximately 6,600-acre facility, to the south and east (chain-link fencing). There is extensive urbanization and residential development north, west and south of the site, from zero to two miles away (Figure 1).

4.3 Plants

During the course of the 2008 general biological assessment and focused surveys, 162 plant species, including Joshua tree and two species of cacti, were detected on the Project Site, Buffer Zone, and ZOI. Appendix 4 includes the scientific and common names for all plant species detected on the Project Site. No special-status plant species were observed.

According to National Oceanic and Atmospheric Association (NOAA) data, mean rainfall totals for the winter season (*i.e.*, December, January, February) in Palmdale from 1971 through 2000 averaged 4.34 inches. A total of 4.31 inches was recorded during the 2007-2008 winter season. Notwithstanding that the timing of precipitation is a critical factor influencing the germination and growth of plants, the 2007-2008 winter precipitation for Palmdale suggests that plant productivity was adequate in Spring 2008 for conducting plant

surveys. In fact, many native annuals were observed during the surveys (see Appendix 4 for a species inventory.)

4.4 General Wildlife

During the course of the 2008 general biological assessment and focused surveys, a total of 87 vertebrate species were detected on the Project Site, Buffer Zone, and ZOI. These included 11 reptiles, 66 birds, and 10 mammals. Appendix 5 includes the scientific and common names for these species.

4.5 Federally Listed Biological Resources

The literature review consisted of an analysis of the CNDDB (Report in Appendix 6), CNPS Inventory, other biological reports, and consultation with other biologists having experience in the vicinity of the Project Site. This review identified 60 special-status biological resources known to occur in the vicinity (within approximately 10 miles) of the Project Site (Figure 4). These resources include: 2 fish, 25 plants, 2 amphibians, 6 reptiles, 10 birds, 9 mammals, and 6 habitat communities. Of these, only five species are federally listed species, along with seven Birds of Conservation Concern (BCC). Table 1 provides a complete list of the federally listed biological resources and their respective conservation status and occurrence potential in the Project vicinity.

The 2006 and 2008 field surveys did not result in the detection of any federally listed biological resources throughout various areas of the Project Site, Buffer Zone, and ZOI (Figure 5). Four BCC were observed: burrowing owl, prairie falcon (*Falco mexicanus*), loggerhead shrike (*Lanius ludovicianus*), and Le Conte's thrasher (*Toxostoma lecontei*). Appendix 7 provides GPS coordinates for the special-status species and sign observed in 2008, including all bird nests identified during surveys. A summary of these special-status biological resources is provided below.

Table 1. Federally Listed Species and Migratory Birds of Conservation Concern Occurring or Potentially Occurring in the Project Vicinity

Resource Common Name *Scientific Name*	Status[1/]			Habitat and Distribution	Activity/ Bloom Period	Occurrence Probability
	Federal	State	CNPS /BLM			
Fish						
Santa Ana sucker *Catostomus santaanae*	T	CSC	None	Endemic to Los Angeles basin south coastal streams. Habitat generalist, but prefers sand-rubble-boulder bottoms. Usually found in small to medium-sized (<7 m wide) permanent streams in water ranging in depth from a few centimeters to a meter or more. Los Angeles, San Gabriel, and Santa Ana Rivers.	Year-round	Absent. Suitable habitat not present.
Unarmored threespine stickleback *Gasterosteus aculeatus williamsoni*	E	E	None	Weedy pools, backwaters, and among emergent vegetation at the stream edge in small southern CA streams. Currently restricted to the upper Santa Clara River drainage in Los Angeles & Ventura Co., San Antonio Creek on Vandenburg Air Force Base, San Luis Obispo Co., and an isolated population in San Felipe Creek in San Diego Co. A remnant population exists in Shay Creek, San Bernardino County.	Year-round	Absent. Suitable habitat not present.
Amphibians						
Arroyo toad *Bufo californicus*	E	CSC	None	Breeding adults require overflow pools adjacent to inflow channels free of predatory fishes. Exposed pools that are shallow, sand- or gravel-based, and have a low current velocity are strongly favored. Breeding pools must occur in the vicinity (10-100 meters) of juvenile and adult habitat, which consists of a shoreline or central bar and stable, sandy terraces. Stable, sandy terraces should possess a moderately well-developed, but scattered shrub and tree vegetation overstory, and typically have mulefat, California sycamore, Fremont's cottonwood, or coast live oak present.	Jan-Aug	Unknown. 2008 biological resource and habitat assessment did not identify suitable habitat. Two historic records from Little Rock Creek: one is over 1 mile upstream (1970), and the other is over 3 miles upstream (2001). However, the arrival of flowing water at the Little Rock Creek crossing (transmission line segment 2) in early 2009 provided potentially suitable habitat. Focused surveys will be conducted in 2009.
Mountain yellow-legged frog *Rana muscosa*	E	CSC	None	Inhabits shallow, permanent rocky streams that are partially shaded or have filtered light at moderate to high elevations. Absent from small creeks because of insufficient depth for adequate refuge and overwintering.	Year-round	Absent. Lack of suitable habitat.
Reptiles						
Desert tortoise *Gopherus agassizii*	T	T	None	Most common in desert scrub, desert wash, and Joshua tree habitats. Require friable soil for burrow and nest construction. Creosote bush habitat with large annual wildflower blooms preferred.	Feb-Nov	Absent: Power plant site, reclaimed water pipeline, natural gas supply pipeline, sanitary wastewater pipeline, potable water pipeline. Low: North-south portion of transmission line segment 1 and southeast portion of transmission line segment 2.

Table 1. Federally Listed Species and Migratory Birds of Conservation Concern Occurring or Potentially Occurring in the Project Vicinity

Resource Common Name *Scientific Name*	Status[1/]			Habitat and Distribution	Activity/ Bloom Period	Occurrence Probability
	Federal	State	CNPS /BLM			
Birds						
Tricolored blackbird *Agelaius tricolor*	BCC	CSC	S	Breeds in freshwater marshes dominated by cattails or bulrushes, willows, blackberries, thistles, and diverse upland and agricultural areas. May forage in various scrub plant associations. Preferred roost sites include cattail and bulrush marshes near suitable foraging areas in pasturelands and croplands.	Year-round	Nesting: Absent. Lack of suitable habitat. Foraging: Moderate. Potentially could forage in desert scrub.
Burrowing owl *Athene cunicularia*	BCC	CSC	S	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Year-round	Occurs. One individual observed on transmission line segment 1 (1,200' zone of influence). Others areas with suitable habitat present.
Swainson's hawk *Buteo swainsoni*	BCC	T	None	Generally migrate in flocks that can be as large as 5,000–10,000 individuals, always during daylight, typically soaring in thermals, and rarely over water. Birds rest and feed in grasslands and harvested fields, especially where grasshoppers are numerous, often perching on fence posts, telephone poles, and power poles. Large flocks may roost at night in trees. Swainson's hawks are also known to nest in Joshua Trees.	Year-round	Nesting: Moderate. There are 8 pairs nesting in the Antelope Valley (Bloom 2008). Foraging: Moderate. Potentially could forage in Project areas.
Mountain plover *Charadrius montanus*	BCC	CSC	S	Coastal prairies, alkaline flats, tilled fields, and Bermuda grass fields. Generally a bird of open, flat, dry tablelands with low, sparse vegetation. Avoids forested or shrubby montane landscapes and seeks areas of local aridity, disturbance, or when found on prairies, of short, intensively grazed grass.	Sep-Mar (Wintering)	Nesting: Absent. Migratory. Foraging: Low. Historic record of foraging birds in agricultural fields near transmission line segment 1.
Prairie falcon *Falco mexicanus*	BCC	CSC	None	Inhabits dry, open terrain, either level or hilly. Breeding sites located on cliffs. Extensive foraging, to marshlands and ocean shores.	Year-round	Nesting: Absent. Suitable nesting habitat not present. Foraging: Occurs - Observed. Suitable foraging habitat and prey present.
Loggerhead shrike *Lanius ludovicianus*	BCC	CSC	None	Open country with short vegetation: pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands. Breeders usually settle near isolated trees or large shrubs.	Year-round	Occurs. Observed on Project site.
Le Conte's thrasher *Toxostoma lecontei*	BCC	CSC	None	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats. Commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground.	Year-round	Occurs. Observed on Project site.

1/ Status:

FEDERAL (United States Fish and Wildlife Service)

E = Federally listed as Endangered
T = Federally listed as Threatened
C = Federal Candidate for listing as threatened or endangered
BCC = Bird of Conservation Concern
D = Federally Delisted

Table 1. Federally Listed Species and Migratory Birds of Conservation Concern Occurring or Potentially Occurring in the Project Vicinity

Resource Common Name *Scientific Name*	**Status**[1/]			**Habitat and Distribution**	**Activity/ Bloom Period**	**Occurrence Probability**
	Federal	**State**	**CNPS /BLM**			

STATE (California Department of Fish and Game)

E = California state-listed as Endangered
T = California state-listed as Threatened
R = California state-listed as Rare
CSC = California Special Concern species
INV = Communities that are either known or believed to be of high priority for inventory in CNDDB

CNPS (California Native Plant Society)

1B = CNPS list of plants that are rare, threatened, or endangered in California and elsewhere
2 = CNPS list of plants that are rare, threatened, or endangered in California, but more common elsewhere
3 = CNPS list of plants that require more information
4 = CNPS list of plants that have a limited distribution (Watch List)
.1 = Seriously endangered in California
.2 = Fairly endangered in California
.3 = Not very endangered in California

BLM (Bureau of Land Management)

S = BLM Sensitive species

OCCURRENCE PROBABILITY

Occurs = Observed on the site by AMEC biologists, or recorded on-site by other qualified biologists.
High = Observed in similar habitat in region by qualified biologists, or habitat on the site is a type often utilized by the species and the site is within the known range of the species.
Moderate = Reported sightings in surrounding region, or site is within the known range of the species and habitat on the site is a type occasionally used by the species.
Low = Site is within the known range of the species but habitat on the site is rarely occupied by the species.
Absent = A focused study failed to detect the species, or no suitable habitat is present.
Unknown = Distribution and habitat use has not been clearly determined.

4.5.1 Federally Listed Plants

No federally listed plant species have been reported from the vicinity of the Project Site based on the literature review. No federally listed plant species were observed during the 2008 surveys. Focused surveys on the power plant site conducted in 2006 also did not detect federally listed plant species.

4.5.2 Federally Listed Fish

Two federally listed fish species have been reported from the vicinity of the Project Site based on the literature review. These include Santa Ana sucker (*Catostomus santaanae*) and unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*). Neither of these species was observed during 2006 or 2008 surveys nor has potential to occur on the Project Site because of a lack of suitable habitat.

4.5.3 Federally Listed Amphibians

Two federally listed amphibian species have been reported from the vicinity of the Project Site based on the literature review. These include arroyo toad and Sierra Madre yellow-legged frog (*Rana muscosa*). Neither of these species was observed during 2006 or 2008 surveys because of a lack of suitable habitat.

However, the arrival of flowing water to the Little Rock Creek crossing (transmission line segment 2) in early 2009 has provided suitable arroyo toad habitat downstream of known arroyo toad populations (see Figure 4-K). Breeding season protocol surveys will be conducted in 2009, and the results will be reported and submitted to FWS.

4.5.4 Federally Listed Reptiles

One federally listed reptile species, the desert tortoise, has been reported from the region of the Project Site based on the literature review (CDFG 2008). No desert tortoise or desert tortoise sign were observed during 2008 surveys. Focused surveys on the power plant site conducted in 2006 also did not detect this species. The desert tortoise is considered to have some potential to occur on the Project Site as discussed below.

4.5.4.1 Desert Tortoise

The Mojave population of the desert tortoise, which includes all tortoises occurring west and north of the Colorado River, is listed as threatened by the FWS and CDFG. The desert tortoise is most common in desert scrub, desert wash, and Joshua tree habitats in a variety of terrain types, including alluvial fans, valleys, rocky hillsides, and washes. The species requires friable soil for burrow and nest construction. Burrows are typically found at the base of shrubs, in the interspaces between shrubs, and occasionally in caliche soil bank areas or underneath boulders/rocks. They are herbivores and feed on a variety of plants including annual herbs and perennial grasses.

Tortoise activity is greatest during the spring and early summer, and to a lesser extent during the fall. Their activity is usually much reduced during hot summer months, but they may be active following summer rains or if temperatures are moderate. Although tortoises hibernate during the winter and typically emerge in late February or early March, hatchlings and juveniles can be fairly active during the winter months. Adults will

also emerge from their burrows to drink if water resources have been limited during the previous activity season and/or winter precipitation has provided standing water (Boarman 2003).

Threats to desert tortoises include loss or degradation of habitat, vandalism, poaching, intentional killing, predation on young tortoises by the common raven (*Corvus corax*) and other predators (*e.g.*, kit fox, snakes, etc.), and disease (*e.g.*, Mycoplasmosis). Off-road vehicles, military training maneuvers, mining, and livestock grazing also affect tortoise habitat by collapsing burrows, eroding soils, reducing availability of food plants, eliminating shrubs which would provide shade for tortoises and support for their burrows, and ultimately results in surface disturbance that promotes conditions more conducive to invasion by exotic plant species, which provide less nutritional value to tortoises than the native species that were replaced. Human activities, including garbage dumping, landfills, roads, increased nesting opportunities, irrigation, and increased vehicle use have lead to increased numbers of common ravens in California deserts. Ultimately, the increased predation on young tortoises by common ravens reduces recruitment into breeding populations (Boarman 2003).

Tortoises are most often detected by their scats and burrows. Tortoises themselves can sometimes be detected in burrows by reflecting sunlight inside the burrow with a mirror. Other tortoise sign include carcasses, or fragments thereof, courtship rings, and drinking depressions. Any of these signs are an indication that tortoises either occur, or have recently occurred, at a particular location. Sign can be detected at any time of the year and usually indicates suitable, if not occupied, habitat.

All areas of the Project Site are located outside of designated critical habitat for the desert tortoise. The nearest designated critical habitat for this species is located approximately 16 miles northeast of the Project Site within the Fremont-Kramer Desert Wildlife Management Area (DWMA). The desert tortoise has been reported from the region of the Project Site – Fremont Valley south to Adelanto, and Highway 14 east to the Calico Mountains (CDFG 2008) – and were known from portions of eastern Antelope Valley (Berry and Nicholson 1984). Transects conducted in 2001 for the West Mojave Plan found tortoise sign approximately nine miles northeast of the northeast corner of transmission segment 1 (BLM 2006). More recent sightings of tortoise have been made approximately 12 miles northeast of the northeast corner of transmission segment 1 (Harris 2008). Evidence suggests major declines in estimated density in most areas (CDFG 2008). Mark Hagan, Edwards Air Force Base (AFB) Natural Resources Program Manager, believes the desert tortoise has been extirpated from the Palmdale region (Hagan 2008).

Despite the lack of known, extant tortoise populations near the Project Site, some vegetation communities represented on the Project Site (*e.g.*, desert scrub, desert wash, and Joshua tree) are known to be used by desert tortoises. Focused surveys for desert tortoise on the PHPP power plant site in 2006 did not detect desert tortoise or sign. Further surveys in 2008 (details in Table 2) on the Project Site, Buffer Zone, and ZOI transects had similar results. One burrow that potentially could be used by a tortoise (Class 5: good condition, undetermined species) was found in 2008 on the 3,960-foot

ZOI transect for the power plant site, west of site (Figure 5-S; Photographs 10 & 11 in Appendix 3). The mouth of the burrow was overgrown with vegetation, and no sign of recent use (*e.g.*, scat, tracks, etc.) was evident. While native remnant habitat exists west of the site, this side of the Project Site is nearly completely surrounded by extensive urban development. Focused surveys for threatened and endangered species on Air Force Plant 42 were conducted in 2008 by the Edwards AFB Environmental Management Natural Resources team. They resulted in no desert tortoise or desert tortoise sign observations (Hagan 2008).

Completed survey data forms are presented in Appendix 8. No desert tortoises were observed during focused surveys, and no sign were observed (with the exception of the one possible burrow on the 3,960-foot ZOI). The highly fragmented nature of the Project Site with numerous barriers (*e.g.*, highways, railroad tracks, development) makes it highly unlikely that desert tortoises are present or could wander onto the Project Site from adjacent lands – the connectivity to known occupied habitat is very low. Known occupied habitat is 16 miles northeast of the Project Site, spanning numerous barriers. Therefore, desert tortoise are presumed to be absent on the power plant site, reclaimed water pipeline, natural gas supply pipeline, and sanitary wastewater pipeline. The occurrence potential along the north-south portion of transmission line segment 1 and the southeast portion of transmission line segment 2 is considered to be low.

Table 2. 2008 Desert Tortoise Survey Details

Date (2008)	Surveyors[1]	Time	Area/Location Surveyed[2]	Percent Cloud Cover	Wind (mph)	Temp. (F)
Apr 01	MA, SF, NMo, NMu	07:00-16:00	Plant	0-15	0-15	45-70
Apr 02	MA, SF, NMo, NMu	07:00-16:00	Plant	15-90	1-15	52-66
Apr 03	MA, SF, NMo, NMu	07:00-15:00	Plant	0-5	1-10	47-72
Apr 04	MA, SF, NMo, NMu	06:30-12:00	Plant	0-60	0-3	38-76
Apr 07	MA, JB, SF, AH, NMu	07:00-17:00	Plant & Plant Buffer	5-40	2-15	48-70
Apr 08	MA, JB, SF, AH, NMu	07:00-12:00	Plant ZOI	0-50	0-15	54-63
Apr 09	MA, JB, SF, AH	07:00-16:00	Water ROW, Buffer, & ZOI	0-20	5-20	47-68
Apr 10	MA, JB, SF, AH	09:00-16:00	Water ROW, Buffer, & ZOI	0	0-5	65-79
Apr 11	MA, JB, SF, AH	07:00-12:00	Gas ROW, Buffer, & ZOI	0	0-10	46-72
Apr 14	MA, JB, SF, AH, NMu	07:00-17:00	T-Line ROW, Buffer, & ZOI	0	0-20	60-88
Apr 15	MA, JB, SF, AH, NMu	07:00-16:00	T-Line ROW, Buffer, & ZOI	0-10	5-22	46-68
Apr 16	JB, SF, AH, NMu	07:30-16:00	T-Line ROW, Buffer, & ZOI	0	0-8	45-75
Apr 17	MA, JB, SF, AH, NMu	07:00-16:30	T-Line ROW, Buffer, & ZOI	0	0-12	48-80
Apr 18	MA, JB, SF, AH, NMu	07:30-14:00	T-Line ROW, Buffer, & ZOI	0-40	0-10	64-86
Apr 21	MA, JB, AH, NMu, HR, DS	08:30-15:00	T-Line Buffer & ZOI	0	0-8	58-82
Apr 22	MA, JB, AH, NMu, HR, DS	08:00-17:00	T-Line ROW & Buffer	0	1-18	58-79
Apr 23	MA, JB, AH, NMu, HR, DS	07:30-15:00	T-Line ROW	0-5	1-25	52-62
Apr 24	JB, AH, NMu, HR, DS	07:00-16:00	T-Line ROW, Buffer, & ZOI	0	1-15	45-76
Apr 25	MA, JB, AH, NMu, HR, DS	07:30-17:00	T-Line ROW, Buffer, & ZOI	0	0-8	60-85
Apr 26	JB, AH	06:45-15:00	T-Line Buffer	0	0-5	55-85

1 Surveyor Initials:	MA	=	Matt Amalong, Wildlife Biologist, AMEC
	JB	=	Jim Boone, Botanist/Ecologist, Desert Wildlife Consultants, LLC
	SF	=	Steve Ferrand, Wildlife Biologist, Nevada Biological Consulting, LLC
	AH	=	Alex Heindl, Herpetologist, Desert Walkabouts, Inc.
	NMo	=	Nathan Moorhatch, Wildlife Biologist, AMEC
	NMu	=	Nathan Mudry, Wildlife Biologist, eGIS Services, LLC
	HR	=	Heather Rothbard, Botanist, AMEC
	DS	=	Dennis Strong, Herpetologist, Nevada Biological Consulting, LLC
2 Area/Location:	Plant	=	Power Plant Site
	T-Line	=	Transmission Line
	Water	=	Reclaimed Water Pipeline
	Gas	=	Natural Gas Supply Pipeline
	ROW	=	Right-of-Way
	Buffer	=	100, 200, 300, 400, & 500-foot Transects
	ZOI	=	1,200, 2,400, 3,960 (Power Plant Site), & 5,280 (Power Plant Site) Zone of Influence Transects

4.5.5 Federally Listed Birds

No federally listed bird species have been reported from the vicinity of the Project Site based on the literature review. However, seven BCC have been reported and include tricolored blackbird (*Agelaius tricolor*), burrowing owl, Swainson's hawk (*Buteo swainsoni*), mountain plover (*Charadrius montanus*), prairie falcon, loggerhead shrike, and Le Conte's thrasher. Three of these species (burrowing owl, loggerhead shrike, Le Conte's thrasher) were observed during the 2008 field surveys. Surveys on the power plant site conducted in 2006 detected two of these same species (loggerhead shrike, Le Conte's thrasher) plus one other (prairie falcon). The BCC are protected under the Migratory Bird Treaty Act (MBTA). Appendix 7 provides GPS coordinates for the special-status species and sign observed in 2008, including all bird nests identified during surveys.

4.5.6 Federally Listed Mammals

No federally listed mammals have been reported from the vicinity of the Project Site based on the literature review, and no federally listed mammals were observed during the 2008 surveys. Focused surveys on the power plant site conducted in 2006 also did not detect any federally listed mammals.

5.0 CONCLUSION AND DETERMINATION

5.1 Arroyo Toad

Designated critical habitat, which currently supports arroyo toad populations, is located 2-3 miles south (upstream) of where transmission line segment 2 crosses Little Rock Creek. During years of favorable rainfall, arroyo toads, larva, and egg masses could potentially move downstream when water is present. However, the most recent recorded sighting was in 2001 (CDFG 2008), approximately 3 miles upstream from the Project's crossing of Little Rock Creek.

Focused breeding season surveys will be conducted in 2009. If arroyo toads are absent, the Project will have no effect on the arroyo toad. A preconstruction survey will also be conducted to verify arroyo toads have not established themselves in this section of Little Rock Creek.

If arroyo toads are present, a monitoring plan that includes the following measures will be developed and implemented to maximize the avoidance of any potential adverse impacts to the arroyo toad. The Project therefore may affect, but is not likely to adversely affect, the arroyo toad if the species is present.

Avoidance and Minimization Measures to Ensure the Project is Not Likely to Adversely Affect the Arroyo Toad

1. A Qualified Biologist with demonstrated expertise with arroyo toads will monitor all construction activities in arroyo toad potential habitat and assist in the implementation of the monitoring program. This person will be approved by FWS prior to the onset of ground disturbing activities. The Qualified Biologist will be

present during all activities immediately adjacent to or within habitat that support populations of arroyo toad.

2. Prior to the onset of construction activities, all personnel who will be present on work areas within or adjacent to the impact area will be provided the following information during a Worker's Environmental Awareness Program (WEAP): 1) A detailed description of the arroyo toad including color photographs; 2) the protection the arroyo toad receives under the Endangered Species Act and possible legal action or that may be incurred for violation of the Act; 3) the protective measures being implemented to conserve the arroyo toad and other species during construction activities associated with the proposed Project; and 4) a point of contact if arroyo toads are observed.
3. Prior to the onset of any construction activities, the Project proponent will meet with the Qualified Biologist and staff from FWS. Information will be provided on the general location of construction activities within arroyo toad habitat and the actions taken to reduce impacts to this species. Because arroyo toads may occur in various locations during different seasons of the year, the Qualified Biologist and FWS will determine the seasons when specific construction activities would have the least adverse effect on arroyo toads (most likely fall and winter). The goal of this effort is to reduce the level of mortality of arroyo toads during construction. Complete elimination of all mortality is not likely possible because arroyo toads may occur anywhere within suitable habitat during any given season. The detection of every individual over large areas is impossible because of the small size, fossorial habits, and cryptic coloration of the arroyo toad.
4. Where construction can occur in habitat where arroyo toads are widely distributed, work areas will be fenced in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. The Qualified Biologist will assist in determining the boundaries of the area to be fenced in consultation with FWS. All workers will be advised that equipment and vehicles must remain within the fenced work areas.
5. The Qualified Biologist will direct the installation of the fence and conduct a minimum of three nocturnal surveys to move any arroyo toads from within the fenced area to suitable habitat outside of the fence. If arroyo toads are observed on the final survey or during subsequent checks, the Qualified Biologist will conduct additional nocturnal surveys if he/she determines that they are necessary.
6. Fencing to exclude arroyo toads will be at least 24 inches in height. The type of fencing must be approved by the Qualified Biologist and FWS. If arroyo toads are found within an area that has been fenced to exclude arroyo toads, activities will cease until the Qualified Biologist moves the arroyo toads.
7. Work will be restricted to daylight hours, except during an emergency, to avoid nighttime activities when arroyo toads may be on the surface and mobile. Work will not occur during rainfall when toads may be on the surface and mobile. Work will not occur in or directly adjacent to water.

8. If construction activities must occur immediately adjacent to breeding pools or other areas where arroyo toads may congregate, they will be conducted during times of the year (fall/winter) when individuals have dispersed from these areas. The Qualified Biologist will assist in scheduling work activities accordingly.
9. If arroyo toads are found in a construction area where fencing was deemed unnecessary, work will cease until the Qualified Biologist moves the arroyo toads. The Qualified Biologist, in consultation with FWS, will then determine whether additional surveys or fencing are needed. Work may resume while this determination is being made, if deemed appropriate by the Qualified Biologist and FWS.
10. Any arroyo toads found during clearance surveys or otherwise removed from work areas will be placed in nearby suitable, undisturbed habitat. The Qualified Biologist will determine the best location for their release, based on the condition of the vegetation, soil, and other habitat features and the proximity to human activities. Clearance surveys shall occur on a daily basis in the work area.
11. The Qualified Biologist will have the authority to stop all activities until appropriate corrective measures have been completed.
12. Staging areas for all construction activities will be located on previously disturbed upland areas designated for this purpose. All staging areas within potential toad habitat will be fenced.

5.2 Desert Tortoise

Although there is no desert tortoise designated critical habitat present on or near the Project Site, some vegetation communities represented on the Project Site (*e.g.*, desert scrub, desert wash, and Joshua tree) are known to be used by desert tortoises. Focused surveys conducted in 2006 on the power plant site did not detect desert tortoise or sign. Focused surveys conducted in 2008 did not detect desert tortoise on the Project Site, Buffer Zone, or ZOI transects. One burrow that potentially could be used by a tortoise (Class 5: good condition, undetermined species) was found during 2008 surveys on the 3,960-foot ZOI transect west of the power plant site. The mouth of the burrow was overgrown with vegetation, and no sign of recent use was evident. Focused surveys conducted in 2008 did not detect desert tortoise or sign on Air Force Plant 42 (Hagan 2008). The highly fragmented nature of the Project Site with numerous barriers (*e.g.,* highways, railroad tracks, development) makes it highly unlikely that desert tortoises are present or could wander onto the Project Site from adjacent lands – the connectivity to known occupied habitat is very low. Known occupied habitat is 16 miles northeast of the Project Site, spanning numerous barriers.

It is highly unlikely that desert tortoises are present on the power plant site. Based on discussions with Dr. Alice Karl, a well-known desert tortoise expert, there is a low chance that desert tortoises are present along the north-south portion of transmission line segment 1 and the southeast portion of transmission line segment 2 (Karl 2008). Based on the survey results from two years of focused surveys, plus other data from historic and recent surveys and assessments, desert tortoise are presumed to be absent

on the power plant site, reclaimed water pipeline, potable water pipeline, natural gas supply pipeline, and sanitary wastewater pipeline. The occurrence potential along the north-south portion of transmission line segment 1 and the southeast portion of transmission line segment 2 is considered to be low. The Project therefore may affect, but is not likely to adversely affect, the desert tortoise.

Avoidance and Minimization Measures to Ensure the Project is Not Likely to Adversely Affect the Desert Tortoise

The following avoidance and minimization measures will be implemented to maximize the avoidance of any potential adverse impacts to the desert tortoise, specifically along the north-south portion of transmission line segment 1 and the southeast portion of transmission line segment 2.

1. A WEAP will be implemented prior to ground disturbance to educate the construction crew of potential special-status species present on the Project Site and measures to avoid impacts to those species.
2. Construction and maintenance personnel will be required to inspect for desert tortoise under vehicles prior to moving a vehicle. If a desert tortoise is found beneath a vehicle, the vehicle would not be moved until the desert tortoise had left of its own accord. All desert tortoise observations would be reported immediately to the Designated Biologist.
3. Clearance surveys on the power plant site will be conducted for desert tortoise prior to surface disturbance and following site fencing. On the linear facilities, clearance surveys will be conducted for desert tortoise immediately prior to surface disturbance. A Biological Monitor will be present at all times to ensure avoidance of special biological resources.
4. The approved Designated Biologist or Alternate Designated Biologist will be on-site during the periods when desert tortoises are expected to be active, to ensure that construction activities are in compliance with these avoidance and minimization measures, and to ensure that any desert tortoises wandering onto the construction site will not be inadvertently harmed.
5. The Designated Biologist will be responsible for: (a) enforcing a litter-control program; (b) ensuring that desert tortoise exclusion fences are maintained where applicable; (c) ensuring that desert tortoise habitat disturbance is restricted to authorized areas; (d) ensuring that all equipment and materials are stored within the boundaries of previously disturbed areas; and (e) ensuring that all vehicles associated with construction activities remain within the proposed construction zones.
6. Project activities that might endanger a desert tortoise will cease if a desert tortoise is found on an active work area. Project activities will resume after the desert tortoise has moved to a safe area on its own. Any such tortoise will be monitored by a Biological Monitor to ensure its safety, including determining if the tortoise has a nearby burrow or is likely to be active in the area. If

necessary, temporary fencing will be installed in the active work area, to separate the tortoise from active construction.

7. If a desert tortoise is in imminent danger of immediate death or injury (such as from an approaching vehicle or equipment), and the desert tortoise has been given the opportunity to move but has withdrawn in its shell and is not moving, the Designated Biologist or Biological Monitor may move it out of harm's way. As such handling would constitute a take, FWS will be immediately notified.
8. Any tortoise found on or near the site will be reported immediately to the FWS and CDFG by the Designated Biologist.
9. Upon locating or receiving a report of a dead/injured tortoise on the Project Site, the Designated Biologist would be required to immediately notify the local CDFG and FWS representatives.

Any common raven nesting encountered during construction, operation, or maintenance of the Project would be documented in a periodic report to the appropriate authorities. Common raven nest removal from proposed facilities, when determined necessary, would occur in consultation with the FWS and CDFG. The low likelihood of tortoises on the Project Site indicates that a raven control plan is not necessary.

5.3 Migratory Bird Treaty Act

Birds nesting within the Project Site during construction activities could be permanently impacted by Project activities. The special-status bird species most likely to nest within the footprint of the Project Site include burrowing owl, loggerhead shrike, and Le Conte's thrasher. This impact would be considered significant if not avoided or mitigated. Mitigation measures, including site grubbing prior to the nesting season and nesting bird clearance surveys during the nesting season, with follow-up biological monitoring to ensure nest avoidance, would be implemented to minimize impacts to nesting birds. Additionally, certain features of the Project, once implemented, may provide nesting opportunities for certain birds-of-prey, as well as loggerhead shrike. Project structures may also provide nesting and foraging habitat for scavenging migratory birds, such as the common raven. However, transmission lines, poles, and towers already exist in much of the Project area, so additional impacts would not be considered significant.

To comply with the MBTA, any vegetation removal or grading occurring during the nesting season of bird species (generally February 1 through August 31) potentially nesting on the Project would require at least one nesting bird survey (more if deemed necessary) to be conducted by a qualified Biologist. If no nests are found, construction would proceed. If nests are found, impact avoidance measures (*e.g.*, buffers) would be required.

5.4 Cooling Tower Drift and Nitrogen Deposition

Occasional salt buildup on vegetation is a fairly natural occurrence in arid environments such as the Mojave Desert. Due to the extremely low salt concentrations emitted from the Project, vegetative adaptations of plants occurring in the Project vicinity, and the high level of urban and agricultural development in the immediate Project area, no adverse

impacts to plant and animal species and communities are anticipated as a result of the Project.

Nitrogen deposition on proximal soils is expected to occur over time as a result of Project operations. While nitrogen deposition may benefit non-native annual grasses occurring in the immediate vicinity of the Project to a small degree, this deposition is not expected to substantially impact native plant and animal species and communities occurring in the area owing to the high level of urban and agricultural development in the immediate Project area.

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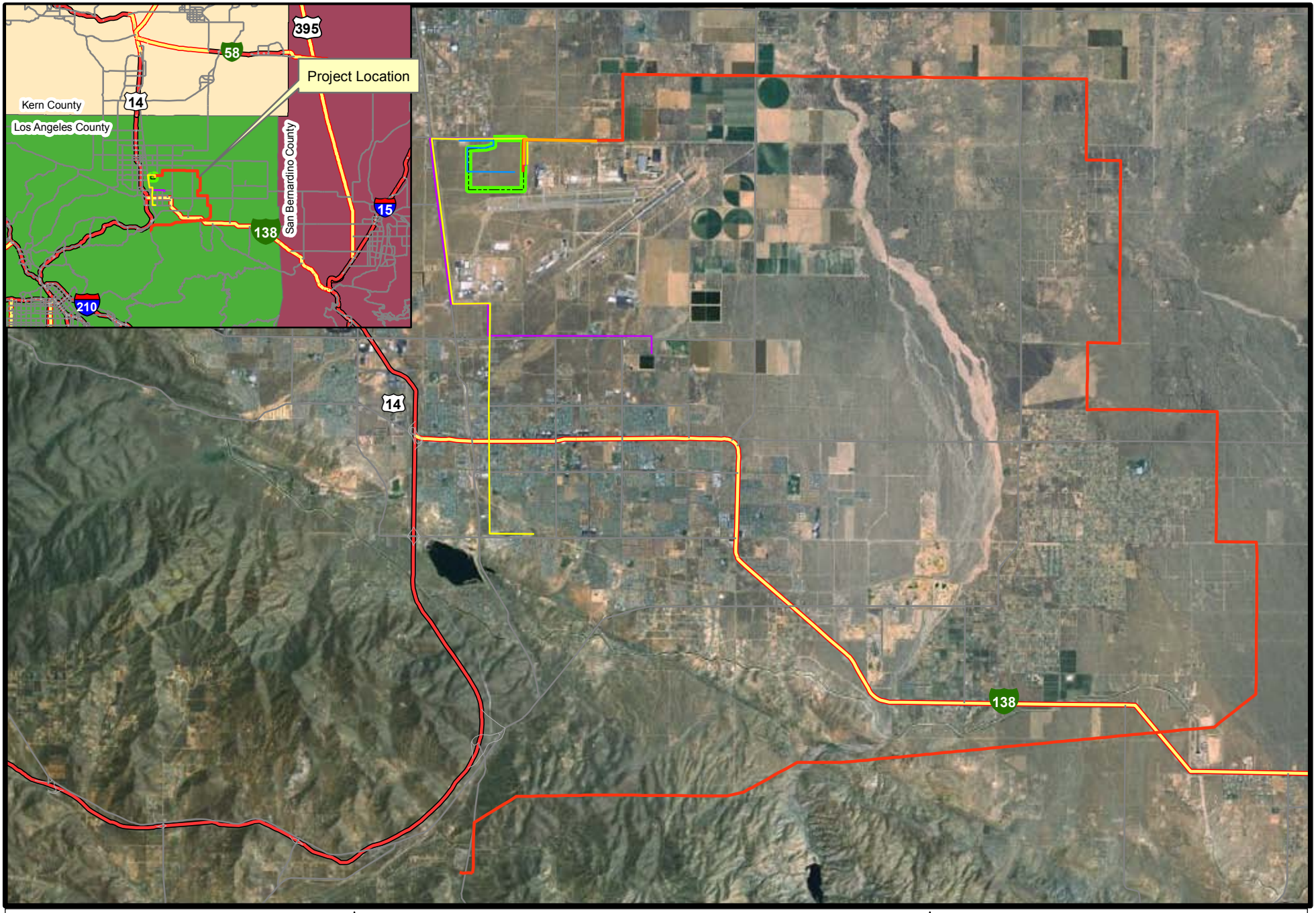
FIGURES



Legend

- Power Plant Site Survey Area
- Transmission Line
- Potable Water
- Sanitary Wastewater Pipeline
- Natural Gas Pipeline
- Reclaimed Water Pipeline

Palmdale Hybrid Power Project

Figure 1

Vicinity & Location

0 1 2 3 4 Miles

1:125,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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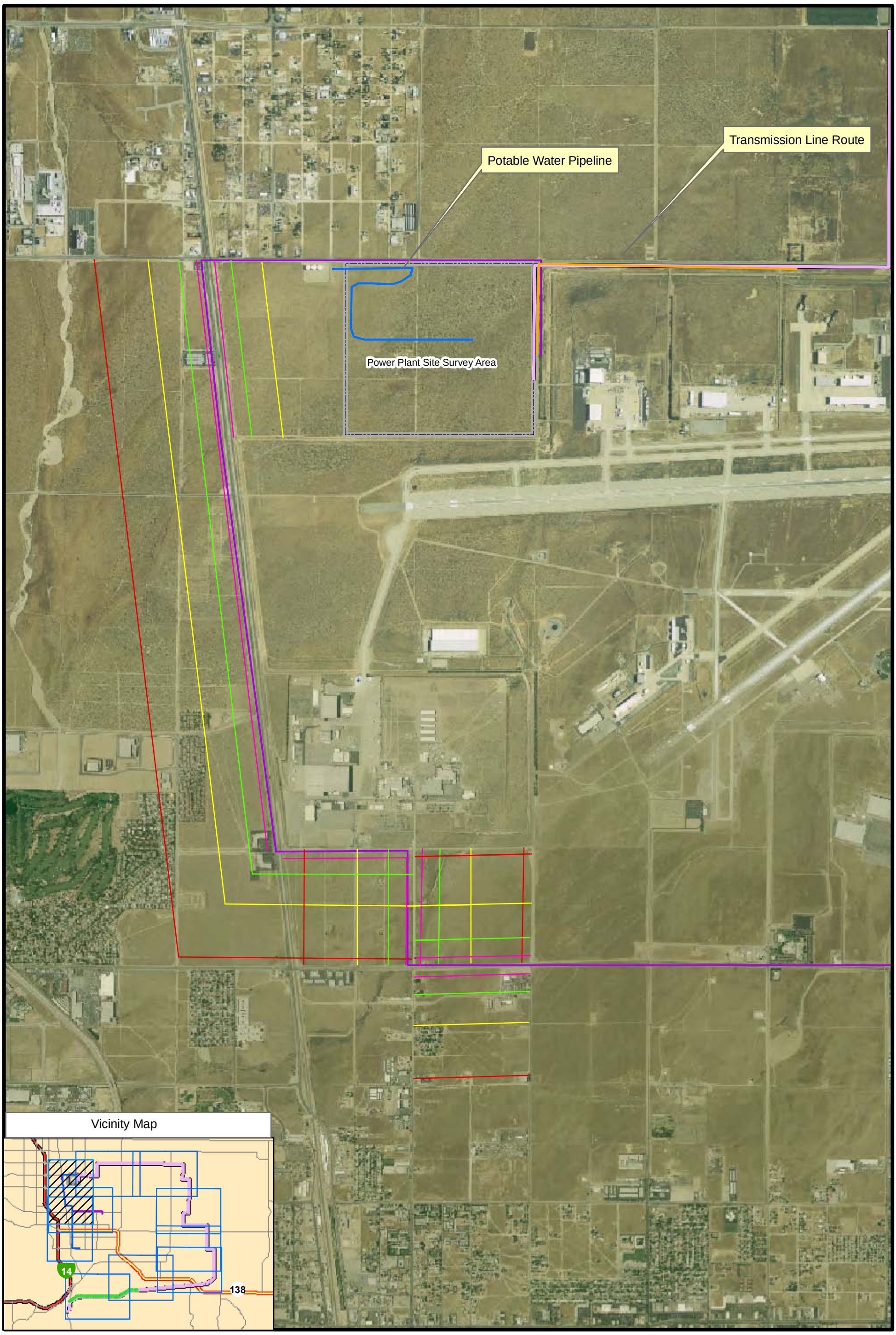

Legend

- Reclaimed Water Supply Pipeline
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Figure 2-A.1
Water Line Survey Area
ZOI

0 500 1,000 2,000 3,000 4,000 Feet
1:24,000

Map Notes:

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Power Plant Bio 6554000247\graphics\mxd\2009
Date: 03/19/09

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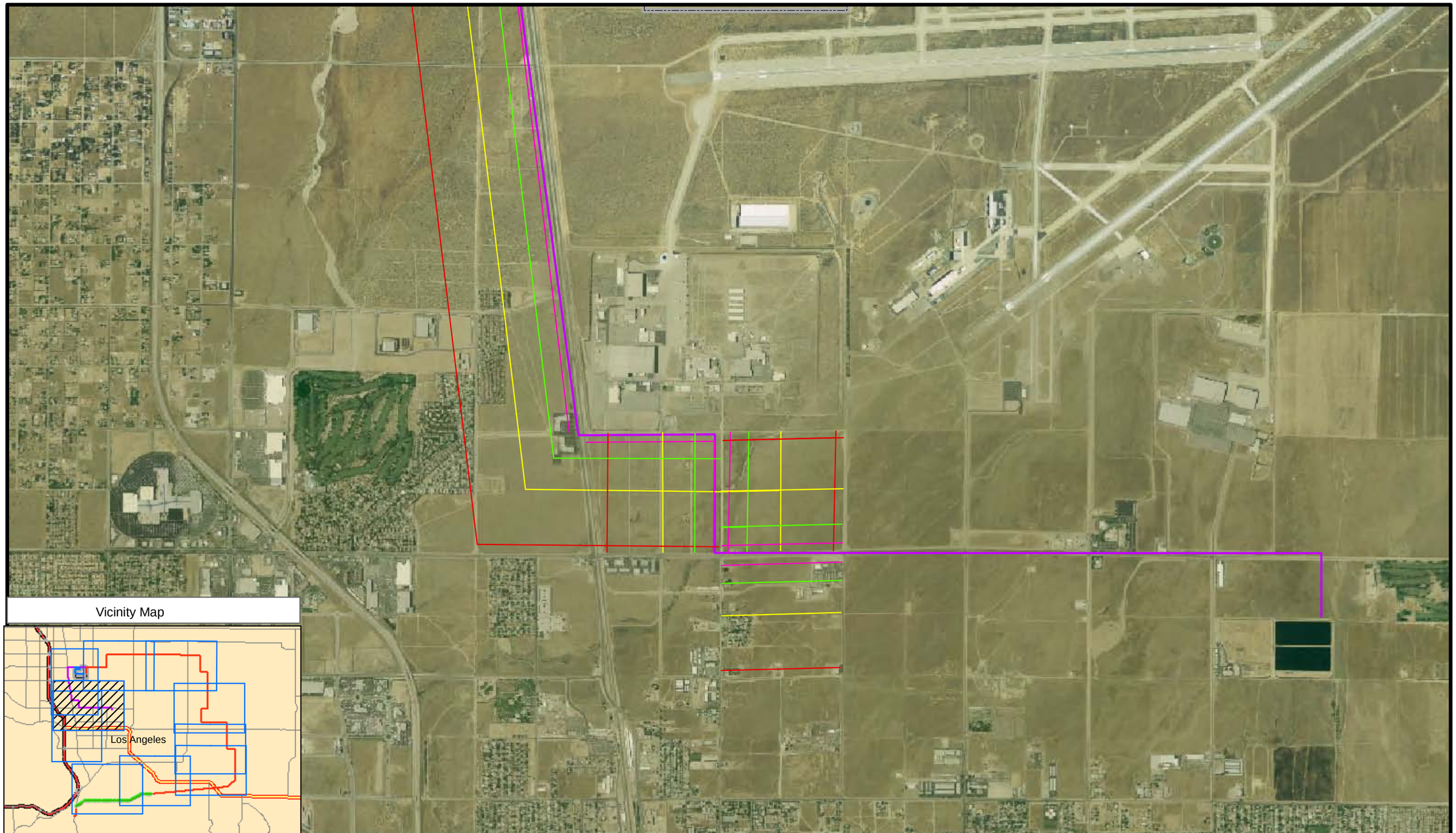

Legend

- Reclaimed Water Supply Pipeline
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100

Palmdale Hybrid Power Project

Figure 2-A.2
Water Line Survey Area
ZOI

0 850 1,700 3,400 5,100 6,800 Feet

1:24,000

Map Notes:

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Power Plant Bio 6554000247\graphics\mxd\2009
Date: 03/02/09

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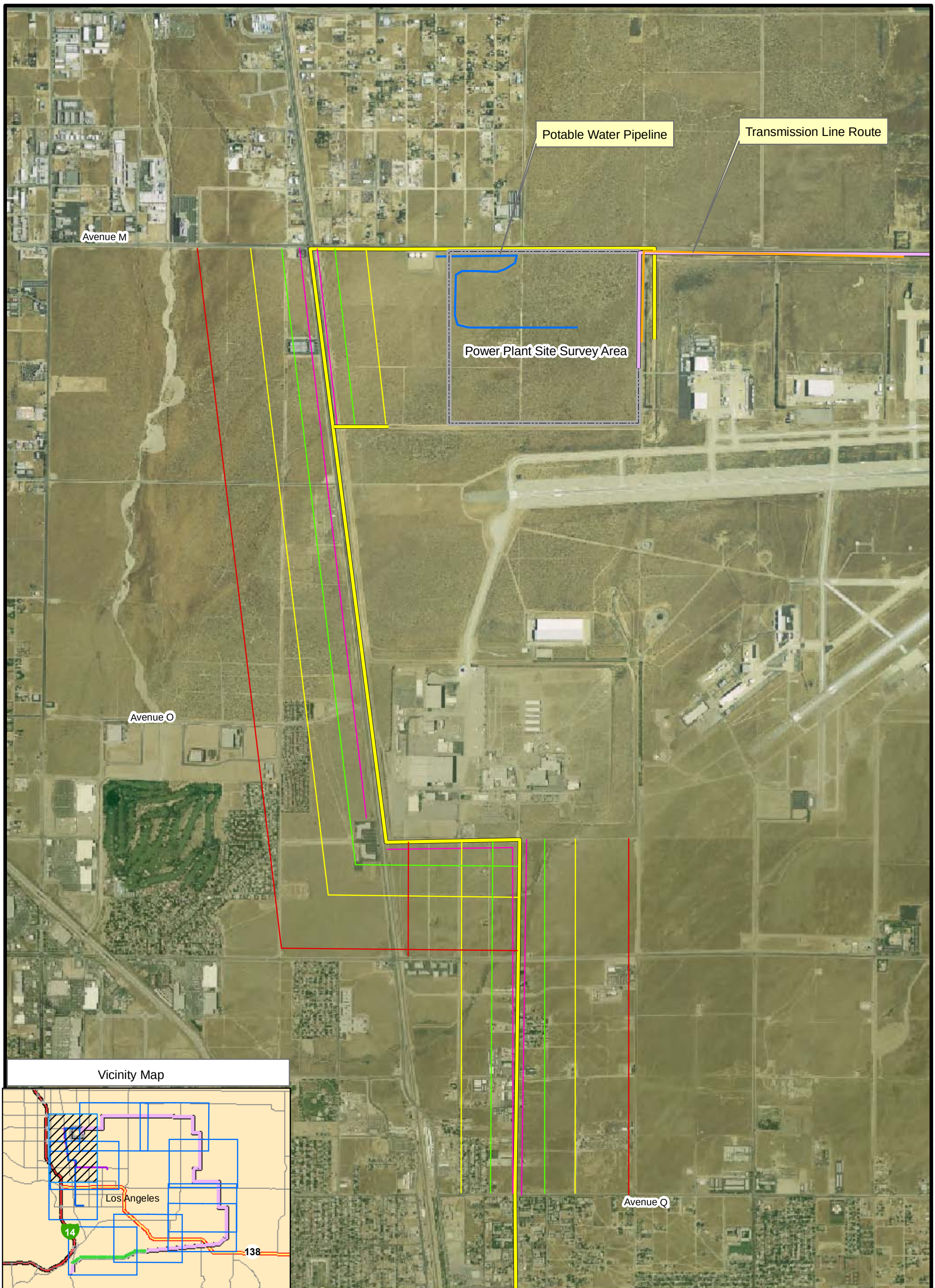
amec



Legend

- Natural Gas Supply Pipeline
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Figure 2-B.1
Gas Line Survey Area
ZOI

0 550 1,100 2,200 3,300 4,400 Feet

1:24,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 03/19/09

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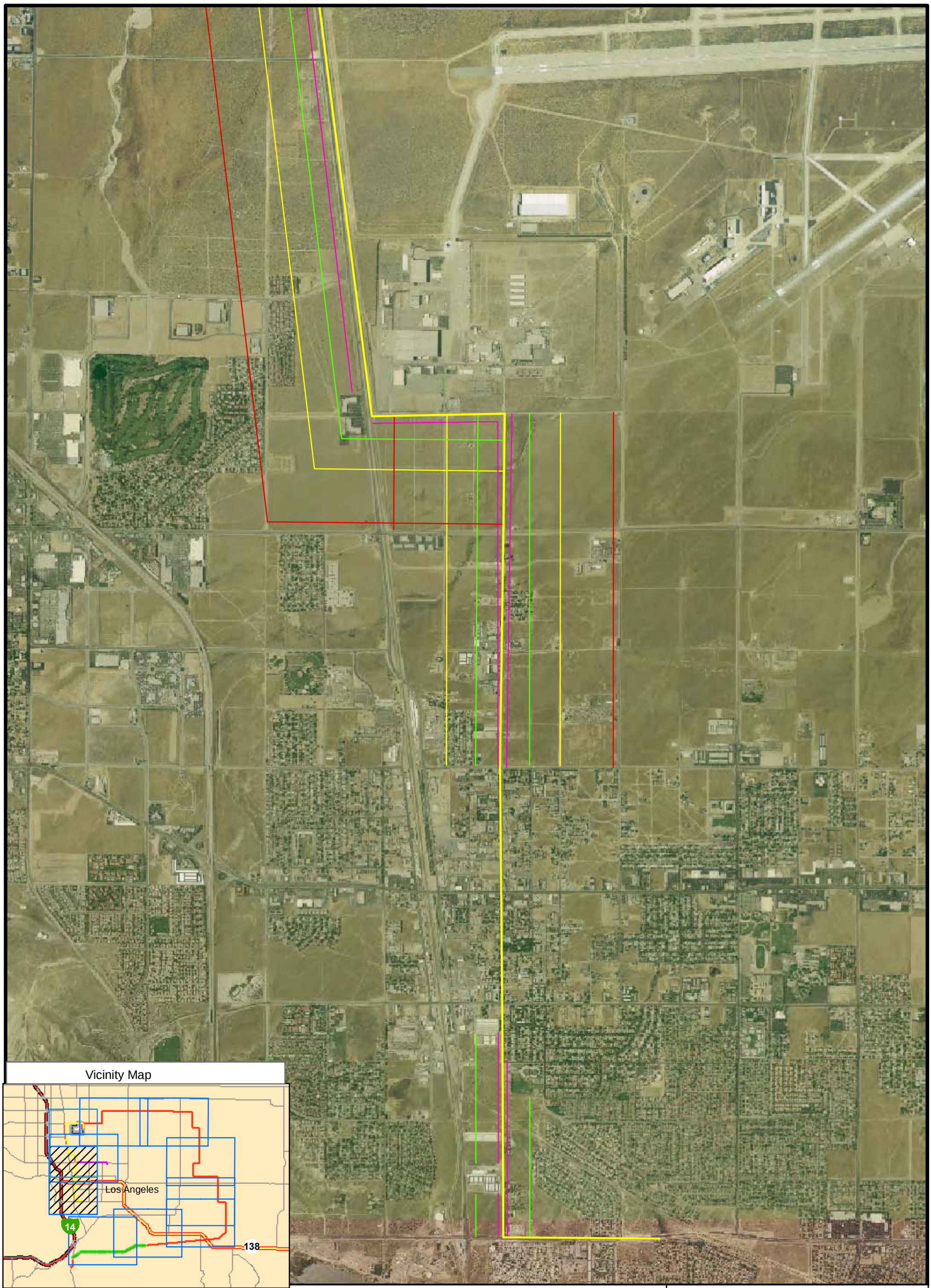

Legend

- Natural Gas Supply Pipeline
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100

Palmdale Hybrid Power Project

Figure 2-B.2
Gas Line Survey Area
ZOI

0 550 1,100 2,200 3,300 4,400 Feet

1:24,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 03/02/09

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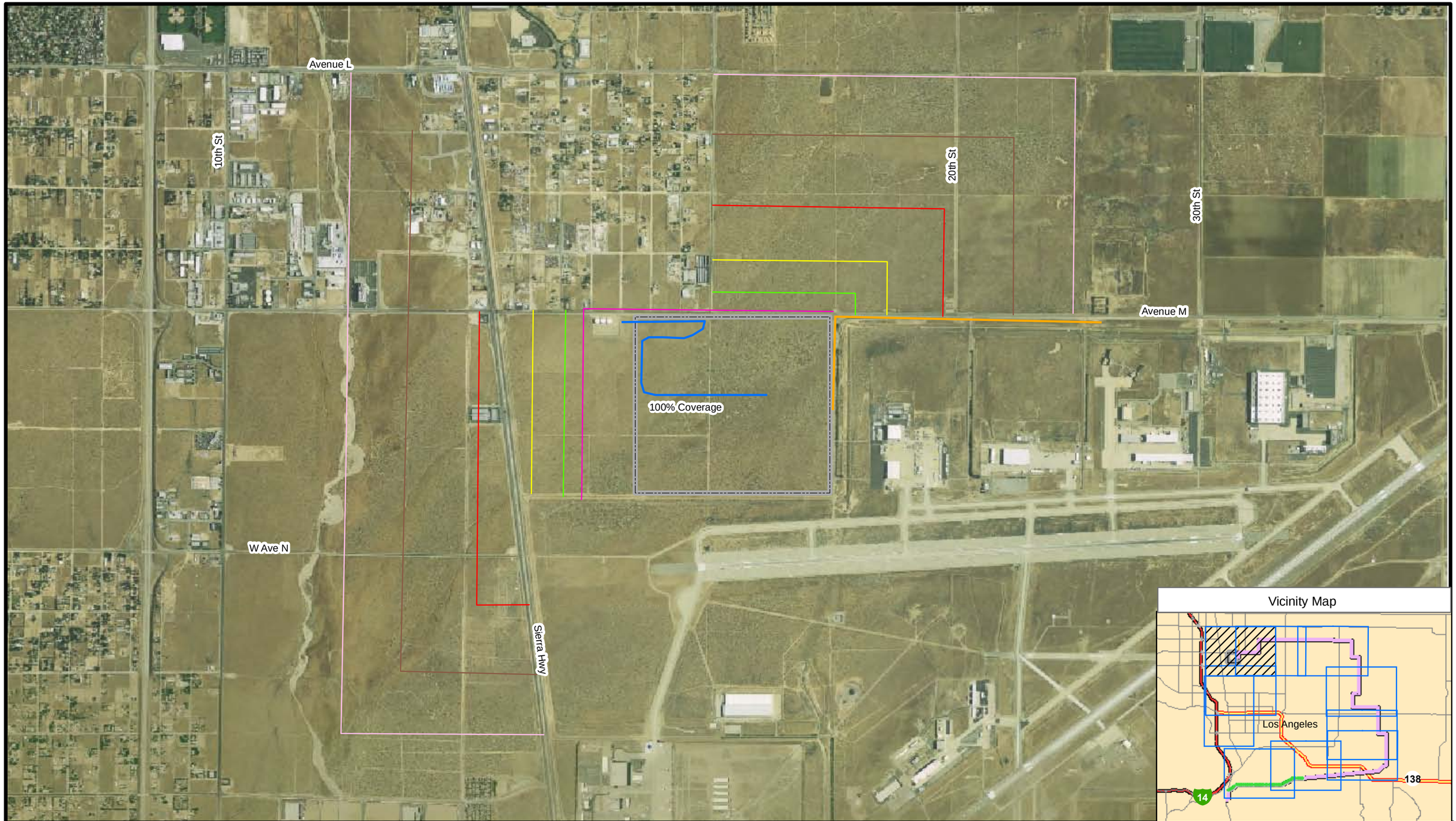

Legend

- Power Plant Site
- Sanitary Wastewater Pipeline
- Potable Water Pipeline
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100
- ZOI 3960
- ZOI 5280

Palmdale Hybrid Power Project

Figure 2-C
Power Plant Survey Area
ZOI

0 625 1,250 2,500 3,750 5,000 Feet

1:24,000

Map Notes:

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Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 03/19/09

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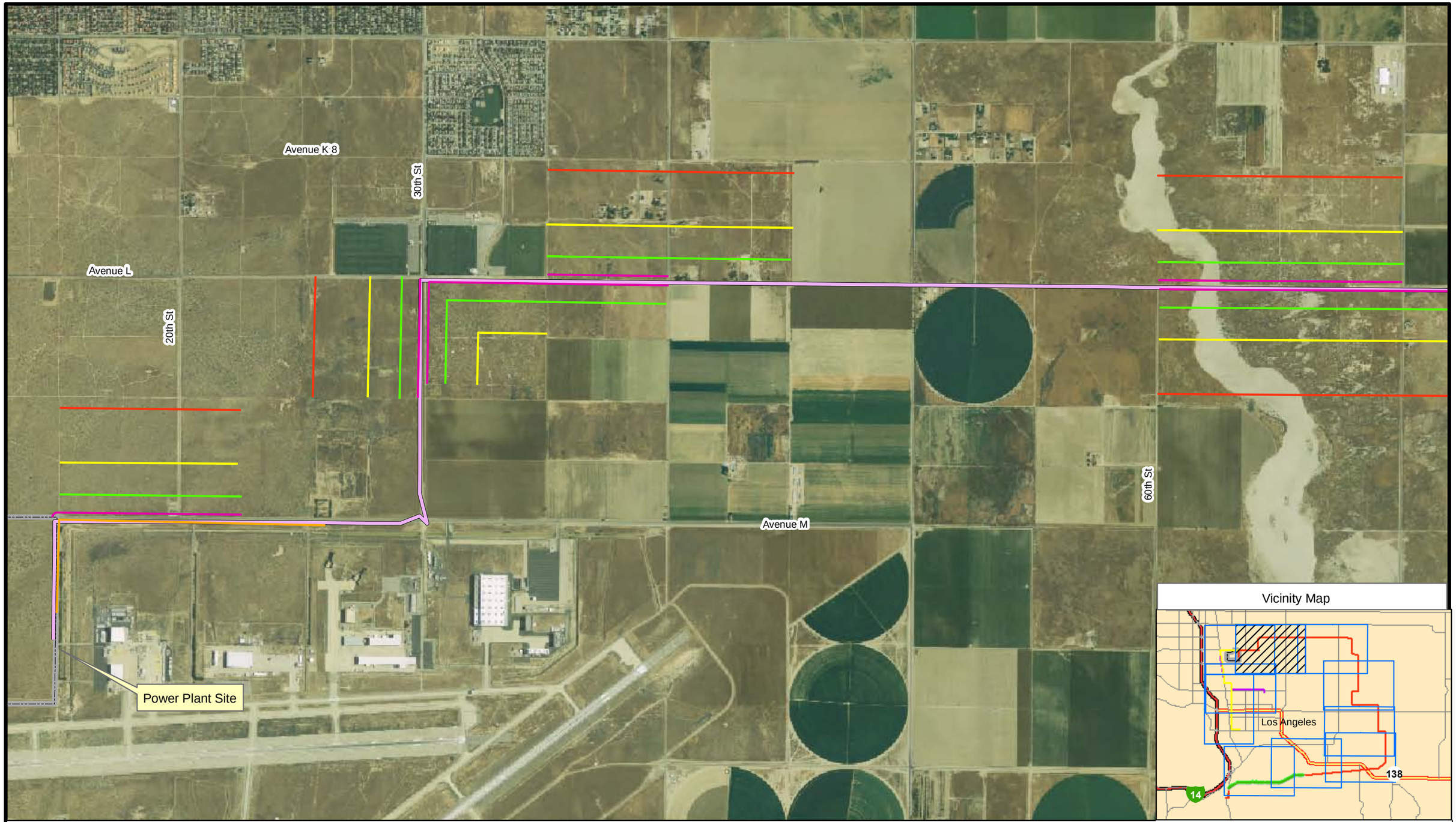

Legend

- Transmission Line Route
- Sanitary Wastewater Pipeline
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100

Palmdale Hybrid Power Project

Transmission Line Survey Areas
ZOI

Figure 2-D

0 1,000 2,000 4,000 6,000 8,000 Feet

1:24,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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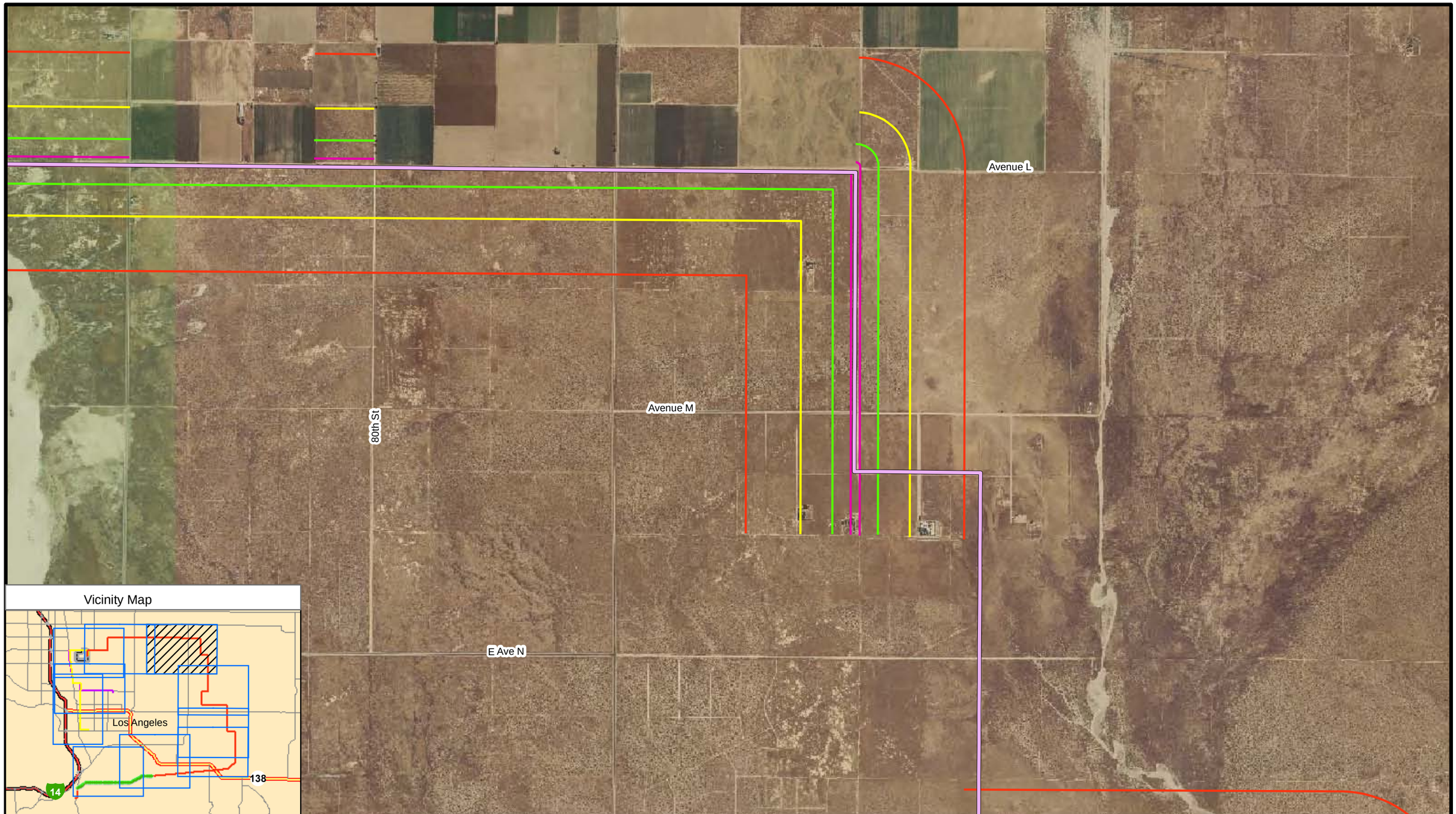

Legend

- Transmission Line Route
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100

Palmdale Hybrid Power Project

Transmission Line Survey Areas
ZOI
Figure 2-E

0 1,000 2,000 4,000 6,000 8,000 Feet

1:24,000

Map Notes:

Projection: NAD 83, Zone 11
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Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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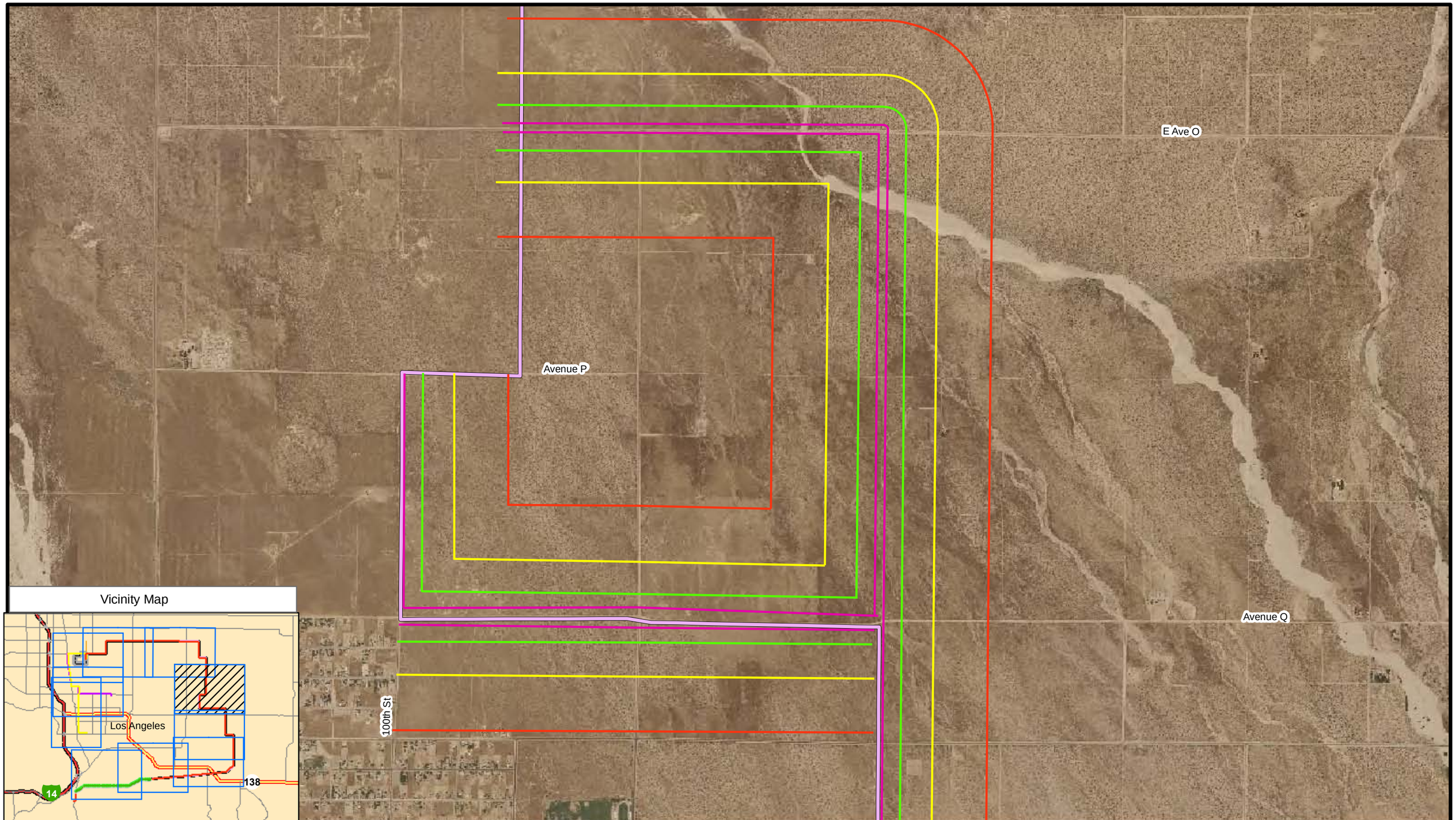

Legend

- Transmission Line Route
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100

Palmdale Hybrid Power Project

Transmission Line Survey Areas
ZOI

Figure 2-F

0 1,000 2,000 4,000 6,000 8,000 Feet

1:24,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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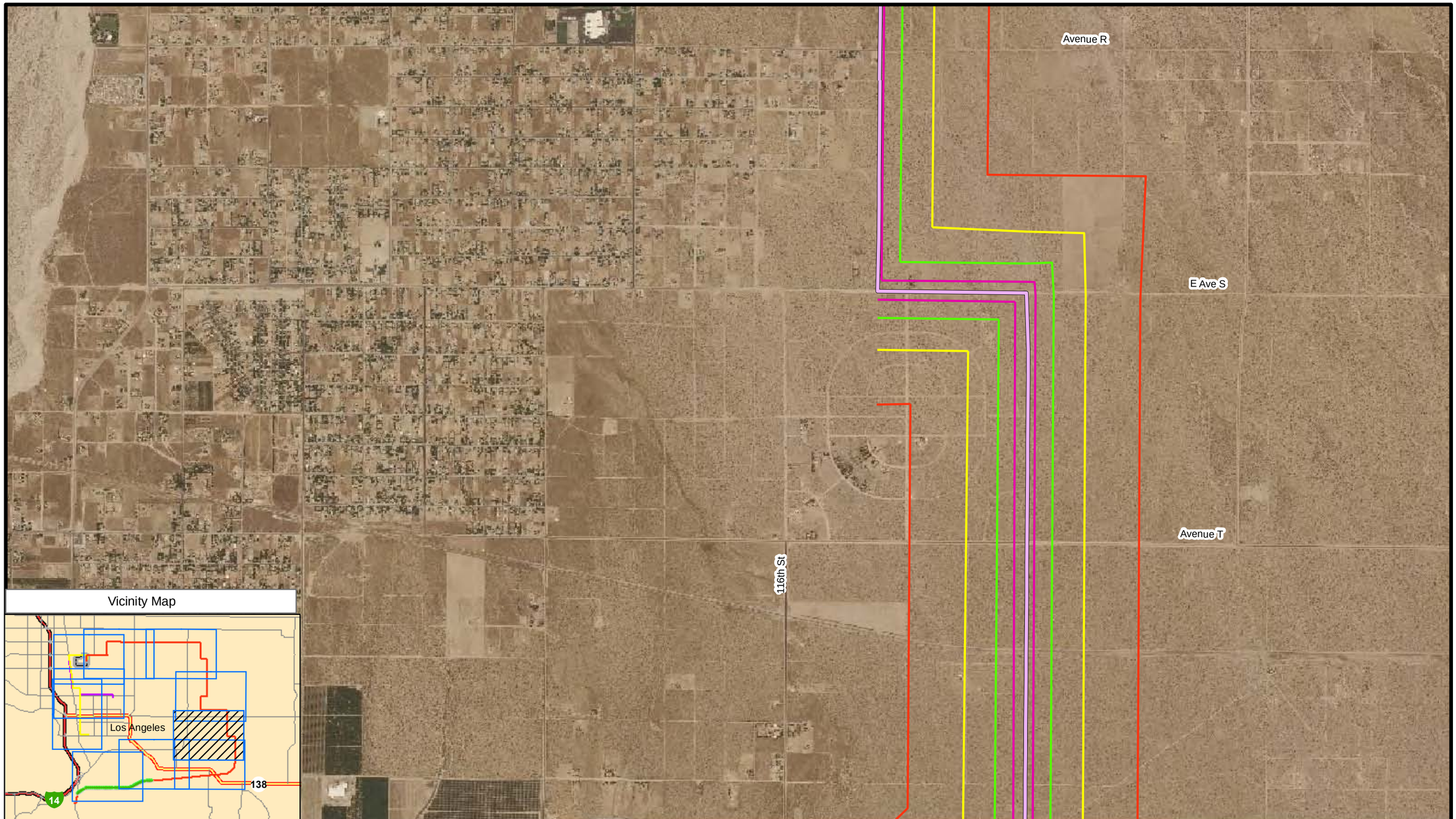

Legend

- Transmission Line Route
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100

Palmdale Hybrid Power Project

Transmission Line Survey Areas
ZOI

Figure 2-G

0 1,000 2,000 4,000 6,000 8,000 Feet

1:24,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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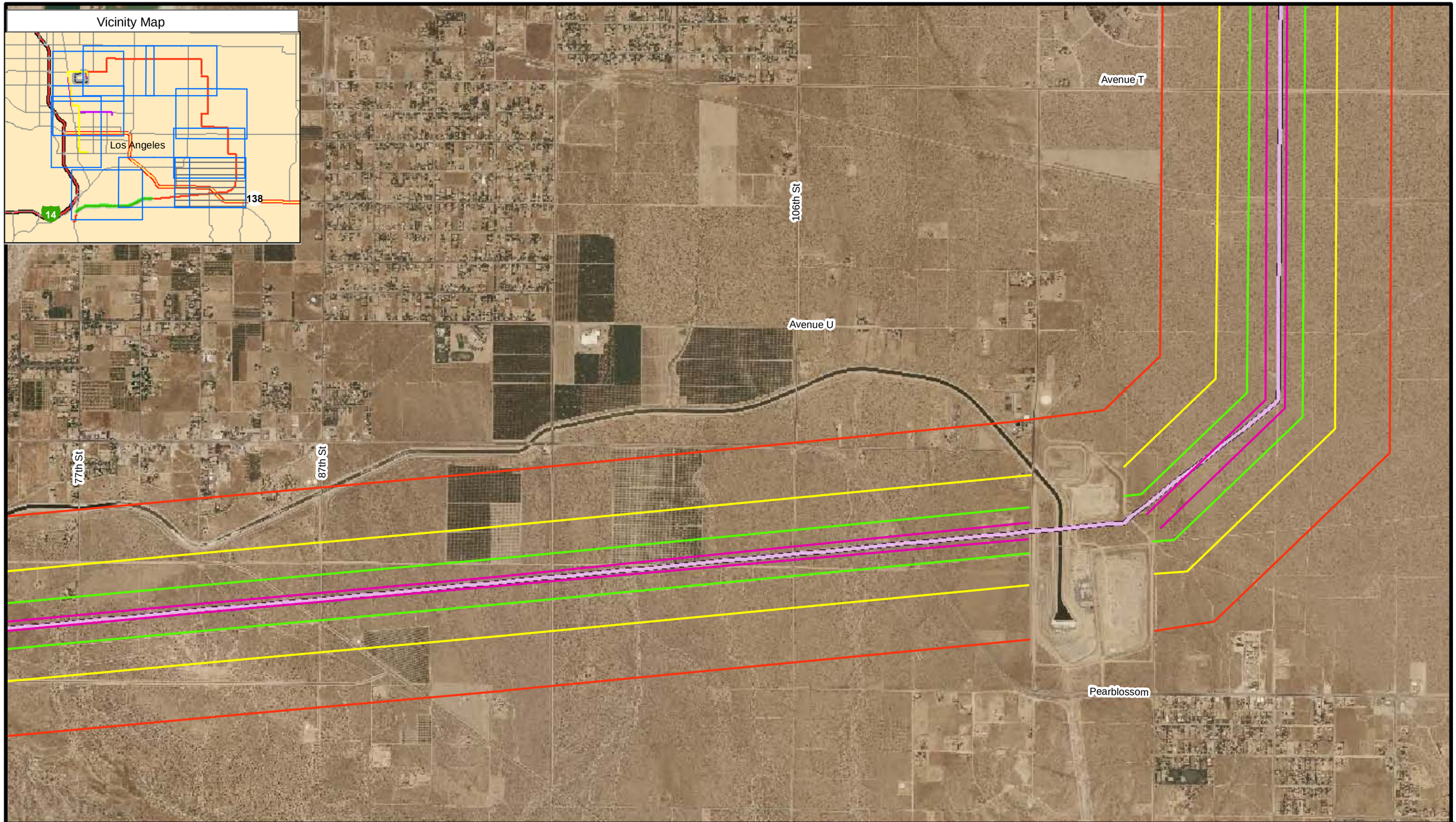

Legend

- Transmission Line Route
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100

Palmdale Hybrid Power Project

Transmission Line Survey Areas
ZOI

Figure 2-H

0 1,050 2,100 4,200 6,300 8,400 Feet

1:24,000

Map Notes:

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Date: 02/26/09

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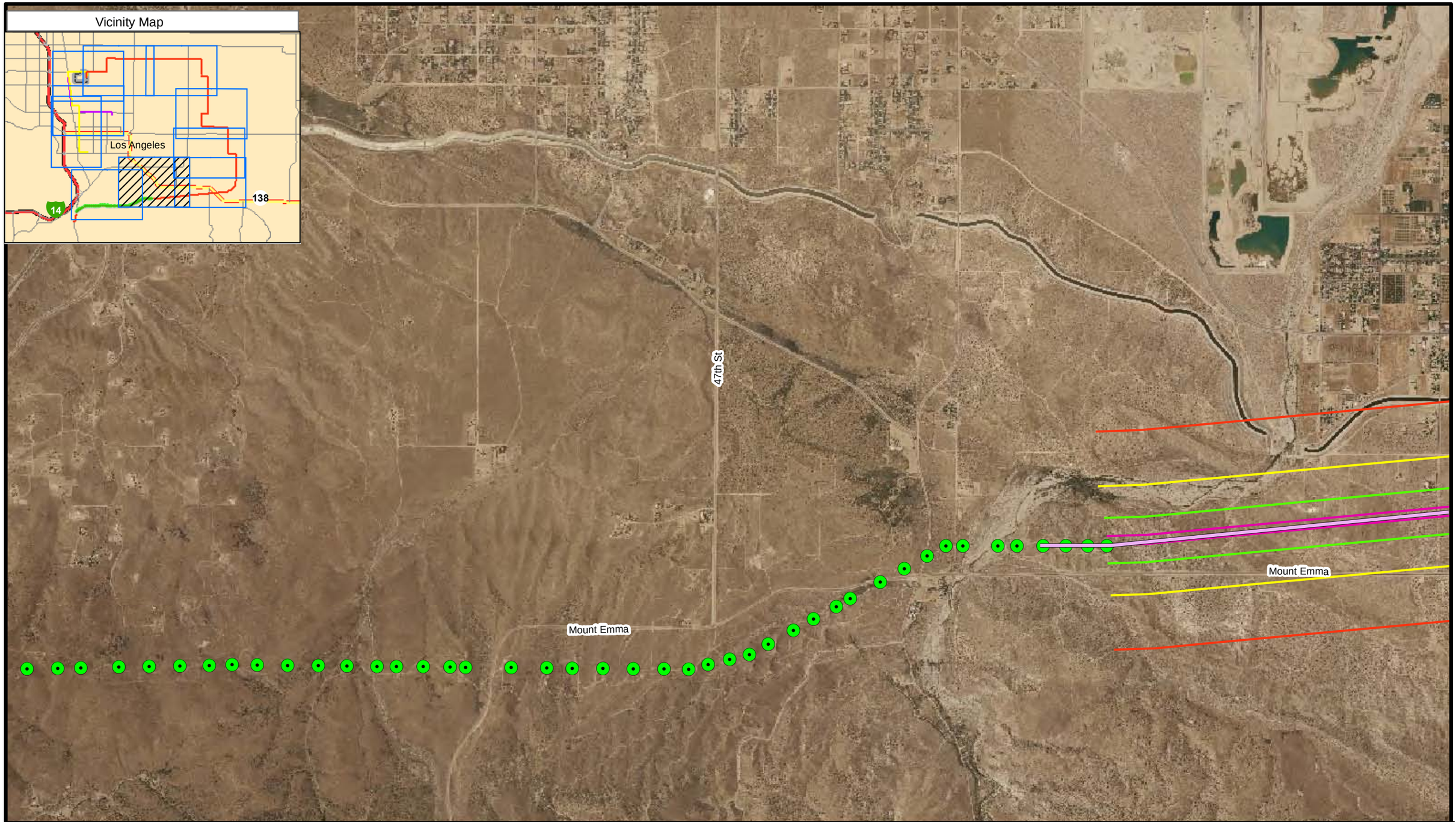

Legend

- Transmission Line Route
- ZOI 2400
- ZOI 1200
- ZOI 500
- ZOI 100
- Towers

Palmdale Hybrid Power Project

Transmission Line & Towers Survey Areas
ZOI

Figure 2-I

0 1,000 2,000 4,000 6,000 8,000 Feet

1:24,000

Map Notes:

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Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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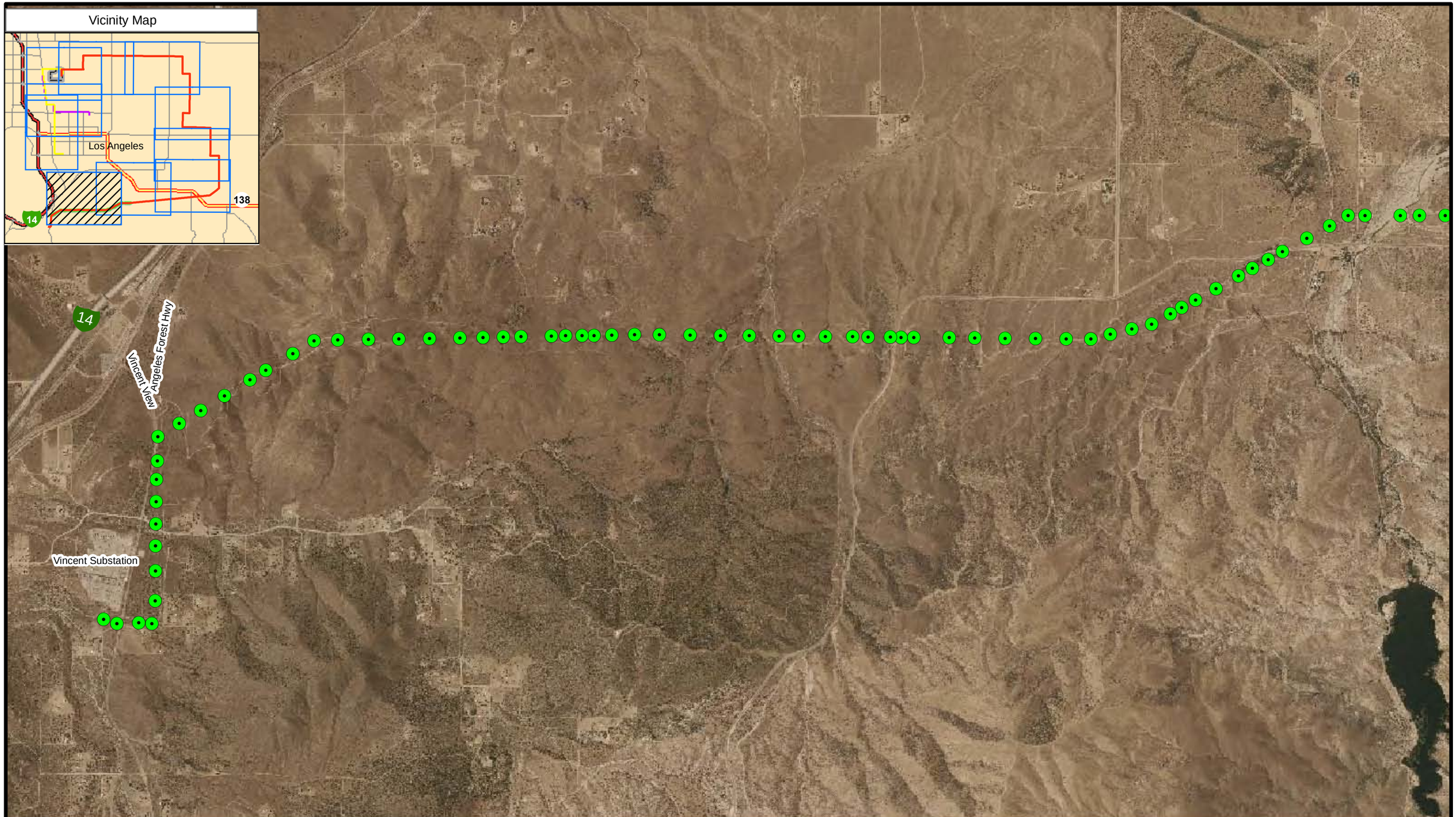

Legend

Towers

Palmdale Hybrid Power Project

Towers Survey Area
ZOI

Figure 2-J

0 1,100 2,200 4,400 6,600 8,800 Feet

1:24,000

Map Notes:

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Date: 02/26/09

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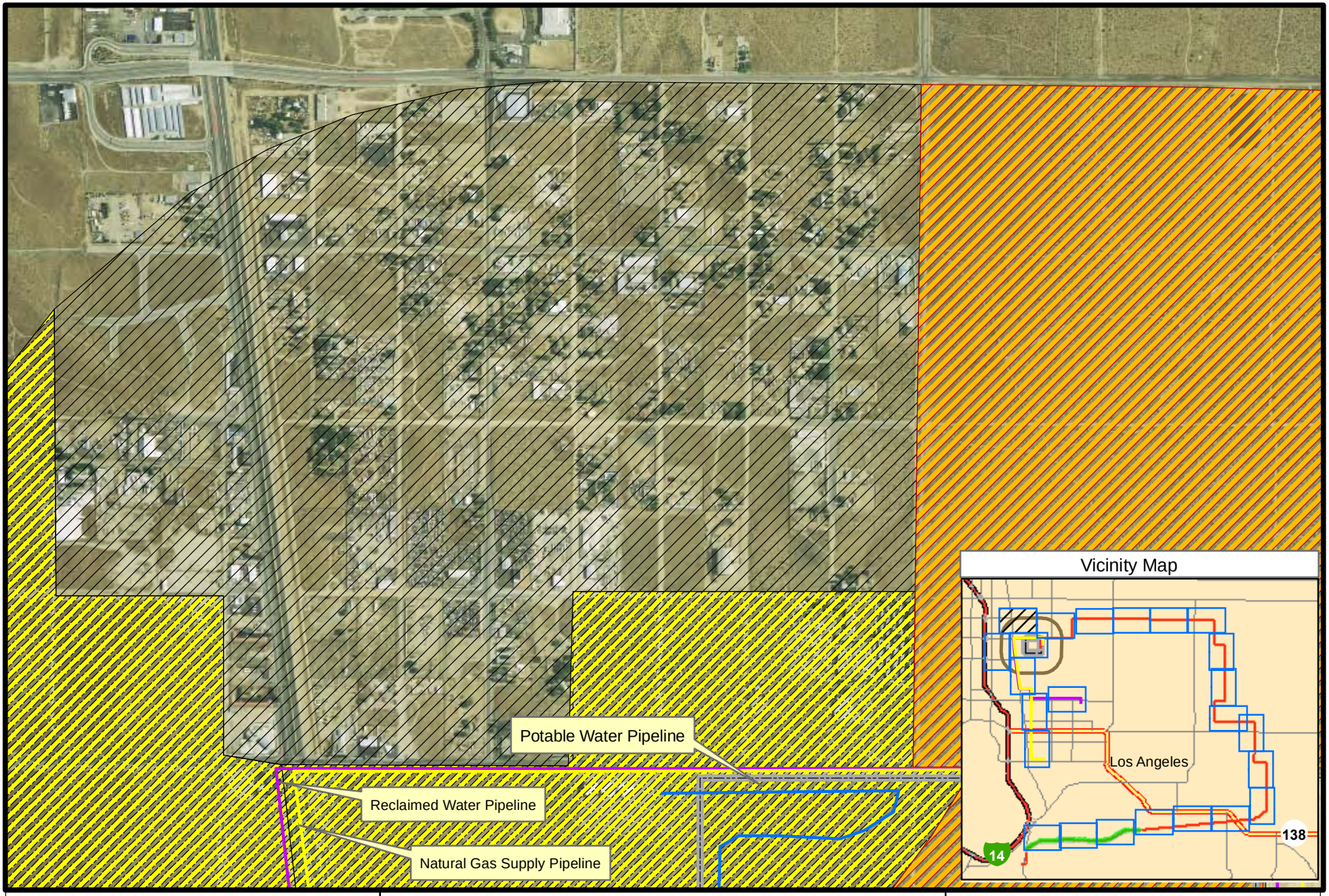

Legend

- Joshua Tree Woodland
- Rabbitbrush Scrub
- Urban& Disturbed/Developed Land
- Power Plant Site

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-A.1

0 0.1 0.2 0.3 0.4 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 03/19/09

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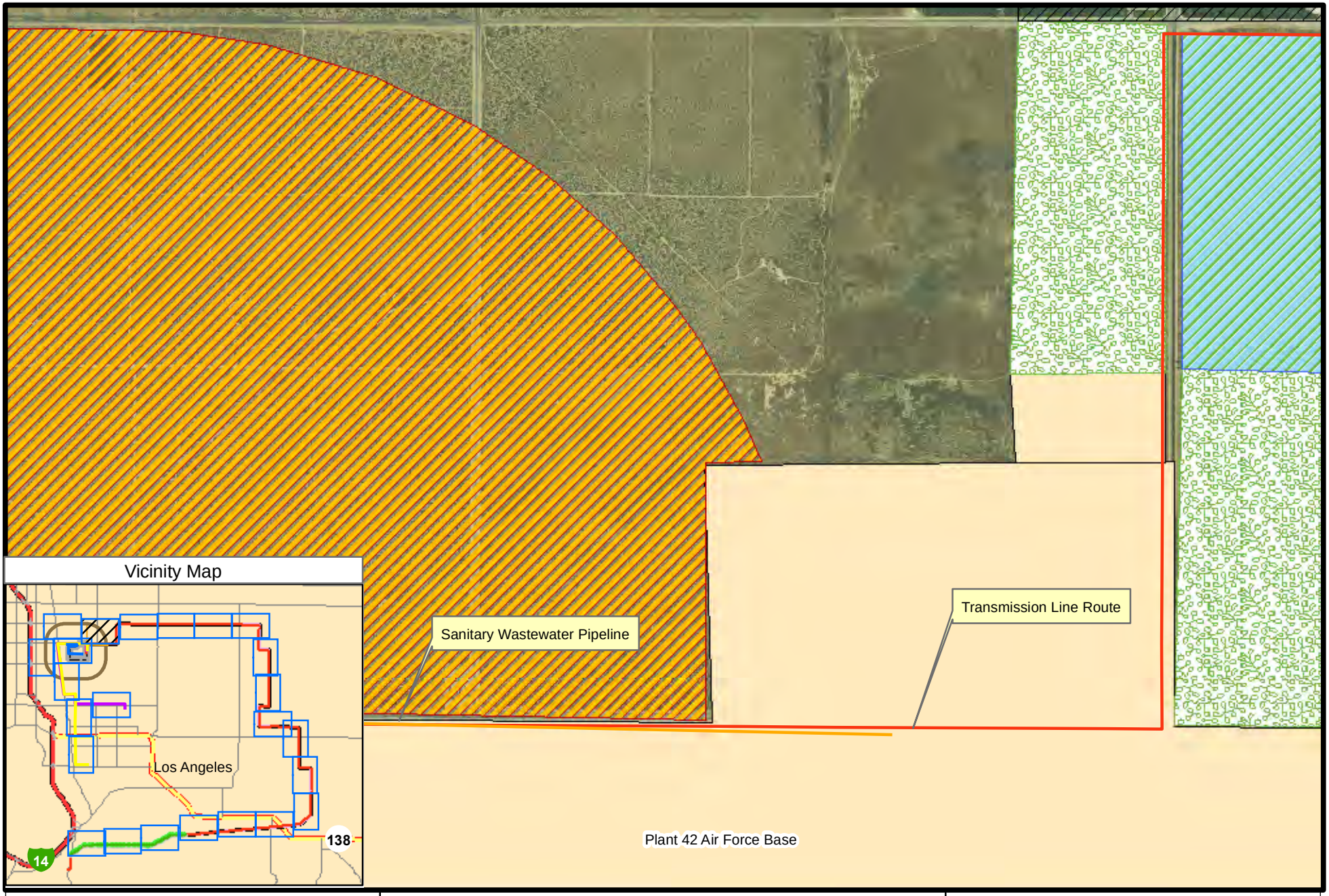

Legend

- Agriculural Land (Active/Fallow) & Orchard
- Joshua Tree Woodland
- Urban& Disturbed/Developed Land
- Desert Saltbush Scrub

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-A.2

0 0.1 0.2 0.3 0.4 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 03/02/09

N

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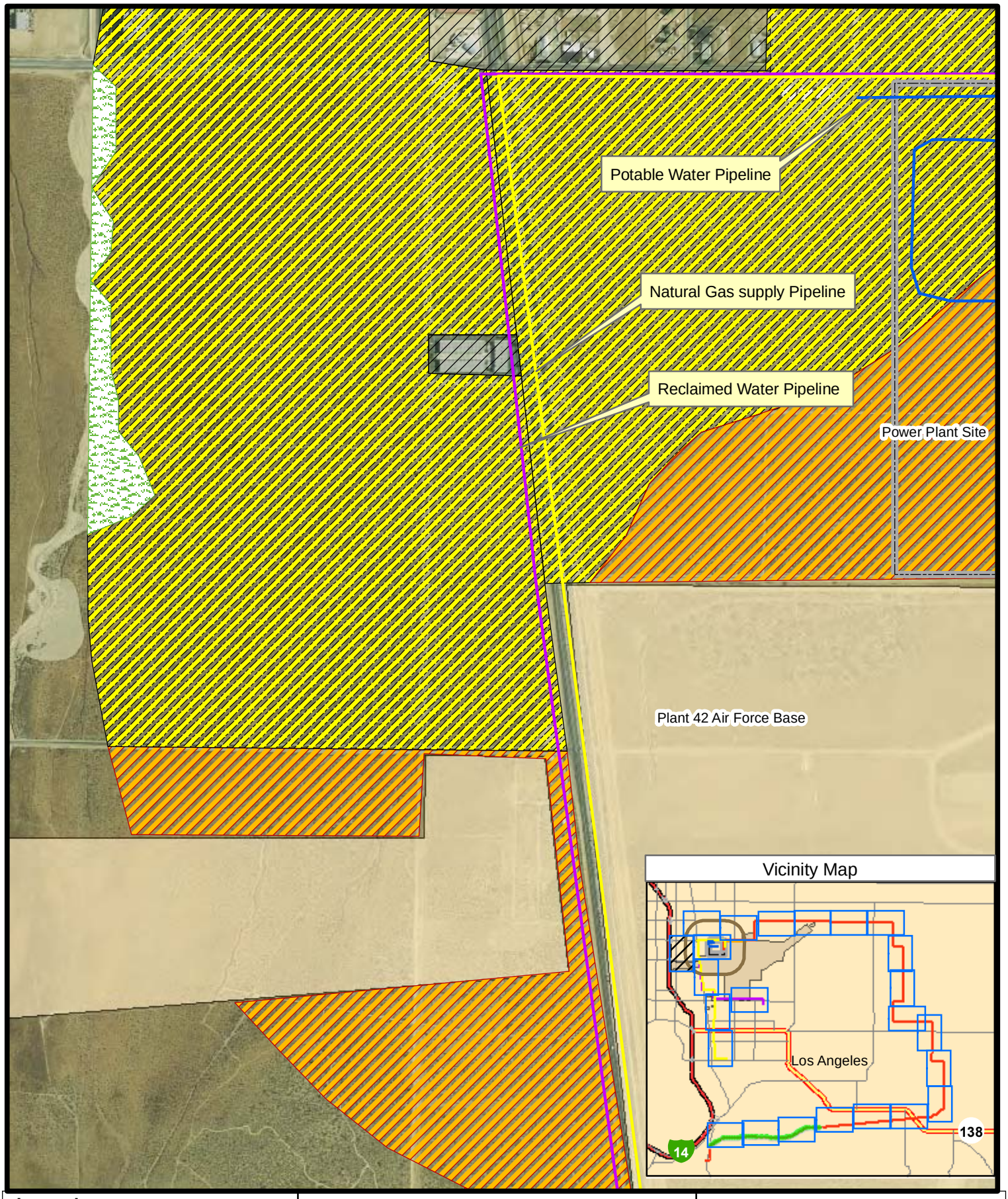

Legend

- Mojave Desert Wash Scrub
- Joshua Tree Woodland
- Rabbitbrush Scrub
- Urban& Disturbed/Developed Land

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-A.3

0 0.08 0.16 0.24 0.32 Miles

1:12,000

Map Notes:

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Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics \mxd\2009
Date: 02/26/09

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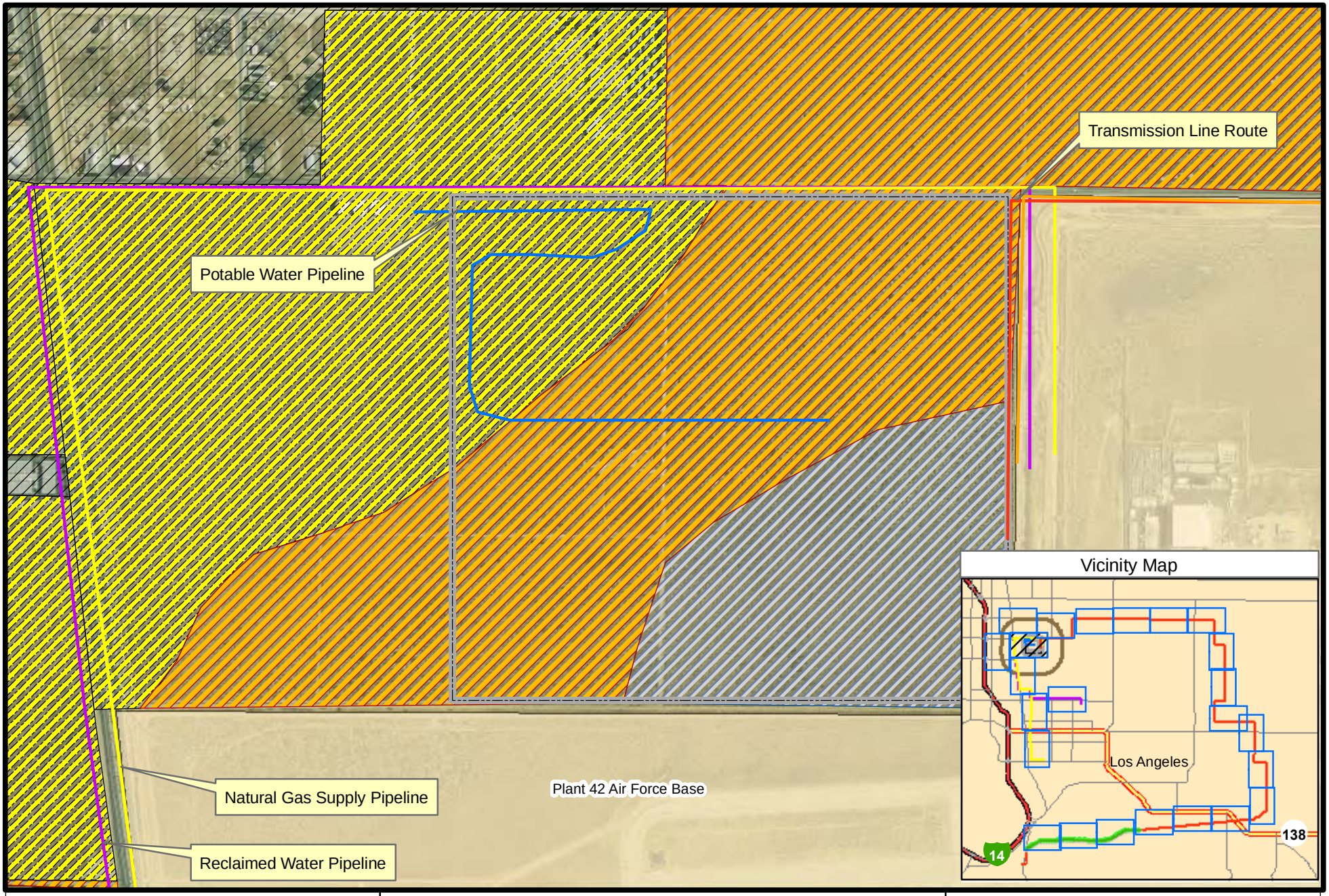

Legend

- Mojave Creosote Bush Scrub
- Joshua Tree Woodland
- Rabbitbrush Scrub
- Urban& Disturbed/Developed Land
- Power Plant Site
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-A.4

0 0.1 0.2 0.3 0.4 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
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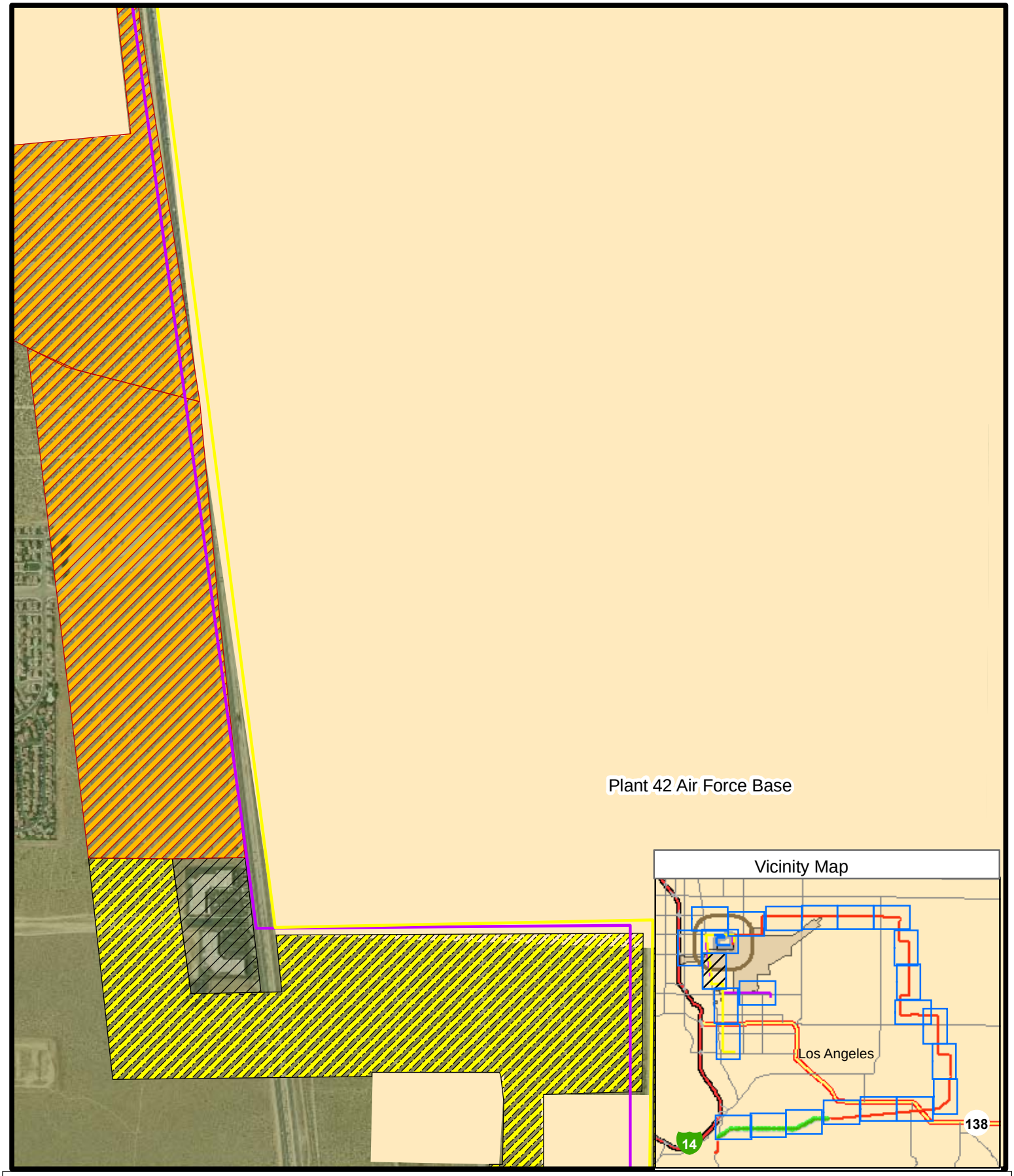

Legend

- Joshua Tree Woodland
- Rabbitbrush Scrub
- Urban& Disturbed/Developed Land
- Natural Gas supply Pipeline
- Reclaimed Water Pipeline

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-B

0 0.075 0.15 0.225 0.3 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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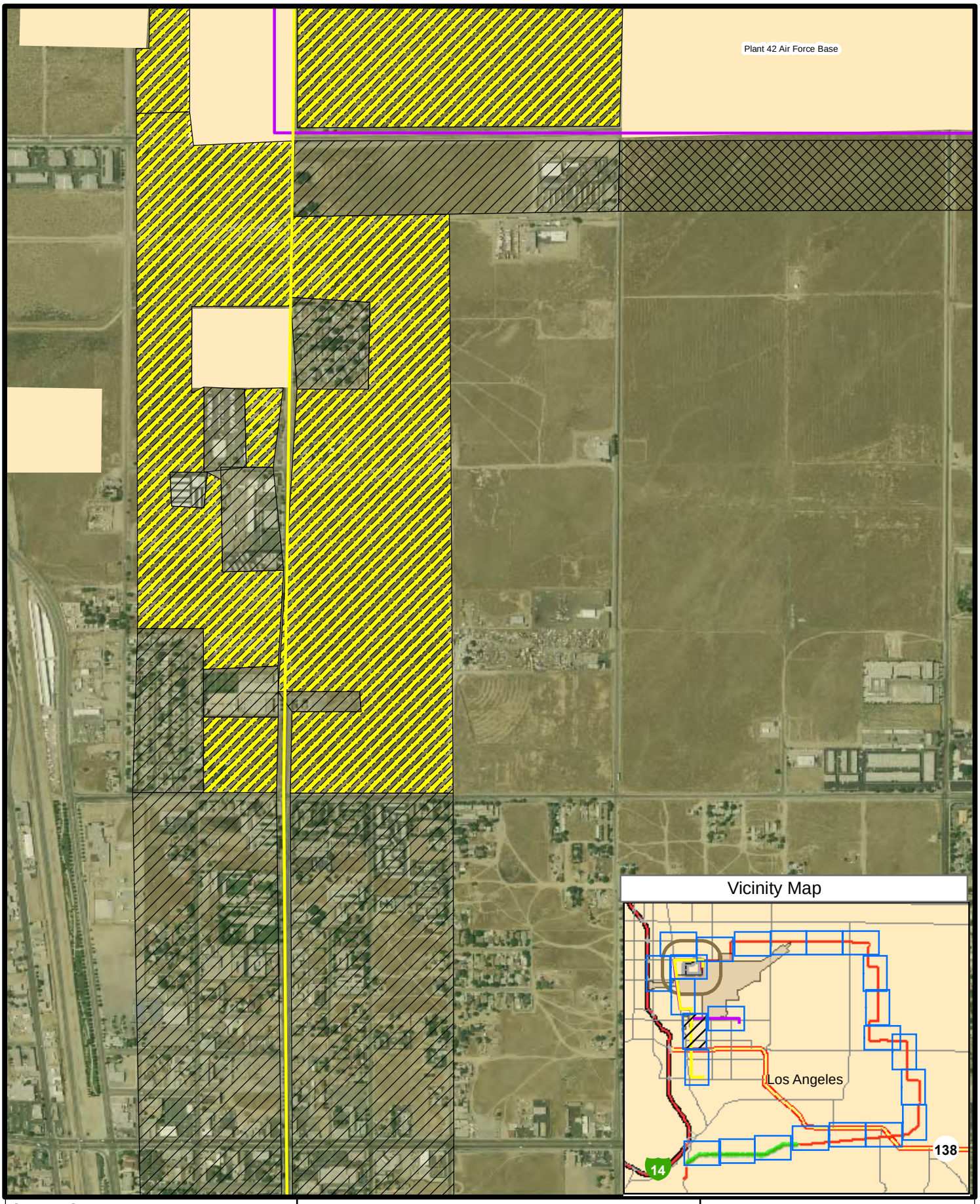

Legend

- Rabbitbrush Scrub
- Urban& Disturbed/Developed Land
- LA World Airports
- Reclaimed Water Pipeline
- Natural Gas Supply Pipline

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-C

0 0.06 0.12 0.18 0.24 Miles

1:12,235

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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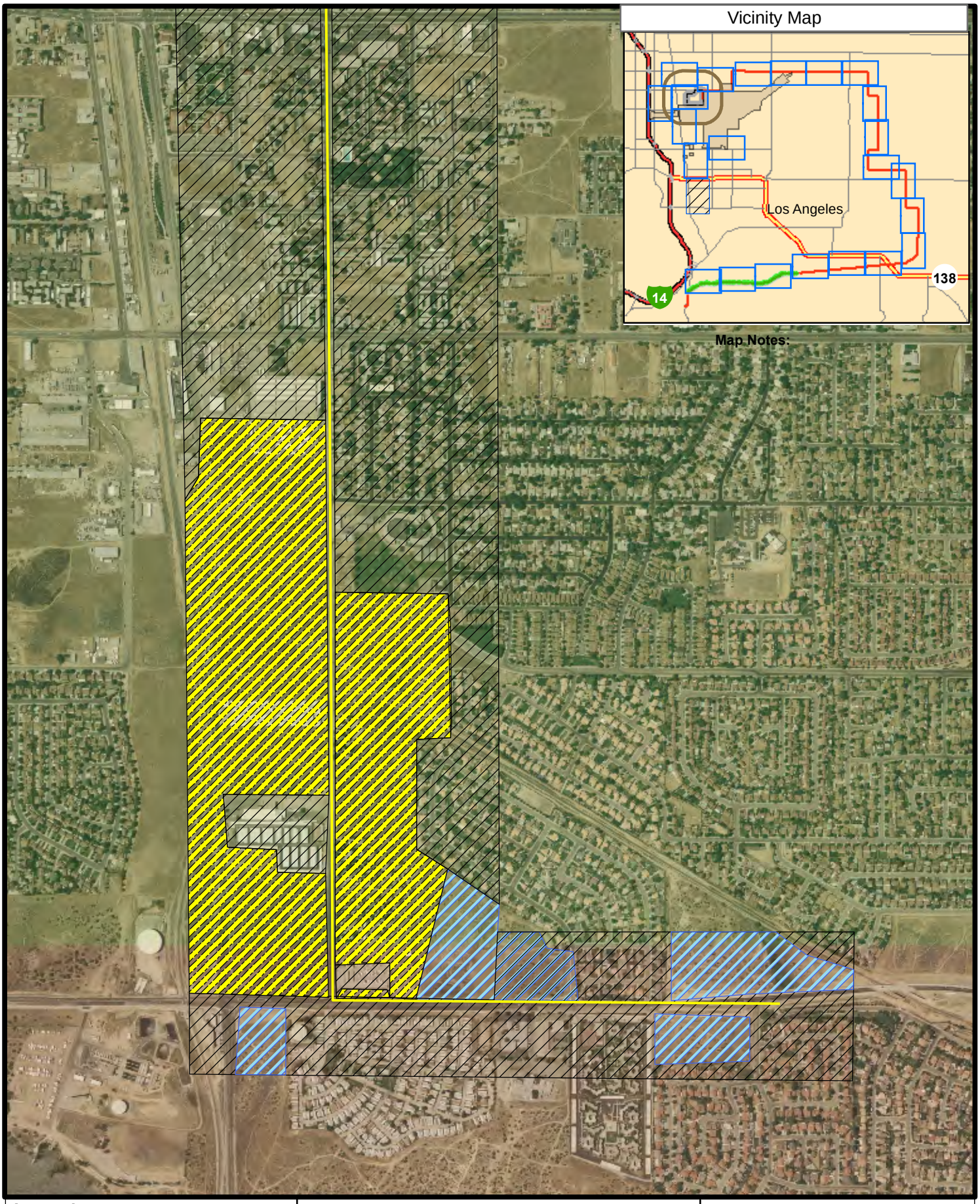

Legend

- Rabbitbrush Scrub
- Urban& Disturbed/Developed Land
- Mojavean Juniper Scrub
- Natural Gas Supply Pipline

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-D

0 0.06 0.12 0.18 0.24 Miles

1:12,000

Map Notes: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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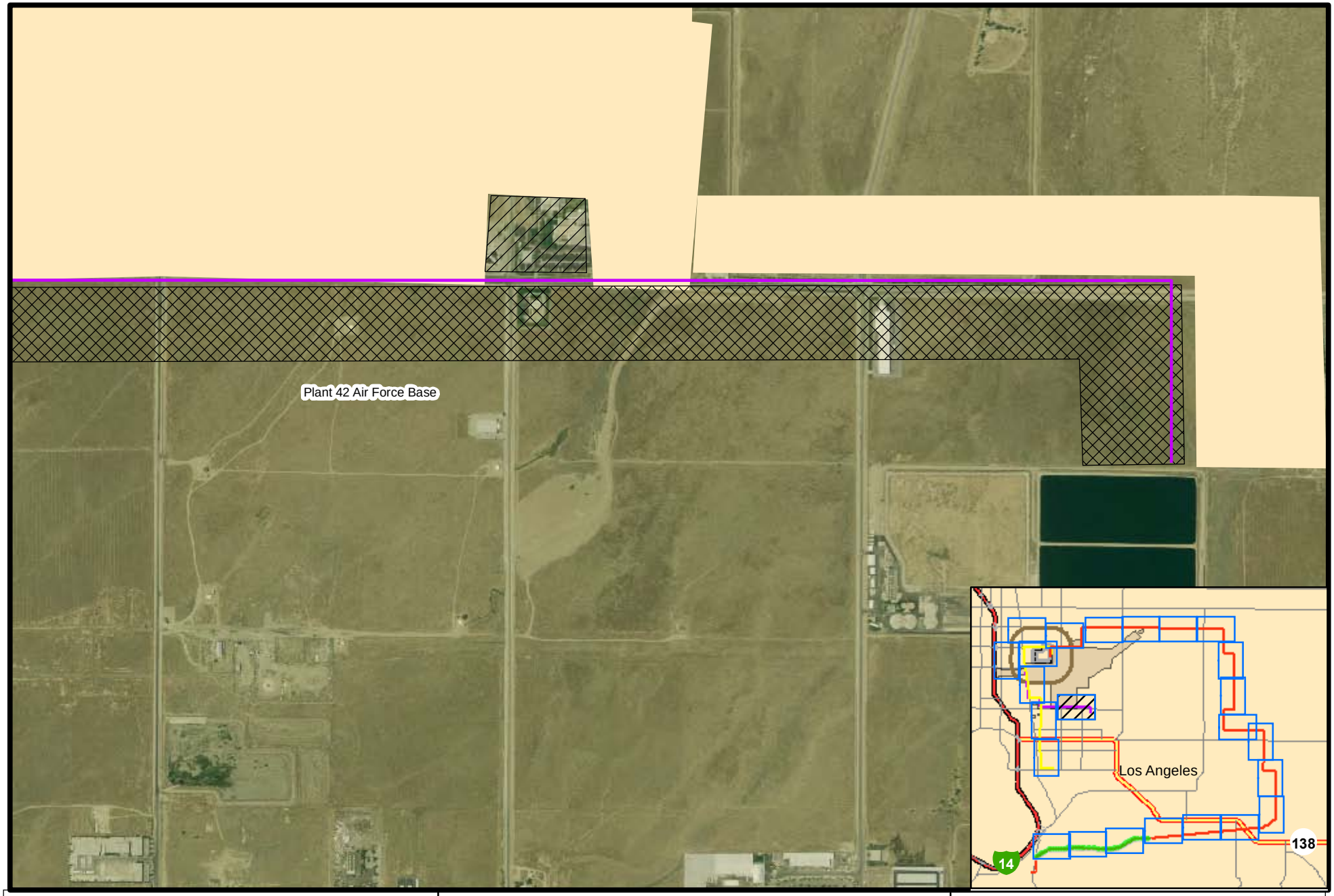

Legend

- LA World Airports
- Urban & Disturbed/Developed Land
- Reclaimed Water Pipeline

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-E

0 0.1 0.2 0.3 0.4 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd \2009
Date: 02/26/09

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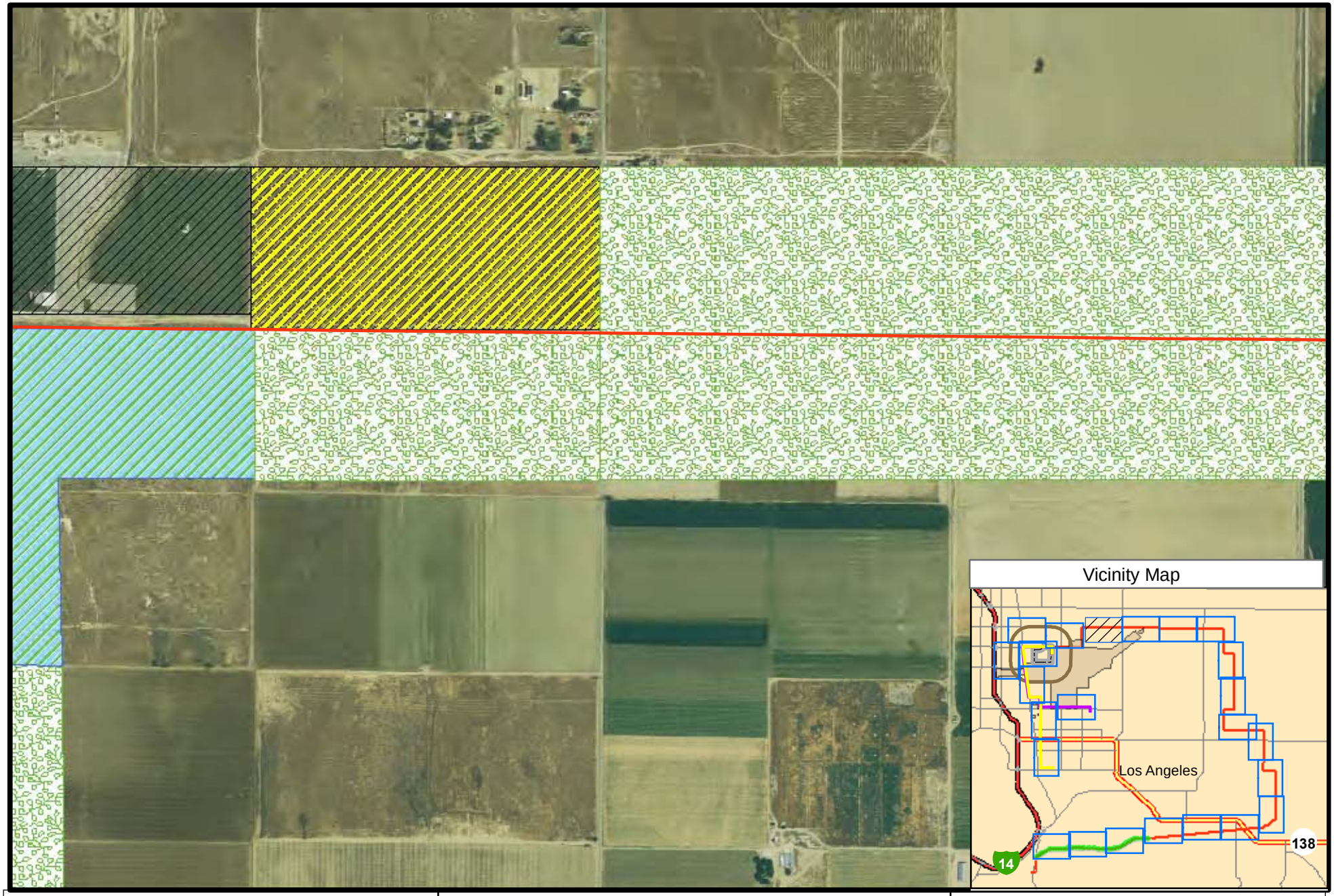

Legend

- Agricultural Land (Active/Fallow) & Orchards
- Rabbitbrush Scrub
- Desert Saltbrush Scrub
- Urban & Disturbed/Developed Lands
- Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-F

0 0.1 0.2 0.3 0.4 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
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Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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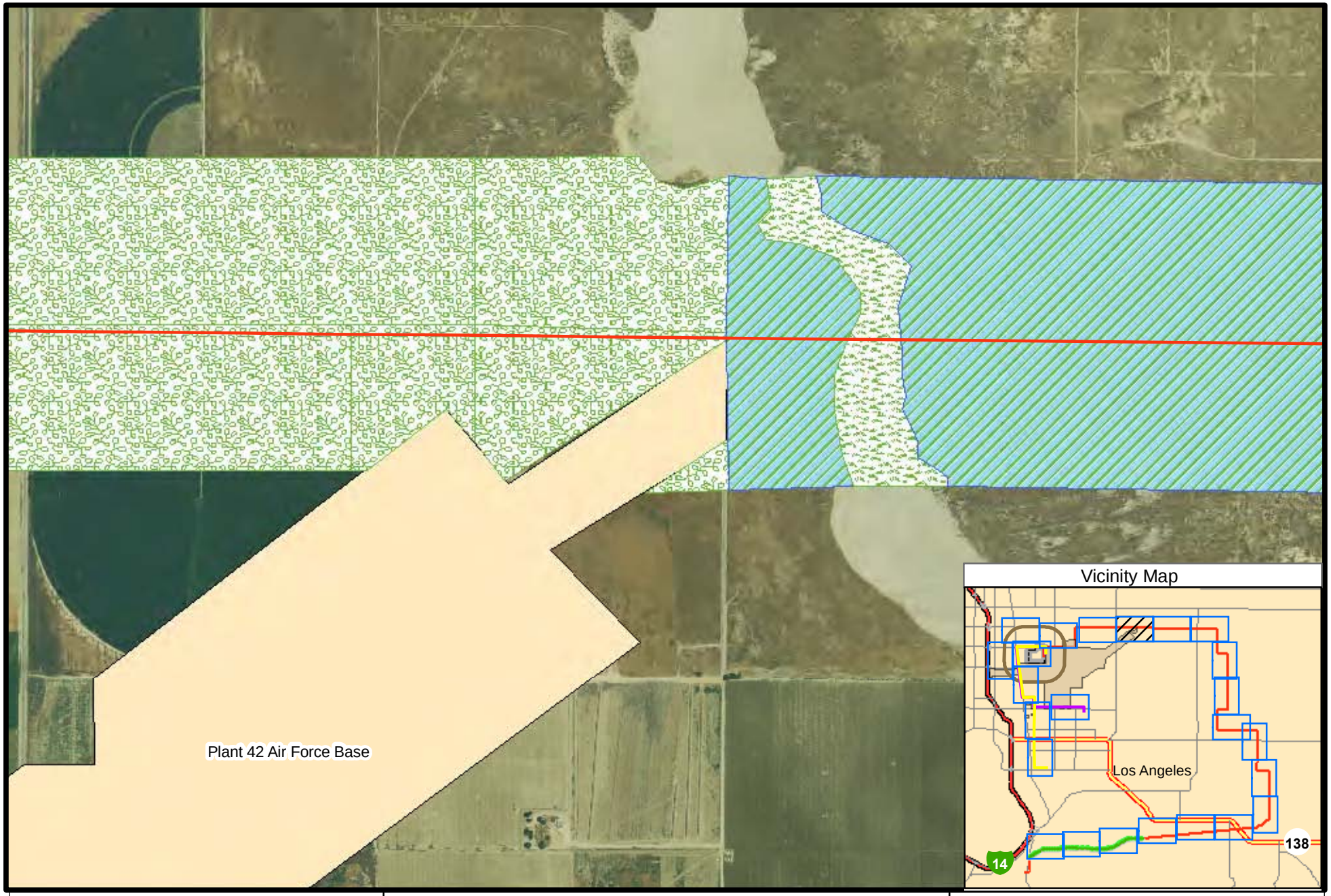

Legend

- Agricultural Land (Active/Fallow) & Orchards
- Mojave Desert Wash Scrub
- Desert Saltbrush Scrub
- Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-G

0 0.1 0.2 0.3 0.4 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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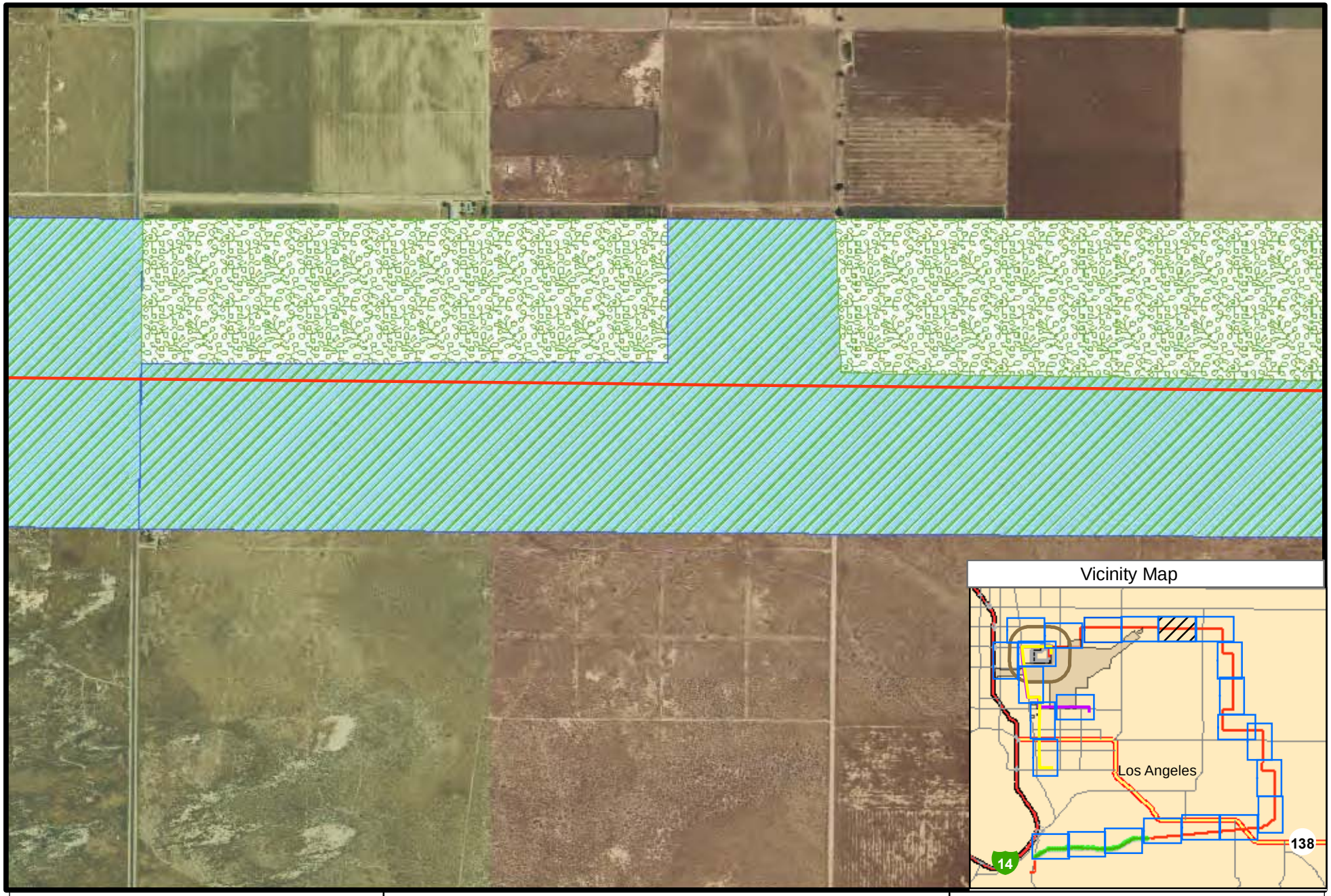

Legend

Agriculural Land (Active/Fallow) & Orchards

Desert Saltbrush Scrub

Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-H

0 0.1 0.2 0.3 0.4 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
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Power Plant Bio 6554000247\graphics\mxd
Date: 02/26/09

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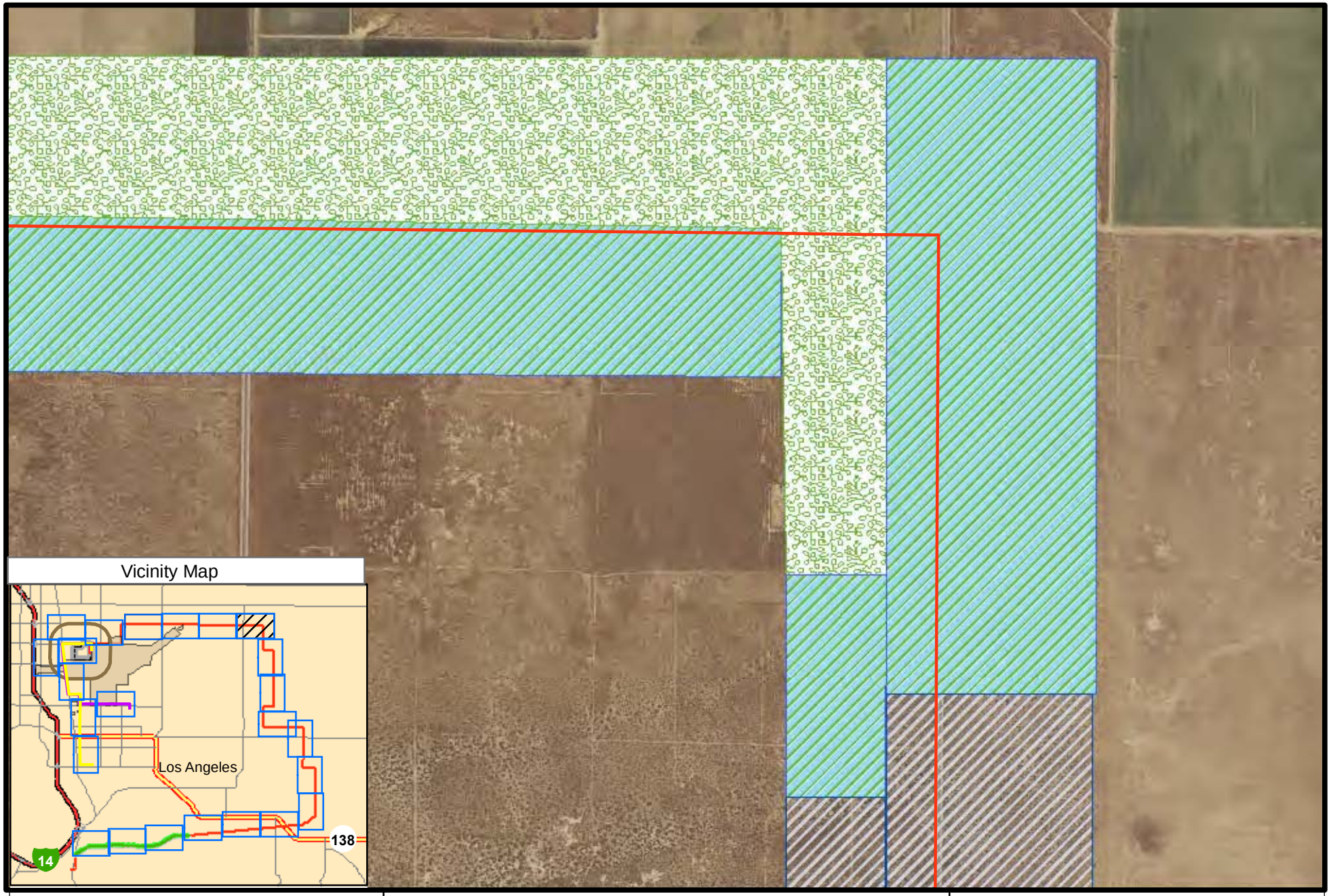
amec



Legend

- Agricultural Land (Active/Fallow) & Orchards
- Desert Saltbrush Scrub
- Mojave Creosote Bush Scrub
- Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-I

0 0.1 0.2 0.3 0.4 Miles

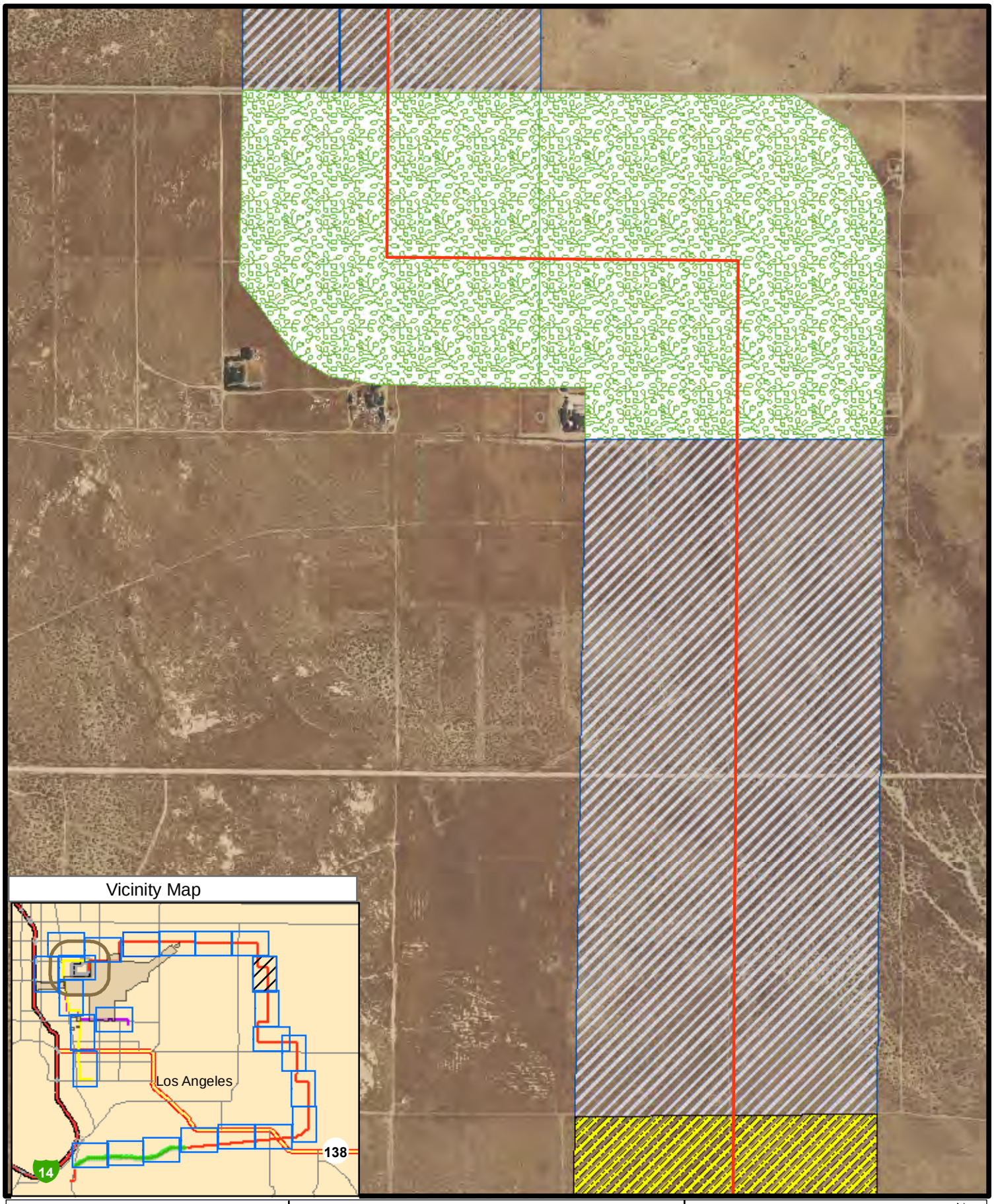
1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Agriculural Land (Active/Fallow) & Orchards
- Mojave Creosote Bush Scrub
- Rabbitbush Scrub
- Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-J

0 420 840 1,260 1,680 Feet

1:12,000

Map Notes:

Projection: NAD 83, Zone 11

Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009

Date:02/26/09

N

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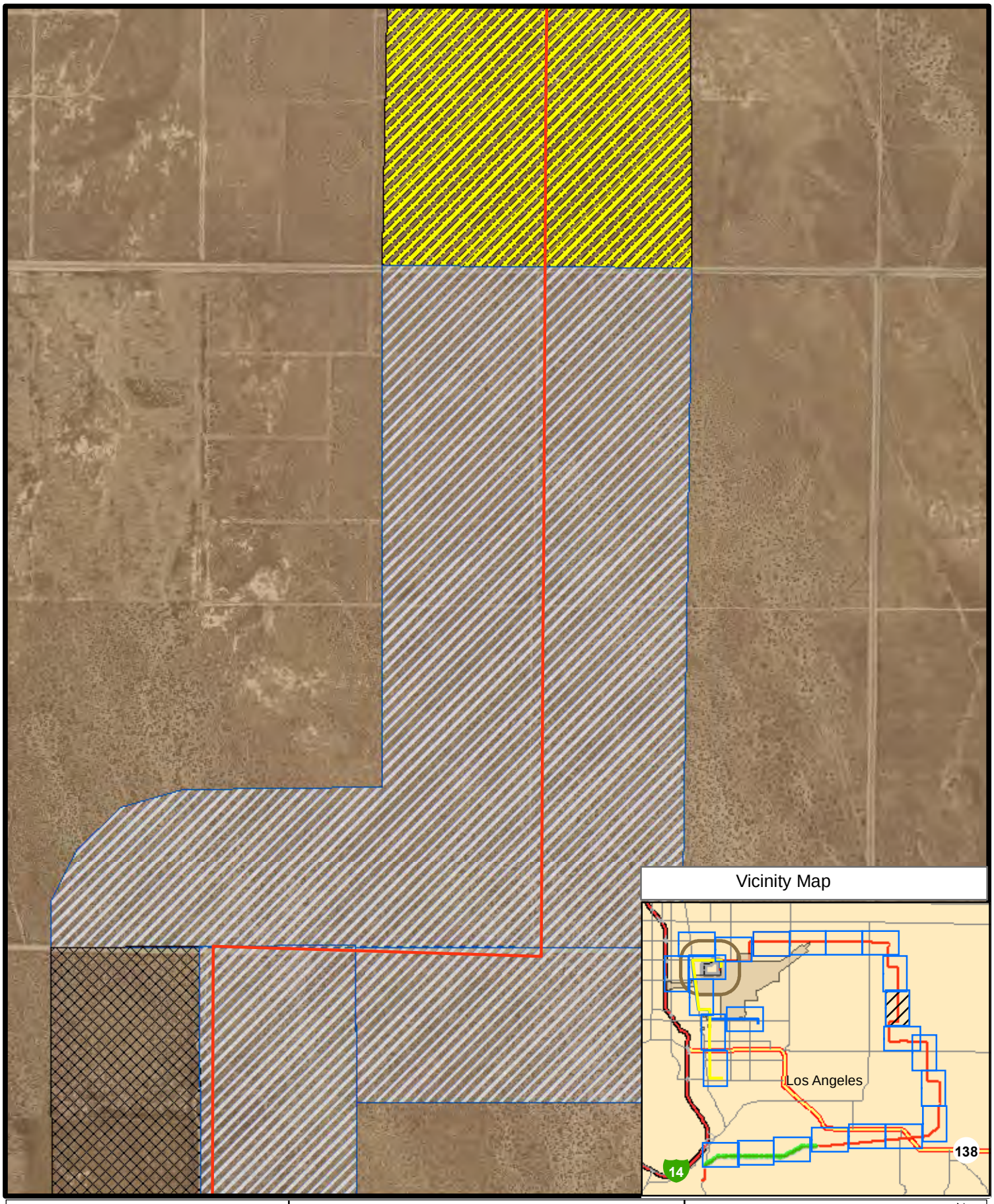


Legend

- Mojave Creosote Bush Scrub
- LA World Airports
- Rabbitbush Scrub
- Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-K

0 400 800 1,200 1,600 Feet

1:12,000

Map Notes:

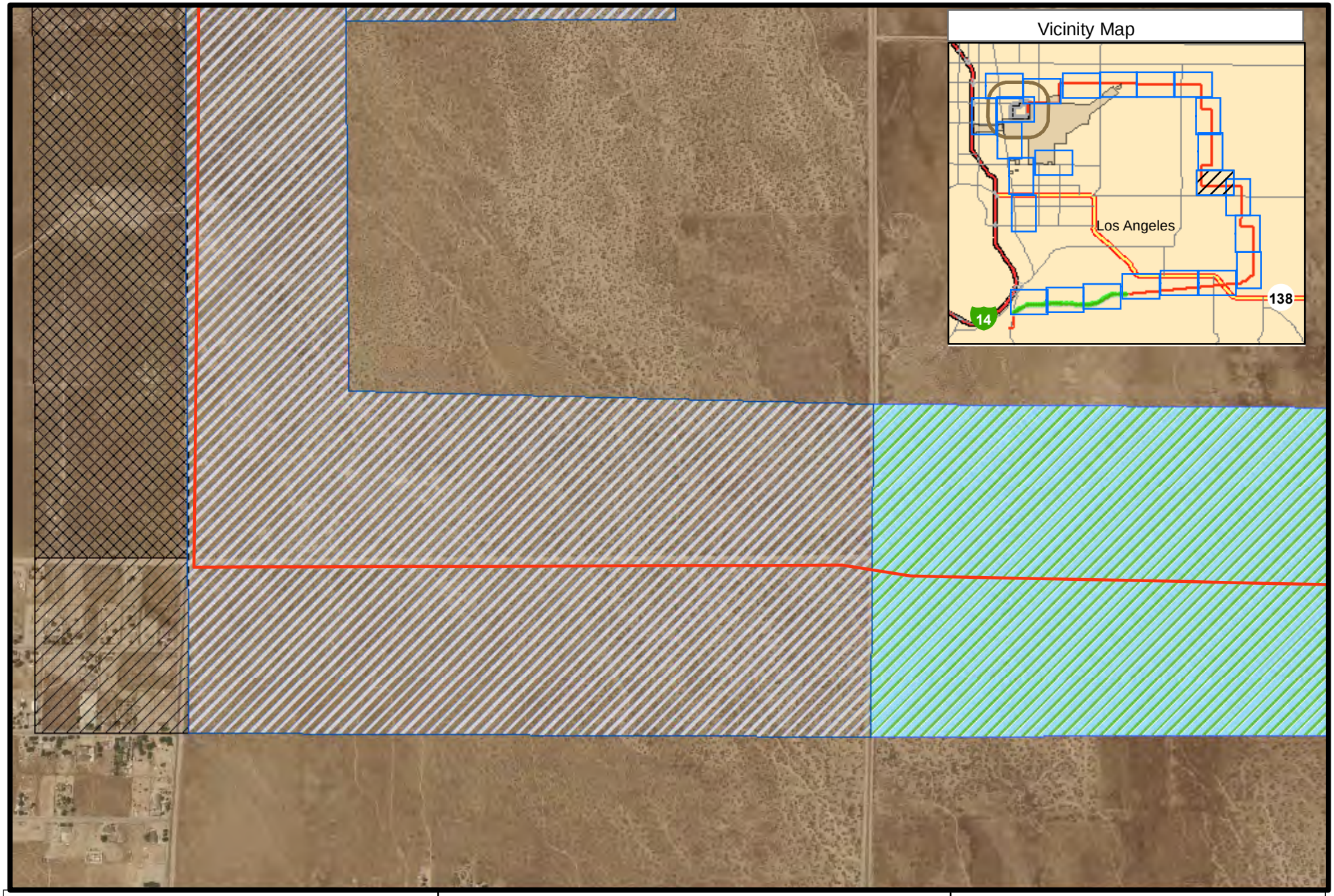
Projection: NAD 83, Zone 11

Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009

Date: 02/26/09

N

amec



Legend

- LA World Airports
- Mojave Creosote Bush Scrub
- Urban & Disturbed/Developed Lands
- Desert Salt Bush Scrub
- Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-L

0 0.09 0.18 0.27 0.36 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

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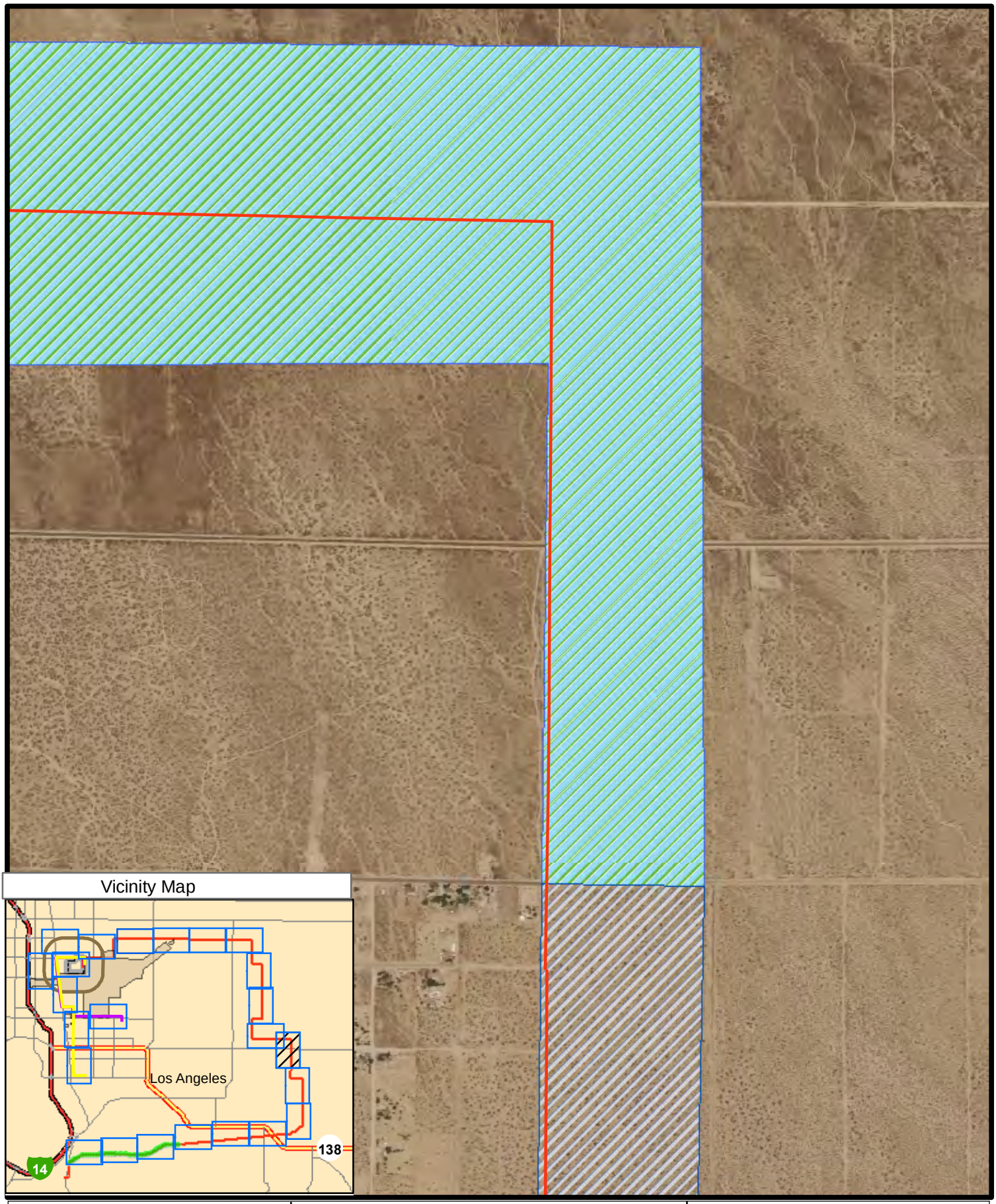
amec



Legend

- Mojave Creosote Bush Scrub
- Desert Salt Bush Scrub
- Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-M

0 420 840 1,260 1,680 Feet

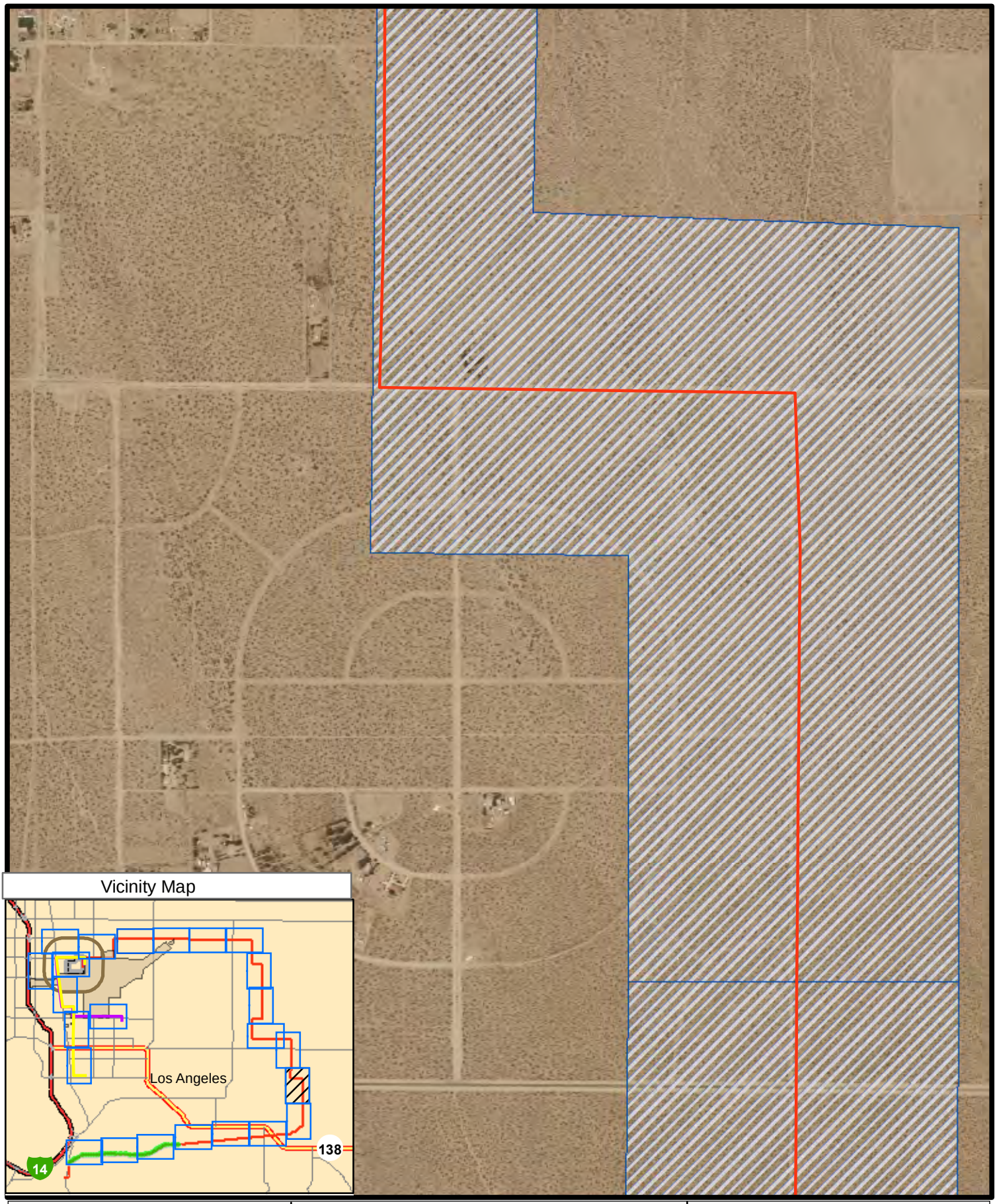
1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

Mojave Creosote Bush Scrub

Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities
Figure 3-N

0 420 840 1,260 1,680 Feet

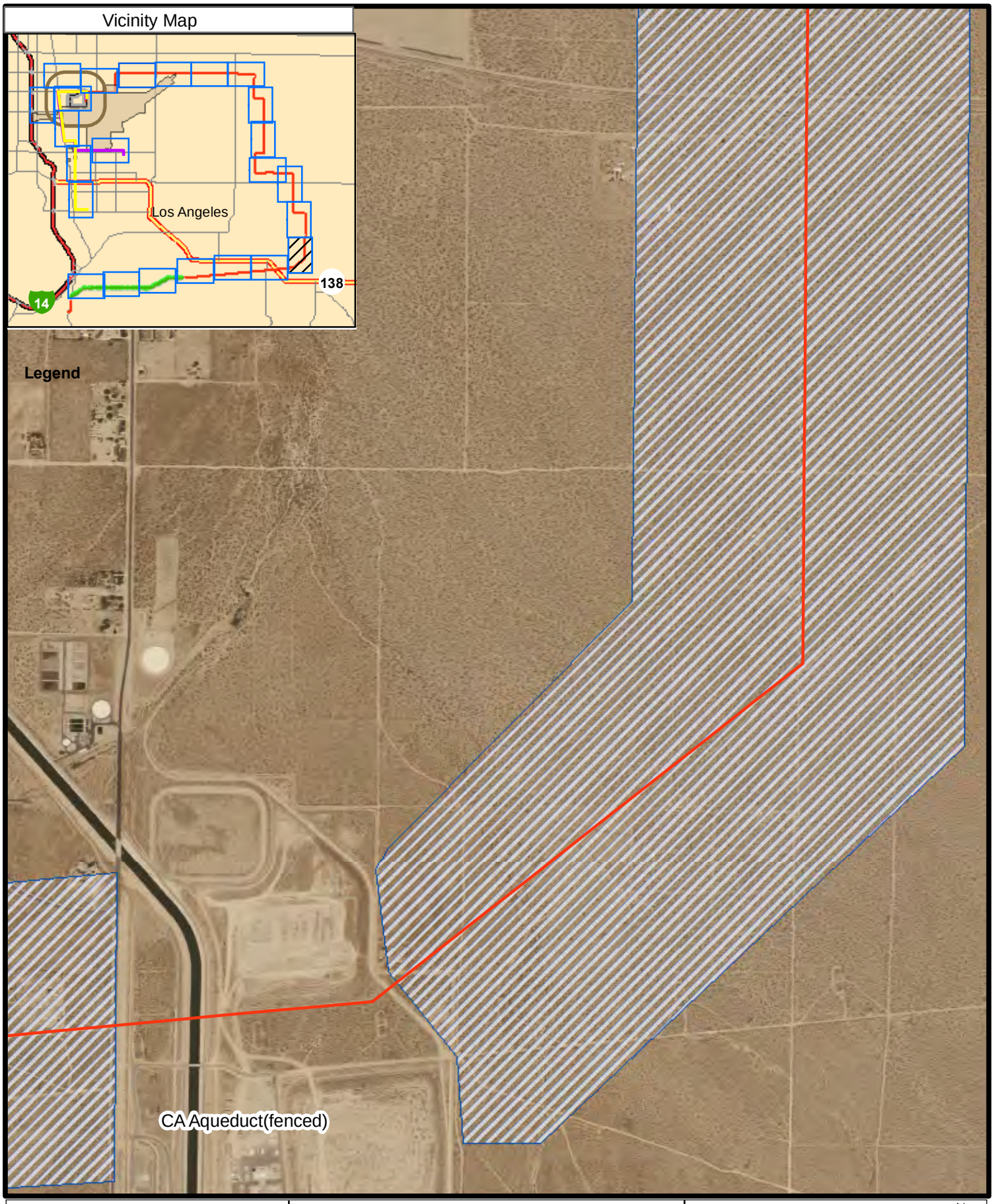
1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legand

Mojave Creosote Bush Scrub

Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-O

0 410 820 1,230 1,640 Feet

1:12,000

Map Notes:

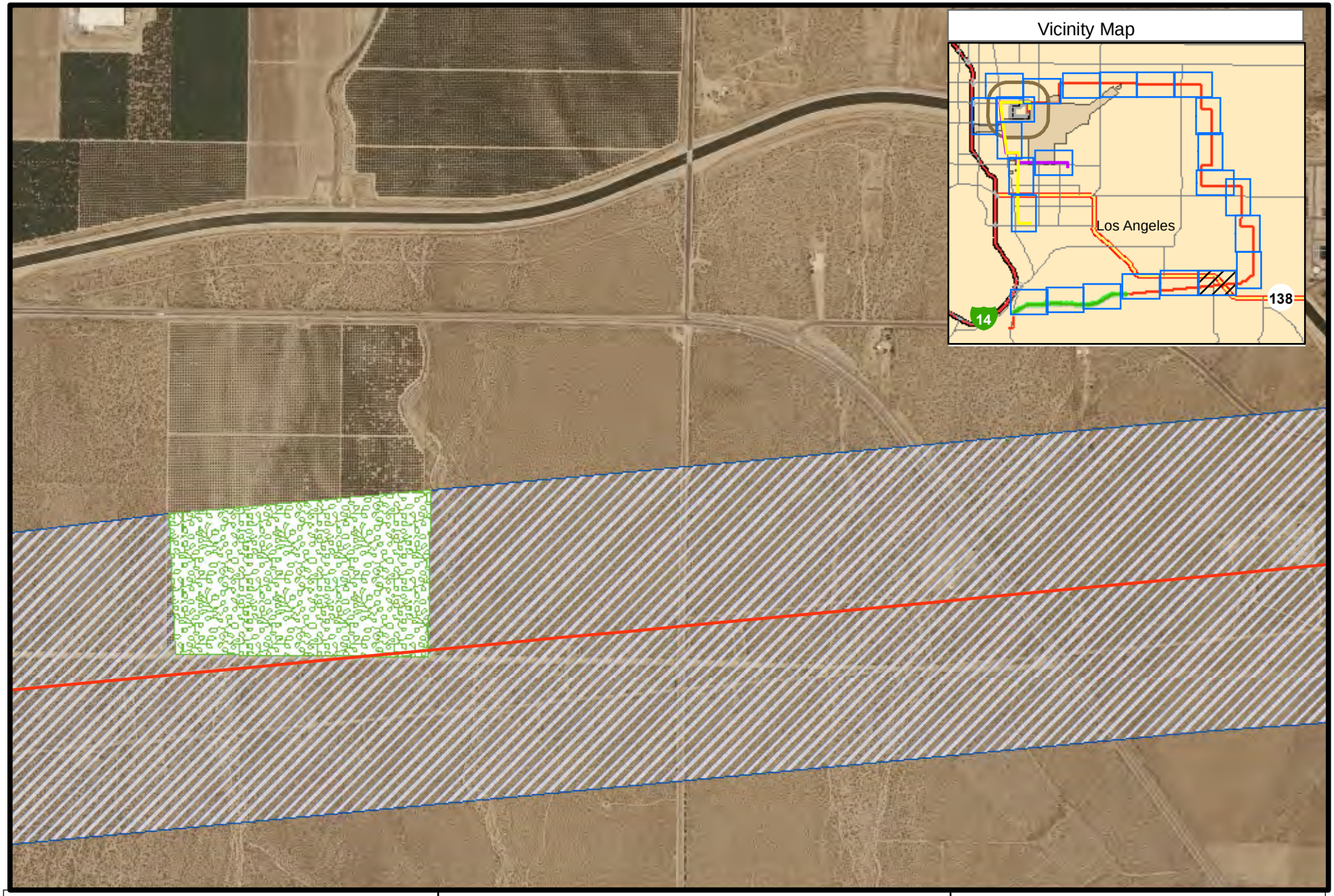
Projection: NAD 83, Zone 11

Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009

Date: 02/26/09

N

amec



Legend

- Mojave Creosote Bush Scrub
- Agriculural Land (Active/Fallow) & Orchards
- Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-P

0 0.09 0.18 0.27 0.36 Miles

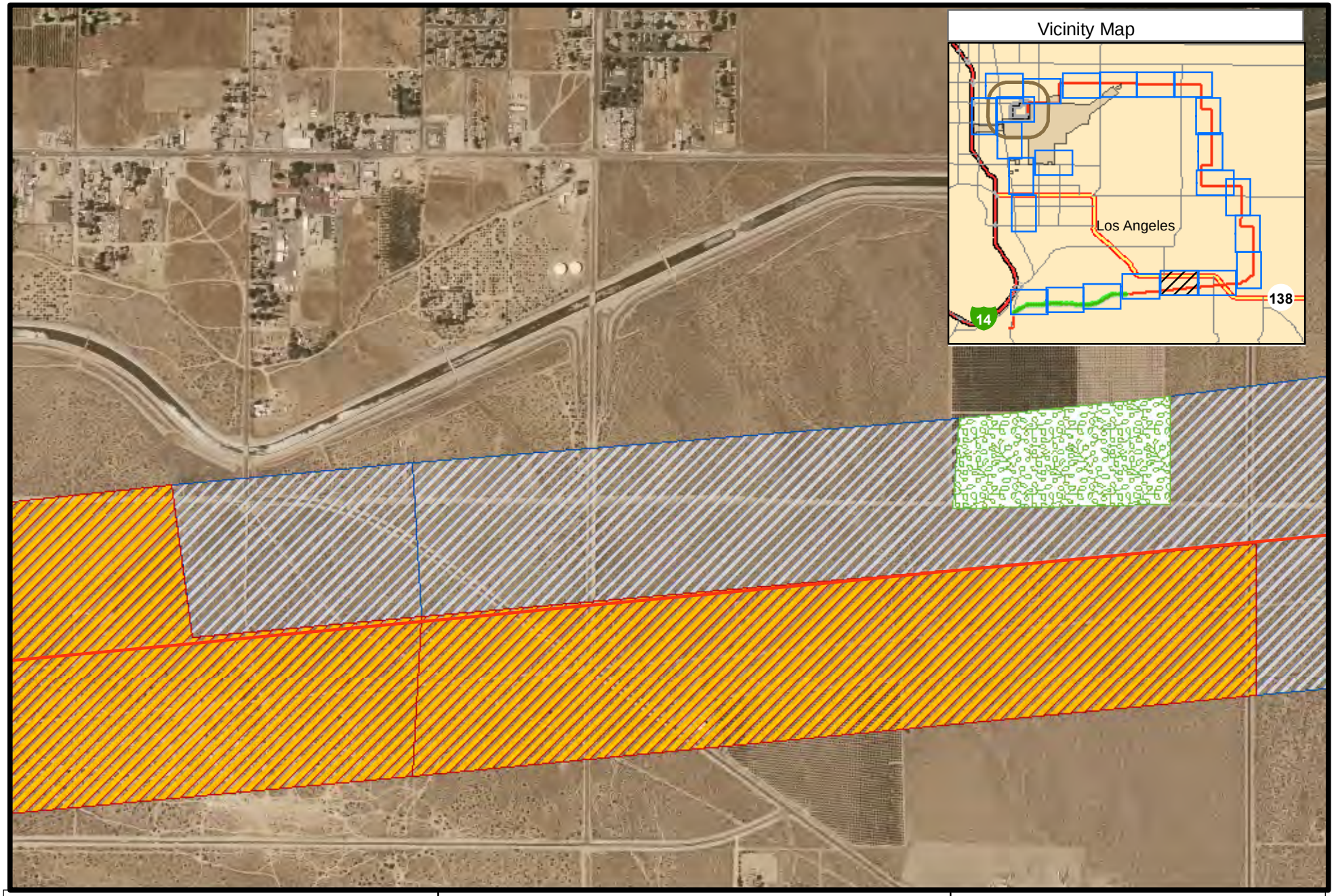
1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Joshua Tree Woodland
- Mojave Creosote Bush Scrub
- Agriculural Land (Active/Fallow) & Orchards
- Transmission Line Route

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-Q

0 0.09 0.18 0.27 0.36 Miles

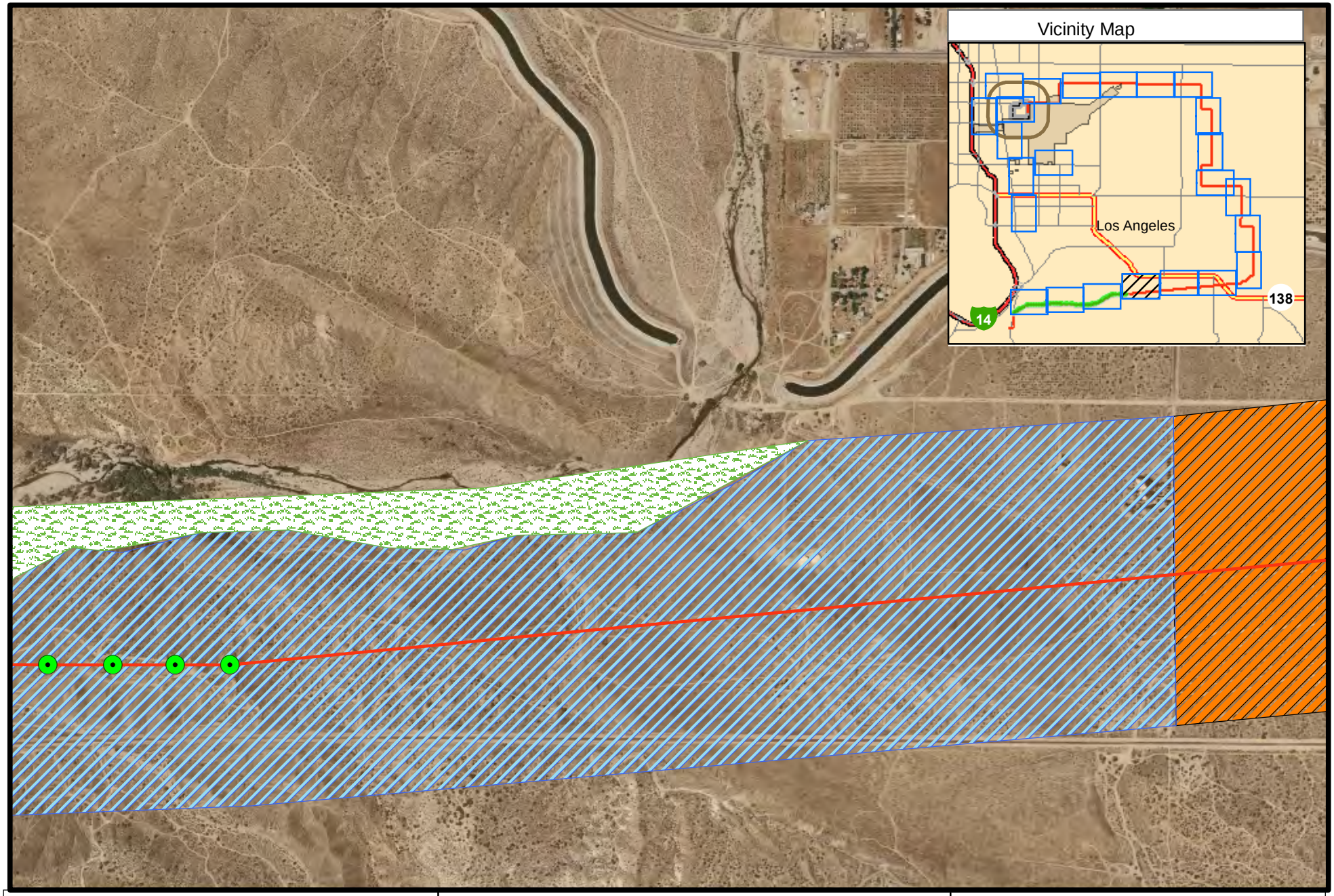
1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Joshua Tree Woodland
- Mojavean Juniper Scrub
- Mojave Desert Wash Scrub
- Transmission Line Route
- Towers

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-R

0 0.08 0.16 0.24 0.32 Miles

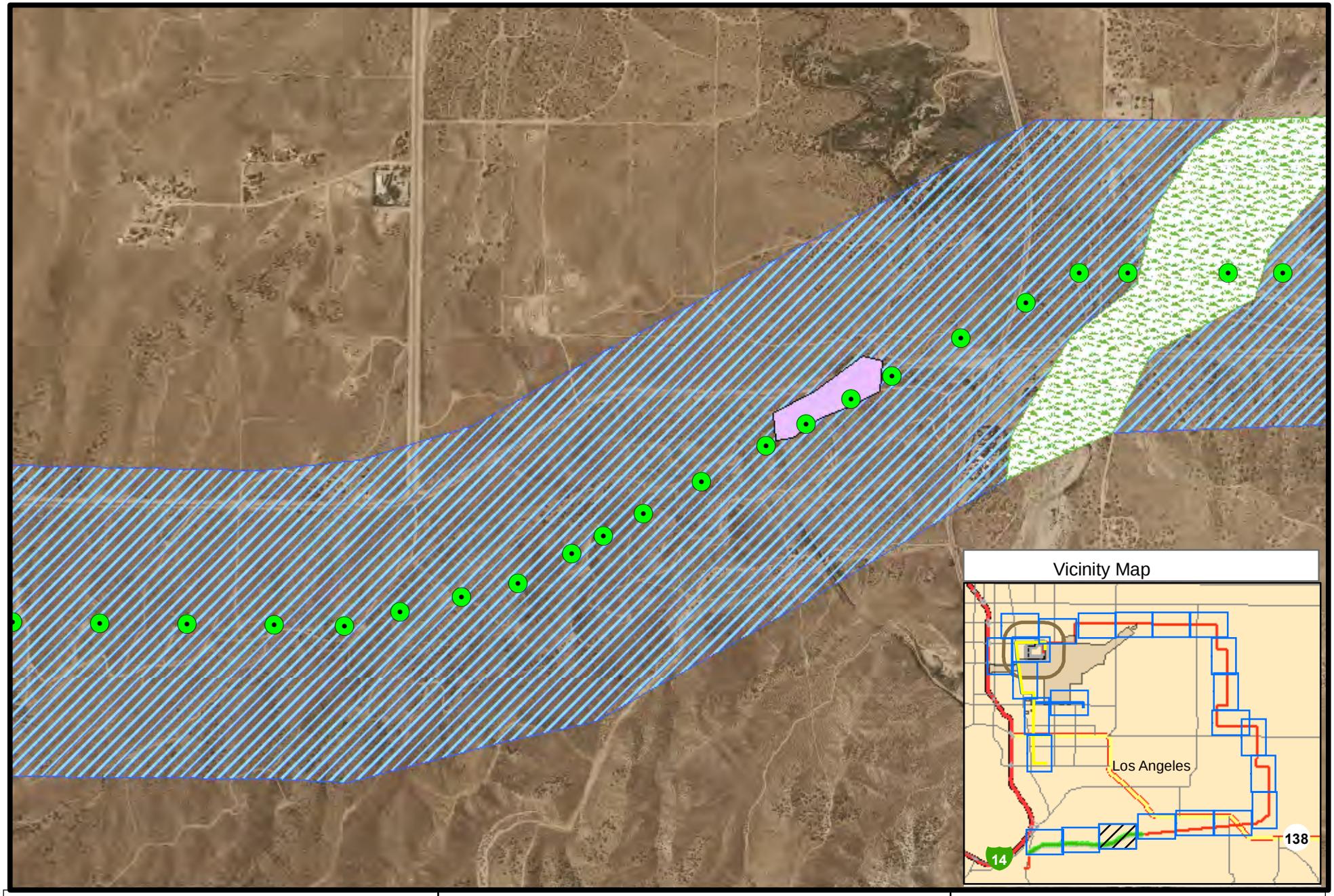
1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Mojave Riparian Forest/Southern Riparian Scrub
- Mojavean Juniper Scrub
- Mojave Desert Wash Scrub
- Towers

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-S

0 0.09 0.18 0.27 0.36 Miles

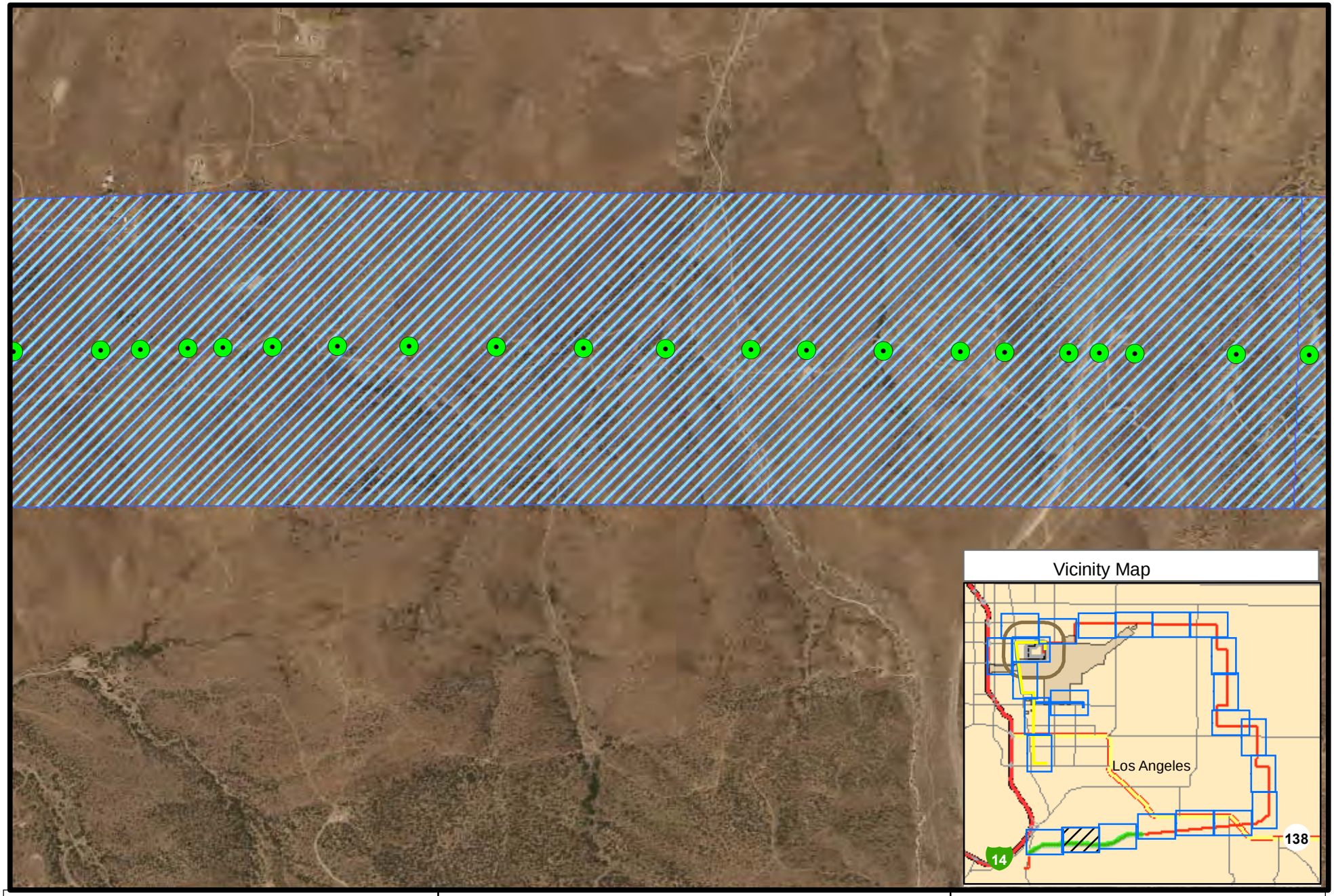
1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 03/02/09

N

amec



Legend

Mojavean Juniper Scrub

Towers

Palmdale Hybrid Power Project

Habitat Communities

Figure 3-T

0 0.09 0.18 0.27 0.36 Miles

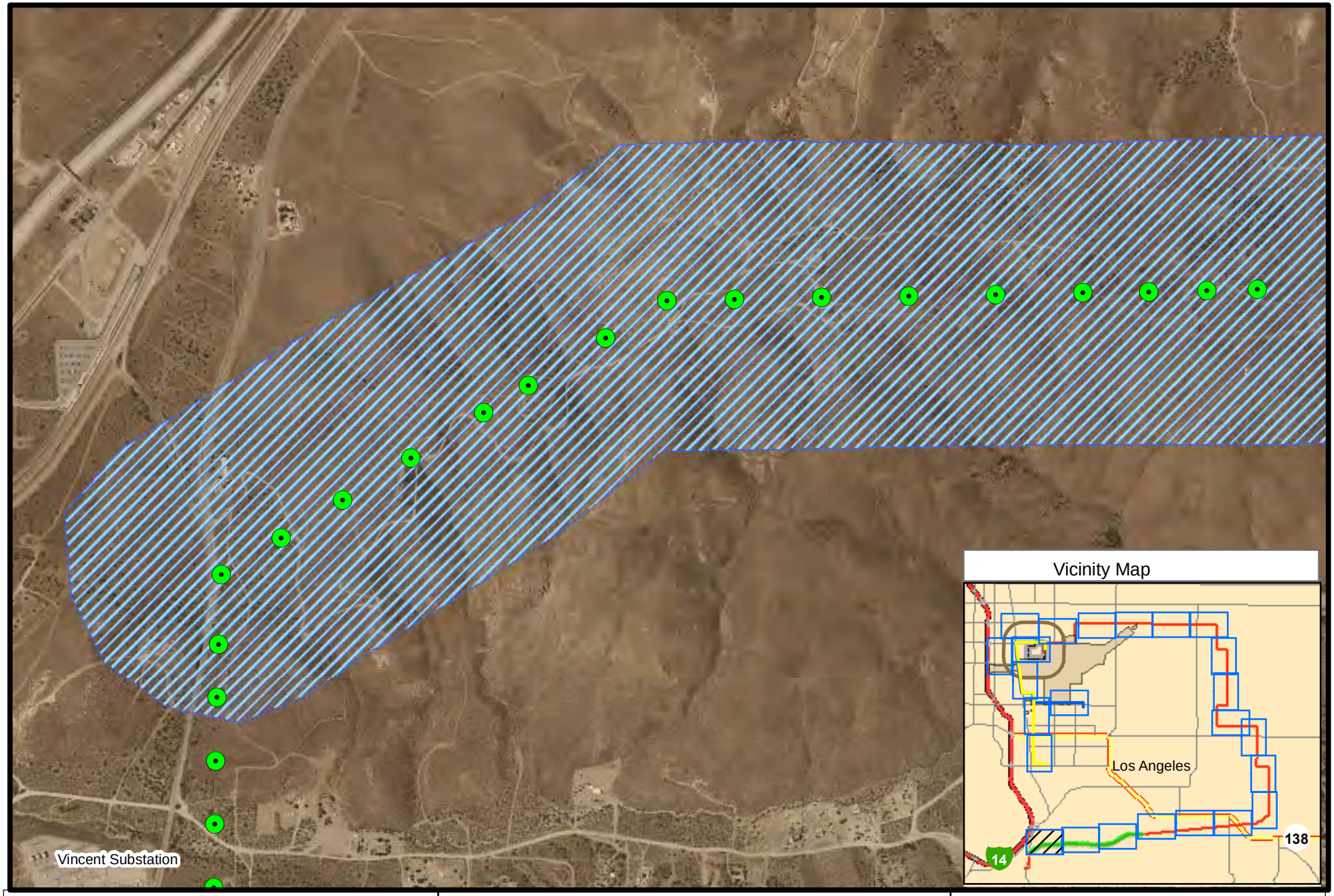
1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

Mojave Juniper Scrub

Towers

Palmdale Hybrid Power Project

Habitat Communities
Figure 3-U

0 0.09 0.18 0.27 0.36 Miles

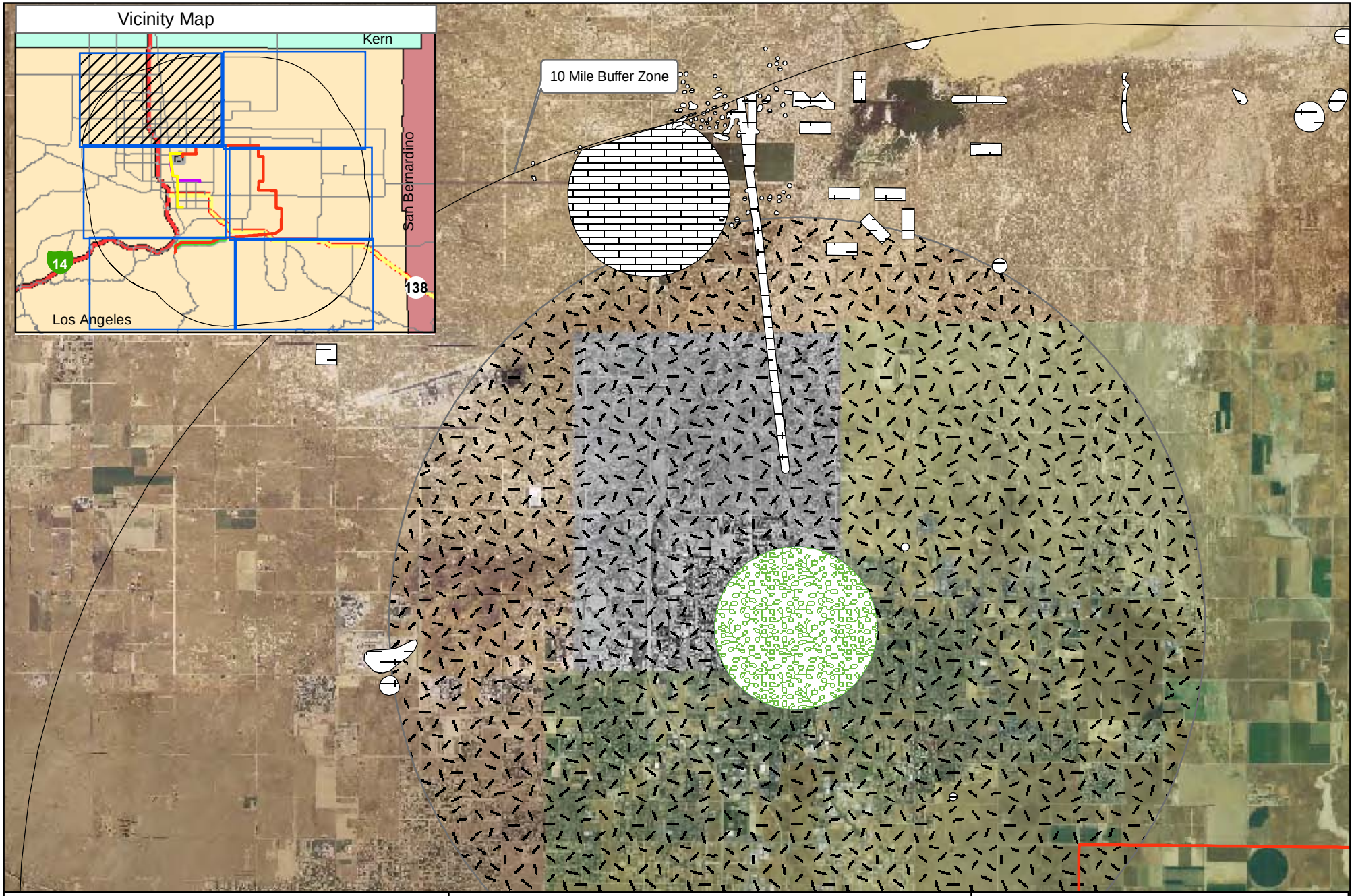
1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Transmission Line Route
- Parry's spineflower
- white-bracted spineflower
- alkali mariposa-lily
- sagebrush loeflingia

Palmdale Hybrid Power Project

CNDDB

Figure 4-A

Plant

0 0.5 1 1.5 2 Miles

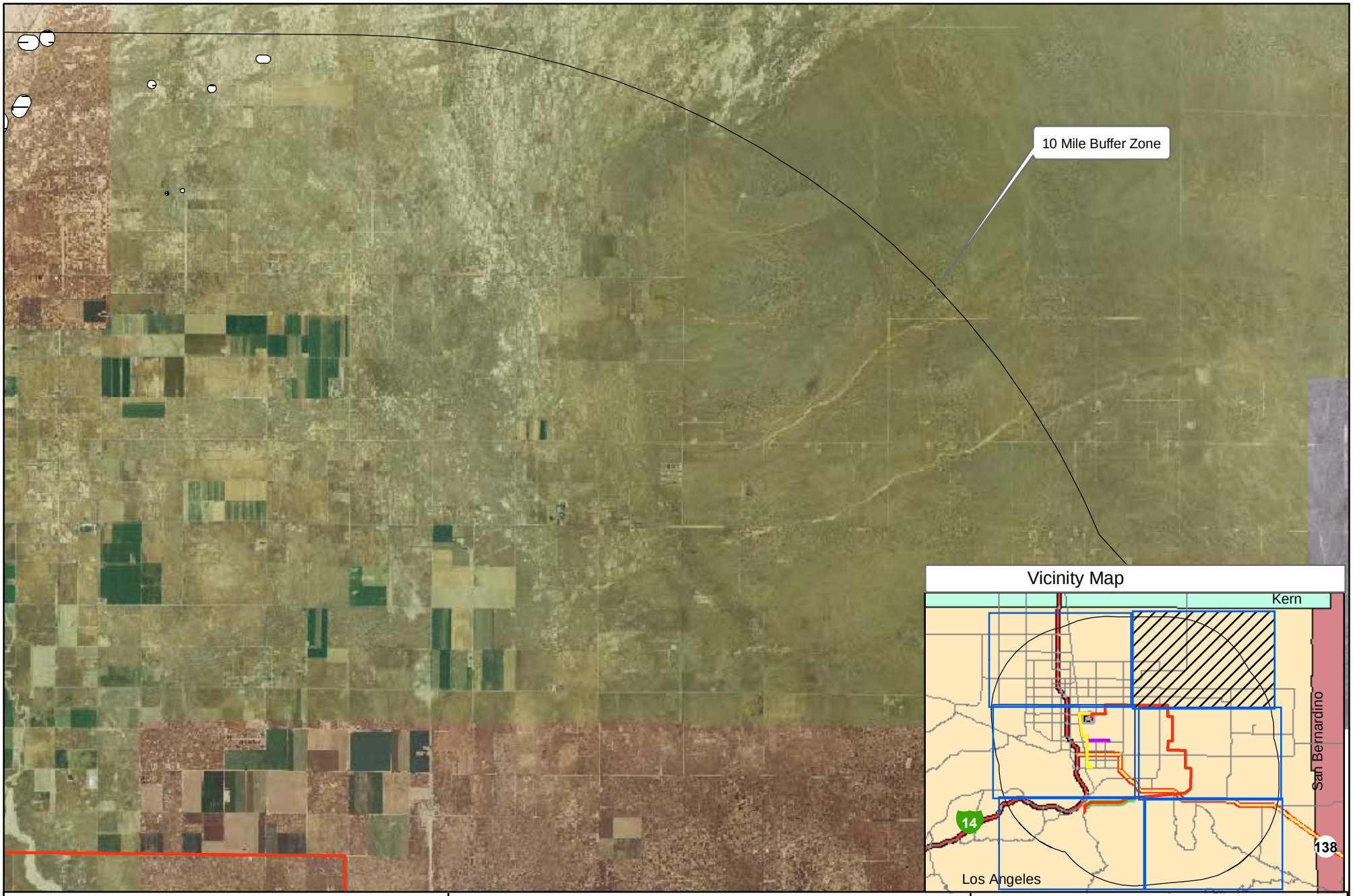
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

Transmission Line Route

alkali mariposa-lily

Palmdale Hybrid Power Project

CNDDB

Figure 4-B

Plant

0 0.5 1 1.5 2 Miles

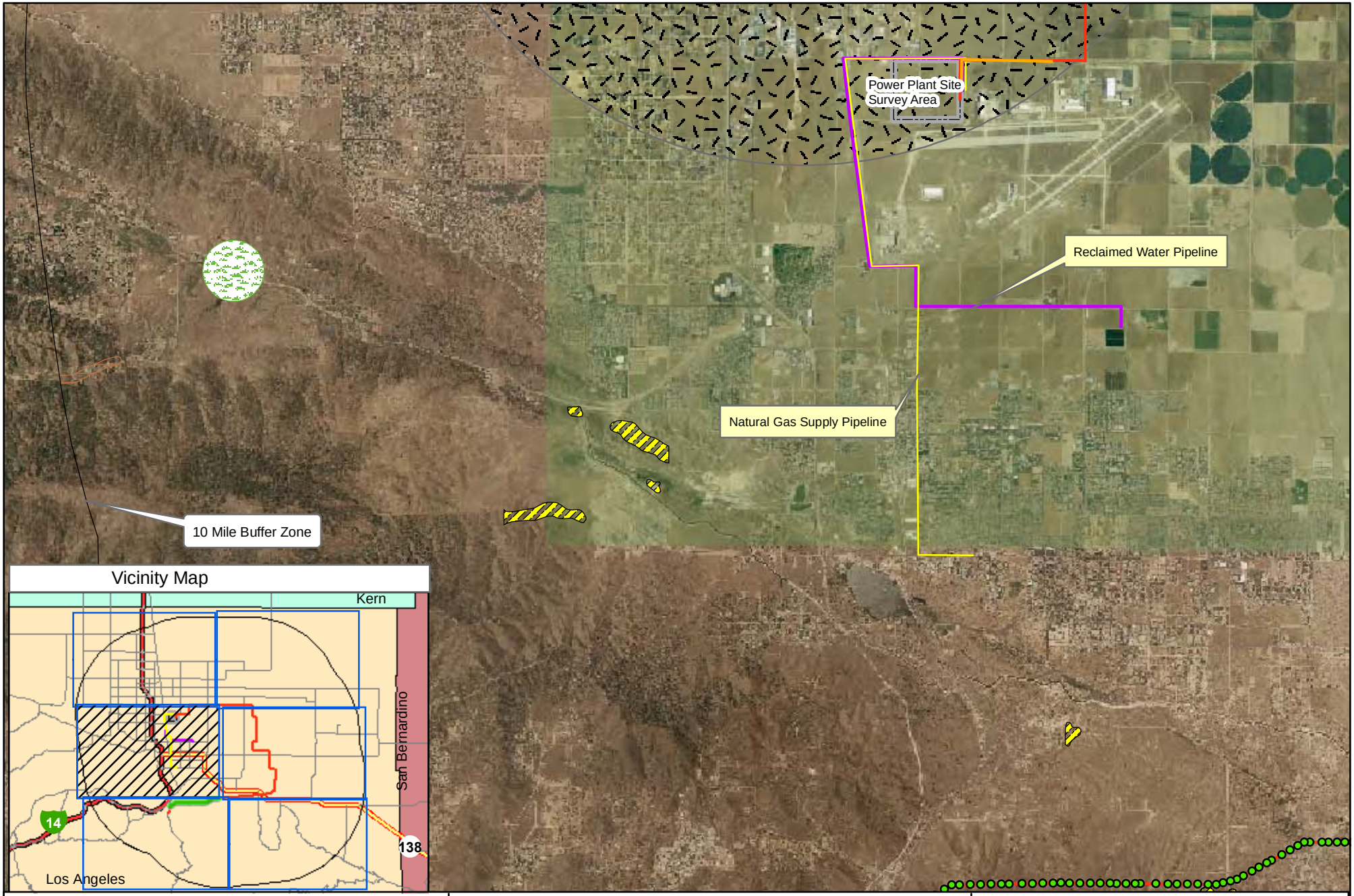
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Transmission Line Route
- Towers
- Peirson's morning-glory
- Sanitary Wastewater Pipeline
- short-joint beavertail
- Greata's aster
- white-bracted spineflower
- Parry's spineflower

Palmdale Hybrid Power Project

CNDDB

Figure 4-C

Plants

0 0.4 0.8 1.2 1.6 Miles

1:100,000

Map Notes:

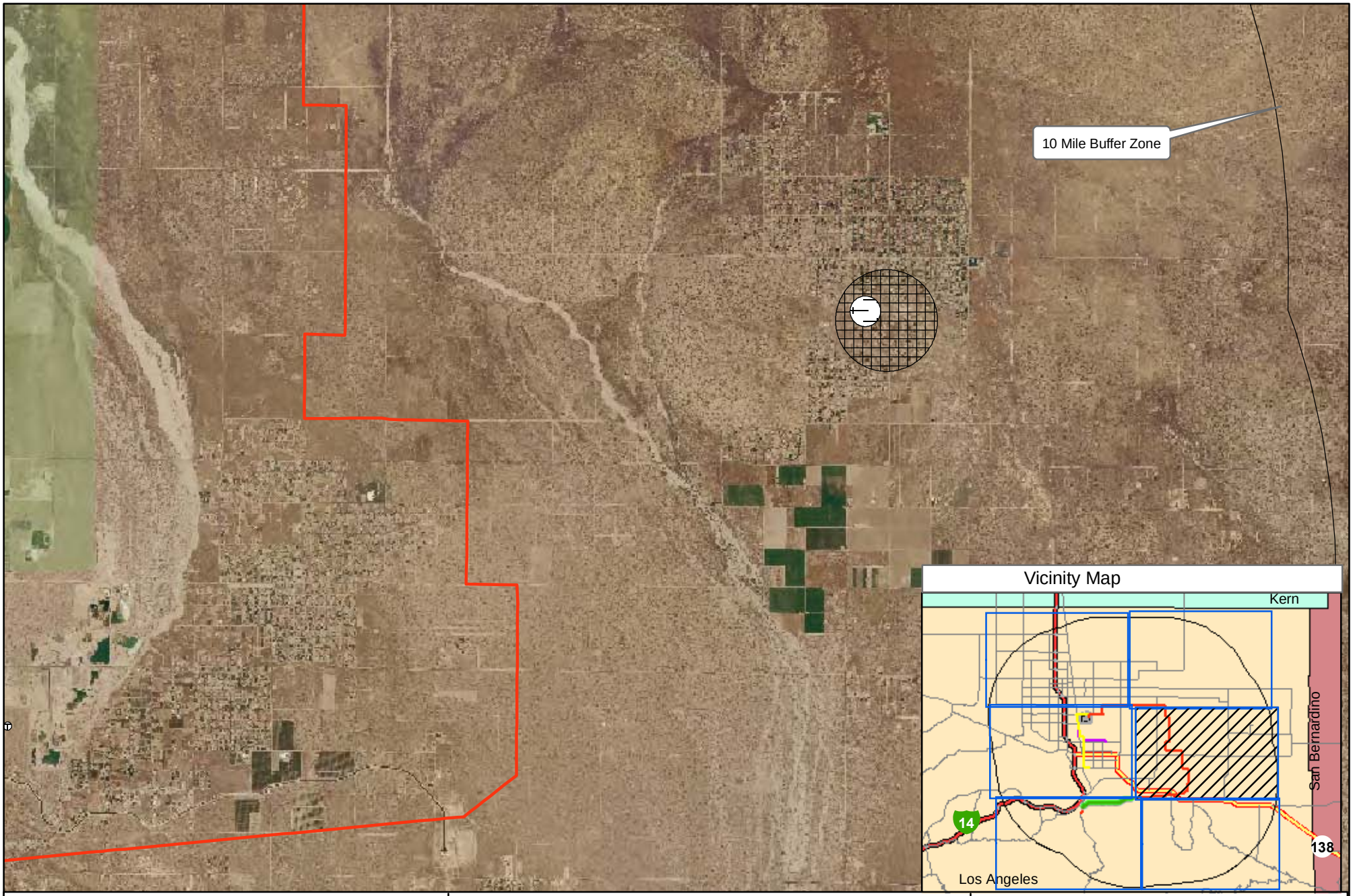
Projection: NAD 83, Zone 11

Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009

Date: 03/19/09

N

amec



Legend

- Transmission Line Route
- sagebrush loeflingia
- alkali mariposa-lily
- Parish's popcorn-flower

Palmdale Hybrid Power Project

CNDDB

Figure 4-D

Plant

0 0.4 0.8 1.2 1.6 Miles

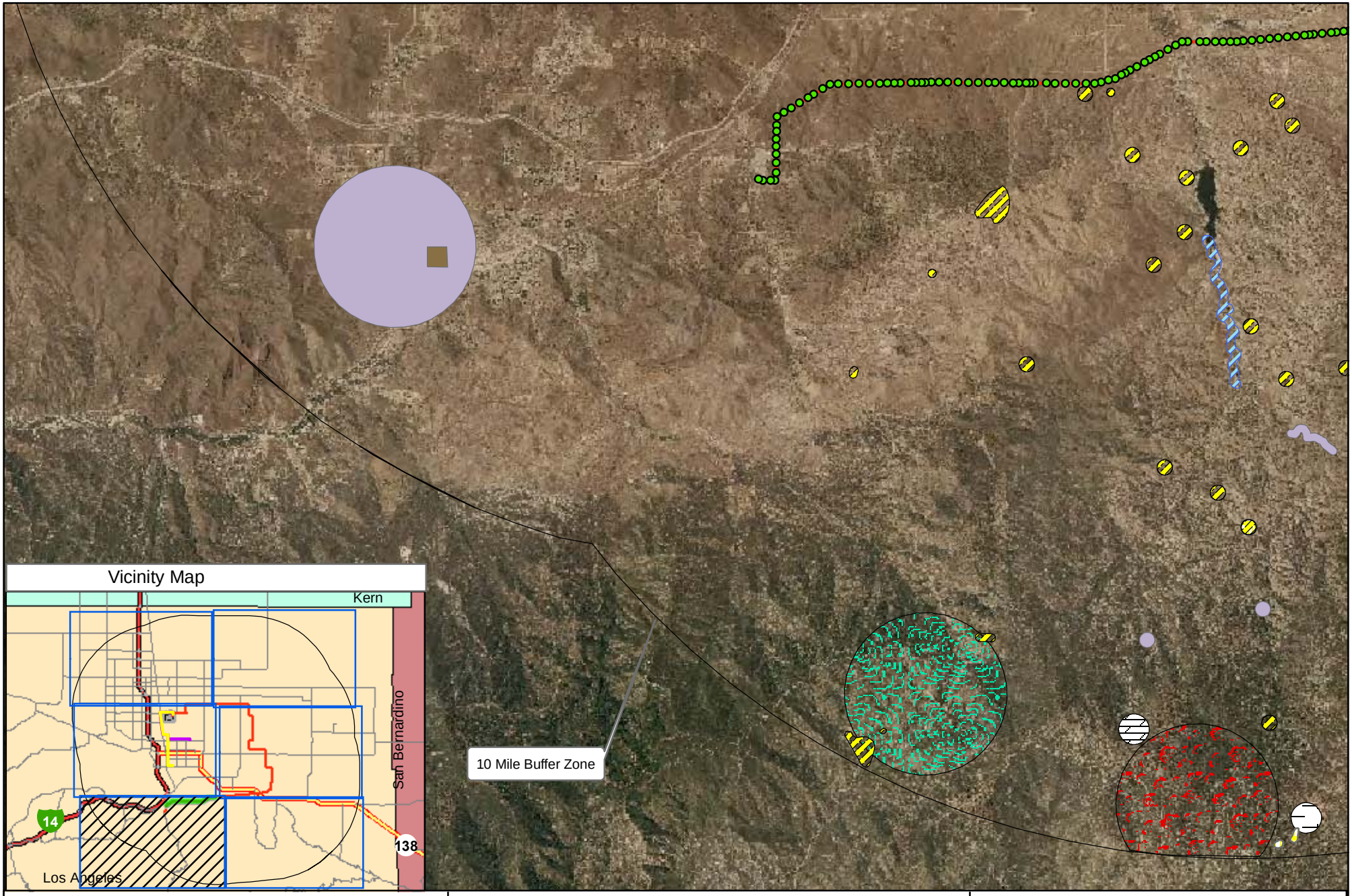
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Transmission Line Route
- Towers
- alkali mariposa-lily
- Greata's aster
- short-joint beavertail
- San Gabriel linanthus
- lemon lily
- white pygmy-poppy
- San Gabriel manzanita

Palmdale Hybrid Power Project

CNDDB

Figure 4-E

Plants

0 0.4 0.8 1.2 1.6 Miles

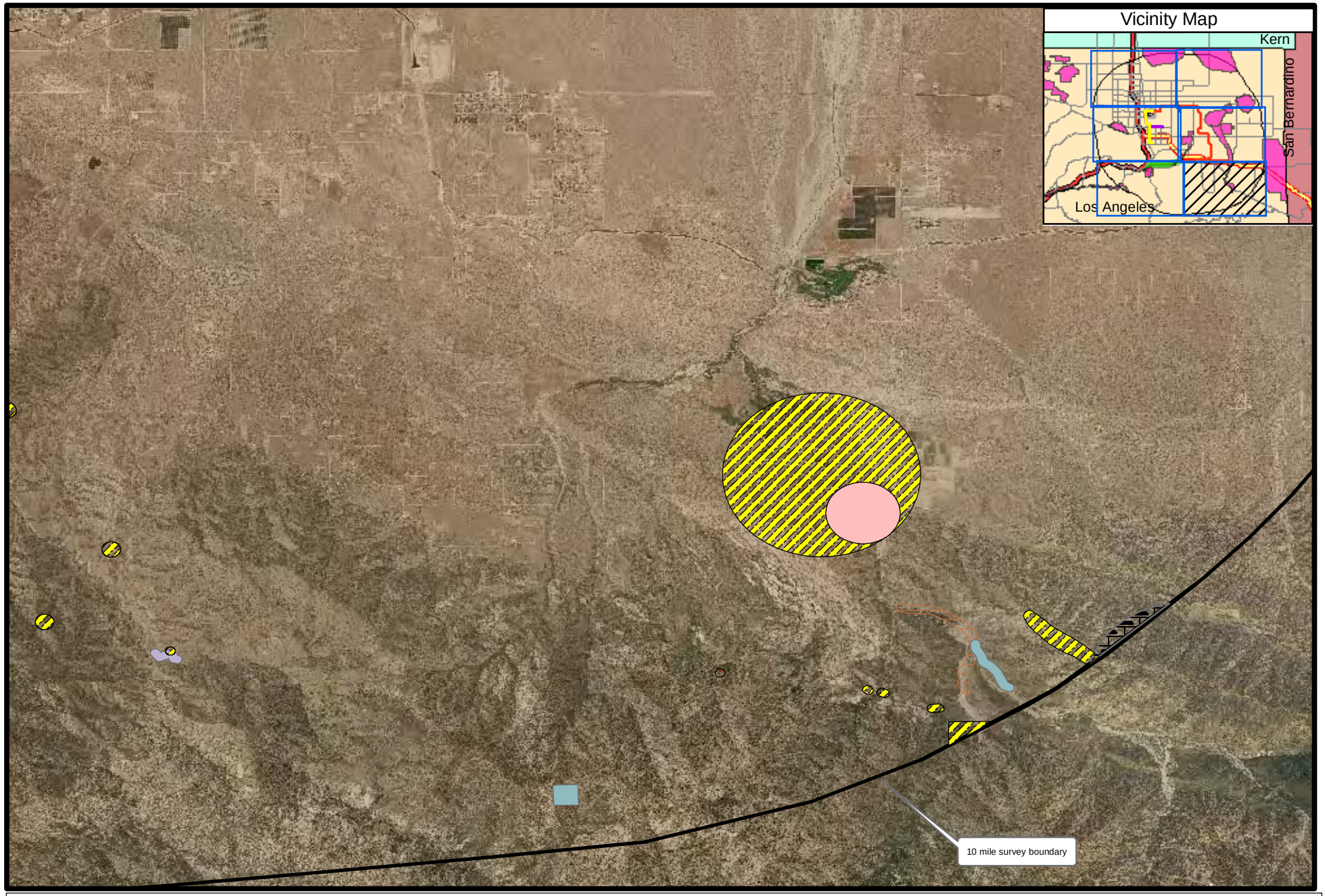
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Transmission Line Route
- Greata's aster
- alkali mariposa-lily
- Peirson's lupine
- short-joint beavertail
- San Gabriel linanthus
- Peirson's morning-glory
- Kern Canyon clarkia
- San Antonio milk-vetch

Palmdale Hybrid Power Project

CNDDB
Figure 4-F
Plants

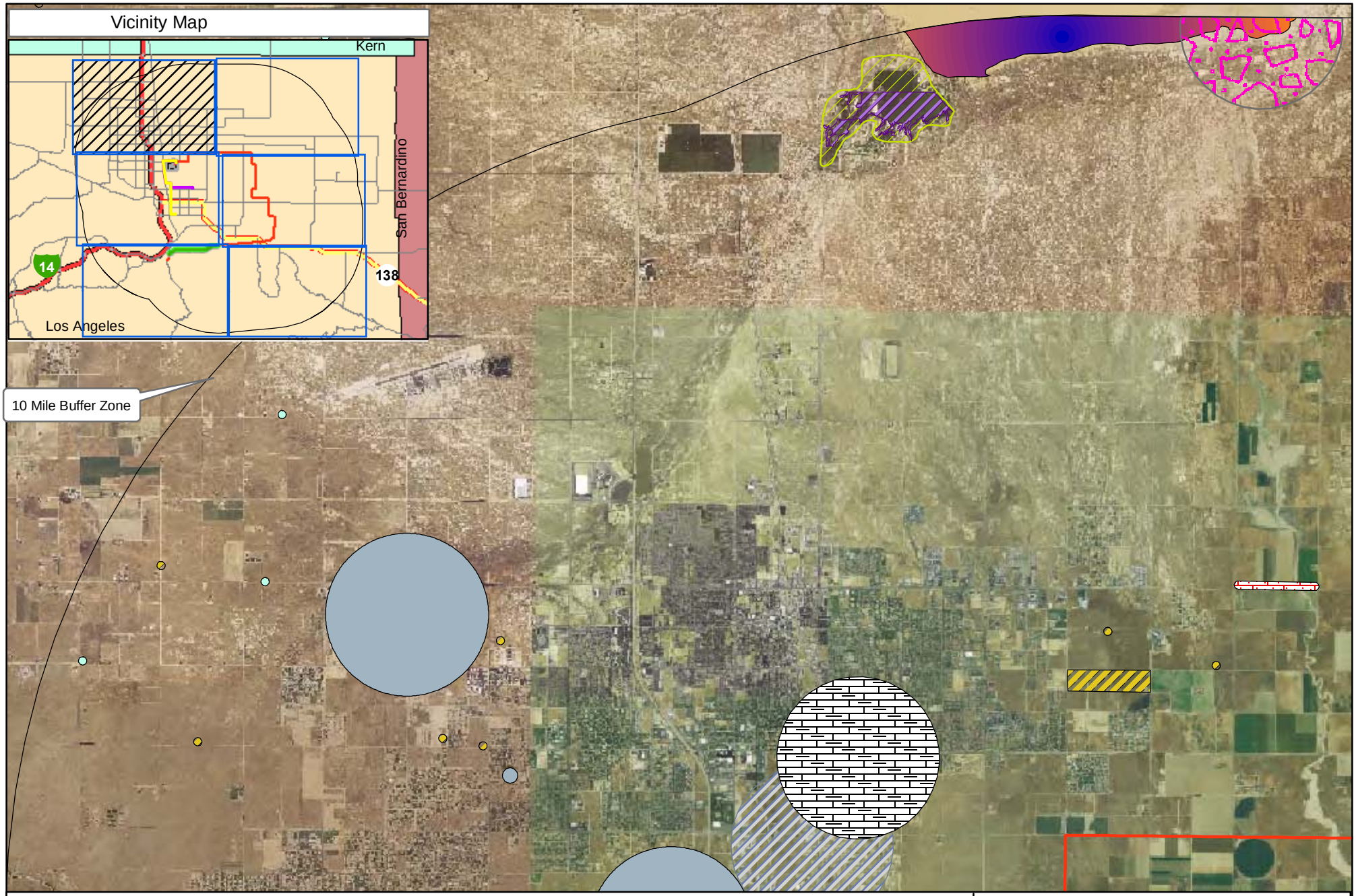
0 0.35 0.7 1.4 2.1 2.8 Miles
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

Transmission Line Route

- western snowy plover
- tricolored blackbird
- coast (San Diego) horned lizard
- silvery legless lizard
- short-eared owl
- burrowing owl
- white-faced ibis
- Mohave ground squirrel
- ferruginous hawk
- Swainson's hawk

Palmdale Hybrid Power Project

CNDDB

Figure 4-G

Animals & Habitat

0 0.5 1 1.5 2 Miles

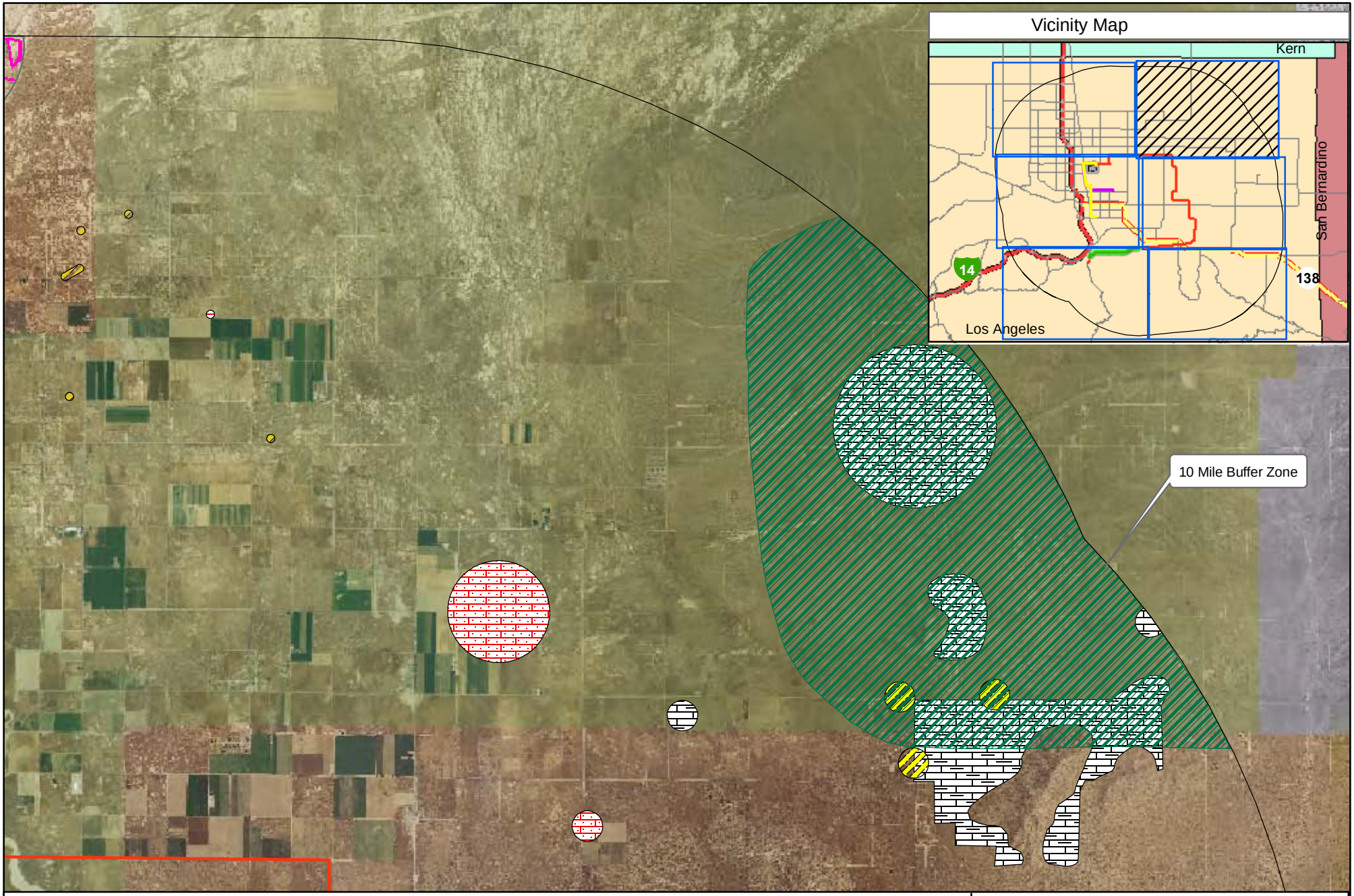
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 03/02/09

N

amec



Legend

- Transmission Line Route
- burrowing owl
- desert tortoise
- Mohave ground squirrel
- ferruginous hawk
- Swainson's hawk

Palmdale Hybrid Power Project

CNDDB

Figure 4-H

Animals & Habitat

0 0.5 1 1.5 2 Miles

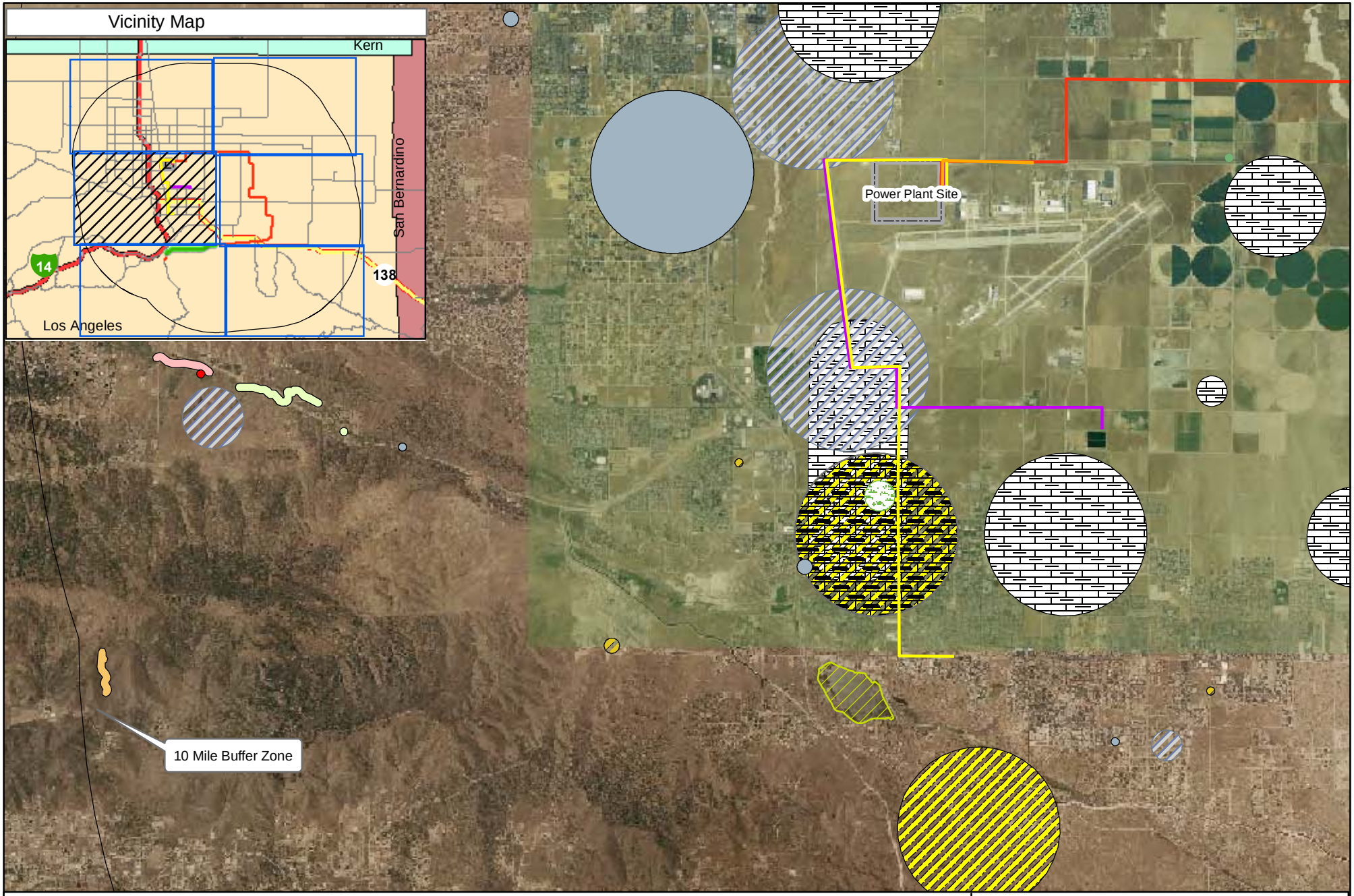
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Transmission Line Route
- Reclaimed water Pipeline
- Natural Gas Supply Pipeline
- Sanitary Wastewater Pipeline
- Le Conte's thrasher
- Cooper's hawk
- silvery legless lizard
- tricolored blackbird
- two-striped garter snake
- burrowing owl
- coast (San Diego) horned lizard, 2
- Southern Willow Scrub
- Mohave ground squirrel
- California red-legged frog
- Southern Cottonwood Willow Riparian Forest
- San Joaquin pocket mouse

Palmdale Hybrid Power Project

CNDDB

Figure 4-I

Animals & Habitat

0 0.4 0.8 1.2 1.6 Miles

1:100,000

Map Notes:

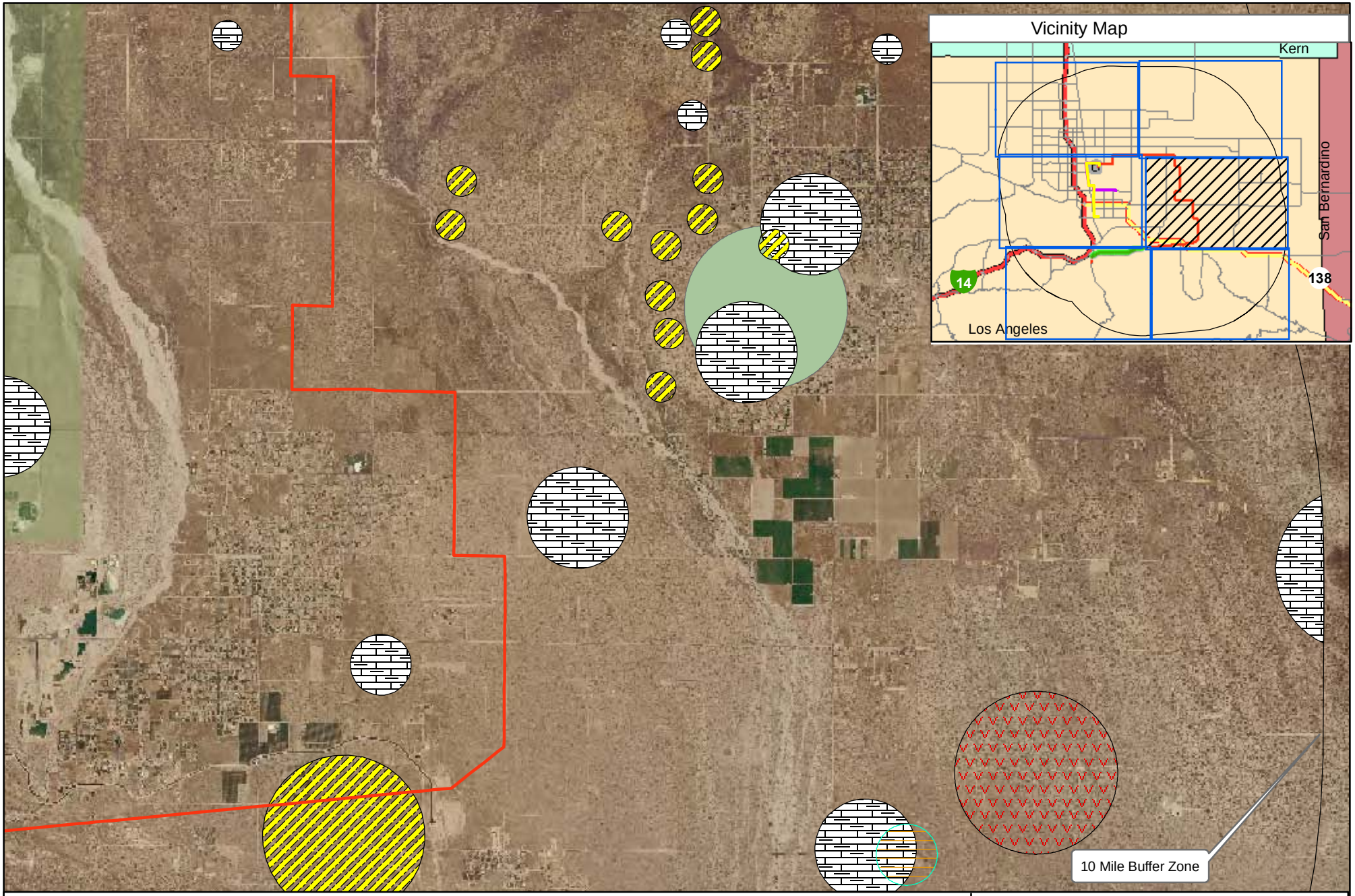
Projection: NAD 83, Zone 11

Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009

Date: 03/19/09

N

amec



Legend

- Transmission Line Route
- American badger
- southern grasshopper mouse
- Le Conte's thrasher
- western mastiff bat
- Mohave ground squirrel

Palmdale Hybrid Power Project

CNDDB

Figure 4-J

Animals & Habitat

0 0.4 0.8 1.2 1.6 Miles

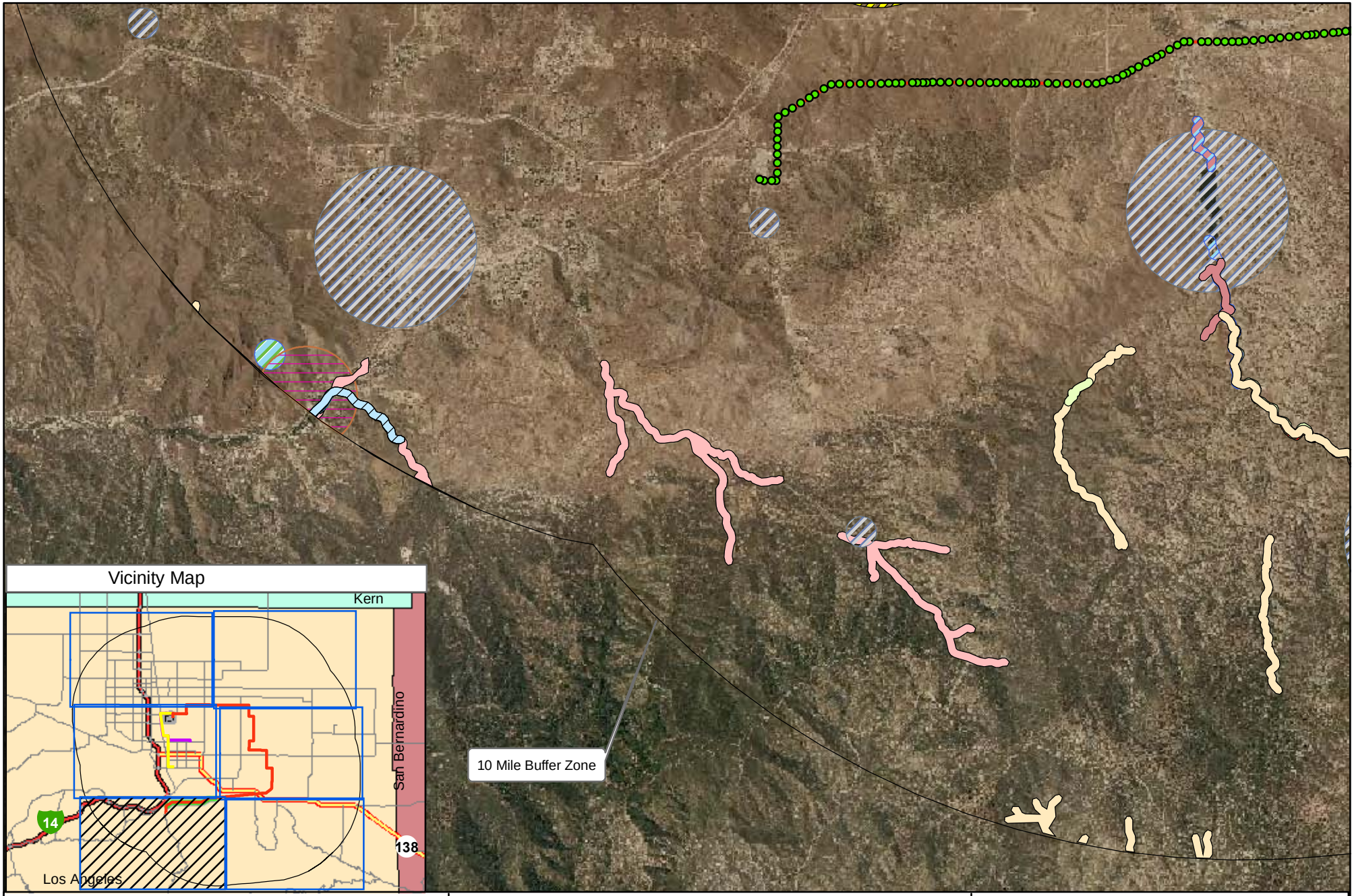
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Transmission Line Route
- Towers
- two-striped garter snake
- unarmored threespine stickleback
- coast (San Diego) horned lizard
- arroyo toad
- Southern California Threespine Stickleback Stream
- Southern Cottonwood Willow Riparian Forest
- prairie falcon
- Southern Sycamore Alder Riparian Woodland
- pallid bat

Palmdale Hybrid Power Project

CNDDB

Figure 4-K

Animals & Habitat

0 0.4 0.8 1.2 1.6 Miles

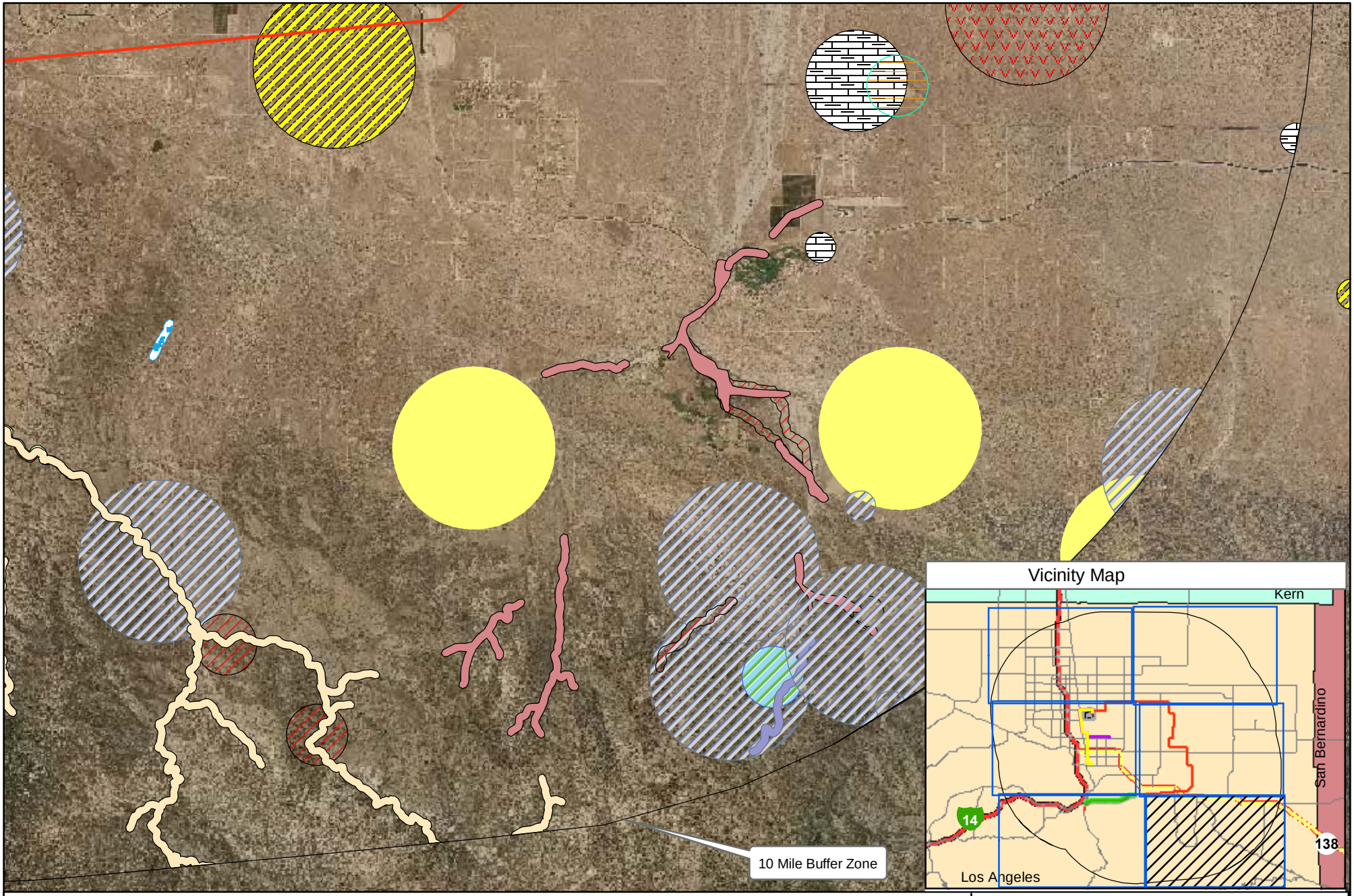
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Transmission Line Route
- Le Conte's thrasher
- coast (San Diego) horned lizard
- Canyon Live Oak Ravine Forest
- Mojave Riparian Forest
- western mastiff bat
- prairie falcon
- Sierra Madre yellow-legged frog
- Mohave ground squirrel
- pallid San Diego pocket mouse
- southern grasshopper mouse
- Southern Sycamore Alder Riparian Woodland
- Southern Riparian Scrub

Palmdale Hybrid Power Project

CNDDB

Figure 4-L

Animals & Habitat

0 0.4 0.8 1.2 1.6 Miles

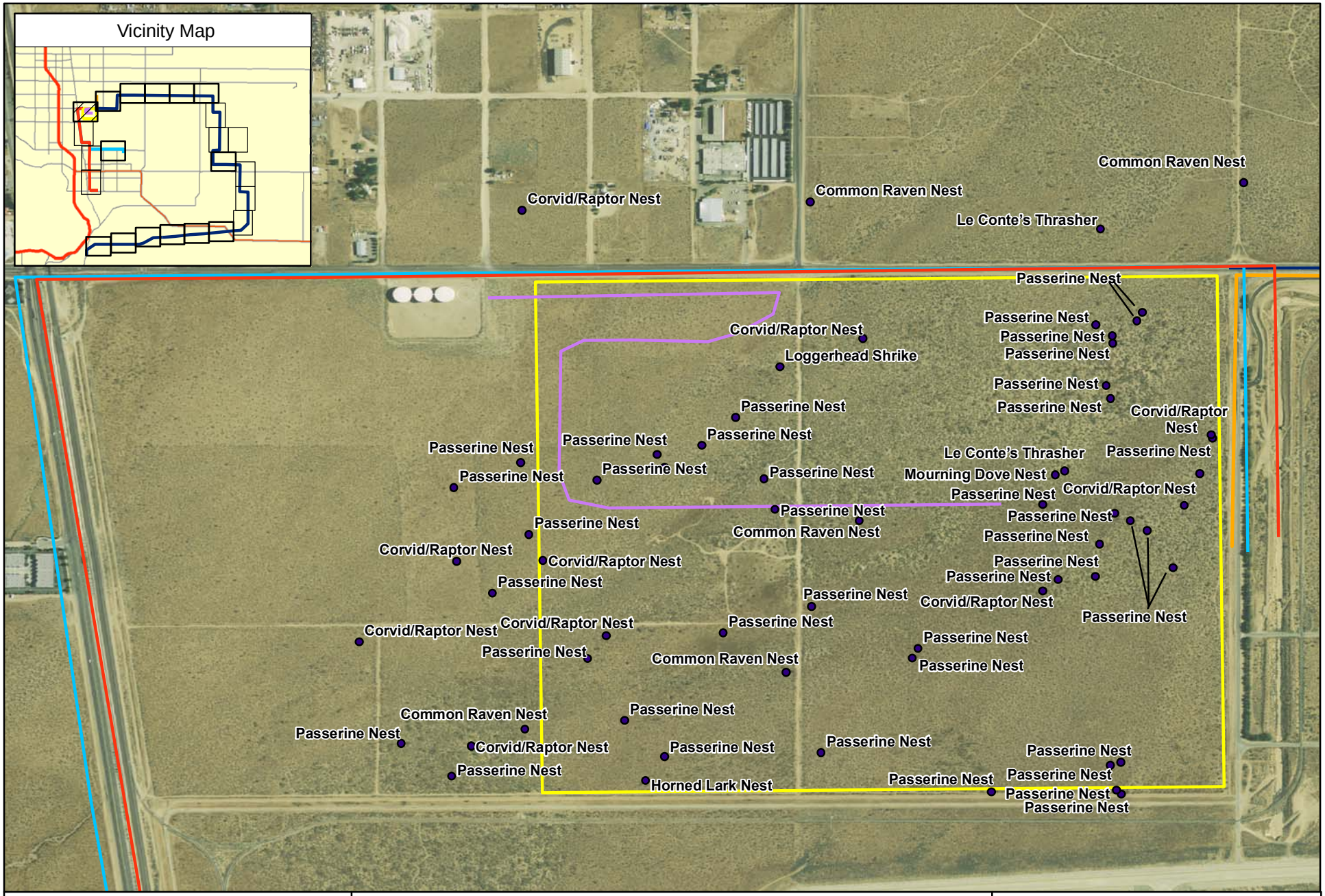
1:100,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 02/26/09

N

amec



Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

1:12,000

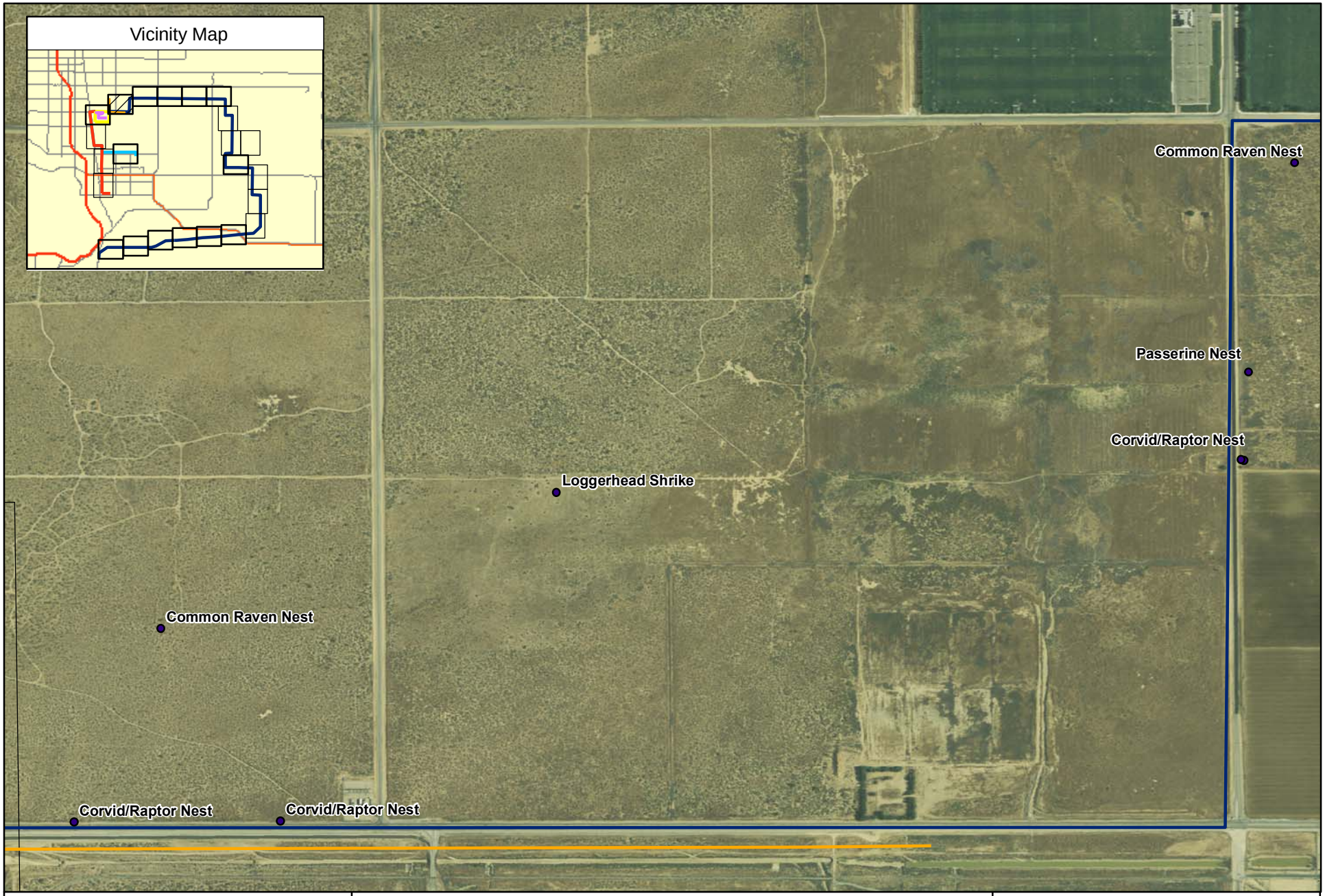
Map Notes:

Projection: NAD 83, Zone 11
Path:G:\sdo8\bio\Palmdale\mxd\sspecies_mb2.2
Date: 07/17/2008

N

Figure 5 - A

amec



Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

1:12,000

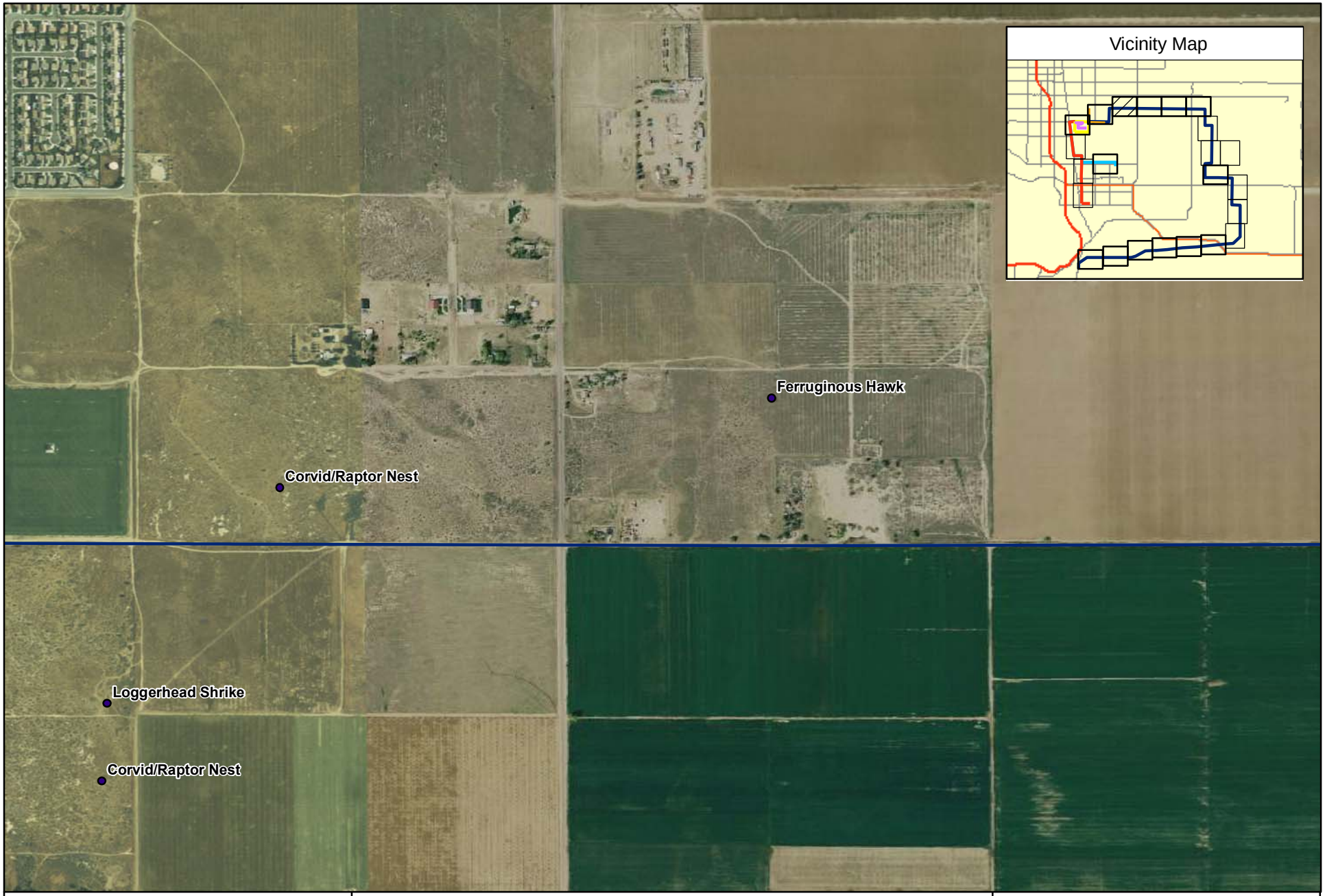
Map Notes:

Projection: NAD 83, Zone 11
Path:G:\sdo8\bio\Palmdale\mxd\sspecies_mb2.2
Date: 07/17/2008

N

Figure 5 - B

amec



Legend
- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

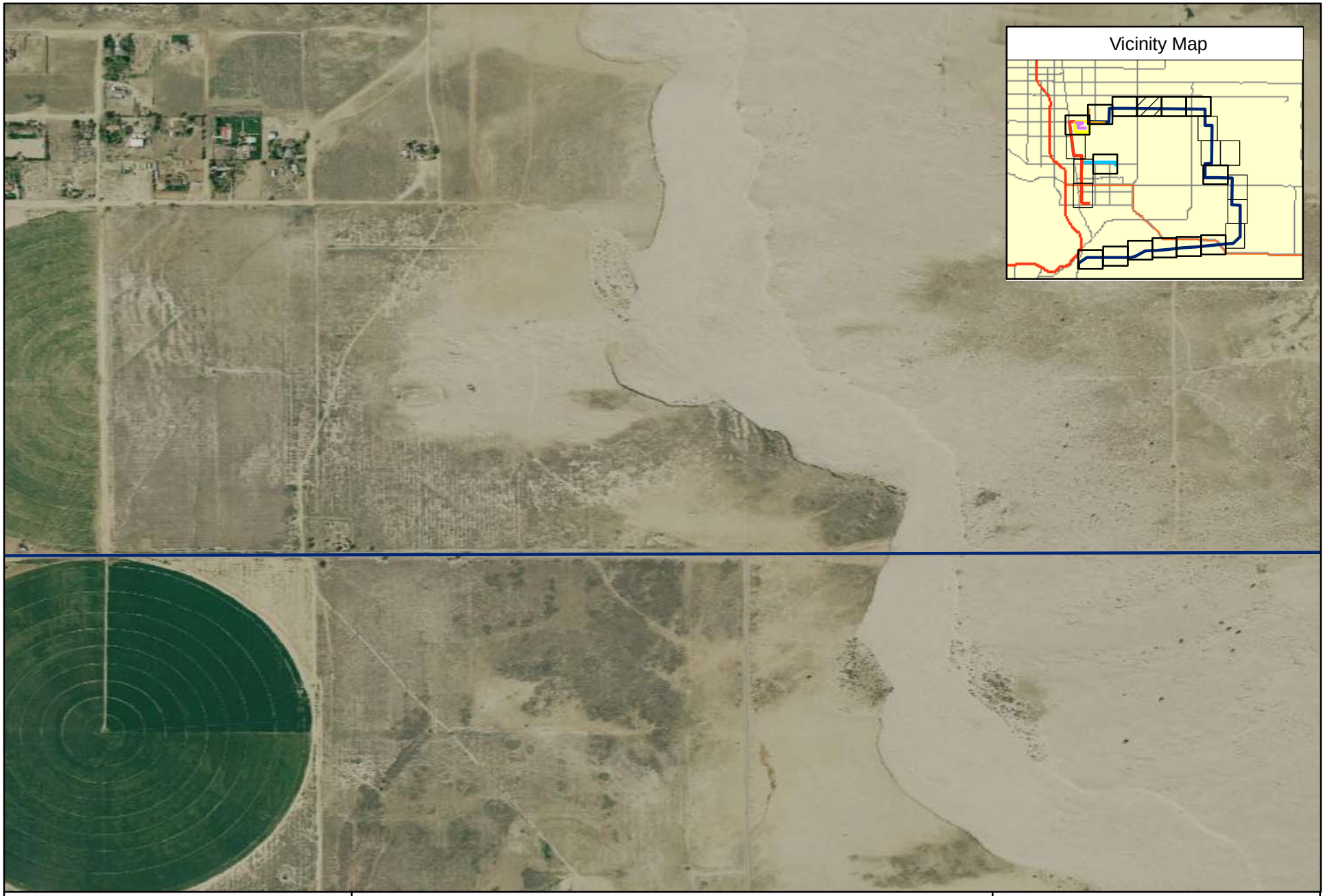
1:12,000

Map Notes:
Projection: NAD 83, Zone 11
Path:G:\sdo8\bio\Palmdale\mxd\sspecies_mb2.2
Date: 07/17/2008

N

Figure 5 - C

amec



Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

1:12,000

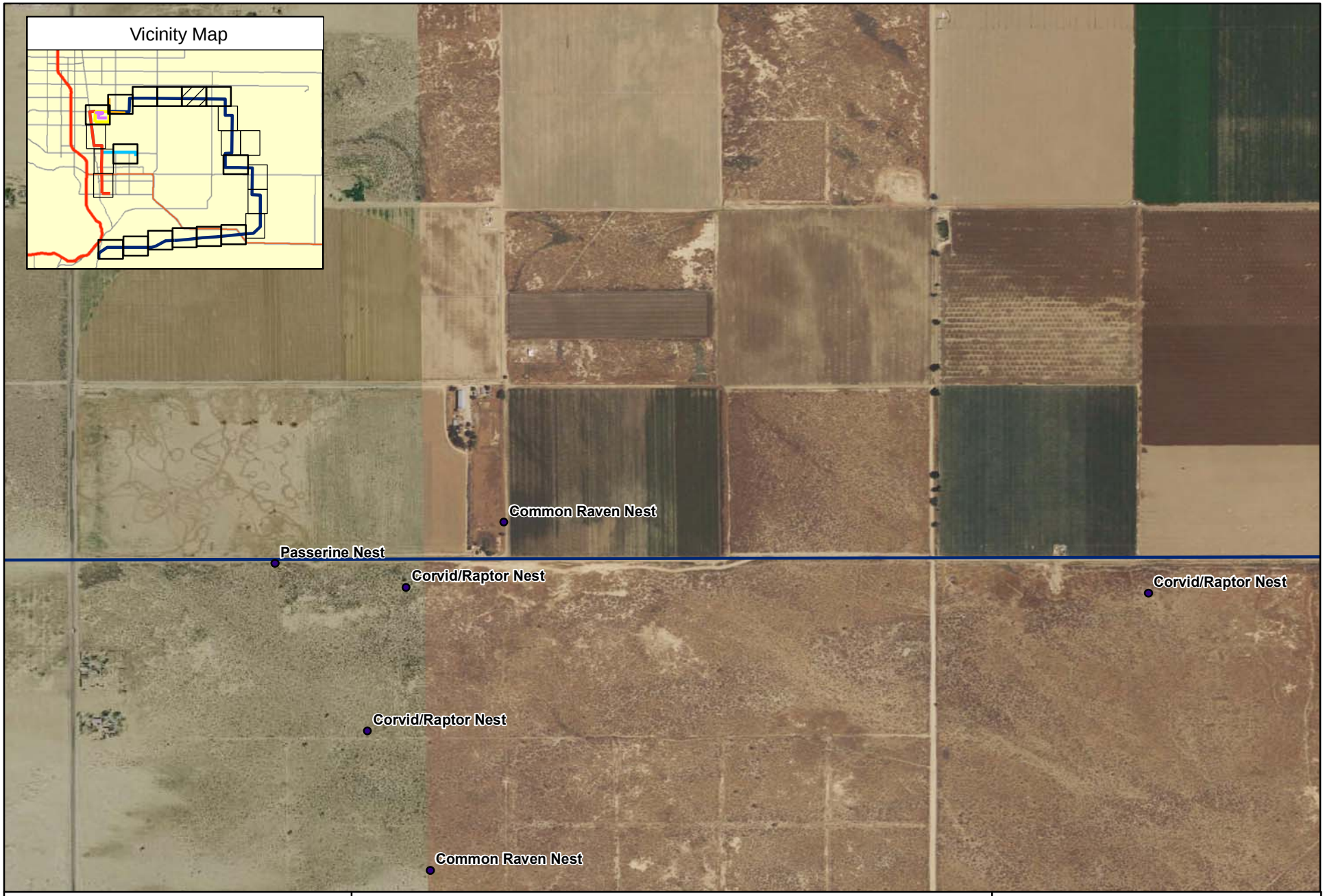
Map Notes:

Projection: NAD 83, Zone 11
Path:G:\sdo8\bio\Palmdale\mxd\sspecies_mb2.2
Date: 07/17/2008

N

Figure 5 - D

amec



Legend
- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

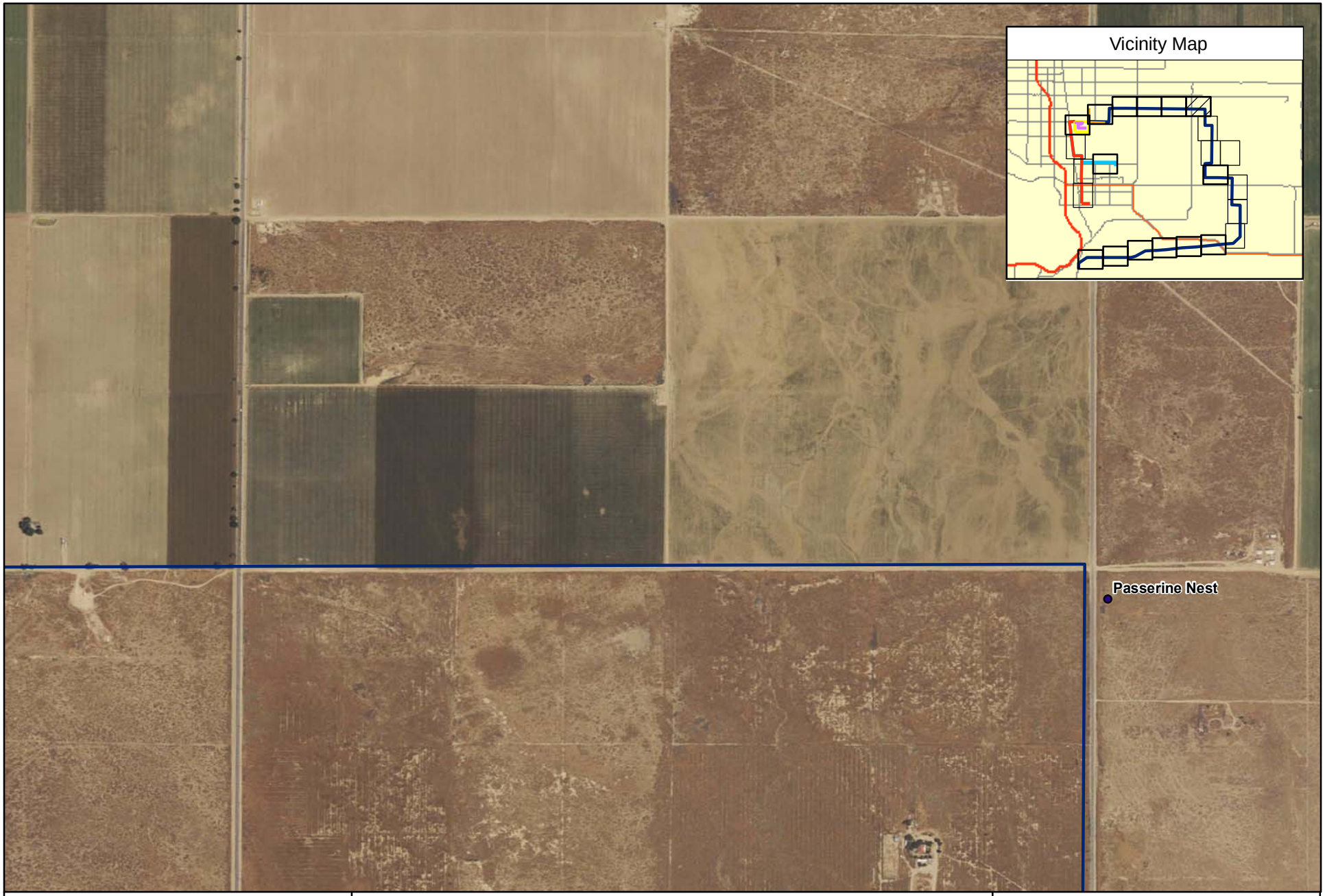
1:12,000

Map Notes:
Projection: NAD 83, Zone 11
Path:G:\sdo8\bio\Palmdale\mxd\sspecies_mb2.2
Date: 07/17/2008

N

Figure 5 - E

amec



Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

1:12,000

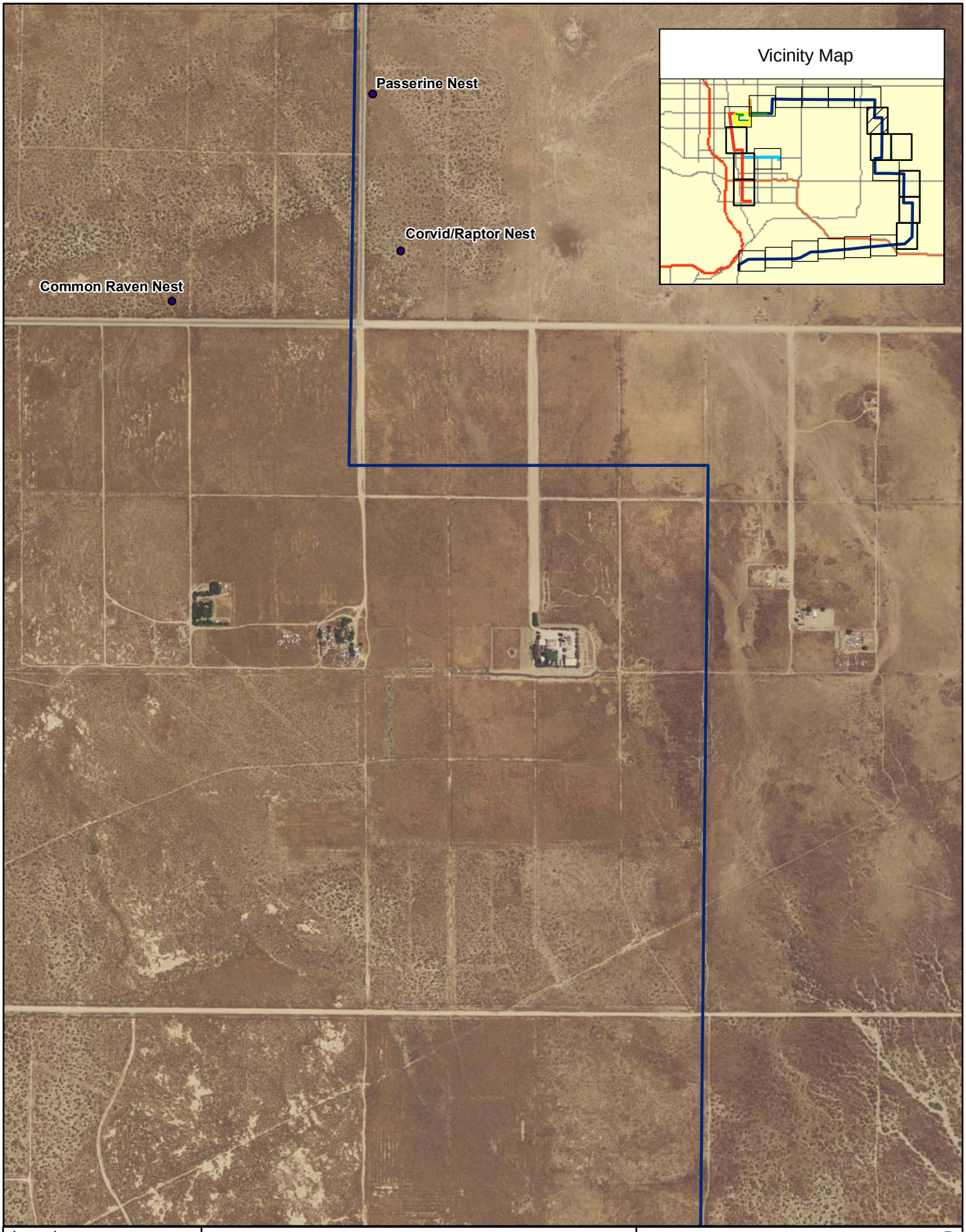
Map Notes:

Projection: NAD 83, Zone 11
Path:G:\sdo8\bio\Palmdale\mxd\sspecies_mb2.2
Date: 07/17/2008

N

Figure 5 - F

amec



Legend
- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

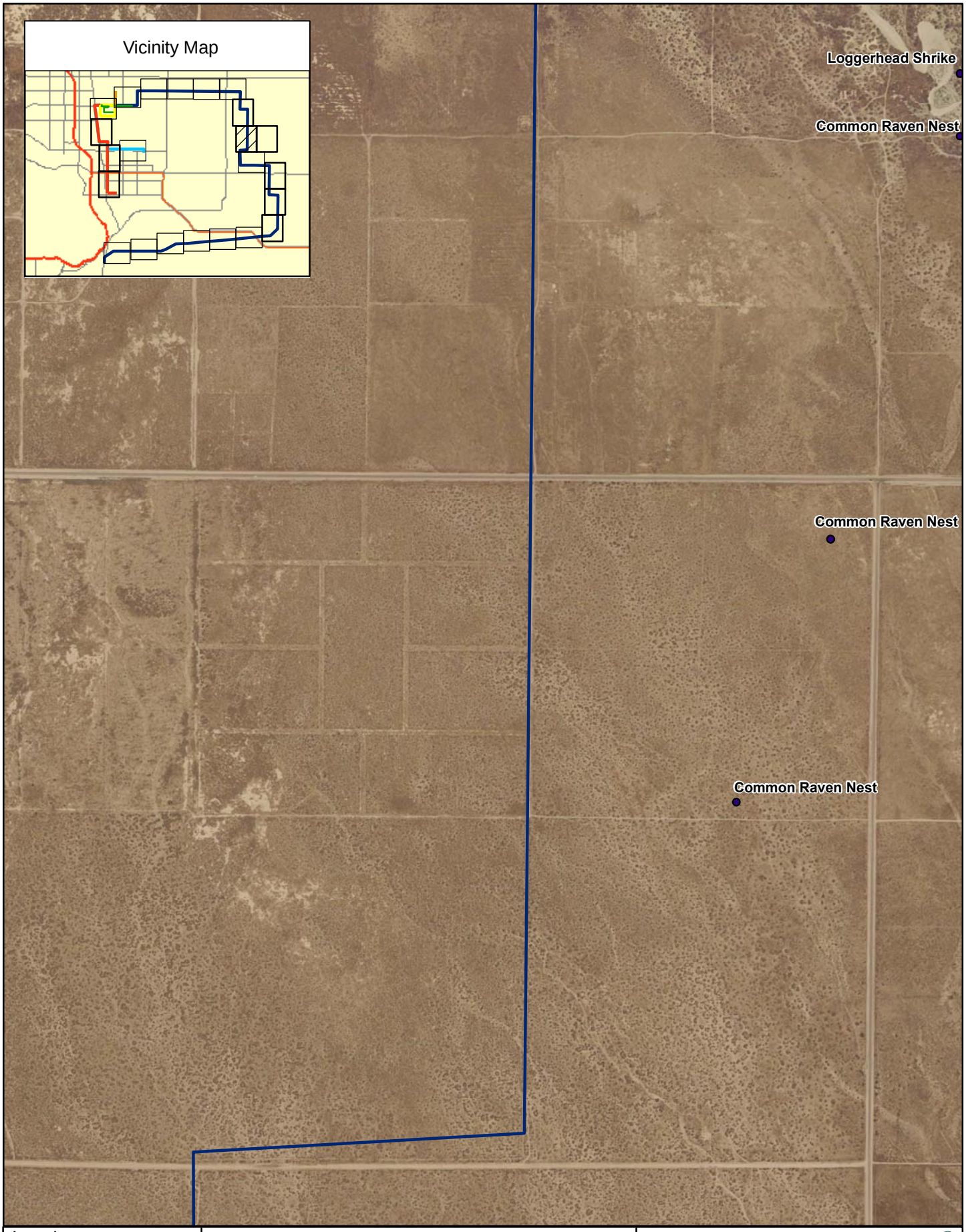
1:12,000

Map Notes:
Projection: NAD 83, Zone 11
Path:G:\sdo8\bio\Palmdale\mxd\sspecies
Power Plant Bio 6554000247\graphics\mxd
Date: 07/17/2008

Figure 5- G

amec

N



Legend
- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

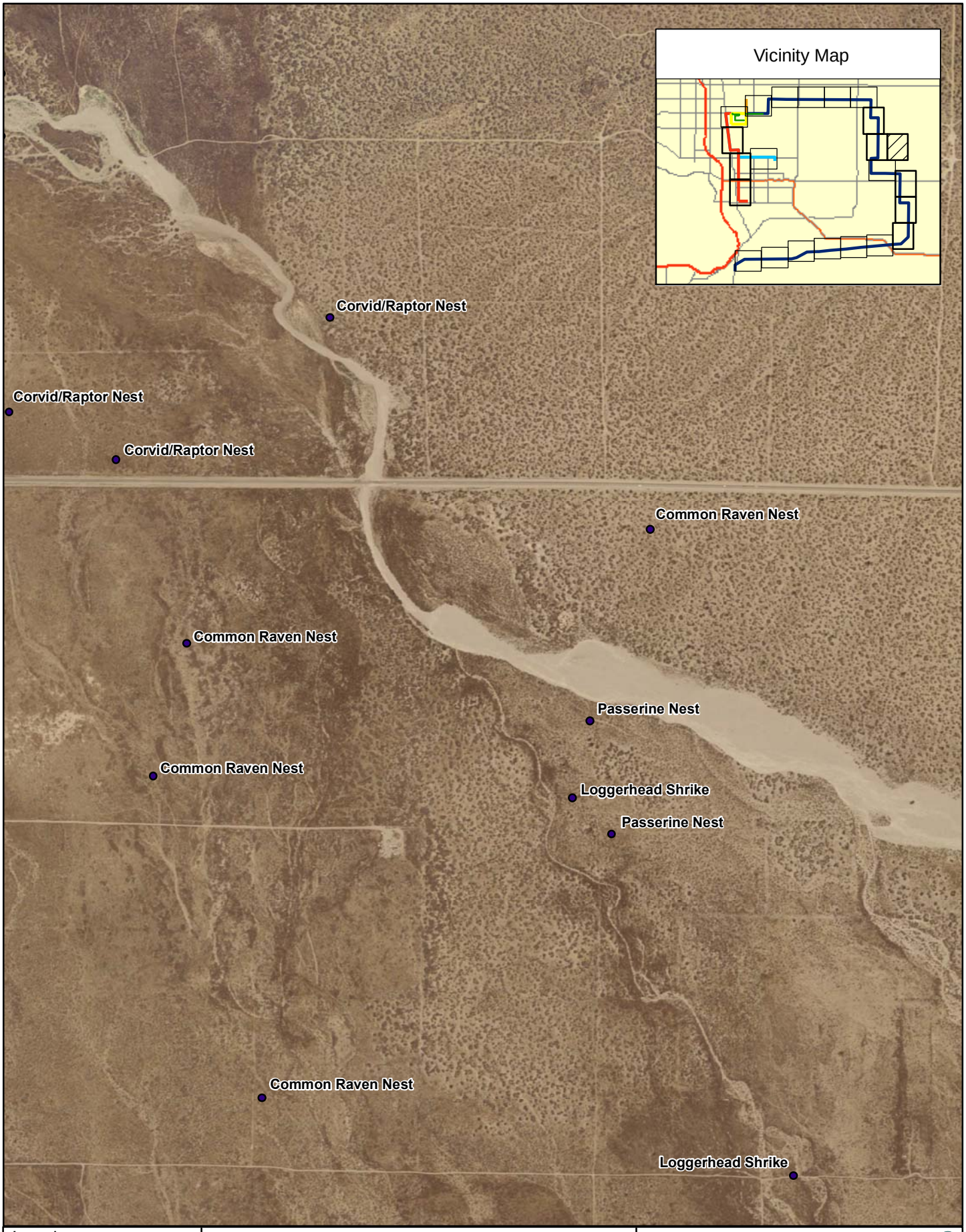
1:12,000

Map Notes:
Projection: NAD 83, Zone 11
Path:G:\sdo8\bio\Palmdale\mxd\sspecies
Power Plant Bio 6554000247\graphics\mxd
Date: 07/17/2008

Figure 5- H

amec

N



Legend
- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

1:12,000

Map Notes:
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Power Plant Bio 6554000247\graphics\mxd
Date: 07/17/2008

Figure 5- H1

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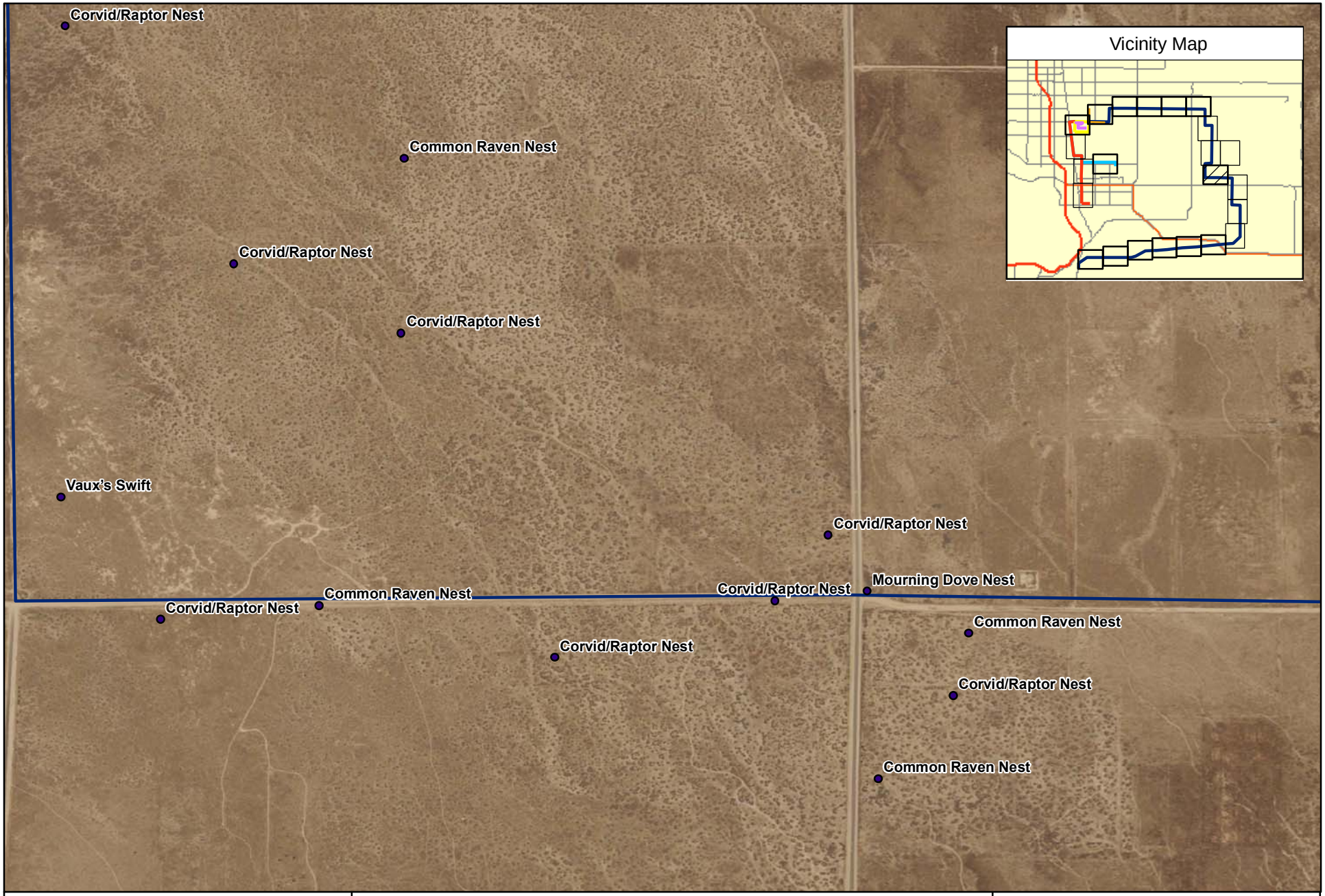

Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

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Map Notes:

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Date: 07/17/2008

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Figure 5 - I

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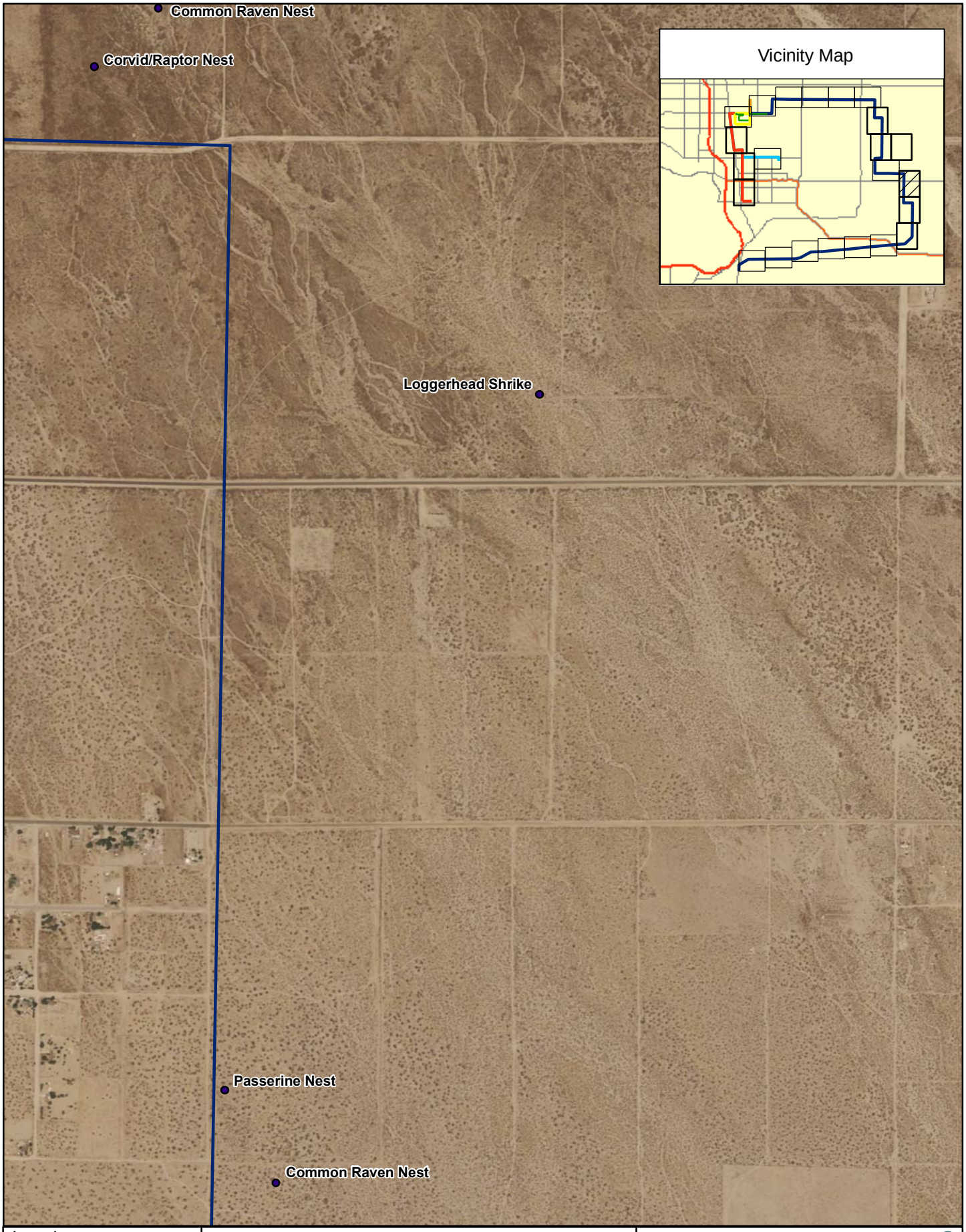

Legend
- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

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Map Notes:
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Date: 07/17/2008

Figure 5- J

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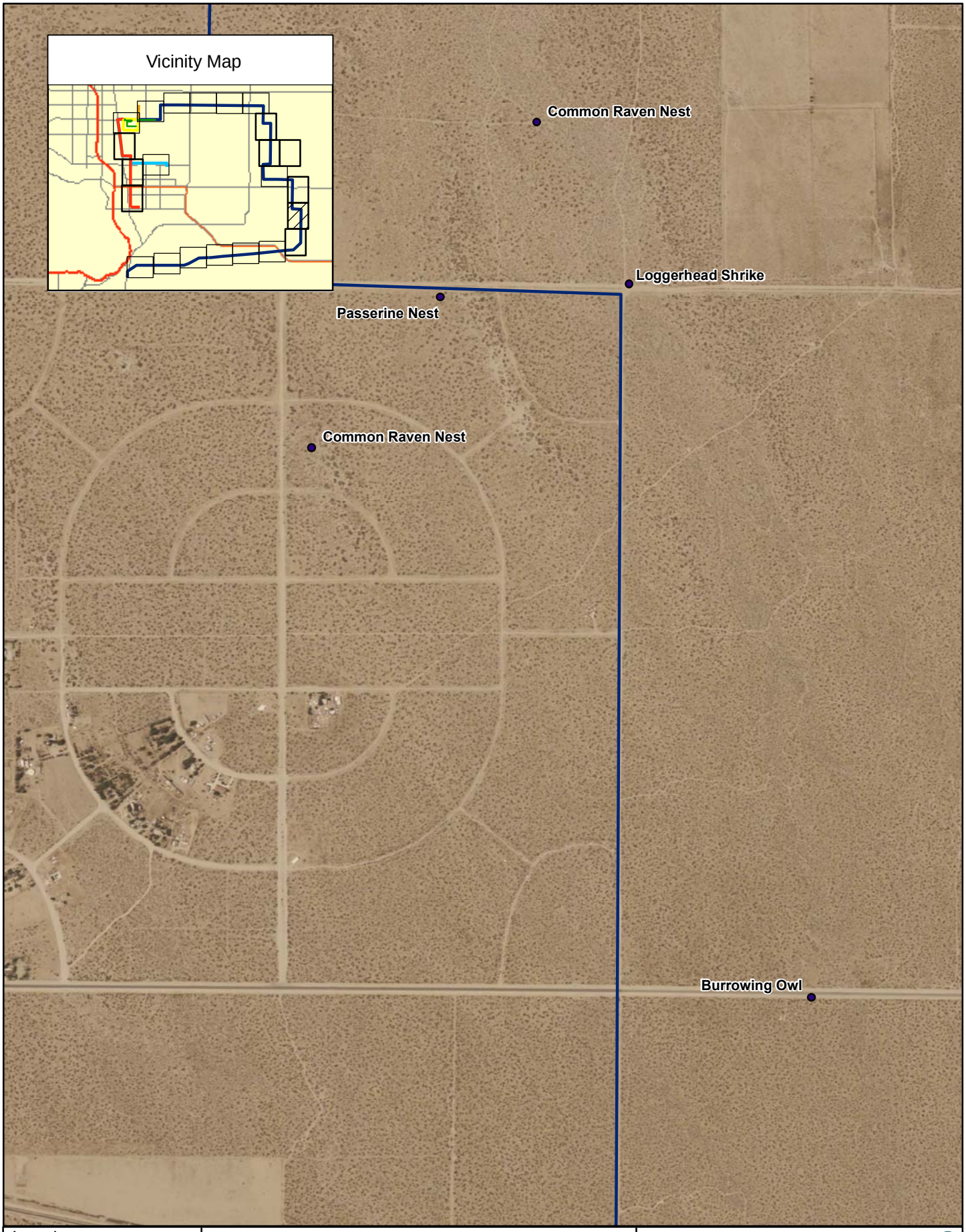

Legend
- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

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Map Notes:
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Figure 5- K

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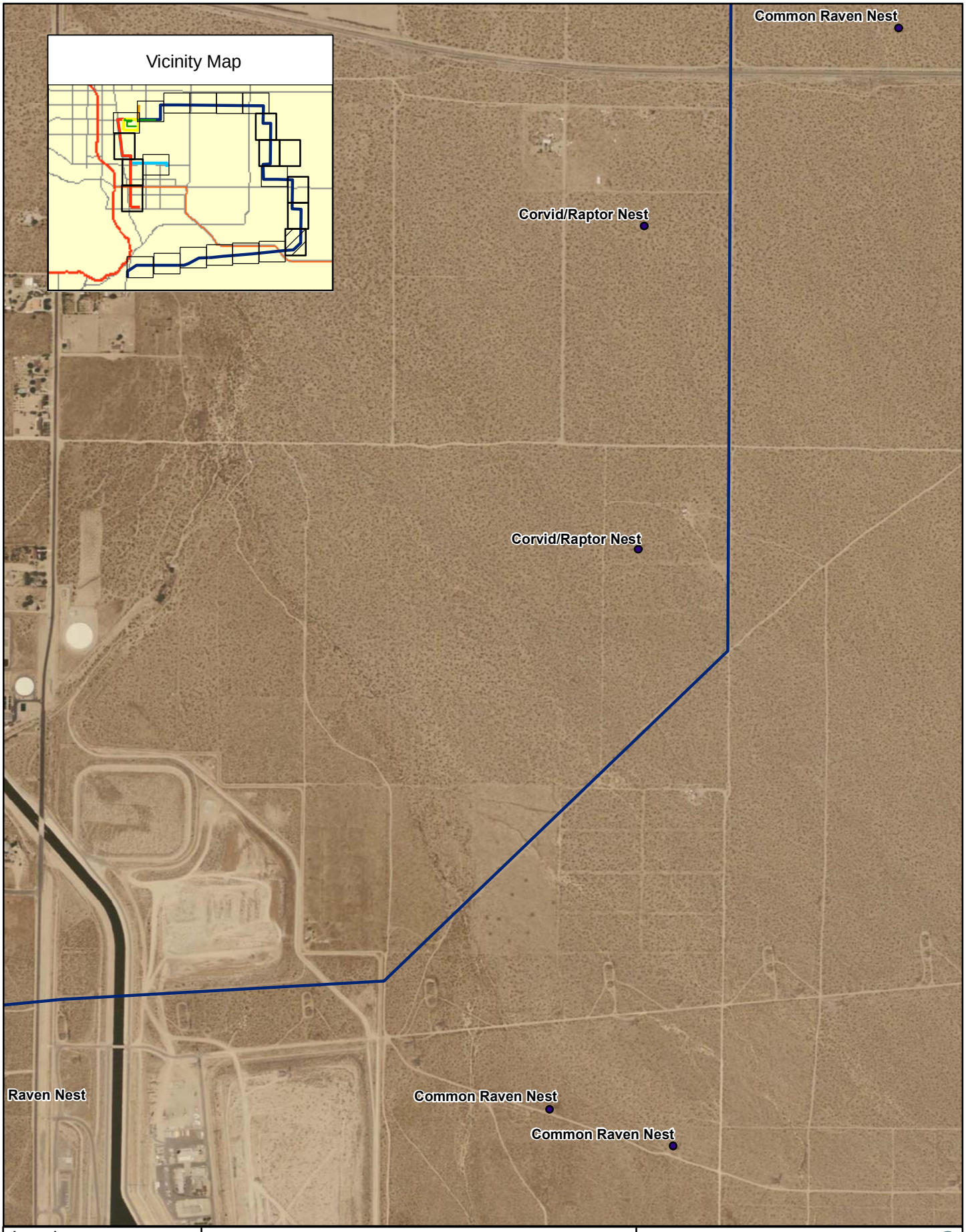

Legend
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- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

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Map Notes:
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Figure 5- L

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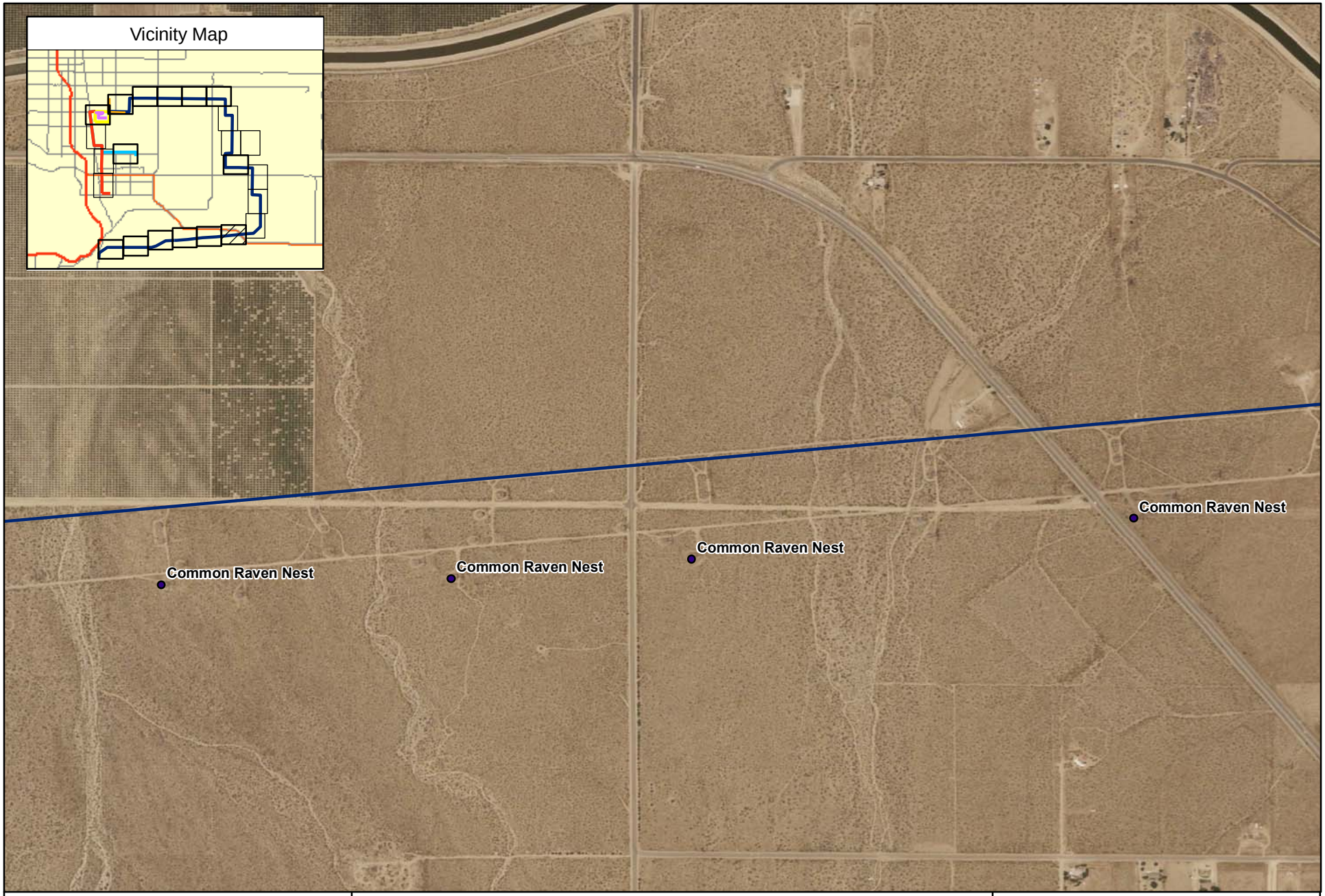

Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

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Map Notes:

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Figure 5 - M

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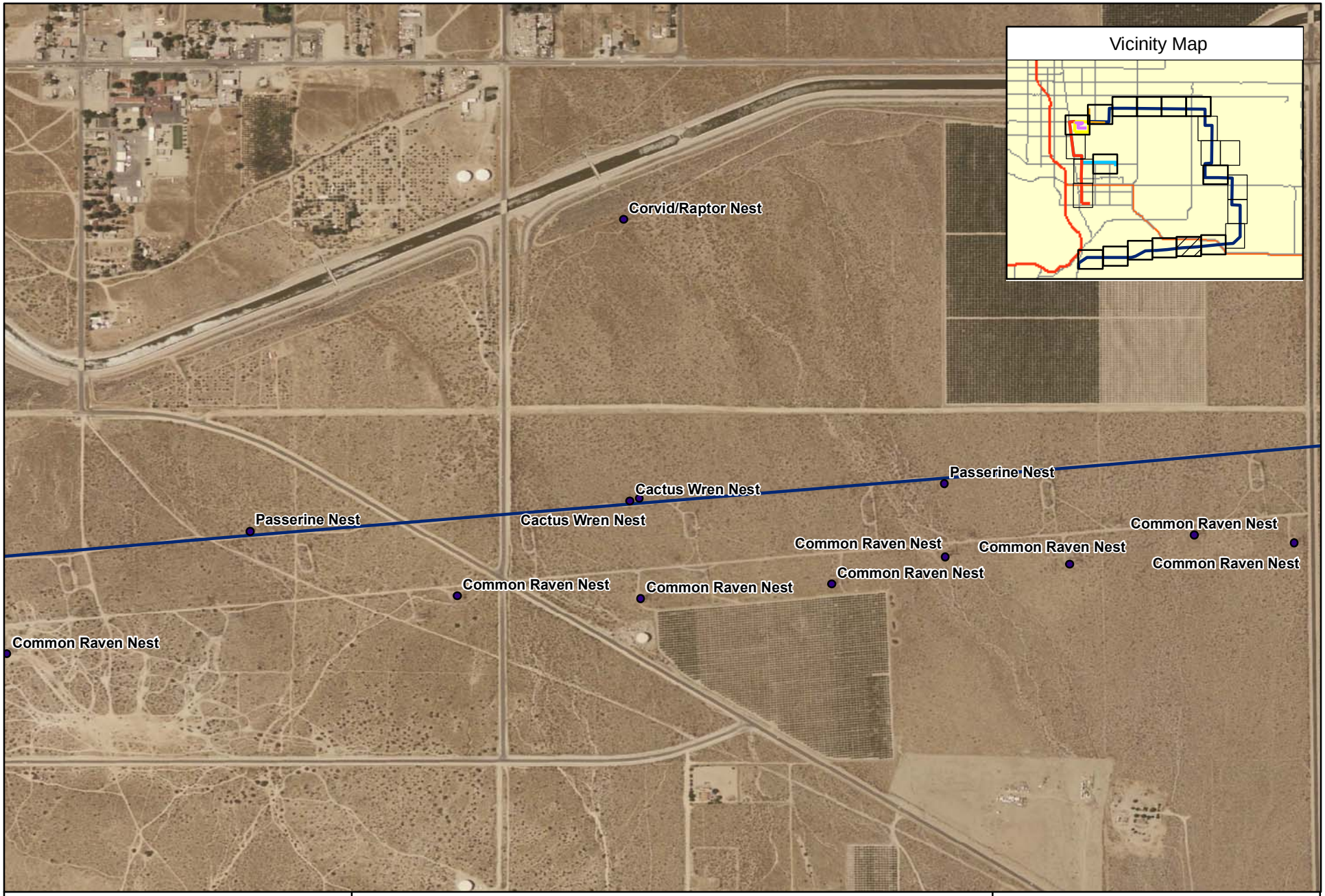

Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

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Map Notes:

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Date: 07/17/2008

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Figure 5 - N

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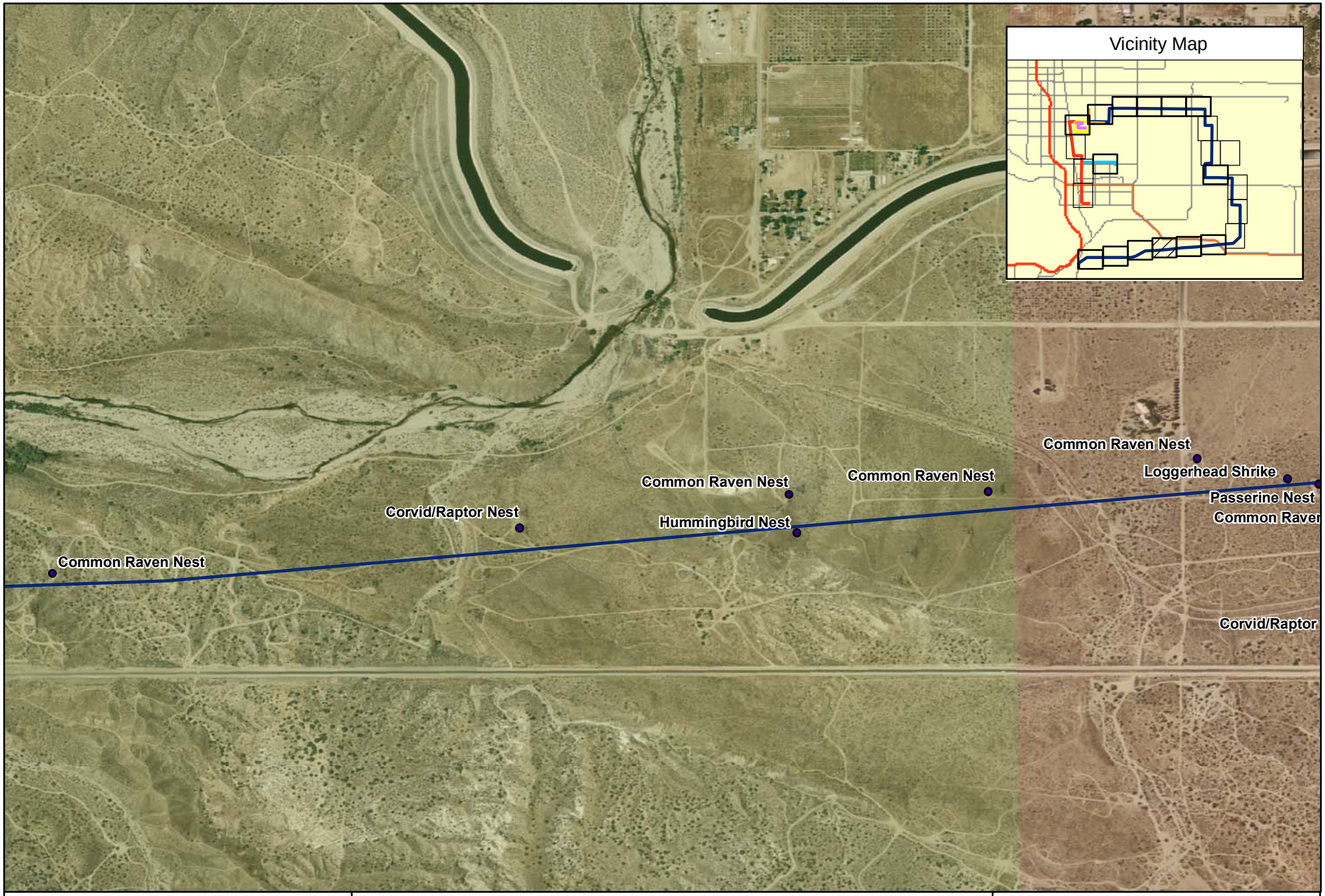

Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

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Map Notes:

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Date: 07/17/2008

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Figure 5 - O

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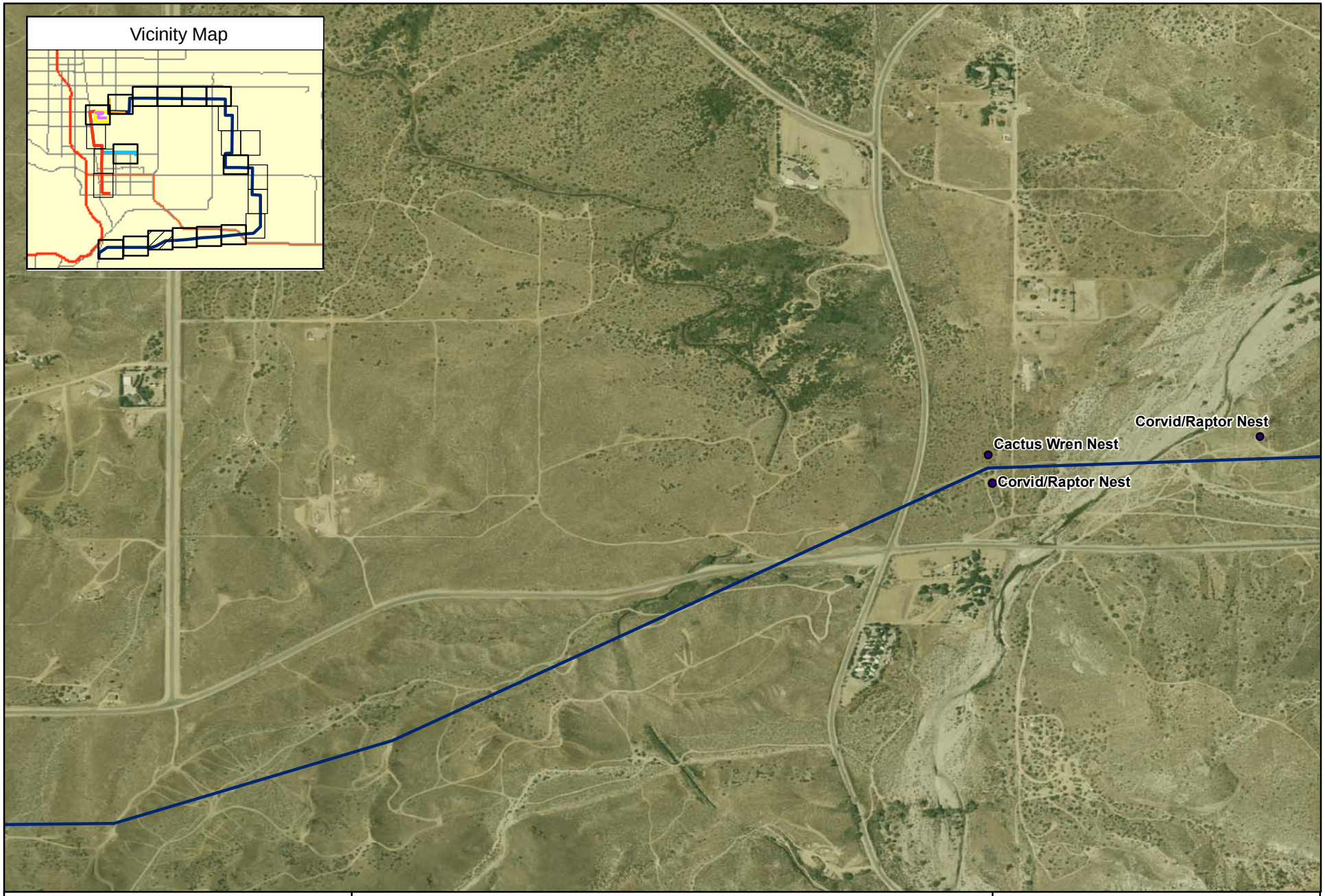

Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
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- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

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Map Notes:

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Date: 07/17/2008

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Figure 5 - P

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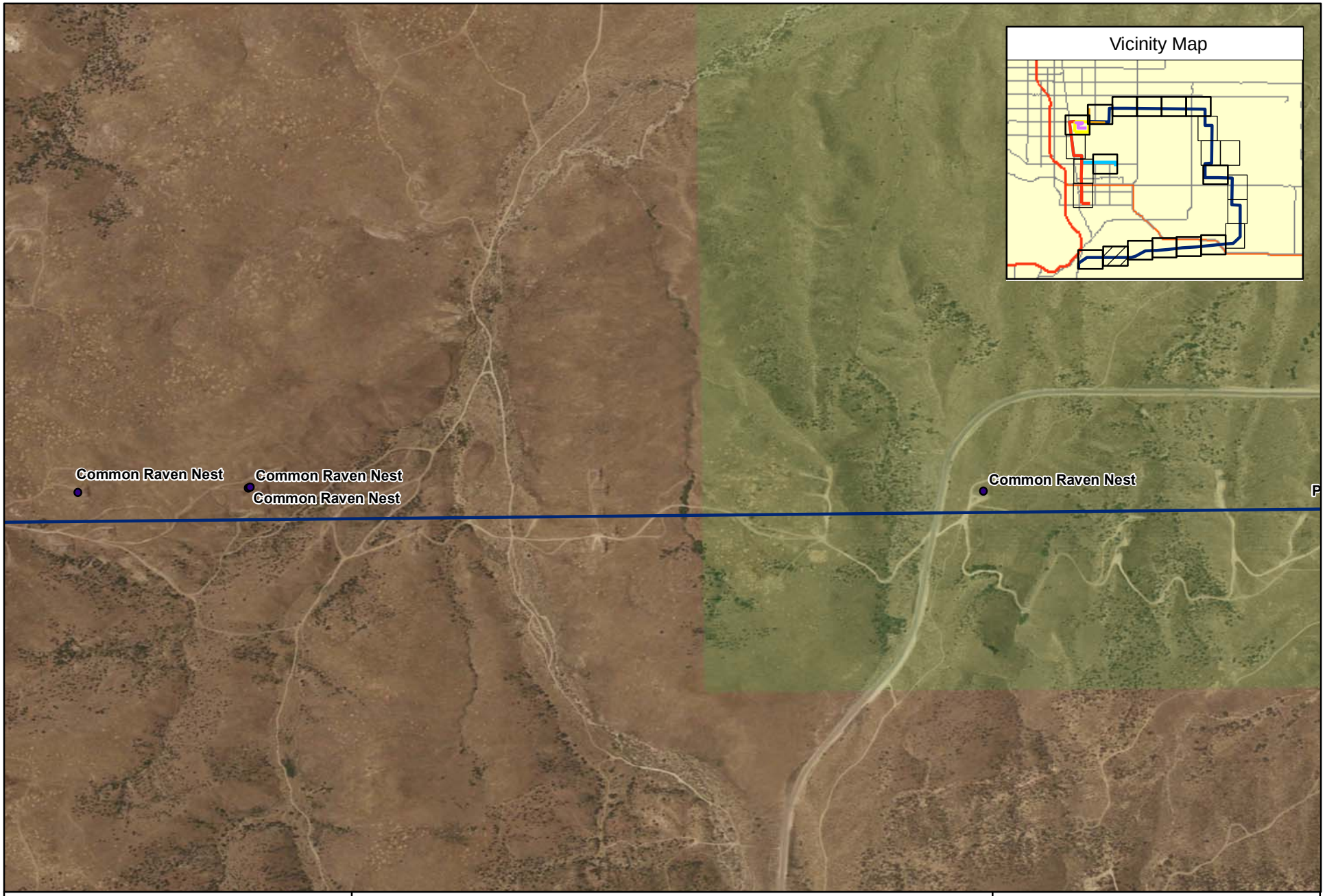

Legend
- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

1:12,000

Map Notes:
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Date: 07/17/2008

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Figure 5 - Q

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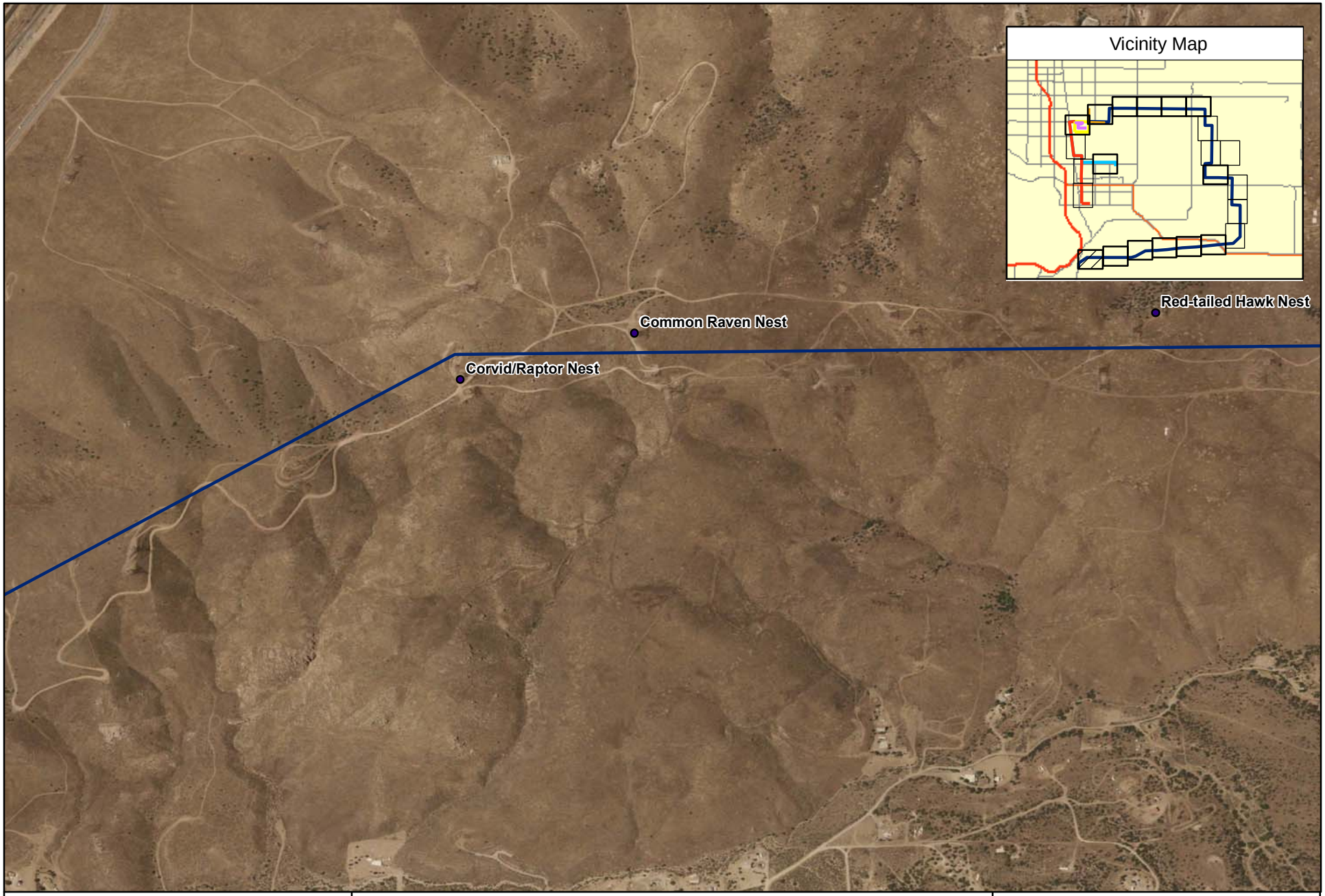

Legend

- Transmission Line
- Reclaimed Water Pipeline
- Natural Gas Supply Line
- Power Plant Site
- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

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Map Notes:

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Date: 07/17/2008

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Figure 5 - R

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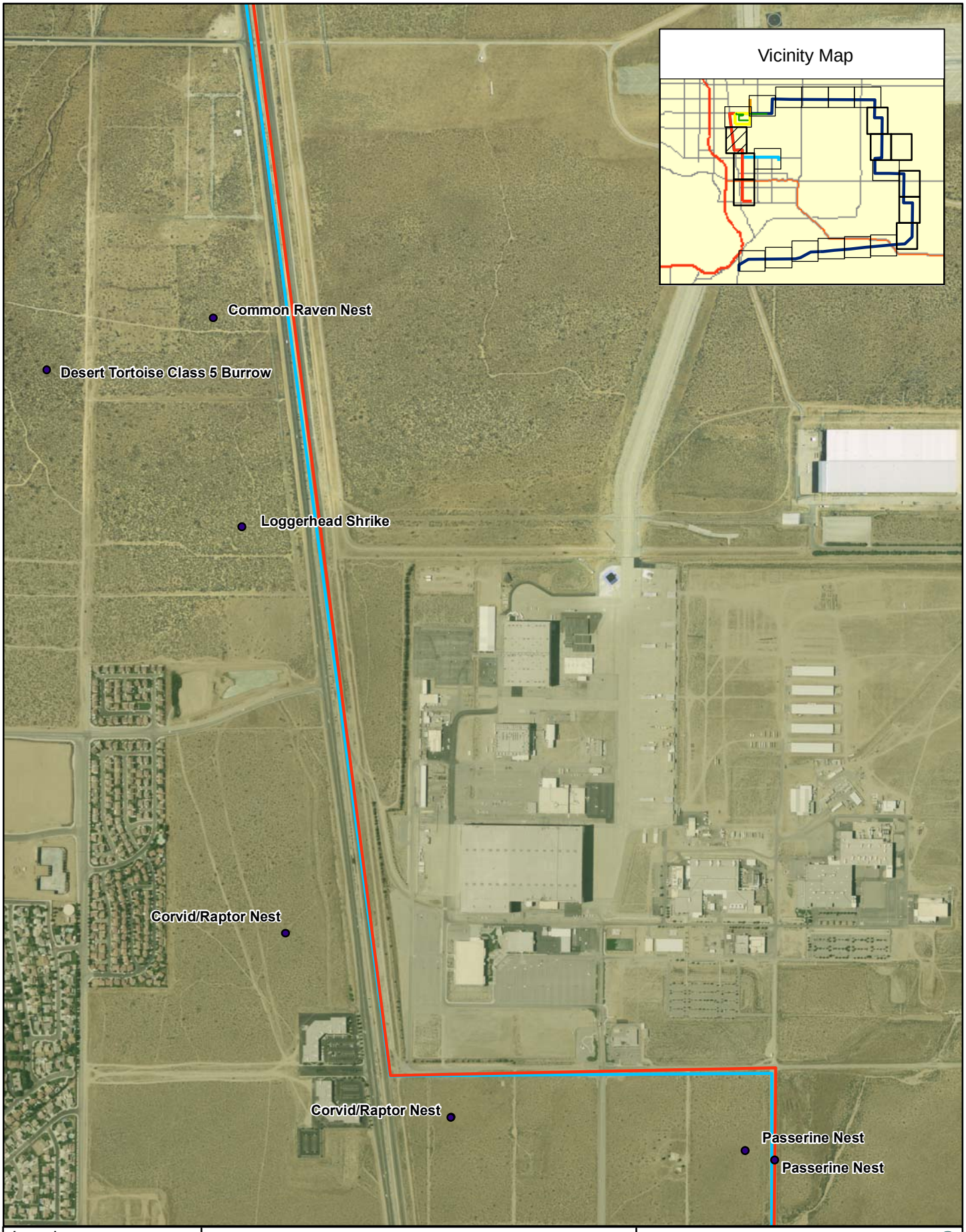

Legend
- Transmission Line
- Reclaimed Water Pipeline
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- Potable Water Line
- Sanitary Wastewater Pipeline

Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

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Map Notes:
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Date: 07/17/2008

Figure 5- S

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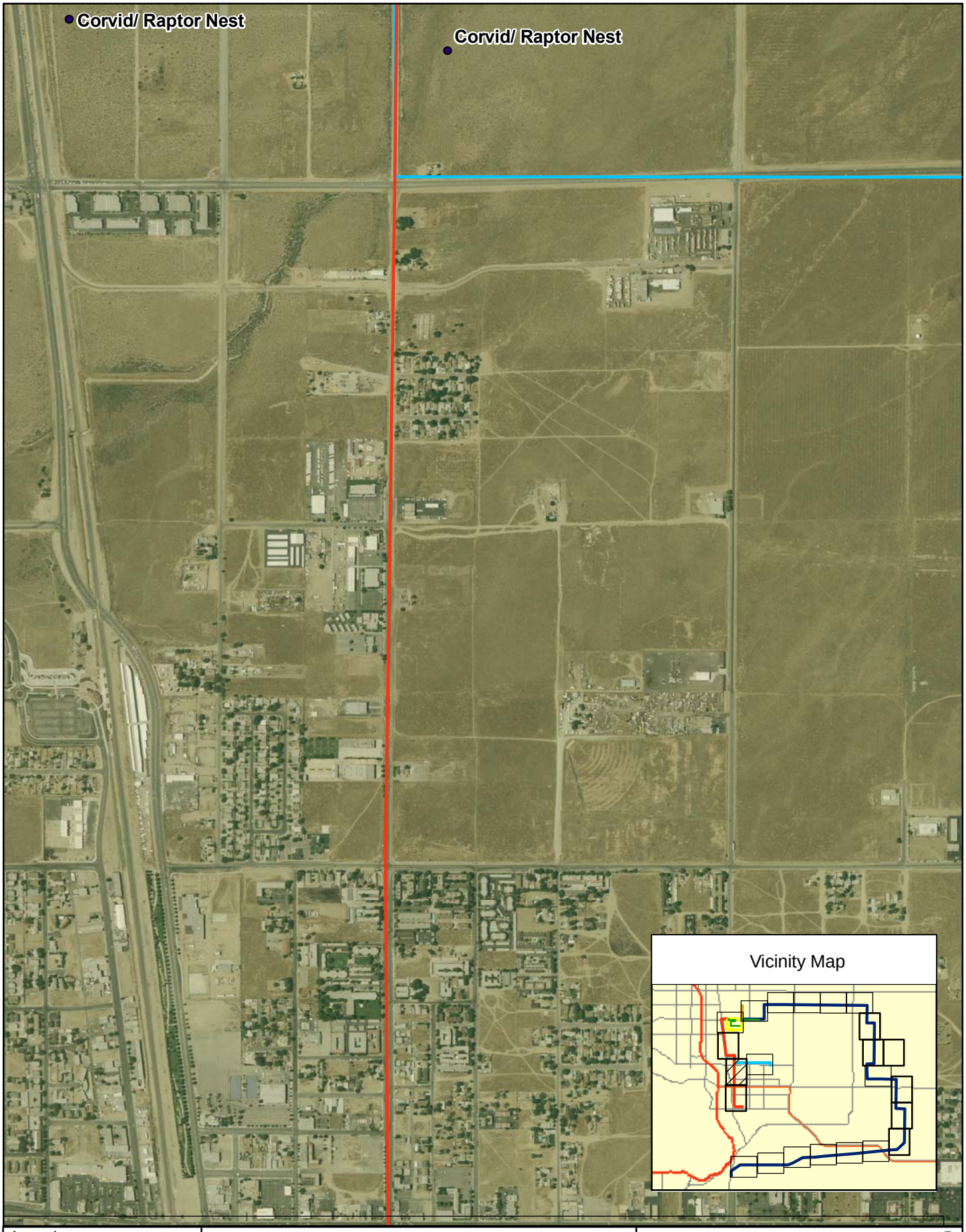

Legend
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Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

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Map Notes:
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Figure 5- T

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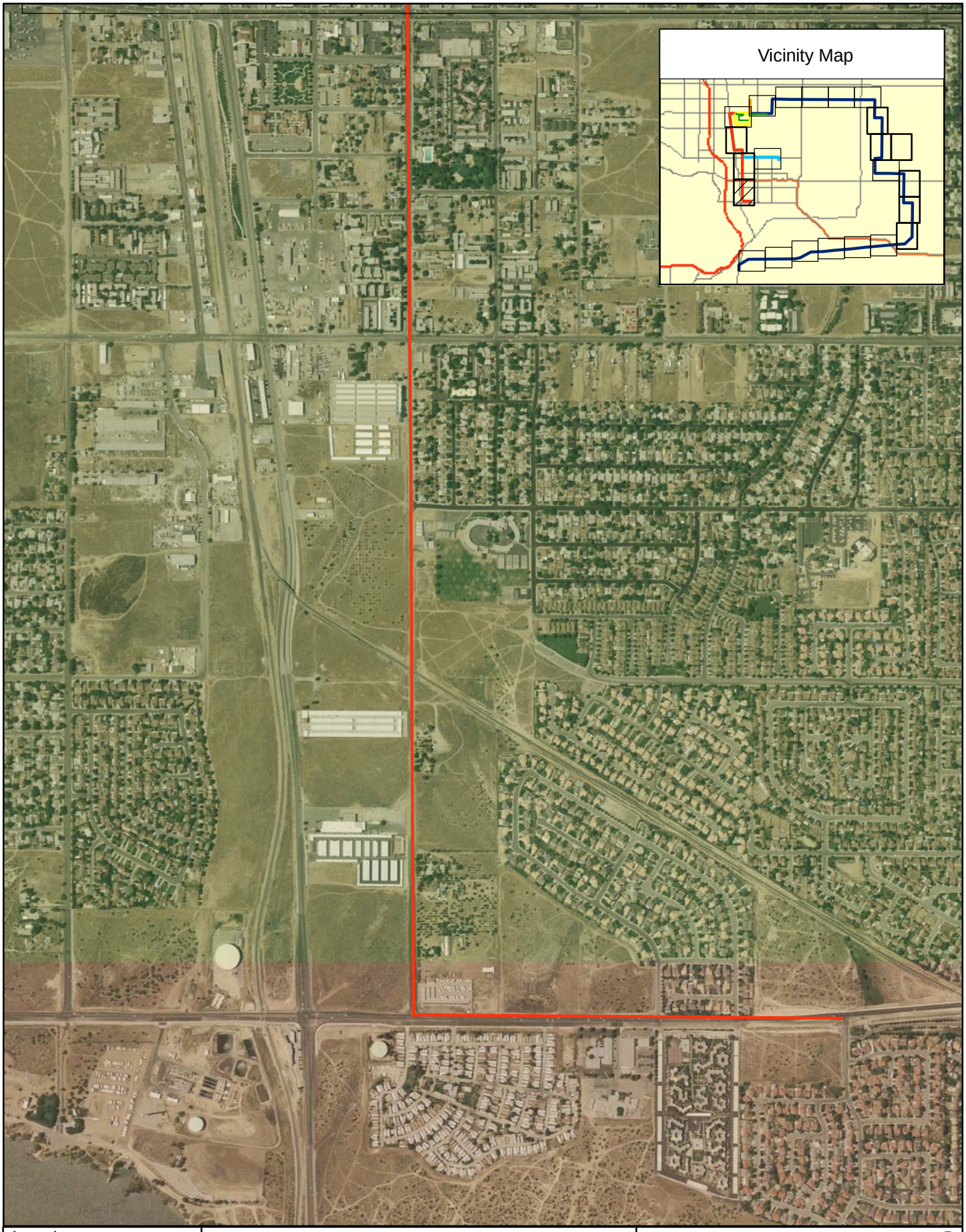

Legend
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Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

1:12,000

Map Notes:
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Power Plant Bio 6554000247\graphics\mxd
Date: 07/17/2008

Figure 5- U

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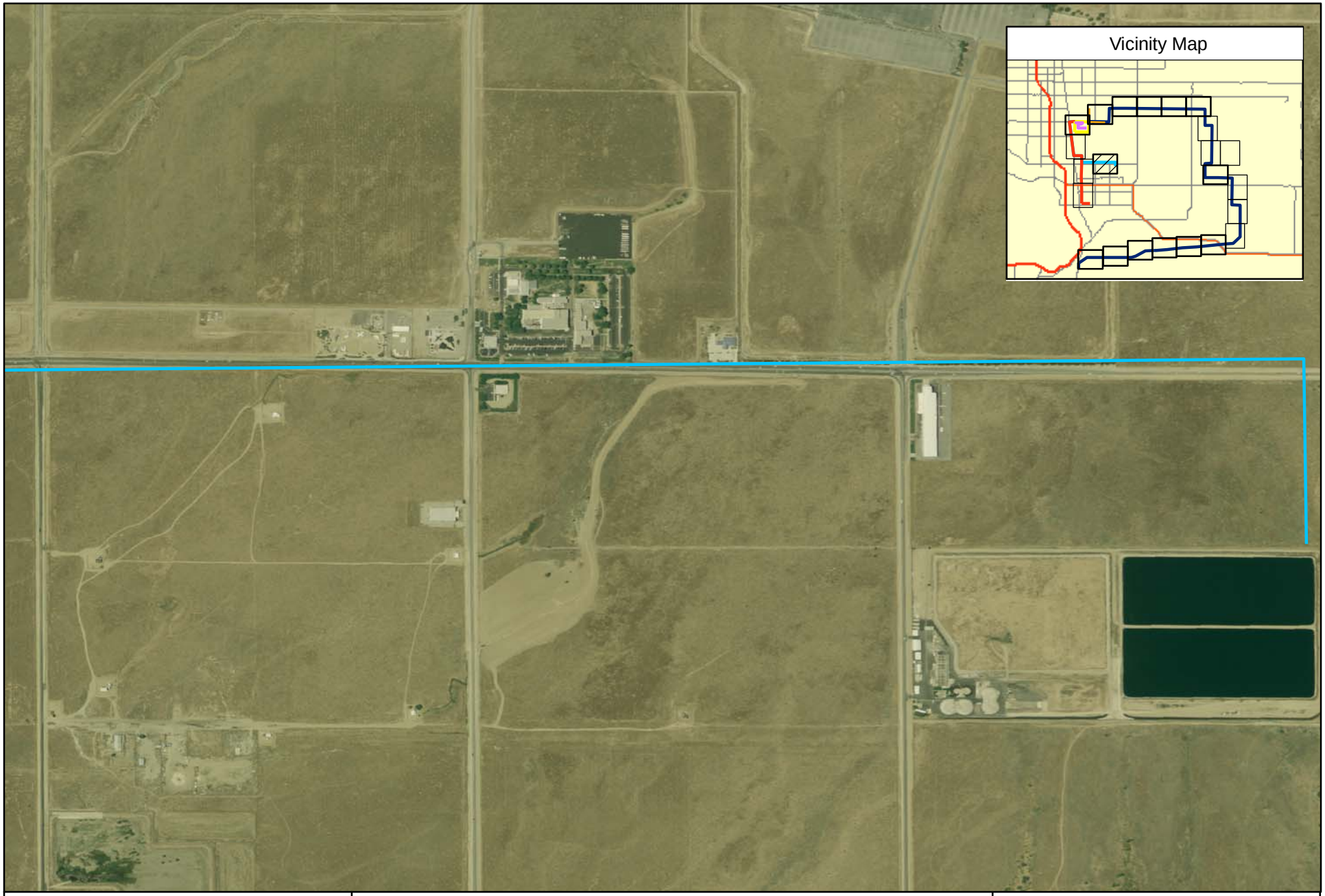

Legend

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Palmdale Hybrid Power Project

Special-Status Species and Sign Observed

0 0.1 0.2 0.4 Miles

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
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Date: 07/17/2008

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Figure 5 - V

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APPENDICES

APPENDIX 1

QUALIFICATIONS OF INDIVIDUALS CONDUCTING STUDIES

Matt Amalong

Wildlife Biologist

Professional summary
Eight years experience as an environmental consultant/biologist. Responsibilities have included: project management; preparation of FERC, BRAR, BRTR, EA, EIR, CIA, AFC and CEQA Biological Resource Reports; preparation of scopes, schedules, and budgets; desktop surveys (CNDDB, internet, literature search, etc.); technical editing and report writing; proposed wind energy facilities surveys (avian, wildlife, plant); monitoring of endangered species (California least tern & western snowy plover); wetland delineation projects; restoration projects; wind energy projects; superfund site projects; coordinating and conducting field surveys (avian, herpetological, mammalian, vegetation); and construction monitoring.

Professional qualifications
Basic Wetland Delineation, Wetland Training Institute, Aug 2007

Desert Tortoise Surveying, Monitoring, and Handling Techniques Workshop, Nov 2006

Avian/Bat Fatality Survey Training, Searcher Efficiency, and Carcass Removal Trials at Wind Farms, Aug 2006

Flat-tailed Horned Lizard Survey Certification, Jun 2006

Successful CEQA Compliance Workshop, Feb 2006

40-Hour HAZWOPER Training, Dec 2005

8-Hour HAZWOPER Refresher, Nov 2006

CDFG Scientific Collecting Permit

Education
Graduate School, Biology/Ornithology, California State University, Long Beach, 2000-2003

B.S., Biology, Stetson University, 1999

Memberships
The Wildlife Society, Western Section

National Wind Coordinating Collaborative

The Desert Tortoise Council

Languages
English

Summary of core skills
As Project Manager, responsible for scope, schedule, budget, and level of quality for a variety of projects.

Detailed core skills or details by project

Oak Creek Energy Systems Inc., Wind Assessment Projects, southern CA and southern NV. Coordinated cultural and biological field surveys for three-year renewable wind prospecting BLM right-of-way grants for the installation of meteorological towers at five project sites in southern CA (San Bernardino and Kern Counties) and southern NV (Clark County). Prepared Biological Resource Assessment Reports to support EA documents.

Energy Unlimited Inc., Revised Commercial WECS 20 Permit Project, Riverside County, CA. Provided biological support and prepared DEIR Response to Comments for a Repower Project in Desert Hot Springs, CA. The proposed Project will install eight new GE 1.5 MW wind turbine generators, remove sixteen existing smaller Bonus 65 kW wind turbine generators, construct a single-story storage building, and expand an existing outdoor storage area within the existing WECS 20 Wind Park.

RES Energy, Granite Mountain Wind Project, San Bernardino County, CA. Prepared biological study plan. Coordinated and conducted bi-weekly avian point-count surveys for proposed 46 MW Granite Mountain Wind Project in San Bernardino County. Analyzed avian point-count data and prepared mean use report providing results of those surveys. Identified species at risk by visual and aural observations. RES proposes to develop a new wind energy generation facility. This facility will include access roads, underground electrical lines, underground communication lines, concrete wind turbine foundations, tubular steel towers, 2.3-megawatt wind turbines, transformers, a communications system, and undisturbed open space. Project work required for preparation of an EIR for submission to the Bureau of Land Management (Barstow Field Office).

Dillon Wind, LLC, Field Surveys and EIR, Riverside County, CA. Coordinated and conducted field surveys for special-status species, including desert tortoise, flat-tailed horned lizard, and burrowing owl. Wrote General Biological Assessment for County of Riverside and Biological Resources Technical Appendix for EIR. Dillon Wind, LLC is proposing to construct and operate an approximately 45 megawatt (MW) wind energy conversion system (WECS) project in the San Gorgonio Pass area of Riverside County. The Project will involve the installation of supporting facilities including on-site access roads, pad mount transformers, underground electrical transmission, and communication lines.

Edwards Air Force Base, Common Raven Study, Lancaster, CA. Developed and implemented a monitoring program to provide information on the population and behavior of ravens and their interaction with desert tortoise within the Desert Tortoise Critical Habitat Area (DTCHA) on Edwards Air Force Base (EAFB). Factors investigated included raven population densities, movement patterns, and diet characteristics. These three primary factors were evaluated both inside and outside the boundaries of the DTCHA and EAFB. Additional information collected included raven nesting locations and staging areas. The study was also intended to establish point count locations where long-term comparative data can be collected to measure the status and impact of raven populations within and adjacent to the DTCHA. Wrote biological report for Army Corps of Engineers.

PPM Energy, Tule Wind Project, San Diego County, CA. Prepared biological study plan. Coordinated and conducted bi-weekly avian point-count surveys, surveys for rare plant species, and surveys for refining vegetation community maps for proposed 177 MW Tule Wind Project in eastern San Diego County. Identified species at risk by visual and aural observations. The primary components of the proposed project are approximately 118 1.5-MW capacity wind turbines with a hub height of approximately 80 meters, a rotor diameter of 77 meters, and a total height of approximately 118 meters. Electrical power generated by the wind turbines would be

collected on-site by underground 34.5kV transmission lines and ultimately delivered to an existing substation in Boulevard, approximately 3 mi. south of the project site via an overhead 230kV transmission line. Project work is required for preparation of an EIR.

FPL Energy, LLC, Beverly and DeKalb & Lee Wind Resource Areas, IL. Wrote Environmental Critical Issues Analysis (CIA) Report for two proposed wind energy conversion facilities in Beverly and DeKalb & Lee Counties, Illinois. These reports evaluated current environmental conditions and potential impacts on sensitive biological and cultural resources within the Wind Resource Areas (WRA). It also evaluated applicable land uses, zoning, and identified the types of permits, plans, and approvals that would likely be required for project development. Current plans for the Beverly WRA include the installation of 126 tubular-steel, 80 meter tall, 1.5 megawatt (MW) GE turbines (approximately 190 MW). Current plans for the DeKalb & Lee WRA include the installation of 129 tubular-steel, 80 meter tall, 1.5 megawatt (MW) GE turbines (approximately 194 MW). Infrastructure to be constructed or installed in conjunction with the turbine arrays and associated substations include access routes and both buried and overhead transmission lines.

Salton Sea Authority, New & Alamo River Wetland Restoration Plan, Imperial County, CA. Coordinated and implemented reconnaissance-level habitat and biota surveys along the New and Alamo Rivers in Imperial County, CA. The primary goal of the proposed surveys were to identify those flora and fauna that are currently present at the undeveloped sites and to help predict those species that may be present in any future wetlands scenario. Wrote biological report for Tetra Tech Divisions to be incorporated as a chapter in the Master Plan for New and Alamo Rivers.

UPC Wind Energy, LLC, Mile High Ranch Wind Project, Hudspeth County, TX. Analyzed avian point-count data and prepared mean use report providing results of those surveys for proposed wind energy conversion facility on an approximately 44.5 km^2 (11,000 acre) area of west-central Texas, approximately 50 km east of El Paso near the El Paso/Hudspeth County line. The proposed design includes GE 1.5 MW turbines, which have an 80-meter hub height and a rotor diameter of 77 meters, resulting in a rotor swept area (RSA) between 41.5 and 118.5 meters above ground level. Infrastructure to be constructed or installed in conjunction with the turbine array and associated substation includes access routes and transmission lines. The protocol for this analysis was similar to protocols used at the Condon, Maiden, Stateline, and Vansycle wind projects in Oregon and Washington, the Buffalo Ridge wind project in southwest Minnesota, and the Foote Creek Rim wind project in Wyoming.

Luke Air Force Base, Barry Goldwater Tactical Range, Nevada. Coordinated and conducted biological surveys for Sonoran pronghorn antelope. Utilized video camera surveillance to monitor wildlife activity at watering/revegetation plots. Included installation of cameras and DVR equipment.

All-American Canal Lining Project, Imperial County, CA. Prepared training and safety materials, including Worker's Environmental Education Program (WEEP) manual, special-status species identification cards, environmental signs, training documentation database, and stickers. The purpose of the AAC Lining Project is to conserve seepage lost from the unlined AAC. The conserved water is needed in the southern California coastal area to offset a projected water shortage of 1.2 million acre-feet that is expected by the year 2010. The proposed project has the potential to conserve about 67,700 acre-feet per year.

North Baja Expansion Project, Imperial and Riverside County, CA. Prepared FERC Resource Report: Vegetation and Wildlife. The purpose of this report was to describe the

existing fish, wildlife, and vegetation resources that would be affected directly and indirectly by the proposed North Baja Expansion (NBX) Project and to assess the potential impacts to these resources resulting from construction and operation of the proposed project. The report also identifies the mitigation measures that are proposed to reduce the impact to these resources. The proposed project consists of the following two components: the B-line, which is comprised of the North Baja Loop, the Blythe Lateral, and the SoCal Gas Lateral; and, the IID Lateral.

Sempra Energy Resources, Imperial Valley Desert Restoration Project. Compiled and edited the "As-built" baseline surveys and initial execution of Sempra's restoration plan, including tamarisk, a non-native invasive shrub/small tree, removal and off-site mitigation for impacts.

North Baja Pipeline Extension, Avian Surveys, AZ and CA. Compiled and edited focused avian survey reports for southwestern willow flycatcher and clapper rail.

South Coast Water District, Laguna Sur Sanitary Easement Natural Resources Evaluation, Orange County, CA. Compiled and edited an assessment intended to determine potential environmental regulatory and compliance issues associated with regular and emergency maintenance activities needed to maintain operation of SCWD facilities within the Laguna Sur Sanitary Easement.

South Coast Water District, Casden Properties, LLC, Los Angeles County, CA. Compiled and edited focused avian survey reports for California gnatcatcher and burrowing owl. Complied with California Environmental Quality Act (CEQA), state and federal Endangered Species Acts (ESA), Clean Water Act (CWA), California Department of Fish and Game (CDFG) Code Sections, and Migratory Bird Treaty Act (MBTA) associated with emergency maintenance activity requisite to maintain use and operation of SCWD facilities.

Department of the Navy, Superfund Site, Hunters Point, CA. Monitored biological resources on former Hunters Point Naval Shipyard superfund cleanup site. Maintained buffer zones to protect biological resources; prepared and filed daily field monitoring reports; interacted with construction staff to ensure compliance with established environmental protection measures.

Rialto Municipal Airport, Phase I Environmental Site Assessments, Rialto, CA. Compiled and edited Phase I Environmental Site Assessments for four properties in and around the Rialto Municipal Airport.

Pacific Gas and Electric, North Baja Natural Gas Pipeline, California and Arizona. Field compliance with NEPA, CEQA, FERC, and federal and state Endangered Species Acts for an 80-mile natural gas line extending from Ehrenberg, La Paz County, Arizona, through Riverside and Imperial Counties, California to an interconnection with Sempra International's proposed Gasoducto Bajanorte pipeline at the U.S./Mexico border west of Yuma, Arizona. Implemented field compliance with terms and conditions of formal consultation with the USFWS pursuant to Section 7 of the Endangered Species Act of 1973 (as amended) and CDFG 2081 Take Permit. Field executed desert restoration plan, field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Assisted with threatened and endangered species surveys for rare plants, desert tortoise, flat-tailed horned lizard, burrowing owl, Gila wood pecker, southwestern willow flycatcher, and nesting bird surveys in accordance with the MBTA. Additional responsibilities included instructing, implementing, and maintaining compliance with various mitigation measures outlined in numerous project approvals and permits.

Port of Los Angeles, Pier 400 California Least Tern Nesting Site, Los Angeles County, CA. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Monitored breeding biology of California least tern. Observed and monitored other sensitive species such as western snowy plover, burrowing owl, black skimmer, Caspian tern. Assisted with predator management (trapping and relocating) of peregrine falcon, American kestrel, burrowing owl, feral cats, corvids, gulls. Conducted banding studies on least, Caspian, and elegant terns. Compiled and analyzed data into annual reports.

City of Murrieta/USFWS, Southern California. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Monitored construction during Clinton Keith Roadway Ramp Interim Improvement Project in habitats containing the endangered California gnatcatcher. Interacted with construction crews to ensure environmental compliance.

Army Corps of Engineers, Southern California. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Conducted California least tern foraging surveys at the Port of Los Angeles and Camp Pendleton. Monitored snowy plover activity adjacent to CLT nesting sites. Compiled and analyzed data in an annual foraging report.

Upper Newport Bay, Orange County, CA. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Conducted avian surveys at Big Canyon and West Bay. Monitored endangered California gnatcatcher. Compiled avian, mammalian, herpetological, and entomological species lists.

Myra Frank, Southern California. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Monitored construction during I-5 highway construction in habitats containing endangered species (Willow Flycatcher, Least Bell's Vireo, Unarmored 3-spined Stickleback). Interacted with CalTrans and construction crews to ensure environmental compliance.

Alameda Corridor, Los Angeles County, CA. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Located and marked nests, monitored breeding biology, interacted with construction crews during railroad construction to minimize disturbance to nests. Prepared annual breeding report.

Cajalco Creek Dam and Detention Basin, Riverside County, CA. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Monitored construction in habitats containing endangered species (California gnatcatcher, Stephens' kangaroo rat). Ensured construction crews were in compliance with environmental permits. Prepared annual report.

Batiquitos Lagoon, Carlsbad, CA. Managed four endangered California least tern and western snowy plover nesting sites. Coordinated and communicated with predator management, CDFG, and others to optimize reproductive success. Prepared annual breeding report.

Employment history

Apr 2007 – present Wildlife Biologist, AMEC Earth & Environmental, Inc., Anaheim, CA

Aug 2005 – Apr 2007 Associate Biologist, Tetra Tech EC, Inc., Santa Ana, CA. Project Manager responsible for preparing and executing biological study plans.

Apr 2000 – Aug 2006 Project Biologist, Keane Biological Consulting, Long Beach, CA. Project Manager responsible for coordinating biological surveys and maintaining compliance with mitigation measures.

Jan 2005 – Aug 2005 Assistant Biologist, LSA Associates, Inc., Irvine, CA. Conducted biological monitoring in habitats containing endangered, threatened, and/or species of special concern.

Apr 2004 – Nov 2004 Biological Monitor, CA Department of Fish and Game, Carlsbad, CA. Managed four California least tern and western snowy plover nesting sites.

James L. Boone
Desert Wildlife Consultants, LLC
3112 Ivory Coast Drive, Las Vegas, NV 89117-2346
(702) 286-6477; email: jlboone@aol.com

WORK SUMMARY

I have been involved in basic and applied environmental research since 1975, and in 1995 I earned a Ph.D. in ecology. My experience includes planning and conducting plant and wildlife field surveys, designing experiments, collecting data, performing advanced statistical and computational procedures using a variety of computer programs and platforms, database management, and preparing technical reports and scientific publications. More recently, I made a living as a technical writer in science and engineering. During that time, I remained active in studying the flora, fauna, and geology of the Mojave Desert, and I maintain a website (birdandhike.com) about the Mojave Desert. I also started an environmental consulting firm focused on monitoring desert tortoise activity on construction sites. In the old days, I worked in wildland fire fighting, law enforcement, search and rescue, and emergency medicine.

EDUCATION

Ph.D., ECOLOGY, 1995. University of Georgia, Athens.
Population genetics, systematics, conservation, ecology, applied mathematics.
Dissertation: *Patterns of Temporal and Geographic Variation in the Genetics and Morphology of Cotton Mice (*Peromyscus gossypinus*)*.

M.S., FOREST RESOURCES, 1990. University of Georgia, Athens.
Population genetics, conservation, wildlife management, land use planning.
Thesis: *Reassessment of the Taxonomic Status of the Cotton Mouse (*Peromyscus gossypinus anastasae*) on Cumberland Island, Georgia, and the Implications of this Information for Conservation*.

B.S., WILDLIFE MANAGEMENT, 1986. Humboldt State University, Arcata, CA.
Wildlife management, biostatistics, botany, computers. Graduated summa cum laude.
Senior Thesis: *Morphological Differences between Populations of Deer Mice (*Peromyscus maniculatus rubidus*) in Sand Dune and Upland Habitats*.

PRIMARY RESEARCH PROJECTS

* Response of Mojave Desert vegetation to wildfire.
* Modeling the movement of radioactive materials on a subsistence farm.
* Ecology of mammals and reptiles at Yucca Mountain.
* Impacts of human activities on mammals and reptiles at Yucca Mountain.
* Small-scale genetic change (geographic and temporal) in populations.
* Subspecific taxonomy of *Peromyscus gossypinus*.
* Vertebrate community ecology in the southern Appalachian Mountains.
* Distribution of Lyme disease in the southeastern U.S.
* Wading birds at Cumberland Island National Seashore.
* Control of invasive salt marsh plants without herbicides.
* Effects of fire on small mammal populations.
* Foraging behavior of White-headed Woodpeckers.
* Black bear research and management.

SELECTED PUBLICATIONS

Boone, J.L. 2006. Birding, Hiking, and Naturalizing Around Las Vegas. www.birdandhike.com

Rautenstrauch, K. R., D. L. Rakestraw, G. A. Brown, J. L. Boone, and P. E. Lederle. 2002. Patterns of Burrow Use by Desert Tortoises (*Gopherus agassizii*) in Southcentral Nevada. Chelonian Conservation and Biology, 4(2):398-405.

Walters, J.P., and J.L. Boone. 2002. Effects of Salinity and Sodicity on Vegetation Used for Strip Mine Reclamation in Webb County, Texas. Farco Mining, Laredo, Texas, 33 pp. plus Appendices.

Boone, J. L., and E. A. Holt. 2001. Field Sexing Young Free-ranging Desert Tortoises (*Gopherus agassizii*) Using External Morphology. Chelonian Conservation and Biology, 4(1):28-33.

Boone, J. L., J. Laerm, and M. H. Smith. 1999. Allozyme Variation in the Cotton Mouse (*Peromyscus gossypinus*). Journal of Mammalogy, 80:833-844.

Boone, J. L. 1998. Indirect Impacts of Site Characterization Activities on Small Mammal Populations in the Larrea-Lycium-Grayia Vegetation Association at Yucca Mountain, Nevada: 1991-1997. CRWMS M&O, B00000000-01717-5705-00102.

Lederle, P. E., M. C. Nelson, and J. L. Boone. 1997. A simple, Inexpensive, and Versatile Research Blind. North American Bird Bander, 22:18-21.

Laerm, J., W. M. Ford, M. A. Menzel, T. S. McKay, J. L. Boone, and T. Pig. 1996. Symposium on Appalachian Biodiversity: Soricid Communities in the Southern Appalachians. Virginia Museum of Natural History, Blackburg.

Laerm, J., and J. L. Boone. 1995. Corrections of Records of Occurrence of *Peromyscus polionotus* (Wagner) and *P. gossypinus* (LeConte) (Rodentia: Muridae) in the Blue Ridge Province of Georgia. Brimleyana, 22:9-14.

Boone, J. L., and R. G. Wiegert. 1994. Modeling Deer Herd Management: Sterilization is a Viable Option. Ecological Modeling, 72:175-186.

Boone, J. L., J. Laerm, and M. H. Smith. 1993. Taxonomic Status of the Anastasia Island Cotton Mouse (*Peromyscus gossypinus anastasae*). Journal of Mammalogy, 74: 363-375.

Weed, J., and J. L. Boone. 1992. A Macintosh Computer System for Collecting and Analyzing Rodent Sexual Behavior. Physiology and Behavior, 52: 183-184.

Magnarelli, L. A., J. H. Oliver, H. J. Hutcheson, J. L. Boone, and J. F. Anderson. 1992. Antibodies to *Borrelia burgdorferi* in Rodents in the Eastern and Southern United States. Journal of Clinical Microbiology, 30: 1449-1452.

Boone, J. L., E. Furbish, K. Turner, and S. P. Bratton. 1988. Clear Plastic. A Non-Chemical Herbicide. Restoration and Management Notes, 6:94-95.

WORK EXPERIENCE

Desert Ecologist
Desert Wildlife Consultants, LLC; Las Vegas, Nevada (2000 to present)

Operated my own business doing consulting work for the county government, state government, mining companies, and individuals, focusing mainly on technical publications. During September 2006 to March 2007, I worked as a Tortoise Biologist as an independent contractor. I attended the Desert Tortoise Council Training Workshop in 2007.

I also developed a website (birdandhike.com) about the ecology of the Mojave Desert (flora, fauna, and geology) by providing information on things to do and places to go in the desert around Las Vegas (e.g., hiking, birding, four-wheeling, and other outdoor activities). During this time, I became proficient in GPS and mapping, drove four-wheel drive vehicles to remote locations, and lived and worked under extreme environmental conditions alone and with small groups for extended periods of time. I collected data, organized information, and published results. My formal education focused on vertebrate ecology and wildlife management, but during this time I studied botany and geology to expand the breadth of my understanding of the Mojave Desert ecosystem.

Temporary Field Botanist (4/2006 to 5/2006)
USGS, Western Ecological Research Center, Henderson, Nevada

Set up study plots and measured vegetation in middle-elevation Mojave Desert habitats as part of a study evaluating the response of plants to fire. Responsible for identifying annual and perennial plants to species, counting plants in quadrats, and measuring plant heights along transect lines. Worked with small crews and lived in field camps.

Technical Writer II (1999 to present)
SAIC (4/1999 to 2/2001)
Bechtel-SAIC, Las Vegas, Nevada (2/2001 to present)

Responsible for writing, editing, compiling, and assisting in the production of scientific technical reports (mostly hydrology and geology), engineering reports (e.g., system description documents, facility description documents, and specifications) for the Yucca Mountain Project. Rewrote technical material to levels appropriate for intended audiences (e.g., rewriting technical jargon and conceptually challenging material using words and writing styles that made the resulting text understandable by the general public). Compiled information from original sources and numerous project authors, developed reference lists and data tracking databases, and produced graphics. Worked with authors and reviewers to resolve technical issues and clarify material. Ensured consistency and professional quality. Worked independently and in groups while leveraging knowledge of computer systems to speed the work while reducing the workload and the cost of doing business. Note: In 2001, management of the Yucca Mountain Project changed from SAIC to Bechtel-SAIC.

Animal Ecologist (Senior Scientist) (1995 to 1999)
EG&G/Energy Measurements (4/1995 to 9/1995)
SAIC, Las Vegas, Nevada (9/1995 to 4/1999)

Responsible for conducting long-term impact assessment and ecological research for the Yucca Mountain Project. Engaged in mark-recapture studies of rodent and reptile community dynamics. Curated faunal collections. Supervised scientists in the field and office. Reviewed and edited technical and other documents. Managed data. Manipulated databases including

GPS and GIS data (ArcView). Performed statistical analyses. Authored technical reports and peer-reviewed journal articles. Worked on teams composed of people from a variety of scientific, technical, and non-technical backgrounds in contributing to environmental impact statements. Lead efforts of the ecology team to model the movement of radioactive materials through a desert agroecosystem. My last year in this position was spent analyzing data and writing reports for other environmental scientists, primarily those in the environmental restoration and botanical research groups. By early 1999, all of the environmental research staff had been laid off, and I transferred to a technical writing position. Note: In 1995, management of environmental research on the Yucca Mountain Project changed from EG&G to SAIC.

Manager of Mammal Collections (Research Associate)
Nevada State Museum, Las Vegas, Nevada (1997 to 2001)

Responsible for curating the mammal collection: organized, updated, and maintained the collection of more than 8,000 specimens. Maintained and updated and the computerized collection catalog. Cleaned and prepared specimens. Reviewed, investigated, and updated historical collection records. Provided reports on holdings.

Graduate Student (Teaching Assistant)
University of Georgia, Institute of Ecology and Museum of Natural History, Athens, GA (1990-1995)

Taught labs for Comparative Anatomy, Mammalogy, Vertebrate Natural History, Ecology, and non-majors Biology. Prepared and delivered lectures in classroom and laboratory settings, made and gave exams, and maintained grade lists. Presented guest and substitute lectures in several classes. Organized and trained new teaching assistants. During this time, I conducted my independent dissertation research on the population genetics and morphology of Cotton Mice (Peromyscus gossypinus). I also helped other graduate students characterize vegetation in the north Georgia and North Carolina mountains (count and measure trees, record data on understory plants, coarse woody debris, and physical conditions), study of the distribution of Lyme disease in the Southeast, inventory amphibians and bats in north Georgia, and inventory shrews in North Carolina.

Macintosh Computer Consultant
MacRescue, Athens, GA (1988-1995)

Operated my own computer consulting business. Assisted individuals and institutions in developing Macintosh computer skills and making purchasing decisions. Performed hardware and software maintenance. Taught non-credit courses through the university continuing education program.

Graduate Student (Research Assistant)
University of Georgia, School of Forest Resources, Athens, GA (1987-1989)

Conducted and published independent and directed research projects mostly dealing with small mammals. Analyzed the data and published reports from the floral and faunal studies that I collected in the Georgia and North Carolina coastal marshes during 1987.

Biological Technician
University of Georgia Institute of Ecology, and National Park Service. 1987.

Designed and implemented field studies concerning small mammals, migrant birds, prescribed fire, and invasive plants in coastal barrier-island marsh communities. In Georgia, studies focused on the effects of disturbance and potential beach erosion on ducks and wading birds along an intercoastal waterway (Cumberland Island). In North Carolina, studies focused on small mammals, birds, and invasive plant species in barrier-island sand dune and salt marsh communities (Cape Hatteras). Evaluated several methods to control invasive plants, including fire, mechanical removal (chainsaws), hand removal (hand tools), and covering with clear plastic. We also studied the effects of disturbance in several habitat types on the island. I participated in all of these studies, but for some, I set up, conducted studies, supervised others, collected data, analyzed data, and published the results. I reactivated my Fire Boss card and participated in experimental burns.

Park Ranger
National Park Service. Joshua Tree National Park, Sequoia and Kings Canyon NP, Grand Canyon NP, Lake Mead National Recreation Area (1978-1986; 12 seasons).

Primarily responsible for emergency response and conflict resolution in law enforcement, emergency medicine, search and rescue, technical rock rescue, structural and wildland fire suppression, ambulance, campground operations, visitor programs (campfire programs and nature walks), backcountry patrol, other technical and non-technical aspects of park management. Supervised employees under technically difficult, life threatening, and stressful situations. Documented activities in written form. Participated in resource management activities such as bear research and management, bird studies, bubonic plague surveys, fire management, and vegetation studies. Details available on request.

Forestry Aid
U.S. Forest Service, Clearwater National Forest, Idaho (1975-1976; 2 seasons)

Worked on timber stand improvement, tree planting, timber cruising, controlled burns, and firefighting crews. Timber cruising involved working in teams of two to inventory timber, identify understory plants, take soil samples, inventory coarse woody debris, and identify forest pathogens. The focus of this work was timber inventory (number, height, DBH, condition, disease) using variable radius plots, but we also collected ecological data for forest fire planning and soils data for soil mapping. Used maps, compasses, and chains to navigate the mountains and locate plots. Lived in remote field camps (drive-in and fly-in) for 10 days at a time. Did seedling survival surveys in replanted clearcuts using fixed radius plots. Worked on a timber stand improvement crew using chainsaws to thin trees in regenerating clearcuts. Selected trees to keep based on species, size, and condition, and cut down the others. Participated in controlled burn to remove debris from clearcuts and fought wild fires. Details available on request.

Details available on request.

S T E V E N C. F E R R A N D

OBJECTIVE

THIS RESUME IS SUBMITTED FOR CONSIDERATION OF OBTAINING A POSITION AS A BIOLOGICAL MONITOR .

EXPERIENCE

FOSTER WHEELER ENVIRONMENTAL CORPORATION

August 2001 – Present

Approved monitor / handler for flat-tailed horned lizard, burrowing owl, Arroyo toad, and desert tortoises.

CONSTRUCTION MONITORING ASSIGNMENTS

- Monitoring of directional drilling under roads, water ways, and riparian areas in burrowing owl habitat in Blythe and Brawley CA.
- Monitoring of conventional plow installation of ducting in burrowing owl habitat in Blythe and Brawley CA.
- Conducted desert tortoise survey, presence / absence along Hwy 78 for a proposed construction corridor change.

TRAINING THROUGH FOSTER WHEELER

1. Cultural & Environmental Training

BIORESOURCE CONSULTANTS, Carl G. Thelander

September, 2001

- Participated in a raptor survey involving recording raptor usage of non APLIC compliant power poles to determine raptor electrocution frequency.

HDR ENGINEERING **O**ctober 2000 – August 2001

CONSTRUCTION MONITORING ASSIGNMENTS

LEVEL 3 (Lines 04 AND 08)

- Directional drilling 100' – 5000' long bores of washes, streams, culverts, roads, Cal Trans off ramps, the New River, Alamo River, and under cultural sites.
- Paving of finished trenching from Santee CA to Alpine CA
- Spider plow installation of ducting west of El Centro CA & from Hesperia CA to Primm NV
- Conventional plow installation of ducting from El Centro CA through the

Algodones Dunes west of Yuma Az.

- Pot holing for utilities throughout El Centro CA
- Trenching for ducting installation with track and back hoes from Santee CA to Yuma AZ & from Hesperia CA to Primm NV
- Rock saw trenching for ducting installation from Santee through Pine Valley CA
- Fiber installation (blowing) east of El Centro CA and from Barstow CA to Baker CA
- Fiber splicing from Barstow CA ILA to Cima Road (between Primm NV & Baker CA)
- Fiber testing from Barstow CA ILA to Cima Road
- Preconstruction sweeps for destert tortoise presence / absence survey from Ogilby Road and I-8 along the construction line to Yuma AZ
- Taught burrowing owl, flat-tailed horned lizard and desert tortoise worker awareness classes on the Level 3 O4 line, Santee CA to Yuma Az. Taught desert tortoise worker awareness classes on the O8 line, Hesperia CA to Primm NV.
- Selected as one of six biologists to conduct preconstruction sensitive plant surveys and flagging from Hesperia CA to Primm NV. This provided information that was used to modify the construction corridor and reduce the impact to native vegetation.
- Field trained biologists that were qualified as tortoise monitors so they could be considered for qualification to be tortoise handlers – 60 hours training each

TRAINING THROUGH HDR ENGINEERING:

1. Biological monitor training
2. Burrowing owl training
3. Flat-tailed horned Lizard training
4. Desert tortoise training
5. Arroyo toad training
6. Union Pacific Railroad training 2000 & 2001
7. Kiewit environmental, cultural & safety training
8. Sexual harassment training

SELF EMPLOYED 1991–September 2000 NEVADA

- Actively involved in Clark County Nevada's Multiple Species Habitat Conservation Plan as a member of the Implementation and Monitoring Committee representing the Searchlight Nevada Town Advisory Board.
- Tortoise monitoring for the University of Nevada at Las Vegas.
- Taught workshop classes for public school educators for Project Wild developed by the Nevada Division of Wildlife.
- Licensed by the Nevada Division of Wildlife to collect selected scientific specimens for the Barrick Museum at University of Nevada at Las Vegas.
- Licensed by the Nevada Division of Wildlife to commercially collect reptiles in

Nevada.

- Wildlife presentations to Nevada public schools (elementary through high school).
- Research assistant for university projects to study the desert tortoise and western chuckwalla.

1975–1990

Employed in the structural steel industry in varying capacities:

- Operations Manager, responsible for company operations, estimating, sales and fabrication of structural steel and reinforcing bar
- Engineering Manager, managed engineering, estimating and detailing departments for structural steel fabrication
- Chief Estimator, managed estimating departments from 3 – 9 estimators
- Estimator, estimated structural steel and pressure vessel projects
- Planner, wrote construction sequence planning for ASME section 8 and nuclear fabricated assemblies
- Steel fabricator working on the shop floor fabricating parts

EDUCATION

1965–1968 Arizona Western College Yuma, AZ

- A.A Applied Sciences1968-1969

1968-1969 Northern Arizona University Flagstaff, AZ

- Major in Zoology, emphasis in Herpetology

INTERESTS

Biological research in herpetology, ecology and conservation biology

REFERENCES

- Alex Heindl, Curator of Reptiles, Barrick Museum, University of Nevada, Las Vegas (702) 895-1401 (office)
- Richard Montanucci, Ph. D., Professor, Department of Biological Sciences, Clemson

University, South Carolina (864) 656-3625 (office)

- Dave Sanger, Biologist, Nevada Division of Wildlife, Reno, NV (administered Project Wild) (775) 688-1500 (office)
- John Wear, Biologist, Biological Resource Specialists, Yucaipa, CA. (909) 797-5740 (office)
- Jim Boone, Ph.D., Ecologist, Las Vegas, NV. (702) 228-4603 (home)

Email: steve@chuckwallas.com

Searchlight, NV 89046 Phone: (702) 296-1616

RÉSUMÉ

Alex L. Heindl

Desert WalkAbouts, Inc.
426 W. Viewmont Dr.
Henderson, Nevada 89015

Res.: *(702) 566-4297* Cell: (702) 370-1309

E-mail: Desertwalkabouts@gmail.com

Education:

B.S. Wildlife Science, Oregon State University, Corvallis, 1972.

M.A. Biology major/Geology minor, University of Nevada, Las Vegas, 1999.
Thesis title: *Preliminary investigations into distribution of the Western Diamondback Rattlesnake,* Crotalus atrox, *in Nevada and discussion of some factors possibly contributing to the species' present Nevada distribution pattern.*

Additional (1.5 years) graduate level study toward PhD in geoscience, University of Nevada, Las Vegas, 2000 – 2002.

Summary of Professional Work Experience:

Thirty-six years terrestrial and marine field experience as wildlife and fisheries biologist/ecologist for state, federal and tribal agencies and academic institutions. Self-employed environmental consultant since 2006. Strong background in all aspects of desert ecology, (particularly herpetology), terrestrial and marine mammalogy, ichthyology and geology. Good background in ornithology, particularly waterfowl and pelagic sea birds. Experienced in archaeological survey and field techniques. Author of numerous staff and technical reports and NEPA documents.

Specific Experience:

ENVIRONMENTAL CONSULTANT - Desert WalkAbouts, Inc., Henderson, Nevada – 2006 to present. Conduct biological and ecological field surveys; prepare project reports and NEPA documents.

CURATOR OF HERPETOLOGY - Marjorie Barrick Museum of Natural History, University of Nevada, Las Vegas - 1993 to 2006. Conduct biological and ecological field studies and surveys; maintain and expand UNLV herpetological collection; write and edit staff reports and NEPA documents. Conduct Museum-sponsored educational outreach program re: local herpetology.

RESEARCH ASSISTANT - Marjorie Barrick Museum of Natural History, University of Nevada, Las Vegas - 1992 to 1993. Duties similar to those in previously described position.

ENVIRONMENTAL ANALYST - Nevada Department of Transportation - 1989 to 1991. Conduct environmental studies and secure federal and state permits necessary to permit maintenance and expansion of state highway system. Write correspondence and project reports; compose and present department testimony before various private and governmental bodies.

FISHERY BIOLOGIST - Columbia River Inter-Tribal Fish Commission, Portland, Oregon - 1979 to 1989. Staff representative of four tribes with treaty fishing rights on Columbia/Snake River system. Conduct field studies; write correspondence and staff reports; write and present testimony to state and congressional bodies; appear as expert witness in court cases involving Indian fishing issues.

FISHERY BIOLOGIST/MARINE MAMMALOGIST - Fisheries Research Institute, University of Washington, Seattle - 1978 and 1981. Foreign Fishery Observer of Japanese salmon gillnet fishery in North Pacific Ocean. Compile harvest records; collect marine mammal sighting and behavior data; conduct field necropsies on incidentally captured marine mammals and write project reports.

WILDLIFE BIOLOGIST - Oregon Department of Fish and Wildlife - 1973 to 1979. Conduct research and management of large and small mammal, bird, and resident and anadromous fish populations in western and central Oregon. Census mammal, bird and fish populations; trap and relocate elk; trap and band waterfowl; plan and direct habitat rehabilitation projects; enforce hunting and fishing regulations; handle animal damage complaints; serve as agency's Public Information Officer.

Pertinent and Related Skills:

> Proficient writer and editor.

> Experienced public speaker, including experience before state and federal congressional bodies.

> Mine Safety and Health Administration (MSHA – US Dept. Labor) certified in underground mine safety (underground biological surveys)

> Experienced in negotiation and dispute resolution.

> Experienced in archaeological field techniques.

> Graduate of Dale Carnegie Course: "Effective Speaking and Human Relations".

> Experienced horseman and outdoorsman.

> Licensed private pilot (license not current).

References:

Dr. Donald Baepler, Director Emeritus
Marjorie Barrick Museum of Natural History
Harry Reid Center for Environmental Studies
University of Nevada, Las Vegas
4505 Maryland Parkway
Las Vegas, Nevada 89154-4009 (702) 895-3381

Ms. Diane Winslow, Director
Cultural Resources Division
Harry Reid Center for Environmental Studies
University of Nevada, Las Vegas
4505 Maryland Parkway
Las Vegas, Nevada 89154-4009 (702) 895-2687

Dr. Will Pratt, Curator of Invertebrates
Marjorie Barrick Museum of Natural History
Harry Reid Center for Environmental Studies
University of Nevada, Las Vegas
4505 Maryland Parkway
Las Vegas, Nevada 89154-4009 (702) 895-1403

Mr. Jeff Wedding, Historic Archaeologist
Cultural Resources Division
Harry Reid Center for Environmental Studies
University of Nevada, Las Vegas
4505 Maryland Parkway
Las Vegas, Nevada 89154-4009 (702) 895-1480

Publications list supplied on request.

Tsegaye Mengistu

Staff Biologist

Professional Summary

Mr. Mengistu has over eight years of professional experience with public and private organizations. To date, he has conducted professional biological and environmental assessment work Minnesota, Oregon, Washington, Nevada and California as well as research in Kenya. He has performed surveys for Desert Tortoise and many other sensitive species in the Coachella Valley. Mr. Mengistu's has worked for the Bureau of Land Management in Medford Oregon, and Las Vegas Nevada under a contract with Environmental Careers Organization performing biological and botanical surveys using GIS/GPS technology. This has incorporated broad computer and mechanical skills to perform analyses and documentation within project-related assignments. Over the past year Mr. Mengistu has served at the lead biological monitor for the Coachella Canal Lining Project and has lead teams doing seed collection and clearance surveys. His expertise has been derived from a formal education and extensive domestic field experience.

Professional Qualifications

Desert Tortoise Council Tortoise Survey Workshop, 2006

Education

B.A. Environmental Science, Hamline University, St. Paul, Minnesota 1999

Employment History

Staff Biologist / Lead Biological Monitor, AMEC Earth & Environmental, Inc.: January 2005 – present

Conducts focused presence/absence surveys for rare and endangered flora and fauna including the Coachella Valley milkvetch, burrowing owl, desert tortoise and many desert Plants. Serves as Lead Field Monitor for biological compliance monitor for large-scale construction projects.

Natural Resource Specialist, Oregon Department of Environmental Quality.: June 2004 – October 2004

- Stream survey involving electro fishing and fish survey.
- Macro invertebrate and Periphyton sampling.

- Stream habitat assessment, and water quality measurements.
- Water sampling and analysis, benthic fauna sampling and fish collecting.
- General water quality and effluent sampling and analysis.

Botanist, Charis Corporation.: April 2004 – May 2004
Performed sensitive plant survey for *Cymopterus deserticola* in the Mojave Desert region. Survey included:

- Establishing transects and performing navigation for survey crew.
- Entering and recording GPS data for input into ArcView GIS.
- Navigation by topographical maps.
- All work performed as a member of a survey team.

Hydrologic Technician and GIS/ Hydrographer, Environmental Careers Organization, placed as an Associate at the Bureau of Land Management (BLM), Medford, Oregon: December 2002 – December 2003

- Organization, collection, and maintenance of BLM hydrography spatial and attribute databases.
- Assess, review, and verify the quality and accuracy of map.
- Performed digitization and map editing techniques with ArcView 3.3 and ArcInfo.
- Served as production assistant for the analysis and creation of spatial display products.
- Performed soil, ground water and surface water sampling.

Hydrologic Technician and GIS/ Hydrographer, Environmental Careers Organization, placed as an Associate at the Bureau of Land Management (BLM), Medford, Oregon: June 2002 – December 2002

- Surveyed stream reaches as defined by the Northwest Forest plan by using topographic maps, compass, clinometer, altimeter, and aerial photos.
- Identified unmapped stream reaches and modified base maps.
- Identified riparian and upland area vegetation.
- Conducted measurements of stream flow along with conductivity and turbidity sampling.
- Utilized Rosgen Classification and Wolman Pebble count methodology for interpreting stream channel characteristics.

Botanist, California Native Plant Society: Spring 2002

- Identify and map endangered plant species using GPS.
- Identify and record Sonoran desert flora.
- Survey Algodones Dunes in CA, for *Helianthus niveus*, *Palafoxia arida*, *Astragalus magdalenae* and *Pholisma sonarae*.

Restoration Ecologist and GIS/ Hydrographer, Environmental Careers Organization, placed as an Associate at the Bureau of Land Management (BLM), Las Vegas, Neveda: November 2001 – May 2002

- Seed collection, harvest and clean seeds from species identified for harvesting.
- Plant restoration, Identify disturbed areas needing restoration.
- Restored roads, trails, corrals, old livestock concentration areas, and abandoned mine sites.

Surveying Technician

- Stream and spring survey.
- Sampling and sorting insects by using deep net and kick net for thirty second trap.
- Identify and keyed aquatic and terrestrial insects for further water quality assessment.
- Used Min Sound 4a Hydrolab for stream and spring survey.
- Utilization survey to determine grazing impacts.
- Identify use patterns and collected data on vegetation and soil conditions.

Botanist /Field Technician (April 2001-September 2001)
Charis Corporation (Environmental Consulting Group), Barstow, CA

- Identify and map all federally listed endangered plant species using GPS.
- Utilize GPS and compass to run transect lines by applying the mid-intensive and reconnaissance survey method.
- Identify and record Mojave Desert flora.
- Survey land in Barstow, CA, for Lane Mountain Milk vetch (*Astragalus Jaegerianus*).
- Administer advanced techniques for determining individual plant species and their precise locations.

Botany/Restoration Technician (June 2000-April 2001)
Employed by Environmental Careers Organization placed as an Associate at the Bureau of Land Management, Las Vegas, Nevada.

- Seed collection.
- Plant restoration.
- Arid land restoration and rehabilitation.
- Identify noxious weeds and GPS area of habitat.
- Identified and inventoried threatened native plant species and GPS perimeters.

Research (1996-1999 Hamline University, St. Paul, MN, and 1999 Kenya, East Africa)

- Examined forest community structure and the diversity between the riverbank and Interior Forest of the Mississippi River.
- Analyzed extinction risks of endangered animals by conducting a population viability analysis under varying environmental conditions.
- Identified and classified plant species in Nairobi National Park for the Kenya Wildlife Service.
- Assessed the effect of feedlots on water, soil, and air.
- Examined the impact of game cropping as a viable land option in Machakos District, Kenya.
- Developed strategies to reduce conflict between the elephants and the Massai people living around Amboseli National Park Kenya.
- Identified ways to reverse rangeland degradation on Nyokie Massai group ranch in Kenya.
- Identified wildlife signs, animal's tracks and dung as well as identified birds and their environment.
- Assessed the roles of the stakeholders and the management structure of Nairobi National Park.
- Examined several different environmental threats to frogs both locally and globally.

Community Involvement (1992-2000)

- Tutored adults with limited English skills in mathematics and citizenship at the YMCA while working for AmeriCorps in Minneapolis, MN.
- Coached youth soccer team for Hopkins School District as well as the YMCA in Minneapolis, MN.
- Assisted with Habitat for Humanity projects in Minneapolis, MN.
- Supervised neighborhood revitalization and clean-up programs for AmeriCorps in Minneapolis, MN.
- Assisted with GPS, GIS and coordinating volunteers for Red Rock Canyon National Conservation Area, Las Vegas, NV.
- Coordinated and Supervised Ameri Corps and Friends of Red Rock Canyon members for Soil and Plant Restoration.

Memberships

California Native Plant Society

Languages

English

Nathan T. Moorhatch

Wildlife Biologist/Herpetologist

Professional summary

Mr. Moorhatch has over 11 years consulting experience performing a wide variety of biological surveys throughout California, spanning from the Sacramento Valley to the International Border. He has had a life-long interest in general biology, and obtained a degree in Zoology from the California State Polytechnic University at Pomona under Dr. Glen Stewart in 1991. Mr. Moorhatch has conducted biological and environmental assessments at project sites in Solano, Monterey, Tulare, Fresno, Inyo, Kern, Ventura, Los Angeles, San Bernardino, Orange, Riverside, San Diego, and Imperial counties in California, as well as in Nevada. He has conducted the following types of assessments: rare plant species surveys; plant species inventory and vegetation mapping; revegetation plan preparation and implementation; general wildlife species surveys; focused sensitive wildlife species surveys and habitat quality assessments; sensitive wildlife species monitoring and relocations; small mammal trapping studies; Corps Section 404 waters/wetlands delineation and jurisdictional determination; CDFG 1601-3 stream and riparian habitat assessments and jurisdictional determinations; and preparation of biological assessment reports and sections of EIS and EIR documents for federal, state, and/or county agency CEQA and NEPA environmental review.

Mr. Moorhatch has extensive experience conducting herpetological studies including focused surveys and monitoring of endangered species. Mr. Moorhatch has performed surveys for a wide variety of sensitive amphibians and reptiles including: California Tiger Salamander, Tehachapi Slender Salamander, Large-blotched Ensatina, Arroyo Toad, California Red-legged Frog, Mountain Yellow-legged Frog, Western Spadefoot, Southwestern Pond Turtle, Desert Tortoise, Switak's Barefoot Gecko, Blunt-nosed Leopard Lizard, San Diego Horned Lizard, Coachella Valley Fringe-toed Lizard, Flat-tailed Horned Lizard, Orange-throated Whiptail, Southern Rubber Boa, and Two-striped Garter Snake. He has a deep personal interest in general Herpetology, and has undertaken numerous forays in the field in search of both common and rare amphibian and reptile species in California, Nevada, Arizona, Utah, Texas, Kansas, Maryland, Virginia, Florida, Hawaii and Costa Rica.

He also is an avid birder, and has assisted in conducting surveys for California Gnatcatcher, Least Bell's Vireo, Burrowing Owl, Le Conte's Thrasher, Snowy Plover, Least Tern, and various nesting raptor species in Riverside, Orange, Los Angeles, Kern, San Diego, and San Bernardino counties. Mr. Moorhatch has conducted Bird Air Strike Hazard (BASH) studies on the Edwards Air Force Base Main Base Flightline during 1998 and 1999, and is currently participating in a base-wide bird survey utilizing point counts to determine distribution and abundance of bird species on EAFB. He has also conducted bird use surveys of several landfill sites in San Bernardino and Tulare Counties in support of BASH studies related to local airports. Mr. Moorhatch is a member of the American Birding Association and the Audubon Society. His personal interest in birds has led him on numerous field searches in California, Arizona, Utah, Texas, Kansas, Florida, Hawaii, Baja California, and Costa Rica.

Mr. Moorhatch has conducted focused surveys for Delhi Sands Flower-loving Fly and Quino Checkerspot Butterfly; and has a Federal Endangered Species Permit [10(a)(1)(A)] for both of these insects. Mr. Moorhatch has also participated in "Fourth of July Butterfly Counts" sponsored by the North American Butterfly Association. He has a personal interest in Entomology and is a member of the Friends of the University of California, Riverside, Entomological Research Museum (FERM).

Mr. Moorhatch has assisted in trapping surveys for several sensitive small mammals including: San Bernardino Kangaroo Rat, Los Angeles Pocket Mouse, Tehachapi Pocket Mouse, and Short-nosed Kangaroo Rat. He has also participated in focused surveys for San Joaquin Kit Fox, San Joaquin Antelope Ground Squirrel, Mojave Ground Squirrel, and Peninsular Bighorn Sheep.

In addition to his experience with sensitive wildlife species, Mr. Moorhatch has conducted numerous surveys for sensitive plant species throughout California. He has conducted surveys for over 35 sensitive plant species, including limestone endemics, Big Bear Valley endemics, vernal pool species, and a wide variety of sensitive species in the San Joaquin Valley, Mojave and Colorado Deserts, and various coastal and inland valley habitats. Mr. Moorhatch has also assisted in the preparation of revegetation plans, and has conducted restoration/revegetation activities including site preparation, seeding/transplanting, and monitoring.on Edwards Air Force Base. Additionally, he conducts general inventories of flora and fauna; and authors biological assessments and mitigation plans. Mr. Moorhatch also has a current California Department of Fish and Game Scientific Collector's Permit.

Professional qualifications

California Department of Fish and Game Scientific Collectors Permit #801166-04

Federal Endangered Species Permit ("10a") for Quino Checkerspot Butterfly, #TE029414-0

Federal Endangered Species Permit ("10a") for Delhi Sands Flower-loving Fly, #TE029414-0

Authorized Individual for studies regarding the Desert Tortoise (Authorized to monitor, handle, and relocate desert tortoises when necessary for specific project implementation).

Education

B.S. Zoology (cum laude), California State Polytechnic University, Pomona, 1991

University of California, Riverside – Extension Course Work: Ornithology – A Field Study of Birds

Victor Valley Community College: Ecology of Costa Rica, 2001

Location

Riverside, California

Seminars, Workshops, and Symposia

Desert Tortoise Council Symposium, 1992 - 1999

Desert Tortoise Council Field Techniques Workshop, 1992, 1994

Mojave Ground Squirrel "CHIEF" Workshop. 1992

Declining Amphibians in California I, San Diego Natural History Museum, 3/97.

Declining Amphibians in California II, San Diego Natural History Museum, 3/98.

Workshop on Year 2000 Draft Quino Checkerspot Butterfly Survey Protocol, Carlsbad, California, 1999.

Planning for Biodiversity: Bringing Research and Management Together. 2/29-3/2/00; Pomona, California.

Arroyo Toad Symposium (*Bufo californicus*): Natural History and Management Practices. 10/05/00; Marine Corps Air Station, Camp Pendleton, California.

Current Research on Herpetofauna of the Sonoran Desert II. 4/5-7/02; Tucson, Arizona.

Memberships

American Birding Association

Friends of the University of California, Riverside, Entomological Research Museum

Desert Tortoise Council

National Audubon Society

Southwestern Herpetologist's Society

Detailed Core Skills by Project

Domestic Water Development and Supply

Cadiz Land Company Inc. Exploratory Drilling and Proposed Water Line Surveys and Monitoring. Conducted presence/absence surveys and monitoring for Desert Tortoise and sensitive plants during exploratory drilling and surveys for proposed water line system right-of-ways, Danby and Cadiz, Fenner Valley, San Bernardino County, California.

Oil and Gas Development and Supply

Kramer Junction Line 6905 Expansion Project. Acted as an assistant Lead Biologist supervising a team of 30+ biologists and biological monitors for the installation and development of a 33-mile natural gas pipeline project in the Mojave Desert. Conducted general and focused (for Desert Tortoise, Burrowing Owl, and sensitive plant species) biological surveys; Desert Tortoise burrow excavation, artificial burrow construction, processing, and relocation; Burrowing Owl burrow excavation, artificial burrow construction, and passive relocation; mitigation monitoring; personnel awareness training, yucca and cacti transplantation, and vertical mulching; San Bernardino County; Southern California Gas Company.

All American Pipeline Project. Conducted general and focused biological surveys and mitigation monitoring for the Desert Tortoise for exploratory geotechnical drilling activities in support of the All American Pipeline Project; San Bernardino County; All American Pipeline Company.

Four Corners Pipeline Company (ARCO). Conducted Desert Tortoise Monitoring for two oil line leak repairs at Danby and Sheephole Pass, San Bernardino County, California.

Four Corners Pipeline Company (ARCO). Conducted Desert Tortoise Monitoring for anode bed installation, San Bernardino County, California.

Renewable Energy Resources

Whitewater Wind Energy Conversion Systems. Acted as a Lead Biologist for the development, installation, and implementation of a wind energy park located in the San Gorgonio Pass area, on the northwestern outskirts of the Coachella Valley. Conducted general and focused (for Desert Tortoise, Burrowing Owl, and sensitive plant species) biological surveys; Desert Tortoise burrow excavation,

artificial burrow construction, processing, and relocation; Burrowing Owl burrow excavation, artificial burrow construction, and passive relocation; mitigation monitoring; personnel awareness training for the life of the project; Shell Oil Corporation; Riverside County.

Cabazon Wind Energy Conversion Systems. Lead Biological manager for the development, installation, and implementation of a wind energy park located in the San Gorgonio Pass area. Conducted general and focused biological surveys (for Desert Tortoise, Burrowing Owl, and Coachella Valley Fringe-toed Lizard), mitigation monitoring, and personnel awareness training for the life of the project; Cannon Power; Riverside County.

Electrical Power

Otay Mesa Generating Plant. Conducted habitat assessments and focused surveys for the Quino Checkerspot Butterfly the proposed generation plant site and throughout the associated transmission line easements on Otay Mesa from the U.S./Mexican border north to Chula Vista; San Diego Gas and Electric Company; San Diego County.

Valley to Auld Electrical Substation and Transmission Line Upgrade Project. Conducted mitigation monitoring for the Valley to Auld transmission line and electrical substation upgrade project. Significant biological issues included the California Gnatcatcher, Burrowing Owl, Stephens' Kangaroo Rat, Quino Checkerspot Butterfly, Belding's Orange-throated Whiptail, San Diego Coast Horned Lizard, and Southwestern Pond Turtle; Southern California Edison Company; Riverside County.

U.S. Forest Service

Arroyo Toad Surveys. Conducted habitat assessments and focused surveys for the Arroyo Toad throughout drainage systems containing potentially suitable and historically occupied habitat within the San Bernardino National Forest (including San Jacinto Range).

Mountain Yellow-legged Frog Surveys. Conducted habitat assessments and focused surveys for the Mountain Yellow-legged Frog throughout drainage systems in historically occupied habitat within the San Bernardino National Forest.

Transportation and Infrastructure

State Highway 138. Conducted habitat assessments and focused protocol surveys for the Arroyo Toad for the proposed realignment of SR 138 between Interstate 15 and State Highway 18; San Bernardino County; Caltrans.

Interstate 215 Seismic Retrofit Project. Conducted habitat assessments and focused protocol surveys for the Arroyo Toad for the proposed Interstate 215 seismic retrofit project in the City of Riverside; Riverside County; Caltrans.

Interstate 15 Bridge Widening Project. Conducted habitat assessments and focused protocol surveys for the Arroyo Toad for the proposed Interstate 15 Bridge Widening Project over the Mojave River in the City of Victorville; San Bernardino County; Caltrans.

State Highway 18 Seismic Retrofit Project. Conducted habitat assessments and focused protocol surveys for the Arroyo Toad for the proposed seismic retrofitting of SR 18 at the crossing of the Mojave River in the town of Apple Valley; San Bernardino County; Caltrans.

State Highway 79/371 Interchange Realignment Project. Conducted habitat assessments and focused protocol surveys for the Quino Checkerspot Butterfly for the proposed SR 79/371 Interchange Realignment Project in the community of Aguanga; Riverside County; Caltrans.

Big Bear Dam/State Highway 18 Improvement Project. Conducted habitat assessments and focused protocol surveys for the Mountain Yellow-legged Frog for the proposed improvements of SR 18 at the

crossing of the dam at the southwest end of Big Bear Lake in the San Bernardino Mountains; San Bernardino County; Caltrans.

Opah Ditch Mining Reclamation Project. Conducted focused protocol surveys for the Desert Tortoise for the proposed Opah Ditch Mining Reclamation Project located south of Baker; San Bernardino County; Caltrans.

Department of Defense.

Edwards AFB Main Base Flightline BASH study. Conducted Bird Air Strike Hazard (BASH) studies on the EAFB Main Base Flightline during 1998 and 1999. Responsibilities included seasonal field inventories of bird species diversity and population size, coordination and management of experimental use of falconry as method to deter bird use, and preparation of documentation summarizing the effectiveness of bird control measures.

Edwards AFB Base-wide Bird Inventory. Base-wide surveys utilizing point counts to determine distribution and abundance of bird species on EAFB, 2000 to present (ongoing).

Edwards AFB Desert Tortoise Monitoring. Conducted Desert Tortoise presence/absence surveys and monitoring throughout EAFB for a variety of projects including: Historic Homestead Well destruction, Monitoring Well Drilling, site restoration, and Joshua Tree transplantation.

Edwards Air Force Base Revegetation Efforts. Has participated in revegetation/habitat rehabilitation on over 270 acres of desert scrub on Edwards AFB. These largely successful efforts have incorporated a wide-variety of seeding methodologies including imprinting and hand seeding. Efforts have also included planting of nursery stock, transplanting of numerous desert shrub species, Joshua tree transplanting, and long-term viability monitoring.

Nellis AFB Desert Tortoise and Rare Plant Survey. Conducted presence/absence surveys for Desert Tortoise and rare plants for proposed road construction and residential expansion projects.

Travis AFB Vernal Pool and Rare Plant Inventory. Conducted field surveys to inventory vernal pools and rare plant species on Travis AFB. Responsibilities included identification and mapping of vernal pools and rare plants (including the federal Endangered Contra Costa Goldfields *Lasthenia conjugens*).

Employment history

Wildlife Biologist/Herpetologist, AMEC Earth and Environmental, Inc. November 2000-present. Conducts field inventories of fauna and flora, performs literature reviews, prepares biological assessment reports emphasizing impact analysis, mitigation measures, and mitigation monitoring. Specializes in herpetological and entomological field studies, and also conducts ornithological field studies. Authorized by U.S. Fish and Wildlife Service to conduct focused surveys for the following Endangered or Threatened species: Quino Checkerspot Butterfly and Delhi Sands Flower-loving Fly.

Wildlife Biologist/Herpetologist, Ogden Environmental and Energy Services, March 2000-November 2000.

Wildlife Biologist/Herpetologist, Tierra Madre Consultants, Inc., August 1999-March 2000.

Wildlife Biologist/Herpetologist, Earth Tech, August 1997 – August 1999

Assistant-Associate Biologist, Lilburn Corporation, November 1991 - August 1997

Languages

Spanish - Fair

EXPERIENCE SUMMARY

Nine years of experience as a environmental consultant/biologist. Responsibilities have included monitoring of nesting grounds for endangered species (California Least Tern & Western Snowy Plover), preparation of field reports, GIS mapping of GPS data (species locations) including vegetation/habitat maps, general avian surveys, construction monitoring, wetland delineation projects, restoration projects, as well as GIS support for a variety of wind and solar energy development projects.

EDUCATION

BS, Biology, 2000, California State University Long Beach

TRAINING

40-Hour OSHA Hazardous Waste Health and Safety Training – 2004
Willow Flycatcher Training May 2004
Wetlands Delineation Training-Jan 2005
Remote/Automatic Camera Monitoring for Wildlife - May 2006
Avian Mortality at Wind Sites- August 2006
Desert Tortoise Surveying, Monitoring, and Handling – November 2006

PROJECT EXPERIENCE

Desert Tortoise/ Raven Interaction Studies, Edwards Air Force Base, Kern County, CA.
Project Biologist responsible for development and supervision of field surveys of populations, movements, and feeding habits of common raven within desert tortoise critical habitat on Edwards Air Force Base. Participated in field surveys for multi-year field program and statistical analyses of field data. Responsible for preparation of GIS-based maps illustrating survey sites and raven distribution and movements within the study area.

PPM Energy, Dillon Wind Project EIR, Riverside County, CA.
Biologist and GIS specialist responsible for coordination and supervision of biological field surveys and preparation of maps and other graphics of an Environmental Impact Report (EIR) prepared for a proposed 45MW wind energy facility near Palm Springs in Riverside County, CA. Participated in field programs to collect information on biological resources and wetlands. Conducted avian point-count surveys, surveys for rare plant species, desert tortoise surveys, and surveys for refining vegetation community maps.

Calpine Corporation, Inland Empire Energy Center Application for Certification, Calpine IEEC, Romoland, CA
Served as Designated Biologist during construction of the 670 MW combined-cycle power plant facilities located in southwest Riverside County, CA. Monitored clearing, grading, and construction activities for potential impacts to biological resources. Prepared daily field reports and incident reports including photographs and maps in cooperation with other staff conducting cultural and paleontological monitoring. Supervised activities of other biological monitors.

North Baja Expansion Project, Imperial and Riverside County, CA
Conducted field surveys on vegetation plots to determine success of plant recruitment along the right-of-way. Conducted protocol level surveys for Desert Tortoise and other special status species. Responsible for coordination of data recording by biological field staff and for production of detailed GIS-based route maps for biological resources.

Blythe Energy Transmission Project, Blythe, CA
Prepared GIS maps for 67.4 mile transmission route in Riverside County proposed by Blythe Energy for submission to the California Energy Commission. Imported engineering data for integration with GIS data to prepare maps for all resources including: cultural resources, water resources, transportation, geology, visual, and biological resources. Conducted bed and bank field surveys for delineation of microphyll woodland habitat to support preparation of CDFG Stream Bed Alteration Agreement. Prepared draft Storm Water Pollution Prevention Plan for construction phase of the project.

Participated in protocol level surveys for Desert Tortoise and other special status species for 67.4 mile primary route and several alternative transmission line routes and alternate substation locations. Responsible for coordination of data recording for approximately 13 biological field staff using standard data sheet resulting in several thousand data points for special stats species observations. Responsible for production of GIS-based route maps for biological resources.

Department of the Navy, Superfund Clean-up Site, Hunters Point, CA
Conducted California Clapper Rail and Burrowing Owl surveys in wetland areas where radiological surveys were being conducted. Conducted biological compliance monitoring during construction activities related to development of replacement wetlands areas. Produced daily reports and summary reports. Prepared a biological assessment for the Department of the Navy for the Shipyard.

Department of the Navy, Superfund Clean-up Site, Alameda Point, CA
Conducted avian surveys in wetland areas where radiological surveys were being conducted. Produced daily reports and summary reports. Prepared a biological assessment for the Department of the Navy for the Shipyard. Produced maps depicting natural resources found on site.

Orange County and Riverside County, CA (Harmsworth Associates)
Conducted site visits at various locations within Orange County and Riverside County to monitor construction related activities in accordance with issued permits. Performed surveys for waterfowl, raptor, burrowing owl, least bell's vireo, yellow breasted chat, and other passerines. Monitored influence of earth moving activities on adjacent biological resources.

Alameda Corridor Project, Alameda, CA (Keane Biological Consultants)
Monitoring of Killdeer nesting area. Conducted weekly monitoring of Killdeer nesting areas adjacent to active construction zones protected by Migratory Bird Treaty Act. Tasks included: bird counts, nest marking, monitoring, and chick and fledgling censuses; Monitoring for presence and activity of predatory birds (such as Kestrel, Red Tailed Hawk, Coopers Hawk and

Peregrine Falcon) and feral cats; Provided advice on biological mitigation measures to both construction workers and engineers regarding precautions that should be taken to ensure nesting success; Preparation of daily field reports.

PPM Energy, Tule Wind Project, San Diego County, CA
Organized and conducted bi-weekly avian point-count surveys for proposed 125 MW Tule Wind Project in southeast San Diego County. Project work is required for preparation of an environmental assessment for submission to the Bureau of Land Management (El Centro office). Prepared GIS maps to identify environmental constraints applicable to the 17,000 acre project area. Utilized California Natural Diversity Data Base (CNDDB) to identify potential habitat for threatened and endangered species.

UPC Energy Wind Projects, San Bernardino and Riverside County, CA
Prepared GIS-based maps for several potential wind energy sites in California with emphasis on biological and cultural resources. Conducted field biology surveys for ten selected sites and prepared biology sections for inclusion in an Environmental Assessment needed to support right-of-way applications for wind testing on lands managed by Bureau of Land Management (BLM).

FPL Energy Wind and Solar Prospecting, CA, NV, AZ, NM
Prepared GIS maps for several wind and solar energy projects in four southwestern states using NREL wind and solar data and GIS database information for topography, land use, land ownership, and environmental constraints (parks, wilderness, areas of critical environmental concern, etc.). Participated in surveys to ground-truth selected sites.

Casden Properties, Los Angeles County, CA
Produced GIS maps for constraints analysis of the entire property. Maps were prepared for resources including wetlands, habitats, and general topography.

Port of Los Angeles, San Pedro, CA (Keane Biological Consultants)
Monitoring of California Least Tern nesting and adjacent feeding areas on Terminal Island in the Port of Los Angeles. The Terminal Island area has three Least Tern nesting areas: Pier 300, Pier 400 and transportation corridor area (known as TC-2). During the 1997 season, Pier 400 was an island under construction in San Pedro Bay. Other species regularly observed during surveys included: Western Grebe, Elegant Tern, Caspian Tern and Black Skimmer. Protection and habitat enhancement for this federally listed Endangered Species at this site has been established under the California Least Tern Recovery Plan. Tasks included: Bird counts, banding, nest marking, monitoring, and chick and fledgling censuses; Monitoring for presence and activity of predatory birds (such as Kestrel and Peregrine Falcon) and feral cats; Recording disturbance to the nesting sites by vehicles, boaters, and aircraft; Preparation of daily field reports.

Batiquitos Lagoon, San Diego County, CA (California Department of Fish and Game)
Monitoring of California Least Tern nesting and adjacent feeding areas in Batiquitos Lagoon, San Diego County, CA. Conducted weekly monitoring of Least tern and Western Snowy Plover nesting areas. The Batiquitos Lagoon area includes five nesting sites for the Least Tern and three for the Snowy Plover. Other species regularly observed during surveys included: Black Skimmer, American Avocet, Black Necked Stilt, and Forester's Tern. Protection and habitat enhancement for this federally listed Endangered Species at this site has been established under

the California Least Tern Recovery Plan. Tasks included: bird counts, nest marking, monitoring, and chick and fledgling censuses; monitoring for presence and activity of predatory birds (such as Kestrel, Red Tailed Hawk, Coopers Hawk and Peregrine Falcon) and feral cats; recording disturbance to the nesting sites by vehicles, boaters, and aircraft.

Venice Beach, Los Angeles County, CA (California Department of Fish and Game)
Monitoring of California Least Tern nesting site. Conducted weekly monitoring of Least Tern (endangered species). Tasks included: Bird counts, nest marking, monitoring, and chick and fledgling censuses; Monitoring for presence and activity of predatory birds (such as Kestrel, Red Tailed Hawk, Coopers Hawk and Peregrine Falcon) and feral cats; Recording disturbance to the nesting sites by vehicles, boaters, and aircraft; Preparation of daily field reports.

Long Beach, CA; Teaching Assistant, (California State University at Long Beach)
Provided instruction for human physiology labs (Bio 207L – 2 semesters) and general biology (Bio 200 – 4 semesters). Topics included: enzymes and energy, nervous system, natural selection, cell biology, general chemistry, plant anatomy, etc.

Veteran Affairs Memorial Hospital Long Beach, CA; Research Assistant.
Assisted with sensitive experimental procedures focusing on techniques used in protein receptor studies and cell culture. Performed electrophoresis and general lab techniques on a daily basis. Study area involving estrogen signaling and its relationship to cancer. Techniques Used: SDS gel electrophoresis, affinity chromatography.

RESEARCH EXPERIENCE

California State University at Long Beach, Long Beach, CA; Masters Thesis Research: Movements and Behavior of Pre-Breeding Island Scrub-Jays.
Movements of 1st year individuals were investigated for dispersal patterns, amount of habitat utilized, and behaviors exhibited during the post-breeding season. Movements were monitored using radio–telemetry techniques and analyzed using Arcmap® (GIS) to establish Kernel Home Ranges (Animal Movements Extension). Home ranges of 1st year Island Scrub-Jays were compared to adult breeding territory sizes to investigate any significant differences. Findings of this study will form recommendations for management / conservation of Island Scrub-Jays during planned island restoration activities.

PUBLICATIONS & PRESENTATIONS

Mudry, N.W. 2003. Movements and behavior of pre-breeding island scrub-jays on Santa Cruz Island. Sixth California Islands Symposium. Ventura Beach, CA.

Mudry, N.W., M. L. Amalong, and K. Keane. 2004. Foraging Patterns of Least Terns in Los Angeles Harbor. The Western Section of the Wildlife Society. Rohnert Park, CA.

Heather Rothbard

Environmental Scientist/Botanist/Planner

Professional summary

Ms. Rothbard has 5 years experience in botanical survey and environmental regulatory compliance. Her experience includes rare and sensitive plant surveys, noxious weed surveys, rangeland studies including flora identification, biomass and species diversity data collection, National Environmental Policy Act (NEPA) documentation, environmental site assessments, Section 404 delineation and permitting, Phase I Environmental Site Assessments, and biological reviews. Ms. Rothbard has managed and performed numerous plant surveys for a major utility in Arizona, managed a biological and soil salinity study on a major oilseed crop for the USDA-ARS, and held responsibility for arthropod collection and identification, identification of native and non-indigenous plants, soil and plant root collection for mycorrhizal fungi detection, and vegetation sampling and monitoring at sites in the Phoenix metro and surrounding area for the Central Arizona Phoenix Long-Term Ecological Research Project (CAP-LTER).

Professional qualifications

40-hour HAZWOPER Training, 2008

Desert Tortoise Survey and Handling Workshop, 2007

Chiricahua Leopard Frog Survey Training, 2007

Southwestern Willow Flycatcher Survey Training, 2007

Integrated Weed Management Workshop, Montana State University, 2007

USFWS Biological Assessment Workshop, 2006

Southwest Noxious Weed Short Course, 2006, 2007

Red Brome (*Bromus rubens*) Grass Symposium, ASU, 2006

Arizona Wildfire Academy, 2006

Sahara Mustard (*Brassica tournefortii*) Workshop, August 2005

Education

Bachelor of Science, Botany: emphasis in Environmental Science and Ecology, Arizona State University, Tempe, Arizona, 2003

Memberships

Arizona-Nevada Academy of Sciences (ANAS), 2003-present

Arizona Riparian Council (ARC), 2005-present

Arizona Native Plant Society (AzNPS), 2005-present

Botanical Society of America (BSA), 2005-present

Central Arizona Weed Management Area (CAWMA), 2005-present

Western Yavapai Weed Management Area (WYWMA), 2005-present

Southwest Vegetation Management Association (SWVMA), 2005-present

Western Society of Weed Science (WSWS) 2006-present

National Association of Environmental Professionals, Arizona Chapter (AZAEP) 2006-present

Desert Tortoise Council – 2007-present

California Invasive Plant Council (CAL-IPC) – 2007 – present

California Native Plant Society – 2007-present

Arizona Field Ornithologists – 2007-present

Location

Tempe, Arizona

Summary of core skills

Clean Water Act Section 404 Delineation and Permitting

Ms. Rothbard has prepared Section 404 jurisdictional delineations for waters of the U.S., including ephemeral washes, intermittent and perennial steams, and freshwater, tree-dominated wetlands. She has also prepared nationwide and individual permit applications. Her Section 404 work includes projects in Arizona, Oklahoma, and South Carolina.

National Environmental Policy Act

Ms. Rothbard has prepared National Environmental Policy Act (NEPA) environmental assessments (EAs) and technical studies for environmental impact statement (EISs) for water distribution and collection, utility, development, aviation, and transportation projects in Arizona, Oklahoma, Nevada, Mexico, and California. Clients include municipalities, transportation departments, United States Air Force Bases, National Guard Training Facilities, and private developers.

Botanical Surveys

Ms. Rothbard has conducted numerous botanical surveys including noxious weed, rare plant, and rangeland diversity surveys in Arizona, California, Oklahoma, and New Mexico. Vegetative areas include low and high desert, chaparral, juniper/pinyon pine, coniferous forest, grasslands, and rangelands. Clients include utilities and federal land management departments.

Environmental Site Assessments

Ms. Rothbard has conducted Phase I Environmental Site Assessments (ESAs) of undeveloped, industrial, residential, and commercial facilities in Arizona. Clients included municipalities, commercial developers, and residential developers.

Employment history

2006 - Present: Environmental Scientist/Planner, AMEC Earth & Environmental, Inc., Tempe, Arizona

2005 - 2006: Botanist/Forestry Planner, Arizona Public Service, Cottonwood, Arizona

2004 - 2005: Field Research Technician, International Institute for Sustainability, Arizona State University, Tempe, Arizona

2002 – 2004: Research Technician, USDA-ARS Water Conservation Lab., Phoenix, Arizona.

Detailed core skills or details by project
National Environmental Policy Act

EA of New Facilities at Yuma International Airport, Yuma, Arizona, Merrick & Company/TEPA/Department of Homeland Security Customs and Border Protection (ongoing, $75,502.44, 7114003050): AMEC is preparing an Environmental Assessment to address Custom and Border Protection Air and Marine Section's construction of new facilities and operations at the Yuma International Airport. The proposed action includes construction of facilities needed to fly and maintain helicopters and fixed wing aircraft and the operation of that aircraft for border security activities. Ms. Rothbard is the environmental scientist for this effort.

Environmental Information Document, Wastewater System Expansion Program Conventional Gravity Sewer Collection System (2008–2012), Lake Havasu City Arizona (ongoing, $43,671, 7114003032): AMEC is preparing an Environmental Information Document (EID) update for the second five-year period of Lake Havasu City's Wastewater System Expansion Program. AMEC is preparing the EID in accordance with the Arizona Water Infrastructure Finance Authority's guidelines. Since the program is receiving federal funds through the Clean Water State Revolving Fund, the EID must be NEPA compliance. Ms. Rothbard is the environmental scientist for this effort.

Winter Storm Management/Operations Plan and EA, Arizona – Statewide, Arizona Department of Transportation (ongoing, $307,000, 7115005004): AMEC was recently awarded the development of a Winter Storm Management/Operations Plan and EA for the implementation of that plan. Ms. Rothbard is preparing the NEPA portion for this project. Preparation of the EA for this project will consist of collecting, reviewing, and evaluating data to define environmental thresholds related to such factors as air quality, socioeconomic factors, water quality, and biological resources. In concert with the evaluation of environmental issues, AMEC's winter storm management specialists will be reviewing winter storm management alternatives regarding cost, including long-term costs such as impacts to pavement, and effectiveness. Ms. Rothbard is the environmental scientist for this effort.

Three EAs for Consolidated Wing Headquarters, New Control Tower, and Realignment of Air Depot Boulevard, Tinker Air Force Base, Oklahoma. (ongoing, $118,895, 376060107, Task Order 0107): Ms. Rothbard is the environmental scientist for preparation of EAs for three projects at Tinker Air Force Base. The projects include construction of a consolidated wing headquarters, construction of a new control tower, and realignment of Air Depot Boulevard. The project is being performed under the requirements of the Air Force Center for Environmental Excellence.

EA Revision for Construction of Consolidated Fuel Overhaul and Repair Facility, Tinker Air Force Base, Oklahoma. (ongoing, $24,852, 376060106, Task Order 0106): Ms. Rothbard is the environmental scientist for revision of an EA for construction of a consolidated fuel overhaul and repair facility. This project is being performed under the requirements of the Air Force Center for Environmental Excellence. The project will impact a wetland; therefore, AMEC's scope of work includes preparation of a Finding of No Practicable Alternative (FONPA) and inclusion of wetland mitigation in the EA.

Integrated Natural Resources Management Plans, Arizona Department of Emergency and Military Affairs, Camp Navajo and Florence Military Reservation, Arizona (ongoing, $77,000, 6114003063): Ms. Rothbard is serving as the primary environmental scientist for completion of Integrated Natural Resources Management Plans (INRMPs) for Camp Navajo, near Bellemont Arizona, and Florence Military Reservation, near Florence, Arizona. The INRMPs document natural resources within the installations and serve as a tool for the Arizona Army National Guard to manage those

resources. In addition to the INRMPs, Ms. Rothbard is also preparing the National Environmental Policy Act (NEPA) compliant Environmental Assessments (EAs) for implementation of the INRMPs.

EA for BRAC Actions, Luke Air Force Base, Arizona. ($74,896.00, 376065DO5): Ms. Rothbard is the environmental scientist assisting in the preparation of an EA for Base Realignment and Closure (BRAC) actions at Luke Air Force Base (AFB) affecting aircraft inventory, aircraft flight operations, and associated mission realignment.

507th KC-135 Transfer EA, Tinker Air Force Base, Oklahoma. (ongoing, $53,546.00, 376060088, Task Order 88): Ms. Rothbard is the environmental scientist assisting in the preparation of an EA for the proposed expansion of the airfield/apron fuel hydrant system; construction of Air Force Reserve Command and Air National Guard squadron operations, operations support squadron, life support storage, and life support work area; construction of a new hangar; and building renovation under the requirements of the Air Force Center for Environmental Excellence.

Diamond Valley Speed Racing, Marathon Racing, LLC, Diamond Valley, Nevada. Ms. Rothbard prepared numerous resource sections of an EA for BLM land in Diamond Valley, Nevada. The project area was within the jurisdiction of BLM's Battle Mountain Field Office.

51st Avenue Intersection Improvements, City of Glendale, Glendale, Arizona (ongoing, $75,240.00, 6114003014)**:** Ms. Rothbard is the environmental scientist/botanist for environmental work, including native plant surveys, related to projects involving intersection improvements at 51st Avenue and Northern Avenue and 51st Avenue and Camelback. The project sponsor, the City of Glendale, is applying for federal funds for these projects; therefore review through the Arizona Department of Transportation's Local Government Program is necessary.

Transboundary Environmental Site Assessment for Construction of a Water Distribution and Wastewater Collection System in Tecate, Border Environment Cooperation Commission, Tecate, Baja California (ongoing, $38,876.00, 6551000503): Ms. Rothbard is preparing a NEPA compliant environmental assessment (EA) to address the impacts of construction of a water distribution and wastewater collection system within colonias of Tecate, Baja California. This project is receiving funding from the Border Environment Cooperation Commission (BECC). BECC receives federal funds from the U.S. and Mexico for projects that improve environmental conditions within the U.S.-Mexico border region.

Clean Water Act Section 404 Delineation and Permitting

Arkoma Connector Pipeline Environmental Field Surveys, MarkWest Energy Partners, L.P. - Atoka, Bryan, and Coal Counties, Oklahoma, AMEC Paragon. (December 2007 – February 2008) Role: Botanist/Environmental Scientist. The Arkoma Connector Pipeline will provide transportation for natural gas from the Woodford field in southeastern Oklahoma to major interstate pipeline systems and will consist of one 24-inch diameter pipeline, approximately 50 miles in length, one compressor station of approximately 10,000 horsepower, and associated pipeline support facilities, including a pig launcher and receiver, and metering equipment. Environmental components of the survey program include land use, wetlands delineation, and threatened and endangered species habitat delineation in accordance with the US Army Corp of Engineers, US Fish and Wildlife Service, and FERC regulations. The surveys were conducted in areas along the proposed pipeline 300 ft ROW.

Section 404 Jurisdictional Delineation, Arizona State Lands Department, 303 Peoria East, Maricopa County, Arizona: Ms. Rothbard is serving as field reconnaissance leader to identify and establish boundaries of Section 404 jurisdictional areas on the 4,600 acre project site. Jurisdictional areas are identified and delineated in accordance with the USACE's 1987 Wetland Delineation Manual, the USACE's 2001 guidelines for conducting JDs in the arid southwest, USACE's 2006 Interim

Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, and USACE's June 2007 Rapano's Guidance Memorandum. Ms. Rothbard prepared the results of the JD in a technical report. The technical report includes a description of the project area drainage features including width, depth, substrate, vegetation characteristics, hydrology, and connectivity to the Agua Fria and New Rivers.

Maricopa County Department of Transportation, Power Road and Guadalupe Road Bridge Expansion. (ongoing, 012007025): Ms. Rothbard is monitoring construction activities for compliance with conditions of Clean Water Act Section 404 Nationwide Permit Numbers 12 and 14 and general conditions of Section 401 Water Quality Certification. Construction activities include widening the bridges that cross the floodway that flows underneath Power Road and Guadalupe Road. Ms. Rothbard's participation includes tri-weekly site visits and weekly reporting of site conditions.

McEntire Joint National Guard Base, Base-wide Wetland Delineation, National Guard Bureau, Columbia, South Carolina. ($305,618, 276220102)**:** Ms. Rothbard has conducted wetland delineation surveys of wetlands and other waters of the U.S. within the Common Installation Footprint per the methods described in the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual at McEntire Joint National Guard Station in South Carolina. Her participation in these surveys included identifying plant species, determining soil color and texture, completing wetland data report forms, and reviewing the wetland delineation report.

Section 404 Jurisdictional Delineation Shadow Ridge Subdivision, Millennia Investment Corporation, Mohave County, Arizona ($11,200, 7114003026): Ms. Rothbard is the environmental scientist/botanist for a Section 404 Jurisdictional Delineation for waters of the United States associated with the development of a 105 acre subdivision in the unincorporated town of Scenic, Arizona. AMEC was selected to assist the client in resolving Clean Water Act Section 404 violations that occurred when portions of the site were graded prior to issuance of a Section 404 permit. AMEC's services include field reconnaissance to identify and establish boundaries of Section 404 jurisdictional areas on the project site and identification of biological resources.

Section 404 Permitting WACOG Air Industrial Park, AMEC Infrastructure/Lake Havasu City ($59,400, 6114003056)**:** Ms. Rothbard is the environmental scientist/botanist for Clean Water Act Section 404 permitting services related to the development of an industrial park near the Lake Havasu City airport. AMEC's environmental services for this project include review of previous environmental documents for the project area, review of grant funding pathways to determine if NEPA documentation is necessary, and preparation of a Section 404 individual permit application. The Section 404 documentation will include verification of previously delineated limits of waters of the United States, an environmental assessment (EA) prepared in accordance with U.S. Army Corps of Engineers guidelines, and a compensatory mitigation and monitoring plan.

Section 404 Jurisdictional Delineation, Florence Military Reservation, Pinal County, Arizona: Ms. Rothbard completed a Section 404 Jurisdictional Delineation for waters of the United States, at 20 utility road crossings at Florence Military Reservation, using the U.S. Army Corps of Engineers guidelines for determining waters of the United States in arid regions.

Section 404 Jurisdictional Delineation and Permitting, Prospectors Road, Pinal County, Arizona: Ms. Rothbard served as environmental scientist/botanist for a Section 404 Jurisdictional Delineation and permit application associated with improvements to Prospectors Road in Apache Junction, Arizona. Ms. Rothbard's responsibilities included the field reconnaissance for the jurisdictional delineation, botanical survey, and production of a Section 404 Jurisdictional Delineation report and permit application.

Botanical/Biological Surveys

Palmdale Power Plant Biological Surveys, Palmdale, California. (April 2008): Ms. Rothbard performed biological surveys in the right of way of a high voltage power line. These surveys included rare and sensitive plants, desert tortoise (*Gopherus agassizii*), and burrowing owl (*Athene cunicularia*) surveys.

Noxious Weed Survey for Palo Verde-North Gila 500kV Conductor Maintenance Project, Arizona Public Service and BLM Yuma Field Office, Yuma to Gila Bend, Arizona (May 2006): Ms. Rothbard managed and performed a noxious weed survey in the right of way of a high voltage power line. All plant identification, vegetative habitat determination, and technical writing was performed by Ms. Rothbard. The project received funding through Arizona Public Service however all data collection was performed on state and federal lands including BLM and the Yuma Proving Grounds.

Rare Plant Survey of 6 Mow Areas for the Prescott 500kV Transmission Line Maintenance Project, Chino Valley Ranger District, Prescott National Forest, Arizona. (Spring 2006): Ms. Rothbard managed and performed a plant survey for rare and sensitive plant species in the right of way of a high voltage power line. All plant identification, vegetative habitat determination, and technical writing was performed by Ms. Rothbard. The project received funding through Arizona Public Service however all data collection was performed on the Prescott National Forest.

Rangeland Survey of the Roswell Grazing Allotment, BLM Roswell Field Office, New Mexico. (Oct 2005): Ms. Rothbard performed plant identification, biomass determination, and species richness and diversity classification on grazing allotments in the Roswell, New Mexico area. Funding was provided by the BLM Roswell Field Office however the project was managed by Southwest Botanical Research, Chino Valley, Arizona.

Arizona State University Central Arizona Project – Long-Term Ecological Research, Phoenix, Arizona. (2004-2005): Ms. Rothbard performed arthropod collections and identification, native and non-indigenous plant identification, vegetation sampling and monitoring at over 32 sites in the Phoenix Metro Area. Funding was provided by the National Science Foundation however all work was managed and performed by the International Institute for Sustainability at Arizona State University.

Environmental Site Assessments

City of Phoenix On-Call Environmental Site Assessments and Biological Surveys (2006, multiple projects)**:** Ms. Rothbard is assisting in numerous Phase I Environmental Site Assessments for the City of Phoenix. For these projects, the City of Phoenix has asked that AMEC include requirements of the All Appropriate Inquiry Rule into the assessments. This contract involves properties associated with Light Rail Transit, the Community Noise Reduction Program, and Tres Rios. The properties include right-of-way in urban areas, undeveloped parcels, residential parcels, and agricultural land.

Publications

Dierig, D.A., Tomasi, P.R., Dahlquist, G.H., **Dawson, H.K***. Measurements of *Lesquerella* Interspecific Hybrids and Parents. Abstract 2003.

Dierig, D.A., Rodriguez, D., Foster, M.A., Grieves, C.M., **Dawson, H.K***., Rodriguez, R. Effects of Salinity on *Lesquerella* at Three Locations. Agronomy Abstracts. 2003.

*Dawson was Ms. Rothbard's married name at the time of publication.

DESERT TORTOISE MONITOR AND BIOLOGIST
RESPONSIBILITIES AND QUALIFICATIONS

DESERT TORTOISE MONITOR -- Approved by the Fish and Wildlife Service to monitor project activities within desert tortoise habitat, ensure proper implementation of protective measures, and record and report desert tortoise and sign observations in accordance with approved protocol, report incidents of noncompliance in accordance with a biological opinion or permit, move desert tortoises from harm's way when desert tortoises enter project sites and place these animals in relocation areas preselected by authorized biologists or maintain the desert tortoises in their immediate possession until an Authorized Biologist assumes care of the animal. Monitors assist qualified biologists during surveys and often serve as "apprentices" under the biologist to acquire experience. Monitors are not authorized to conduct presence/absence or clearance surveys unless directly supervised by an authorized biologist; "directly supervised" means the authorized biologist is direct voice and sight contact with the monitor. A desert tortoise monitor must have thorough knowledge of desert tortoise behavior, natural history, and ecology, and demonstrated substantial field experience and training to successfully:

- handle desert tortoises
- relocate desert tortoises

AUTHORIZED BIOLOGIST – Approved by the Fish and Wildlife Service to conduct all activities described in the previous section for desert tortoise monitors, and to locate desert tortoises and their sign (i.e., conduct presence/absence and clearance surveys) and ensuring that the effects of the project on the desert tortoise and its habitat are minimized in accordance with a biological opinion or permit. An authorized biologist must have thorough knowledge of desert tortoise behavior, natural history, and ecology, and demonstrated substantial field experience and training to successfully:

- handle desert tortoises
- excavate burrows to locate desert tortoise or eggs
- relocate desert tortoises
- reconstruct desert tortoise burrows
- unearth and relocate desert tortoise eggs
- locate, identify, and record all forms of desert tortoise sign

GENERAL DESERT TORTOISE BIOLOGIST/MONITOR QUALIFICATIONS STATEMENT

This form should be used to provide your qualifications to handle desert tortoises during construction or other projects authorized under Sections 7 or 10 (HCPs) of the Endangered Species Act. If you seek approval to attach/remove/insert any devices or equipment to/into tortoises, withdraw blood, or conduct other procedures on desert tortoises, a recovery permit or similar authorization may be required. Application for a recovery permit requires completion of Form 3-200. Supplemental information for the recovery permit application should be provided with the form, *Statement of Skills and Experience with Specialized Desert Tortoise Procedures* which is available from a U.S. Fish and Wildlife Service Field Office.

1. Contact Information:

Name	**Dennis Strong**
Address	**23143 Canyon Estates Drive**
City, State, Zip Code	**Corona, Ca. 92883**
Phone Number(s)	**(951) 316-9279**
Email Address	**Getulus20@aol.com**

2. **Date of Statement:** 1/23/06

3. **States in which authorization is requested (check all that apply):**

☐ California X Nevada ☐ Utah ☐ Arizona

4. if authorization is sought for desert tortoise work under a Biological Opinion (BO) or Habitat Conservation Plan (HCP), provide the following:

USFWS BO or HCP Number		**Date:**
Project Name		
Federal Agency		
Proponent or Contractor		

5. Specify project and/or activities anticipated that require authorization (e.g. capture/release, weigh, measure, attach and remove telemetry devices and other hardware, etc.). Specifically reference the relevant document and page numbers with authorizing statements (e.g., BO, page 19, terms and conditions 6, 7, and 8):

6. If you hold, or have held, any relevant state or federal wildlife permits, provide the following:

Dates	
Species	
State (specify) or Federal Permit Number	
Authorized Activities	

7. Education (provide up to three):

Institution	Dates attended	Major/Minor	Degree received
1. California State University, Fullerton	1996	Biology	Master of Arts
2. California State University, Fullerton	1989	Biology	Batchelor's of Arts
3.			

8. Desert Tortoise Training:

Name/Type of Training	Dates (From/To)	Location	Instructor/Sponsor
1. Attended class on the proper way to process and pit tag desert tortoises.	**1995**	**Fort Irwin Army Base**	**Chambers Group Environmental Consultants**
2. Attended the Desert Tortoise Council Workshop and observed a U.S. Fish and Wildlife Service approved demonstration of the appropriate way to trans-locate tortoise eggs out of harms way. Also observed a U.S. Fish and Wildlife Service approved demonstration of the appropriate way to construct artificial tortoise burrows.	**1995 & 2003**	**Ridgecrest, Ca.**	**Desert Tortoise Council**
3.			
4.			

9. Experience – Complete for each position held, attach additional sheets as necessary. Include only those positions relevant to the requested work with desert tortoises. Distinguish between Mojave Desert tortoise and other experience. Include only your experience, not information for the project you worked on (e.g. if 100 tortoises were handled on a project and you handled 5 of those tortoises, include only those 5). Add more lines, as necessary.

General Field Experience:

Project Name & Job Title	Dates (From/To)	Job Duties & Responsibilities/ Skills Used or Acquired
1. **P.F. Net, Fiber Optic Environmental Compliance, 2473, AT&T Nexgen /Core, Los Angeles to San Diego To Blythe, CA Environmental Inspector and Resource Specialist - 2003** .	**Oct. 2003**	Responsibilities include inspection for environmental mitigation measure compliance, identification, delineation and monitoring of biological resources (including Desert Tortoise), wetlands and water crossings along a fiber optic right-of-way in Southern California.

Project Name & Job Title	Dates (From/To)	Job Duties & Responsibilities/ Skills Used or Acquired
2. **Larson Lane Gravel Pit Desert Tortoise Clearance, Las Vegas NV; Tortoise Handler – 2003**	**July 2003**	Helped survey the 640-acre gravel pit for desert tortoises and the subsequent removal and relocation. Helped supervise the team's salvage of over twenty desert tortoises
3. **Kern River Pipeline, Barstow CA; Field Crew Leader for Spread 9 – 2002, 2003**	**Oct. 2002 – May 2003**	Responsible for overseeing 45 tortoise biologists and monitors over an 80-mile gas pipeline installation and was also a certified tortoise handler (USFW & CDFG) for this spread. The following is a list of personal contributions to helping protect the desert tortoise on this project.• Personally helped construct four (4) . Tortoise pens. • Personally removed 35 tortoise pens. • Personally monitored 40 tortoises . . Pens. • Personally walked two (2) tortoises . From their pens. • Personally excavated and relocated one (1) tortoise from its burrow on the right of way to a new burrow safely off the right of way. Also monitored this tortoise for several days afterward as per biological opinion. • Personally moved seven (7) tortoises on an emergency basis. • Lead pre-construction surveys and personally found 15 tortoises, 403 burrows, 33 scats, and six (6) bones. • Personally salvaged one (1) starving and blind tortoise from the right of way. Helped rehabilitate and then return to the wild (as per direction of USFW, CDFG, BLM & Project Biologist).

Project Name & Job Title	Dates (From/To)	Job Duties & Responsibilities/ Skills Used or Acquired
4. ***Fort Irwin Army Base, San Bernadino, Ca; Tortoise Handler***	**1995**	**-** In 1995 while working with the Chambers Group at Fort Irwin, Ca. I received Desert tortoise training from Mr. Scott Rolands of the Chambers Group and personnel from Fort Irwin's Natural resources department. The training covered proper handling of Desert tortoise so as not to spread disease between humans and tortoises, and between tortoise populations. Other techniques learned included: total processing of Desert tortoises (i.e. capturing without inducing urination, measuring, weighing, sexing, checking general health, pit tagging, and re-releasing animals after processing). The Natural Resource Department at Fort Irwin also showed us a tortoise with Upper Respiratory Disease (URD) so we could learn first hand how to tell if a tortoise has active URD's. I saw and processed dozens of tortoises on this job. This project was commissioned by Fort Irwin in order to construct a habitat quality index based on several years of recapture data. We walk 100 % coverage surveys on the south end of the base and I personally walked over 100 miles of transects. The transects were walked in the spring and consisted of approximately 4 to 10 miles a day depending on how many tortoises had to be processed.

Total Field Experience:

a. Number of hours or 8-hour days (specify) conducting desert tortoise-related activities (referenced above): Thousands of hours over the past twenty years.

b. Number of miles/kilometers walked conducting survey transects: Thousands of miles over the past twenty years.

c. Number of wild, free-ranging desert tortoises you encountered; <100 mm carapace length: > 50

>100 mm carapace length: > 1000

d. Number of wild, free-ranging desert tortoises you personally handled (circle one for each size category);

<100 mm carapace length:

Zero	**<10**	**<u>10-50</u>**	**50-100**	**100-200**	**>200**

>100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**<u>>200</u>**

e. Number of captive-held tortoises you personally handled (circle one for each size category);

<100 mm carapace length:

Zero	**<10**	**<u>10-50</u>**	**50-100**	**100-200**	**>200**

>100 mm carapace length:

Zero	**<10**	**<u>10-50</u>**	**50-100**	**100-200**	**>200**

f. Number of telemetry devices you personally attached to wild, free-ranging desert tortoises (circle one for each size category);

<100 mm carapace length:

<u>Zero</u>	**<10**	**10-50**	**50-100**	**100-200**	**>200**

>100 mm carapace length:

<u>Zero</u>	**<10**	**10-50**	**50-100**	**100-200**	**>200**

g. Number of telemetry devices you personally attached to captive-held desert tortoises (circle one for each category);

<100 mm carapace length:

<u>Zero</u>	**<10**	**10-50**	**50-100**	**100-200**	**>200**

>100 mm carapace length:

<u>Zero</u>	**<10**	**10-50**	**50-100**	**100-200**	**>200**

Total Field Experience Continued:

h. Number of telemetry devices you personally removed from wild, free-ranging desert tortoises (circle one for each size category);

<100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

>100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

i. Number of telemetry devices you personally removed from captive-held desert tortoises (circle one for each category);

<100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

>100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

j. Number of blood-withdrawal events that you personally conducted on wild, free ranging desert tortoises (circle one for each size category);

<100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

>100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

k. Number of blood-withdrawal events that you personally conducted on captive-held desert tortoises (circle one for each size category);

<100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

>100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

l. Experience conducting other procedures on wild, free-ranging desert tortoises;
Specify type of procedure: Weight, measure, sex, inspect health, relocate and pit tag.

<100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

>100 mm carapace length:

Zero	**<10**	**10-50**	**50-100**	**100-200**	**>200**

Total Field Experience Continued:

m. Experience conducting other procedures on captive-held desert tortoises;
Specify type of procedure:

<100 mm carapace length:

Zero **<10** **10-50** **50-100** **100-200** **>200**

>100 mm carapace length:

Zero **<10** **10-50** **50-100** **100-200** **>200**

n. Prior authorizations for desert tortoise under Biological Opinions or Habitat Conservation Plans (specify number, date, project name and location). Do not reiterate "general field experience" information:

10. List 3 references that can verify your field qualifications and skills:

Name	Employer/Position	Address/Location	Phone Number	Email
1. Rick Goette	Applied Bio	4012 S Rainbow Blvd K192 Las Vegas, Nv. 89103	(702) 596-4346	Appliedbio@aol.com
2. Steve Ferrand	Nevada biological Consultants	P.O. Box 3 Searchlight, Nv. 89046	(702) 296-1616	Lizards@powernet.net
3. Jon Martin	Blue Zoo	Vancouver, Wa.	(360) 607-2843	

I certify that the information submitted in this form is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. Ch.47, Sec. 1001.

Signed: _____

Date: January 23, 2006

Form Revised December 2005 ALS

APPENDIX 2

MOHAVE GROUND SQUIRREL REPORTS

MOHAVE GROUND SQUIRREL HABITAT ASSESSMENT
PALMDALE HYBRID POWER PLANT

Philip Leitner
2 Parkway Court
Orinda, CA 94563
(925) 253-8400
pleitner@pacbell.net

July 15, 2008

INTRODUCTION

Inland Energy, Inc. proposes to construct a 550 MW hybrid natural gas and solar power plant in the City of Palmdale adjacent to Air Force Plant 42. Linear facilities associated with the power plant include an electric transmission line and pipelines for natural gas, water, and sewage. This report provides an assessment of habitat suitability for the state-listed Mohave ground squirrel (*Spermophilus mohavensis*) on the power plant site and along the linear facilities. It also discusses habitat suitability of the project sites in a regional context and evaluates the potential for impacts to the species.

METHODOLOGY

The conclusions in this report are based upon two field visits to the proposed project sites and surrounding habitat and evaluation of all relevant data including the California Natural Diversity Database (CNDDB). On April 16, 2008, I conducted a field assessment of habitat conditions at the power plant site and along the natural gas and water pipeline routes. I surveyed the power plant site visually by walking through selected areas. I drove the pipeline routes, stopping at appropriate intervals to walk thorough the habitat adjacent to the routes. On June 19-20, 2008, I drove the proposed routes for the transmission line and the water pipeline, stopping as needed to walk thorough adjacent habitat. During these site visits, I focused on the species composition and physical structure of the vegetation and the soil conditions at the proposed power plant site and along the linear routes.

I consulted the California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB) to determine historic occurrences of the Mohave ground squirrel within ~5 miles of the proposed project facilities (CDFG 2008). In addition, I utilized other records of Mohave ground squirrel occurrence that I have collected for a comprehensive database covering the period 1998-2007 (Leitner 2008).

HABITAT SUITABILITY CATEGORIES

Based upon the results of the field investigation, I have defined 3 habitat suitability categories that are primarily based upon land use and vegetative cover.

Suitable Habitat

Habitat that is suitable for the Mohave ground squirrel has not been disturbed by human activity and continues to support a diverse desert scrub community. Dominant plant species include Joshua tree (*Yucca brevifolia*), creosote bush (*Larrea tridentata*), and saltbush (*Atriplex* spp.). Suitable habitat also supports a variety of other shrub species and native herbaceous plants.

Unsuitable Habitat

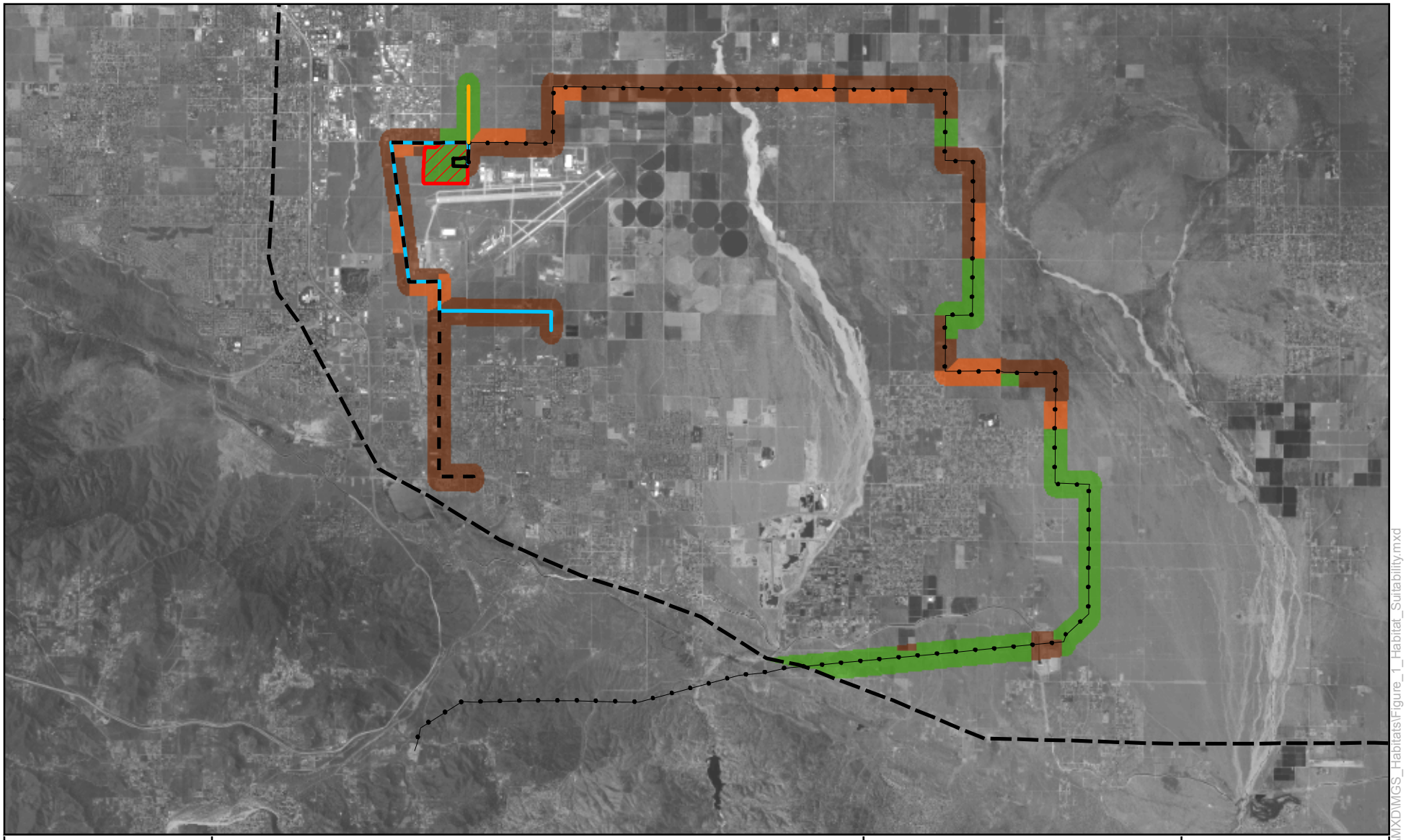
Habitat that is unsuitable for the Mohave ground squirrel has been disturbed by clearance of native vegetation and includes areas developed for residential, commercial, and industrial land uses. It also includes lands that are currently in agricultural production or were previously used for crops but are now temporarily fallow or permanently abandoned. The vegetation in vacant land considered to be unsuitable may consist of artificial landscaping, monotypic stands of rabbitbrush (*Chrysothamnus* spp.) or allscale (*Atriplex polycarpa*) of varying densities, or ruderal (weedy) grasses and herbs.

Suitable Habitat Adjacent to Linear Facility Corridors

Finally, I have identified a third category that is associated with the project linear facilities. In a number of locations, the linear facilities are proposed to follow a narrow corridor of disturbed, unsuitable habitat along an existing street or road. Where suitable Mohave ground squirrel habitat exists adjacent to such a corridor, there is the potential for impacts from the construction or maintenance of linear project facilities. If project activities are confined to the corridor of disturbed, unsuitable habitat, it should be possible to avoid impacts.

HABITAT ASSESSMENT

The results of the habitat assessment effort are shown graphically in Figure 1. It can be seen that habitat suitable for occupancy by Mohave ground squirrels is present on the power plant site, along the proposed sewer line, and on several segments of the proposed transmission line. The proposed alignments for the natural gas and water pipelines pass through largely unsuitable habitat. However, there are several areas where patches of suitable habitat exist adjacent to these pipeline routes. It should be possible to install the pipelines in disturbed habitat along existing streets and avoid impacts. Much of the proposed transmission line corridor passes through unsuitable habitat, primarily agricultural land. However, there are a number of transmission line segments where suitable habitat exists within the proposed alignment or immediately adjacent to it.



Map Location

Legend

- Project Site
- Power Block
- Sewer Line
- Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- Proposed Transmission Line

MGS Habitat Suitability

- Suitable
- Suitable Adjacent to Corridor
- Unsuitable
- Boundary of MGS Historic Range

1 inch equals 2.5 miles

0 1.25 2.5 5 Miles

N W E S

Palmdale Hybrid Power Plant Project

Figure 1
Mohave Ground Squirrel Habitat Suitability within Project Site and Quarter Mile of Linears

ENSR | AECOM

Project: 10056-014
Date: June 2008

Y:\Projects\InlandEnergy\PalmdaleMXD\MGS_Habitats\Figure_1_Habitat_Suitability.mxd

A detailed description of habitat suitability for the Mohave ground squirrel is presented below for all components of the Palmdale Hybrid Power Plant project.

Power Plant Site

The power plant site consists of ~300 acres located south of East Avenue M and east of Sierra Highway. It is immediately adjacent to Air Force Plant 42, which borders the site on the south and east. The vegetation on the site is a dense desert scrub, with a variety of plant species represented. It includes Joshua trees (*Yucca brevifolia*), saltbush (*Atriplex* spp.), creosote bush (*Larrea tridentata*), and several other shrub species. To the north, across East Avenue M, this vegetation is continuous with about 1.5 sections of similar desert scrub habitat. However, this habitat to the north appears to be separated from other undisturbed areas with native vegetation by extensive areas of urban development and agricultural land. The ~300 acres of habitat on the proposed power plant site is suitable for Mohave ground squirrels and is of good quality. However, its value is reduced since it is part of an isolated patch of remnant habitat surrounded by lands that do not provide suitable habitat for the species.

Construction Laydown Area

Immediately to the west of the power plant site and just south of a Water District facility is a proposed construction laydown area of ~30 acres that would be impacted during construction of the power plant. The vegetation on this land is a dense monotypic stand of rabbitbrush (*Chrysothamnus* spp.) that has developed here after a previous disturbance removed the natural vegetation. This is not a natural desert scrub community and does not provide the variety of food resources necessary to support a Mohave ground squirrel population. Although it is not suitable habitat for this species, there is the possibility that an individual animal could enter the area briefly from suitable adjoining habitat.

Natural Gas Pipeline

The natural gas fuel supply for the power plant will be carried by a pipeline that will run from East Avenue S and 15th Street East along city streets to the southern edge of the power plant site. The total length of the natural gas pipeline is ~7 miles.

The southernmost segment of the gas pipeline route (~3.5 miles) is proposed to run along East Avenue S from 15th Street East to 10th Street East and then north along 10th Street East to East Avenue P. This segment of the gas pipeline would be installed beneath city streets or in the bare street shoulder. This area is characterized by urban development with occasional vacant lots. The undeveloped areas here are disturbed sites that have no vegetation, support only sparse ruderal vegetation, or have a few scattered rabbitbrush shrubs. There is no suitable Mohave ground squirrel habitat in this segment of the route.

Water Pipeline

The water pipeline will begin at the Palmdale Water Reclamation Plant and will run along city streets to its terminus at the power plant site. The total length of the water pipeline is ~7.3 miles, with the northernmost 5 miles following the same route as the natural gas pipeline.

The water pipeline is proposed to run north on 30th Street East from the Water Reclamation Plant to East Avenue P (0.3 mile). On the west side, there is a wide shoulder next to the paved road and the habitat beyond is disturbed vacant land with ruderal vegetation. On the east side of 30th Street East, there is disturbed vacant land and a large building with landscaping. All habitat adjacent to this segment of the proposed pipeline is unsuitable for Mohave ground squirrels.

The pipeline route then follows East Avenue P west for 2 miles to its intersection with 10th Street East. A few buildings and an aircraft museum are present on the north side of East Avenue P near its intersection with 30th Street East, although most of the habitat here is open land without shrub vegetation or with a few scattered rabbitbrush. The habitat on the south side is almost entirely disturbed, vacant land with ruderal vegetation and a few scattered rabbitbrush. A small industrial development is located in the vicinity of 15th Street East. All habitat adjoining this segment of the proposed pipeline is unsuitable for Mohave ground squirrels.

Combined Natural Gas and Water Pipeline Route

At the intersection of 10th Street East and East Avenue P, the natural gas pipeline route is joined by the proposed water supply pipeline from the Palmdale Water Reclamation Plant to the east.

The two pipelines then follow the same alignment along 10th Street East for ~0.5 mi north to Blackbird Lane. On the west side, there is a wide cleared shoulder and beyond that a disturbed strip with some rabbitbrush. A 25 ft wide disturbed strip with rabbitbrush parallels the street on the east side. There is desert scrub vegetation beyond these disturbed strips that provides poor quality but suitable Mohave ground squirrel habitat. If the 2 pipelines are installed within the road shoulder or in the adjacent disturbed vegetation, there should be no impact to potential Mohave ground squirrel habitat.

From the intersection of 10th Street East and Blackbird Lane, the combined pipeline route heads west for ~0.5 mi toward the Southern Pacific Railroad right-of-way and Sierra Highway. There is no suitable habitat on the north side of Blackbird Lane. On the south there is a cleared shoulder (~15 ft) and then a 30-40 ft strip of disturbed soil with rabbitbrush. The moderately disturbed desert scrub habitat beyond the rabbitbrush strip is poor quality but suitable Mohave ground squirrel habitat. If installation of the pipelines is restricted to the shoulder and rabbitbrush strip, there should be no impact to potential Mohave ground squirrel habitat.

The combined pipeline route then turns north, following Sierra Highway for ~2.5 miles from East Avenue O-8 to East Avenue M (Columbia Way). Habitat is unsuitable on the eastern side of this route, where the Southern Pacific Railroad right-of-way parallels Sierra Highway. From East Avenue O-8 north to East Avenue O, the paved street is bordered on the west by a wide barren shoulder and then a wide flood control channel. If the pipelines are installed east of the channel, there will be no impact to potential Mohave ground squirrel habitat. There is a wide (~40 ft) shoulder along the west side of Sierra Highway between East Avenue O and East Avenue N. To the west of the road shoulder for about 0.4 mile north of East Avenue O there is suitable Mohave ground squirrel habitat with Joshua trees and native desert shrubs. The more northerly 0.6 mile between East Avenue O and East Avenue N is unsuitable, with low ruderal vegetation. The combined pipeline route continues north to East Avenue M (Columbia Way). On the west side of Sierra Highway from East Avenue N to East Avenue M (Columbia Way), there is again a wide (~40 ft) shoulder adjacent to unsuitable ruderal habitat. If the pipelines are installed in the road shoulder, there will be no impact to potential Mohave ground squirrel habitat from East Avenue O to East Avenue M (Columbia Way).

The final segment of the common pipeline route runs east for ~1.0 mile along the south side of Columbia Way toward the power plant site. There is a wide (~40 ft) shoulder here that should accommodate the pipeline. If the pipeline is installed in the street shoulder, there should be no impacts to Mohave ground squirrel habitat. However, the native shrub vegetation beyond the street shoulder to the south is suitable for Mohave ground squirrels.

Sewer Line

A sewer line is proposed to extend for 1 mile north from the power plant site, running from East Avenue M to East Avenue L. It crosses native desert scrub dominated by Joshua trees and creosote bush, all of which is suitable habitat for the Mohave ground squirrel.

Transmission Line

An electric transmission line will leave the northeast corner of the power plant site and extend east, south, and west for ~36 mi to connect with the regional grid at the Vincent Substation south of Palmdale. Approximately 28 mi of this route lies within the historic range of the Mohave ground squirrel.

Much of the proposed transmission line route goes through land that does not currently support native desert scrub vegetation and is unsuitable as Mohave ground squirrel habitat. Other segments of the proposed route pass through relatively undisturbed saltbush scrub, creosote bush scrub, or Joshua tree woodland, habitats that are suitable for occupancy by Mohave ground squirrel populations. Construction of the transmission line and associated service roads through these habitats could potentially impact this species. Finally, in other areas, the proposed route would follow narrow corridors of disturbed or degraded habitat that are bordered by tracts of desert scrub vegetation that is suitable for

the Mohave ground squirrel. In these situations, impact could be avoided by restricting construction of transmission facilities to these previously disturbed corridors.

Table 1 identifies those segments of the proposed transmission line route that pass thorough native scrub habitat that is suitable for the Mohave ground squirrel. This table distinguishes between those segments in which impacts to suitable habitat seem unavoidable and those in which impacts could be avoided by staying in corridors with previously disturbed habitat. Figure 1 shows the locations of the transmission line segments that pass directly through suitable habitat or are bordered by suitable habitat.

Table 1. The distribution of suitable Mohave ground squirrel habitat on various segments of the Palmdale Hybrid Power Plant electric transmission line route.

Transmission Line Segment	Habitat Suitability
East Ave. M—15th St. to 25th St.	Suitable desert scrub habitat on north; avoid if possible
30th St. East—E Ave. L-8 to E Ave. L	Suitable desert scrub habitat on east; avoid if possible
East Ave. L—30th St. to 35th St.	Suitable desert scrub habitat on south; avoid if possible
East Ave. L—70th St. to 80th St.	Suitable desert scrub habitat on south; avoid if possible
East Ave. L—77th St. to 80th St.	Suitable desert scrub habitat on north; avoid if possible
East Ave. L—83rd St. to 93rd St.	Suitable desert scrub habitat on south; avoid if possible
100th St. East—E Ave. L-6 to E Ave. M	Suitable desert scrub habitat on both east and west sides; cannot avoid
105th St. East—E Ave. N to E Ave. O	Suitable desert scrub habitat on east; avoid if possible
105th St. East—E Ave. O to E Ave. P	Suitable desert scrub habitat on both east and west sides; cannot avoid
East Ave. P—105th St. to 100th St.	Suitable desert scrub habitat on both north and south sides; cannot avoid
100th St. East—E Ave. P to E Ave. P-6	Suitable desert scrub habitat on east; cannot avoid
East Ave. Q—100th St. to 110th St.	Suitable desert scrub habitat on both north and south sides; avoid if possible

East Ave. Q—110th St. to 113th St.	Suitable desert scrub habitat on south; cannot avoid
120th St. East—E Palmdale Blvd. to E Ave. R	Suitable desert scrub habitat on both east and west sides; avoid if possible
120th St. East—E Ave. R to E Ave. S	Suitable desert scrub habitat on both east and west sides; cannot avoid
East Ave. S—120th St. to 126th St.	Suitable desert scrub habitat on both north and south sides; cannot avoid
126th St. East—E Ave. S to E Ave. U-4	Suitable desert scrub habitat on both east and west sides; cannot avoid
Lone Oak Road to California Aqueduct	Suitable desert scrub habitat on both sides; cannot avoid
California Aqueduct to 82nd St.	Suitable desert scrub habitat on both sides; cannot avoid

POTENTIAL IMPACTS TO MOHAVE GROUND SQUIRREL HABITAT

Habitat assessment has identified several areas in which construction and operation of the Palmdale Hybrid Power Plant project is likely to result in impacts to suitable Mohave ground squirrel habitat. These areas include the power plant site itself, the sewer line, and approximately 10.3 miles of the transmission line route. Table 2 shows the extent of potential habitat loss associated with these facilities. I assume that the power plant site and the transmission line access road would be kept clear of vegetation for the life of the project, resulting in a permanent loss of 331.4 acres of suitable habitat. On the other hand, I assume that a strip of vegetation will be temporarily removed during installation of the sewer line and when electrical conductors are pulled into place during transmission line construction. With subsequent revegetation, this is a temporary loss of 31.0 acres.

Table 2. Potential temporary and permanent impacts to Mohave ground squirrel habitat associated with various proposed facilities of the Palmdale Hybrid Power Plant project.

Project Facility	Type of Impact	
	Temporary Loss	Permanent Loss
Power Plant Site		300 acres
Transmission Line Access Road		24.9 acres
Transmission Line Support Structures		6.5 acres
Transmission Line Construction Strip	24.9 acres	
Sewer Line	6.1 acres	
Totals	31.0 acres	331.4 acres

LOCAL AND REGIONAL CONTEXT

The power plant site and the proposed alignments of the natural gas pipeline, the water pipeline, and the sewer line are completely within the historic range of the Mohave ground squirrel (Figure 2). All but the final 8 miles of the proposed transmission line are within the historic range.

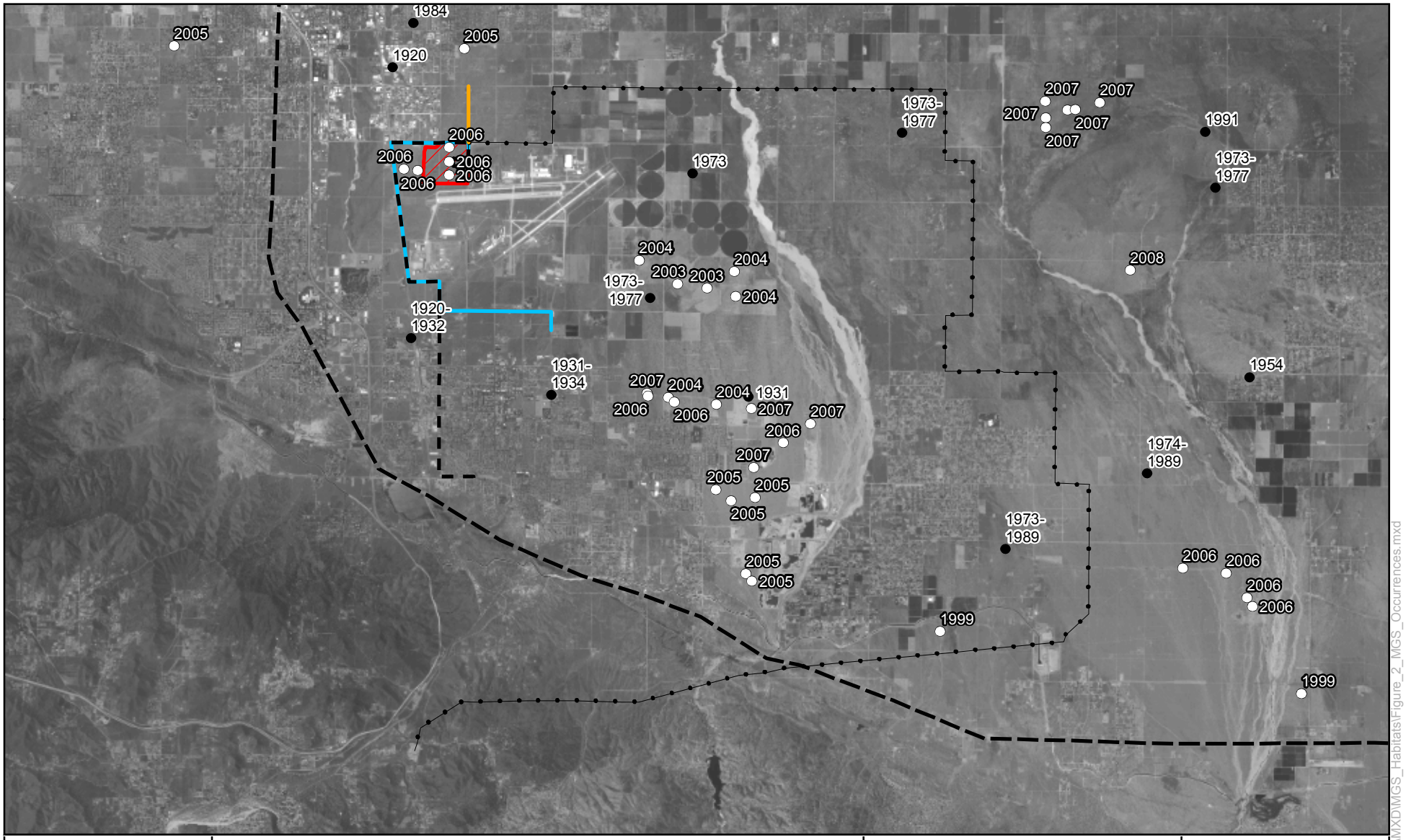
The CNDDB (CDFG 2008) lists a number of Mohave ground squirrel occurrences in the region of the Palmdale Hybrid Power Plant project (Table 3). The locations of these records and the associated dates are shown in Figure 2. Four of these occurrences refer to museum specimens that were collected in the vicinity of Palmdale and Lancaster during the period 1920-34, while another record at Lovejoy Butte dates from 1954. Three occurrences within 2-4 miles of the power plant site were recorded from 1973 to 1984, while there were 3 detections within 1-2 miles of the transmission line route dating from 1973 to 1989. The most recent Mohave ground squirrel record in the region was a visual observation in 1991 about 4 miles to the east of the transmission line route.

Table 3. Mohave ground squirrel records in the vicinity of the Palmdale Hybrid Power Plant project site and associated linear facilities.

CNDDB Occurrence No.	Legal Description	Year
26	Section 26, T 7 N, R 12 W	1920
24	Sections 14, 23 & 26, T 6 N, R 12 W	1920-32
135	Section 26, T 6 N, R 11 W	1931
45	Sections 29 & 30, T 6 N, R 11 W	1931-34
23	Section 20, T 6 N, R 9 W	1954
271	Section 3, T 6 N, R 11 W	1973
134	Section 16, T 6 N, R 11 W	1973-77
230	Section 6, T 6 N, R 9 W	1973-77
255	Section 32, T 7 N, R 10 W	1973-77
279	Section 9, T 5 N, R 10 W	1973-89
280	Section 36, T 6 N, R10 W	1974-89
26	Section 23, T 7 N, R 12 W	1984
226	Section 31, T 7 N, R 9 W	1991

While there have been no Mohave ground squirrel detections in the region since 1991, many protocol trapping efforts have been made conducted during the past 10 years (Leitner 2008). No Mohave ground squirrels have been captured or observed in spite of these extensive efforts. The locations of these trapping attempts are shown in Figure 2.

Protocol trapping for the Mohave ground squirrel was carried out at 5 grid locations on and adjacent to the power plant site in 2006 (Figure 2). The results were negative; no Mohave ground squirrels were captured.



Map Location

Legend

- Project Site
- Power Block
- Unsuccessful Trapping Attempts
- Mohave Ground Squirrel Occurrences
- Boundary of MGS Historic Range
- Sewer Line
- Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- Proposed Transmission Line

N W E S

1 inch equals 2.5 miles

0 1.25 2.5 5 Miles

Palmdale Hybrid Power Plant Project

Figure 2
Mohave Ground Squirrel Occurrences and Trapping Attempts

ENSR | AECOM

Project: 10056-014
Date: June 2008

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The data on Mohave ground squirrel occurrences and recent trapping attempts indicate that the species was widespread in the Palmdale-Lancaster region during the first half of the 20th Century. Several occurrence records east of Palmdale from the period 1973-1989 suggest that Mohave ground squirrels were still present there in remaining patches of desert scrub habitat. The absence of any positive records in the region since 1991, in spite of protocol trapping at almost 40 locations, raises the possibility that the species is no longer present within the general area that would affected by the Palmdale Hybrid Power Plant project. However, there are still a number of existing patches of apparently suitable habitat that have yet to be sampled.

CONCLUSIONS

There is no evidence that Mohave ground squirrels occur on the proposed site of the Palmdale Hybrid Power Plant. Protocol trapping on 5 grids in 2006 failed to detect the species. However, the desert scrub habitat on the site is suitable for occupancy by the species.

No protocol trapping has been carried out along the proposed natural gas and water pipeline routes and there have been no Mohave ground squirrel records in this area for over 30 years. There is no suitable habitat directly on these proposed alignments. If small areas of suitable habitat adjacent to these alignments are avoided during installation of the pipelines, there should be no impacts to Mohave ground squirrels or potential habitat.

There has been no protocol trapping on the proposed sewer line route. However, this alignment goes directly through habitat that is suitable for occupancy by the Mohave ground squirrel.

No protocol trapping has been carried out along the proposed transmission line route. There have been 3 Mohave ground squirrel occurrences in the general area of this alignment, the most recent in 1989. Substantial segments of the route pass through habitat suitable for the species, so that impacts may be unavoidable. However, much of the alignment passes through disturbed agricultural lands where suitable habitat is not present or could be avoided during construction of the transmission facilities.

The project will likely have adverse impacts to suitable Mohave ground squirrel habitat, amounting to a temporary loss of 31.0 acres and a permanent loss of 331.4 acres. The areas that would be affected support good quality habitat for the species. If the project proponent chooses to assume that Mohave ground squirrels are present in areas of suitable habitat that would be impacted, acquisition of compensation lands will be required. Because the power plant site is within an isolated fragment of habitat cut off by urban and agricultural development and because extensive protocol trapping in 2006 failed to detect Mohave ground squirrels there, it would seem reasonable to apply a ratio of 2:1 to compensate for the permanent loss of 300 acres here. However, the transmission line goes through suitable areas that are connected to larger blocks of habitat to the north and east and the current status of the species is basically unknown here due to

lack of recent protocol trapping (Figure 2). In these circumstances, a ratio of 3:1 would be appropriate to compensate for the permanent loss of 31.4 acres. Mitigation for temporary loss of 31.0 acres could take the form of revegetation with native species.

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California Department of Fish and Game. 2008. Rarefind 3. California Natural Diversity Database, California Department of Fish and Game, Sacramento, CA.

Leitner, P. 2008. Final Report on the Current Status of the Mohave Ground Squirrel. Prepared by Tetra Tech, Inc. for 95 ABW/EM, Edwards Air Force Base, CA. 16 pp. + appendices.

MOHAVE GROUND SQUIRREL SURVEY

IN A PORTION OF THE PROPOSED PALMDALE POWER PROJECT SITE,

PALMDALE, LOS ANGELES COUNTY, CALIFORNIA

Prepared for

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15 August 2006

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SUMMARY

Inland Energy, Inc. proposes to develop a power plant on approximately 450 acres in Palmdale, Los Angeles County, California. Visual and trapping surveys were conducted on a portion of the project site, totaling approximately 150 acres, to determine the presence or absence of Mohave ground squirrels (*Spermophilus mohavensis*), a State listed threatened species. The remaining acreage was evaluated by personnel from the California State University Stanislaus Endangered Species Recovery Program. Two trapping grids were established at the site. No Mohave ground squirrels were seen during the visual survey or trapped during the three trapping sessions. The negative result does not necessarily prove that Mohave ground squirrels do not exist on the site or that the site is not actual or potential habitat of the species. However, in the circumstance of such a negative result, the California Department of Fish and Game will stipulate that the project site harbors no Mohave ground squirrels. This stipulation will expire one year from the ending date of the last trapping on the project site, which was 14 July 2006.

This study was conducted under the authority of a Memorandum of Understanding between EREMICO Biological Services and the California Department of Fish and Game, dated 26 April 1999, amended on 3 March 2006, and expiring on 31 October 2010.

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INTRODUCTION

PROJECT DESCRIPTION

Inland Energy Inc. proposes to develop an electric generating facility at a site south of the intersection of Avenue M and 10th Street East in the City of Palmdale, Los Angeles County, California. The proposed facility is a hybrid power plant, consisting of approximately 500 megawatts generated using natural gas-fired, combined-cycled generating technology, combined with approximately 50 megawatts generated using solar thermal technology. The proposed project also includes a number of linear features, including transmission lines to connect with the existing regional electrical grid, as well as water supply, wastewater, and natural gas fuel pipelines.

The California Department of Fish and Game (CDFG) has determined that the Mohave ground squirrel (*Spermophilus mohavensis*), a State listed threatened species (CDFG 2006c), may occur on the project site. The site lies within the known range of the species (Gustafson 1993). Since the project may negatively impact a State listed species, surveys following CDFG recommended protocols (CDFG 2003) were initiated to determine the status of Mohave ground squirrels in the proposed project area.

PROJECT SITE

The project site is located in Section 1 (northwest quarter and the north half of the southwest quarter) and Section 2 (a portion of the north half, the north half of the southeast quarter, and a portion of the north half of the southwest quarter), Township 6 North, Range 12 West, SBM (Figure 1). The elevation ranges from 2,020 ft to 2,080 ft. The site is bordered by Avenue M on the north (partially), the Southern Pacific Railroad and Sierra Highway on the west, and the fenced boundary of Air Force Plant 42 on the east and south. The project site and all adjacent parcels support native vegetation. EREMICO Biological Services conducted Mohave ground squirrel surveys only in the western portion of the project site (EREMICO study area); personnel from the California State University Stanislaus Endangered Species Recovery Program (CSUS) conducted surveys in the eastern portion of the site (Figure 1).

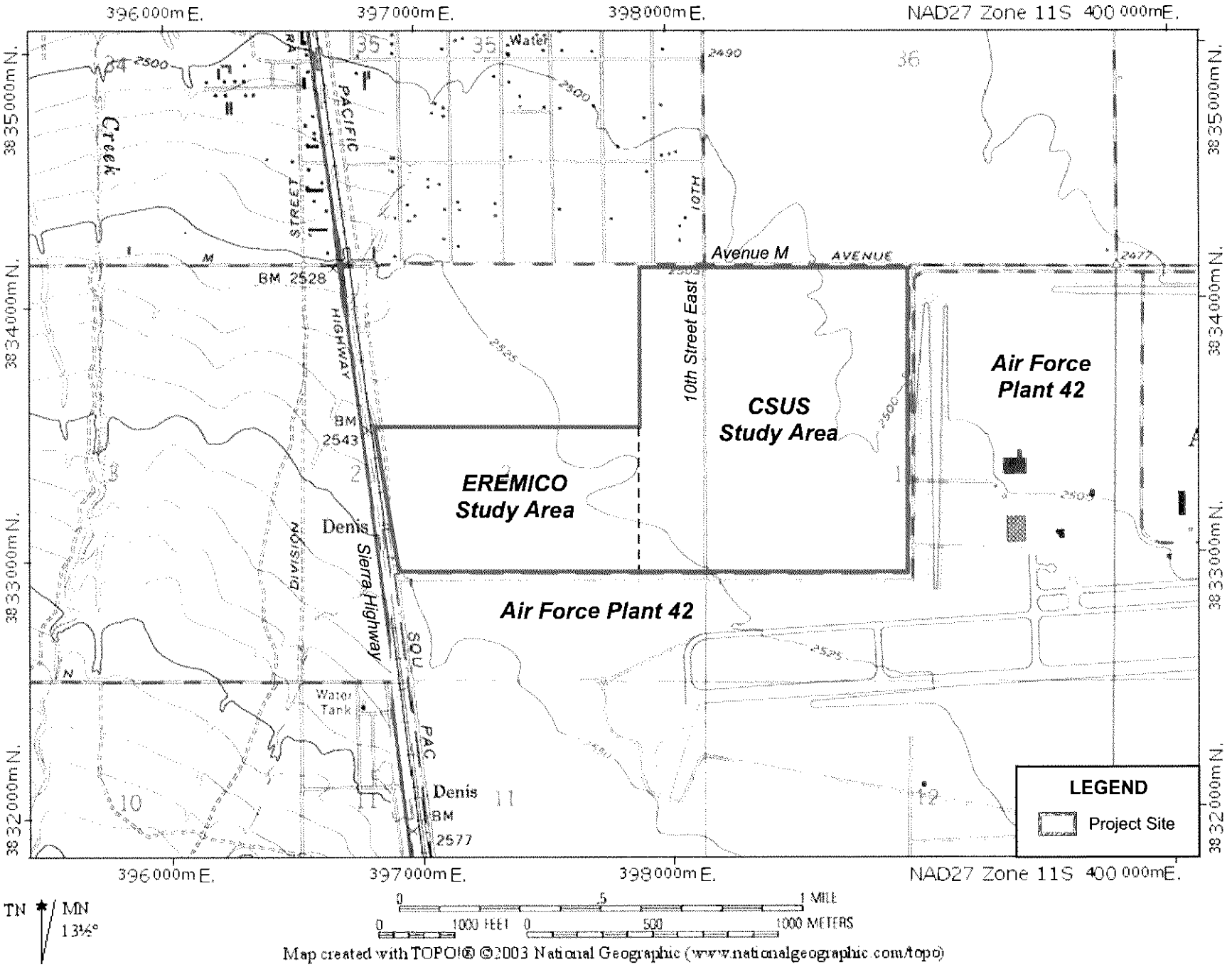

Figure 1. Palmdale Power Project site, Los Angeles County, California

EREMICO Biological Services

METHODS

To determine presence of Mohave ground squirrels on the project site, a visual survey and then a trapping survey were conducted. The visual survey was conducted by walking a meandering transect through the EREMICO study area. The purpose of this survey was to unobtrusively search for Mohave ground squirrels and to select the sites for the trapping grids. If no Mohave ground squirrels were observed during the visual survey, then a Mohave ground squirrel presence-or-absence trapping study was conducted using survey guidelines recommended by the CDFG (2003). One grid is required per 80 acres of project site (CDFG 2003). Since the EREMICO study area was about 150 acres, 2 grids were established.

The locations of the trapping grids (Grids 1 and 2) are mapped on Figure 2. Each grid consisted of 100 Sherman live traps (12-inch, kangaroo rat model) placed in a standard 10-trap by 10-trap configuration. The distance between traps was the standard 35 m. Each trap was placed in a 13 cm by 13 cm by 42 cm (5 in by 5 in by 16.5 in) open-ended corrugated cardboard box. The boxes not only provided shade but also insulation to minimize thermal stress on captured animals. Traps and shelters were placed on the north-south axis and were baited with a mixture of sweet horse grain and a blend of peanut butter and rolled oats.

The traps were opened by one hour after sunrise or when the air temperature at 30 cm (1 ft) above the ground reached 10°C (50°F). The ambient air temperature 30 cm above the ground and surface temperature, both in the shade, were recorded every hour during the trapping effort. Cloud cover and wind speed and direction were also recorded three times during trapping. If the air temperature exceeded 32°C (90°F), then the traps were closed until the temperature fell below the upper limit. Traps were also closed during periods of rain and high wind. Traps were checked every 2-4 hours and closed by sunset.

The following data were recorded on all captured animals: capture time, trap number, species, sex, age (adult or juvenile), and reproductive condition. No animals were marked. After each animal was processed, it was released at the point of capture. A California Native Species

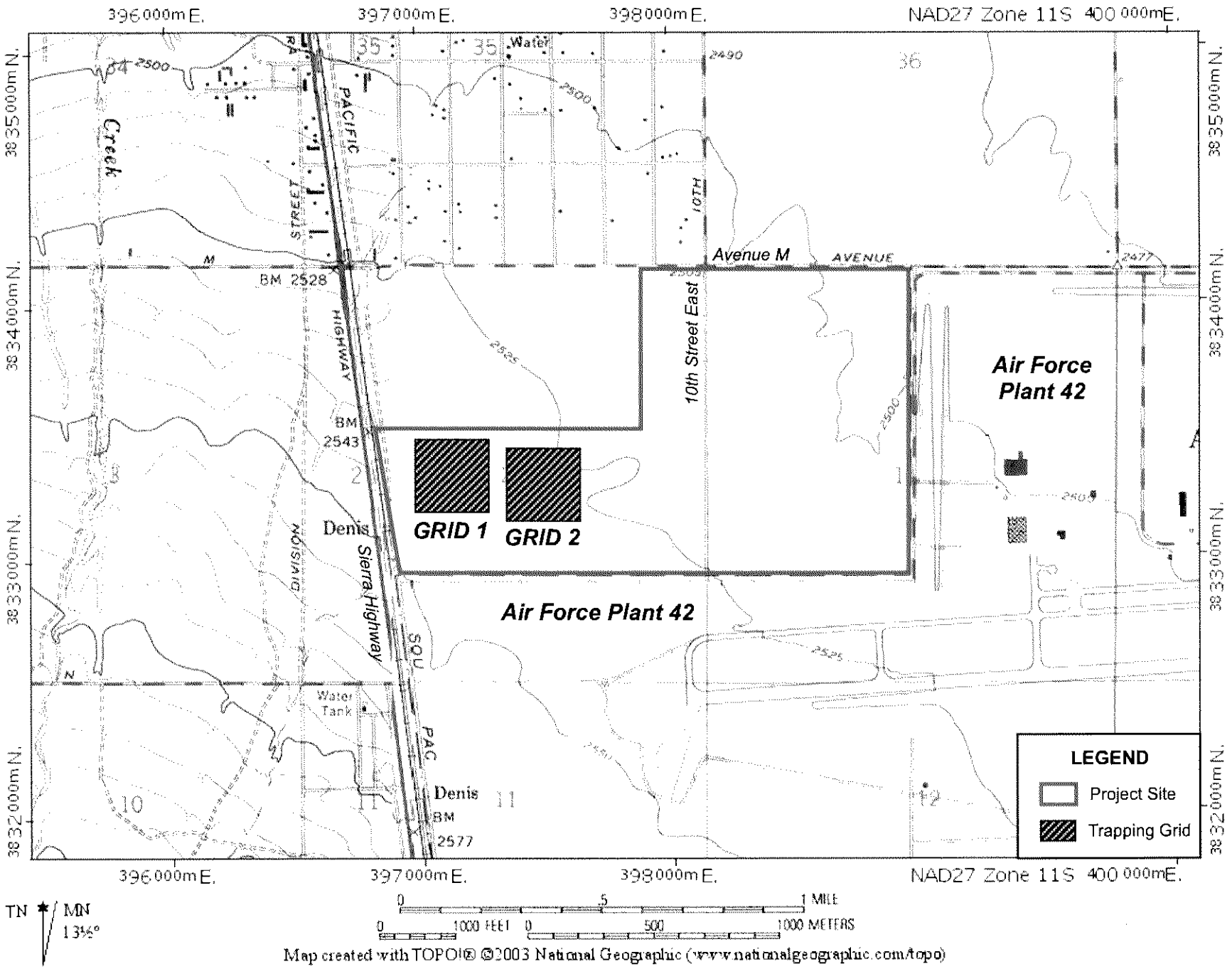

Figure 2. Mohave ground squirrel trapping grids in the EREMICO study area, Palmdale Power Project site.

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Field Survey Form for Mohave ground squirrels was completed for the study area regardless of the outcome of trapping.

Each grid was trapped for a maximum of three, 5-consecutive day periods. According to the trapping protocol (CDFG 2003), the first trapping session was to occur between 15 March and 30 April 2006. The second session was to occur at least two weeks after the end of the first trapping session and between 1 May and 31 May 2006. The third session was to occur at least two weeks after the end of the second trapping session and between 15 June and 15 July 2006. Trapping was to cease upon the capture of a Mohave ground squirrel on any grid. Hence, if a Mohave ground squirrel was captured during the first trapping period on a given grid, then the second and third trapping sessions would not be necessary on any grid.

The Mohave ground squirrel survey was conducted under the authority of a Memorandum of Understanding (MOU) between EREMICO Biological Services and the California Department of Fish and Game, dated 26 April 1999, amended on 3 March 2006, and expiring on 31 October 2010. The visual survey was conducted by biologist Denise LaBerteaux. The trapping survey was conducted by biologist William A. Clark. Ms LaBerteaux is designated as principal investigator and Mr. Clark as field investigator on the List of Authorized Individuals under the MOU, dated 3 March 2006.

During the course of the Mohave ground squirrel survey, the biologists noted other wildlife species occurring in the EREMICO study area.

RESULTS AND DISCUSSION

PHYSICAL ENVIRONMENT

The project site is located in the Antelope Valley in the southwestern Mojave Desert. The site is on an alluvial plain with a 0-1% slope, draining northeast. A Joshua tree woodland on sandy soils occurred at the EREMICO study area. Dominant perennial species included Joshua tree (*Yucca brevifolia*), winter fat (*Krascheninnikovia lanta*), Nevada ephedra (*Ephedra nevadensis*), and cheesebush (*Hymenoclea salsola*). Other perennial species that were observed during the surveys are listed in Table 1.

Annual plants were moderately abundant due to near normal precipitation during the previous fall/winter. The dominant species were slender combseed (*Pectocarya penicillata*) and the non-native red-stemmed filaree (*Erodium cicutarium*) and Mediterranean grass (*Schismus* spp.). Other annual species present in the study area during the surveys are listed in Table 1.

Existing impacts in the study area were few and included some dumped and wind-blown trash. In addition, a homeless person occupied the site during some of the surveys. Photographs of the project site are provided in Appendix A.

MOHAVE GROUND SQUIRRELS

The Mohave ground squirrel's range is limited to the western Mojave Desert, generally from Lucerne Valley in San Bernardino County to Cartago in Inyo County. Within its range the Mohave ground squirrel has a patchy distribution but occupies a variety of habitats, including desert saltbush scrub, creosote bush scrub, Joshua tree woodland, shadscale scrub, blackbrush scrub, and sagebrush scrub. It occurs at elevations up to at least 5,600 feet. Mohave ground squirrels eat mainly leaves of forbs, shrubs, and grasses; fruit and flowers of forbs; seeds of forbs, grasses, shrubs, and Joshua trees; fungi; and anthropods (Gustafson 1993). Reasons for decline and extirpation of local populations include persistent drought, habitat destruction, degradation and fragmentation; use of pesticides for rodent control; domestic cat predation; and, possibly, shooting and vehicle strike (Gustafson 1993). The Mohave ground squirrel is a State list threatened species (CDFG 2006c).

Table 1. Vascular plants that were found in the EREMICO study area, Palmdale Power Project site.

FAMILY SCIENTIFIC NAME	SPECIES COMMON NAME	HABIT
CUPRESSACEAE		
Juniperus californica	California juniper	shrub/tree
EPHEDRACEAE		
Ephedra nevadensis	Nevada ephedra	shrub
ASTERACEAE		
Acamptopappus sphaerocephalus var. *hirtellus*	goldenhead	shrub
Ambrosia acanthicarpa	sand-bur	annual
Ambrosia dumosa	burro-bush	shrub
Artemisia tridentata	big sagebrush	shrub
Chrysothamnus nauseosus	rubber rabbitbrush	shrub
Eriophyllum pringlei	Pringle eriophyllum	annual
Eriophyllum wallacei	Wallace eriophyllum	annual
Filago depressa	spreading filago	annual
Hymenoclea salsola	cheesebush	shrub
Lasthenia californica	goldfields	annual
Layia glandulosa	white tidy-tips	annual
Lessingia lemmonii	vinegar-weed	annual
Rafinesquia neomexicana	desert chicory	annual
Stephanomeria exigua ssp. *exigua*	annual mitra	annual
Stephanomeria pauciflora	desert milk-aster	subshrub
Stylocline psilocarphoides	Peck nest straw	annual
Tetradymia axillaris var. *longispina*	cotton-thorn	shrub
Tetradymia stenolepis	Mojave horsebrush	shrub
Uropappus lindleyi	silver stars	annual
Xylorhiza tortifolia var. *tortifolia*	Mojave aster	subshrub
BORAGINACEAE		
Amsinckia tessellata var. *tessellata*	fiddleneck	annual
Cryptantha circumscissa	capped cryptantha	annual
Cryptantha micrantha	purple-rooted forget-me-not	annual
Pectocarya penicillata	slender combseed	annual
Plagiobothrys arizonicus	Arizona popcorn flower	annual
Tiquilia plicata	string plant	herbaceous perennial
BRASSICACEAE		
*Brassica tournefortii**	Saharan mustard	annual
Descurainia pinnata	tansy mustard	annual
CACTACEAE		
Cylindropuntia echinocarpa	golden cholla	cactus
CAMPANULACEAE		
Nemacladus sp.	thread plant	annual
CARYOPHYLLACEAE		
Loeflingia squarrosa var. *squarrosa*	loeflingia	annual
CHENOPODIACEAE		
Atriplex canescens	four-winged saltbush	shrub
Atriplex polycarpa	allscale	shrub
Grayia spinosa	spiny hop-sage	shrub
Krascheninnikovia lanata	winter fat	shrub
Salsola tragus	Russian thistle	annual

Table 1 (continued). Vascular plants that were found in the EREMICO study area, Palmdale Power Project site.

FAMILY SCIENTIFIC NAME	SPECIES COMMON NAME	HABIT
EUPHORBIACEAE		
Chamaesyce albomarginata	rattlesnake weed	herbaceous perennial
Eremocarpus setigerus	dove weed	annual
Stillingia paucidentata	stillingia	herbaceous perennial
FABACEAE		
Lotus strigosus	stiff-haired lotus	annual
GERANIACEAE		
*Erodium cicutarium**	red-stemmed filaree	annual
HYDROPHYLLACEAE		
Nama demissum	purple mat	annual
Phacelia fremontii	yellowthroats	annual
LAMIACEAE		
Monardella exilis	Mojave pennyroyal	annual
Salazaria mexicana	bladder sage	shrub
LOASACEAE		
Mentzelia sp.	blazing star	annual
MALVACEAE		
Sphaeralcea ambigua ssp. *ambigua*	apricot mallow	herbaceous perennial
NYCTAGINACEAE		
Abonia pogonantha	Mojave sand verbena	annual
ONAGRACEAE		
Camissonia boothii ssp. *desertorum*	woody bottle-washer	annual
Camissonia campestris ssp. *campestris*	Mojave sun cup	annual
Camissonia palmeri	Palmer primrose	annual
Oenothera deltoides	devil's lantern	annual
POLEMONIACEAE		
Eriastrum densifolium	eriastrum	herbaceous perennial
Eriastrum sp.	woolly star	annual
Linanthus aureus	golden linanthus	annual
Linanthus parryae	sand blossoms	annual
Loeseliastrum matthewsii	desert calico	annual
POLYGONACEAE		
Eriogonum deflexum var. *deflexum*	skeleton weed	annual
Eriogonum inflatum var. *inflatum*	Desert trumpet	herbaceous perennial
Eriogonum mohavense	Mojave buckwheat	annual
Eriogonum palmerianum	Palmer buckwheat	annual
Rumex hymenosepalus	wild rhubarb	herbaceous perennial
PORTULACACEAE		
Calyptridium monandrum	sand cress	annual
SOLANACEAE		
Datura wrightii	jimson-weed	herbaceous perennial
Lycium andersonii	desert tomato	shrub
Lycium cooperi	peach-thorn	shrub
TAMARICACEAE		
*Tamarix ramosissima**	salt cedar	tree

Table 1 (continued). Vascular plants that were found in the EREMICO study area, Palmdale Power Project site.

FAMILY SCIENTIFIC NAME	SPECIES COMMON NAME	HABIT
ZYGOPHYLLACEAE		
Larrea tridentata	creosote bush	shrub
LILIACEAE		
Yucca brevifolia	Joshua tree	tree
POACEAE		
Achnatherum hymenoides	Indian ricegrass	perennial
Achnatherum speciosum	desert needlegrass	perennial
Bromus madritensis ssp. *rubens**	red brome	annual
*Bromus tectorum**	cheat grass	annual
Hordeum murinum ssp. *leporinum**	wild barley	annual
*Schismus arabicus**	Arabian grass	annual
*Schismus barbatus**	Mediterranean grass	annual
Vulpia octoflora var. *octoflora*	fescue	annual

* non-native species.

Locality records for Mohave ground squirrels in the vicinity of the project site are presented in Table 2 (CDFG 2006a). The current status of Mohave ground squirrels at these locations is not know, but due to the increase in development in Lancaster and Palmdale and the subsequent habitat loss, degradation, and fragmentation, it is unlikely that the squirrels continue to inhabit these previously occupied sites. At a minimum, though, the project site lies within the historic range of the species.

Visual Survey Results

The visual survey was conducted on 11 April 2006 between 0930 and 1130 hours at the EREMICO study area. No Mohave ground squirrels were observed during the visual survey. Hence, the trapping survey was initiated.

Trapping Results, Grid 1

The first trapping period on Grid 1 occurred from 15-19 April 2006 and consisted of 5,558 trap-hours. Daily temperatures during this period never reached or exceeded 32°C (90°F), so trap closures were not necessary due to heat, as required in the trapping protocol (CDFG 2003). However, the opening of traps was delayed until the air temperature reached 10°C. Temperatures during trapping ranged from 2.6°C to 25.3°C. Results of the trapping effort during the first period are summarized in Table 3. There were 300 captures of white-tailed antelope squirrels (*Ammospermophilus leucurus*). Other captured animals included 4 Panamint kangaroo rats (*Dipodomys panamintinus*), one deer mouse (*Peromyscus maniculatus*), and one desert spiny lizard (*Sceloporus magister*). No Mohave ground squirrels were trapped or observed during this period.

The second trapping period on Grid 1 occurred from 18-22 May 2006. The effort totaled 4,775 trap-hours. Daytime temperatures during this period ranged from 10.7°C to 37.5°C. Trap closures were necessary due to heat on 2 days. Results of the trapping effort during the second period are summarized in Table 3. There were 381 captures of white-tailed antelope squirrels. Other animals that were trapped included 4 California ground squirrels (*Spermophilus beecheyi*) and 1 western whiptail (*Cnemidophorus tigris*), 5 desert wood rat (*Neotoma lepida*), one Panamint kangaroo rat, and one desert spiny lizard. No Mohave ground squirrels were trapped or observed on the project site during the second period.

Table 2. Locality records for Mohave ground squirrels in the vicinity of the Palmdale Power Project site.

Location	Year of Record	Approximate Distance and Direction from Project Site
T7N, R12W, SEC. 23	1984	2.5 miles, N
T7N, R12W, SEC. 26	1920	1.5 miles, N
T6N, R11W, SEC. 3	1973	4 miles, E
T6N, R11W, SEC. 16	1977	3.5 miles, SE
T6N, R12W, SEC. 23	1920	2.5 miles, S
T6N, R11W, SEC. 29	1931	4 miles, ESE
T6N, R11W, SEC. 16	1931	6 miles, SE

Table 3. Results of the Mohave ground squirrel trapping effort on Grid 1, EREMICO study area, Palmdale Power Project site.

PERIOD	DATE	TRAP-HOURS	SPECIES	Ad. M	Ad. F	Juv. M	Juv. F	Unk.	TOTAL CAPTURES
1	15 April 2006	1000	white-tailed antelope squirrel	26	24				50
	16 April 2006	1000	white-tailed antelope squirrel	35	40				75
	17 April 2006	1025	white-tailed antelope squirrel	27	29				56
			Panamint kangaroo rat					4	4
	18 April 2006	1000	white-tailed antelope squirrel	31	29				60
			deer mouse					1	1
	19 April 2006	1033	white-tailed antelope squirrel	34	25				59
			desert spiny lizard					1	1
2	18 May 2006	525	white-tailed antelope squirrel	16	20	1	1		38
	19 May 2006	750	white-tailed antelope squirrel	23	39	1	3		66
	20 May 2006	1200	white-tailed antelope squirrel	37	66	5	3		111
			California ground squirrel					2	2
			Panamint kangaroo rat					1	1
			desert wood rat					1	1
			desert spiny lizard					1	1
	21 May 2006	1200	white-tailed antelope squirrel	28	57		4		89
			California ground squirrel					1	1
			desert wood rat					3	3
	22 May 2006	1100	white-tailed antelope squirrel	31	40	4	2		77
			California ground squirrel					1	1
			desert wood rat					1	1
3	3 July 2006	350	white-tailed antelope squirrel	16	15				31
	4 July 2006	375	white-tailed antelope squirrel	15	13				28
	5 July 2006	400	white-tailed antelope squirrel	22	19				41
	6 July 2006	400	white-tailed antelope squirrel	26	28				44
			California ground squirrel					2	2
	7 July 2006	400	white-tailed antelope squirrel	24	17	1			42
			California ground squirrel					2	2
			Panamint kangaroo rat					1	1
			California vole					1	1

The third trapping period on Grid 1 occurred from 3-7 July 2006. Daytime temperatures during this period ranged from 12.6°C to 42.7°C. Temperatures exceeded 32°C on all five days of trapping; hence, trap closures were necessary, and the trapping effort totaled only 1,925 trap-hours. Results of the trapping effort during the third period are summarized in Table 3. Captured animals included 186 white-tailed antelope squirrels, 4 California ground squirrels, one Panamint kangaroo rat, and one California vole (*Microtus californicus*). No Mohave ground squirrels were trapped or observed during the third period.

Trapping Results, Grid 2

The first trapping period on Grid 2 occurred from 21-26 April 2006. The grid was trapped for six days because 6 lines of traps were moved during the second day of trapping after a vandal destroyed several traps. The effort totaled 5,383 trap-hours. Daily temperatures during this period never reached or exceeded 32°C (90°F), so trap closures were not necessary due to heat. However, the opening of traps was delayed on 3 days until the air temperature reached 10°C. Temperatures ranged from 6.8°C to 25.4°C. Results of the trapping effort during the first period are summarized in Table 4. Captured animals included 238 white-tailed antelope squirrels, 11 California ground squirrels, one desert wood rat, one red racer (*Masticophis flagellum piceus*), and one Cactus Wren (*Campylorhynchus brunneicapillus*). No Mohave ground squirrels were trapped or observed during this period.

The second trapping period on Grid 2 occurred from 23-27 May 2006. The effort totaled 4,600 trap-hours. Daytime temperatures during this period ranged from 6.5°C to 34.1°C. The opening of traps was delayed on 3 days until temperatures reached 10°C. Trap closures due to high temperatures were necessary on 2 days. Results of the trapping effort during the second period are summarized in Table 4. Captured animals included 386 white-tailed antelope squirrels, 31 California ground squirrels, 3 Panamint kangaroo rats, 9 desert wood rats, 2 desert cottontails (*Sylvilagus audubonii*), and one desert spiny lizard. No Mohave ground squirrels were trapped or observed on the project site during this period.

The third trapping period on Grid 2 occurred from 10-14 July 2006. Daytime temperatures during this period ranged from 12.2°C to 39.5°C. Temperatures exceeded 32°C on all 5 days of trapping; hence, trap closures were necessary, and the trapping effort totaled only 1,650 trap-hours. Trapping effort results during the third period are summarized in Table 4.

Table 4. Results of the Mohave ground squirrel trapping effort on Grid 2, EREMICO study area, Palmdale Power Project site.

PERIOD	DATE	TRAP-HOURS	SPECIES	Ad. M	Ad. F	Juv. M	Juv. F	Unk.	TOTAL CAPTURES
1	21 April 2006	1100	white-tailed antelope squirrel	27	41				68
			California ground squirrel					11	11
			desert wood rat					1	1
	22 April 2006	350	white-tailed antelope squirrel	6	4				10
	23 April 2006	1000	white-tailed antelope squirrel	21	20				41
	24 April 2006	1050	white-tailed antelope squirrel	25	26				51
			California ground squirrel					2	2
			red racer					1	1
	25 April 2006	1083	white-tailed antelope squirrel	23	25				48
			California ground squirrel					4	4
			Cactus Wren					1	1
	26 April 2006	800	white-tailed antelope squirrel	10	10				20
			California ground squirrel					1	1
2	23 May 2006	1200	white-tailed antelope squirrel	38	65	1	3		107
			California ground squirrel					4	4
			desert wood rat					2	2
			Panamint kangaroo rat					1	1
			desert spiny lizard					1	1
	24 May 2006	700	white-tailed antelope squirrel	12	38	2	2		54
			California ground squirrel					4	4
	25 May 2006	700	white-tailed autelope squirrel	17	37		1		55
			California ground squirrel					4	4
			desert wood rat					2	2
			Panamint kangaroo rat					2	2
			desert cottontail					1	1
	26 May 2006	1200	white-tailed antelope squirrel	36	60	4	1		101
			California ground squirrel					10	10
			desert wood rat					2	2
			desert cottontail					1	1
	27 May 2006	800	white-tailed antelope sqnirrel	23	45		1		69
			California ground squirrel					9	9
			desert wood rat					3	3

Table 4 (continued). Results of the Mohave ground squirrel trapping effort on Grid 2, EREMICO study area, Palmdale Power Project site.

PERIOD	DATE	TRAP-HOURS	SPECIES	Ad. M	Ad. F	Juv. M	Juv. F	Unk.	TOTAL CAPTURES
3	10 July 2006	300	white-tailed antelope squirrel	16	14				30
	11 July 2006	325	white-tailed antelope squirrel	17	18				35
			California ground squirrel					1	1
	12 July 2006	375	white-tailed antelope squirrel	18	31		1		50
			California ground squirrel					2	2
			desert wood rat					1	1
	13 July 2006	350	white-tailed antelope squirrel	21	23				44
			desert wood rat					1	1
	14 July 2006	300	white-tailed antelope squirrel	19	21	1	1		42
			California ground squirrel					1	1
			desert spiny lizard					2	2

There were 201 captures of white-tailed antelope squirrels. Other animals captured included 4 California ground squirrels, 2 desert wood rats, and 2 desert spiny lizards. No Mohave ground squirrels were trapped or observed on the project site during the third period.

A standardized form, included in the survey guidelines (CDFG 2003), summarizing the Mohave ground squirrel survey and trapping effort is provided in Appendix B. A completed California Native Species Field Survey Form appears in Appendix C.

OTHER WILDLIFE

Vertebrate wildlife species that were observed during the Mohave ground squirrel surveys are listed in Table 5. Most of the species are commonly found in the Mojave Desert. However, six special status species (CDFG 2006b), 5 birds and one mammal, were noted on the project site and are identified in Table 5. Three of the birds, Prairie Falcon (*Falco mexicanus*), Le Conte's Thrasher (*Toxostoma lecontei*), and Loggerhead Shrike (*Lanius ludovicianus*) are California Species of Special Concern (CDFG 2006b). The Le Conte's Thrasher and Loggerhead Shrike are year-round residents of the Mojave Desert and probably nest on the project site, although no nests were found during the surveys. The Prairie Falcon is expected to hunt on or near the project site throughout the year, but it will not nest there. It requires cliffs for nesting sites.

The Brewer's Sparrow (*Spizella breweri*) and Lawrence's Goldfinch (*Carduelis lawrencei*) were observed in April and were probably only migrating through the project area. They are not observed during the nesting season. These species are on "watch" lists of the National Audubon Society and Partners in Fight (CDFG 2006b). The Panamint kangaroo rat (*Dipodomys panamintinus*) is ranked as rare and/or as a species with a restricted range by the CDFG Natural Diversity Database (CDFG 2006b).

Table 5. Vertebrate wildlife species that were observed in the EREMICO study area, Palmdale Power Project site.

SPECIES	
SCIENTIFIC NAME	COMMON NAME
REPTILES	
Sceloporus magister	Desert Spiny Lizard
Uta stansburiana	Side-blotched Lizard
Gambelia wislizenii	Long-nosed Leopard Lizard
Cnemidophorus tigris	Western Whiptail
Masticophis flagellum piceus	Red Racer
Crotalus scutulatus	Mojave Rattlesnake
BIRDS	
Buteo jamaicensis	Red-tailed Hawk
Falco sparverius	American Kestrel
Falco mexicanus†	Prairie Falcon
Callipepla californica	California Quail
Zenaida macroura	Mourning Dove
Chordeiles acutipennis	Lesser Nighthawk
Calypte anna	Anna's Hummingbird
Picoides scalaris	Ladder-backed Woodpecker
Sayornis saya	Say's Phoebe
Corvus corax	Common Raven
Campylorhynchus brunneicapillus	Cactus Wren
Mimus polyglottos	Northern Mockingbird
Toxostoma leconteii†	Le Conte's Thrasher
Lanius ludovicianus†	Loggerhead Shrike
Spizella breweri†	Brewer's Sparrow
Zonotrichia leucophrys	White-crowned Sparrow
Carpodacus mexicanus	House Finch
Carduelis lawrencei†	Lawrence's Goldfinch
MAMMALS	
Sylvilagus audubonii	Desert Cottontail
Lepus californicus	Black-tailed Jackrabbit
Ammospermophilus leucurus	White-tailed Antelope Squirrel
Spermophilus beecheyi	California Ground Squirrel
Dipodomys panamintinus†	Panamint Kangaroo Rat
Peromyscus maniculatus	Deer Mouse
Neotoma lepida	Desert Wood Rat
Microtus californicus	California Vole
Vulpes macrotis assipis	Desert Kit Fox

† special status species

CONCLUSION

Surveys were conducted from mid April through mid July 2006 to determine the presence or absence of Mohave ground squirrels on 150 acres of the 450-acre proposed Palmdale Power Project site in the City of Palmdale, California following the CDFG survey guidelines (CDFG 2003). No Mohave ground squirrels were observed or trapped during the surveys. The negative result does not necessarily prove that Mohave ground squirrels do not exist on the site or that the site is not actual or potential habitat of the species. However, in the circumstance of such a negative result, the CDFG will stipulate that the project site harbors no Mohave ground squirrels. This stipulation will expire one year from the ending date of the last trapping on the project site, which was 14 July 2006.

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Gustafson, J. R. 1993. A status review of the Mohave ground squirrel (*Spermophilus mohavensis*). Nongame Bird and Mammal Section Report 93-9. Department of Fish and Game, Wildlife Management Division. Sacramento, Calif. 104 pp. + appendices.

APPENDIX A

PHOTOGRAPHS OF THE PROJECT SITE

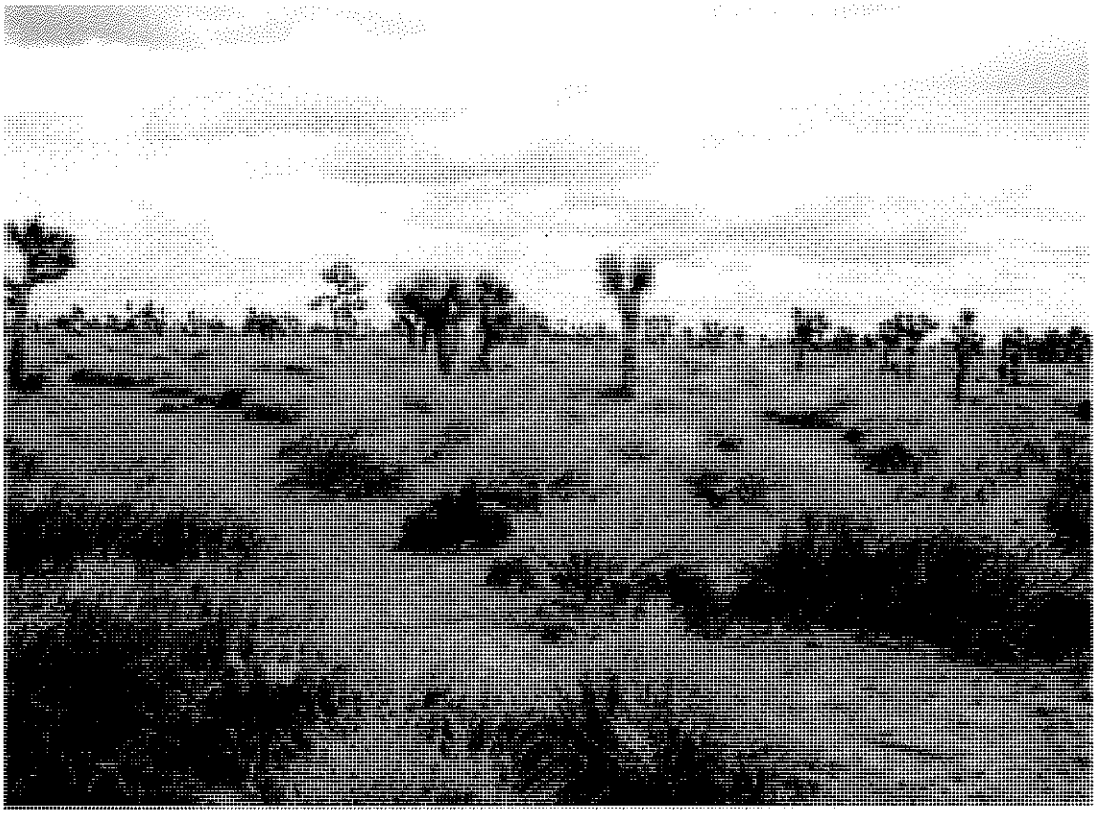

Photo 1. From the southwest corner of the study area towards the north.

Photo 2. From the northwest corner of the study area towards the southeast.

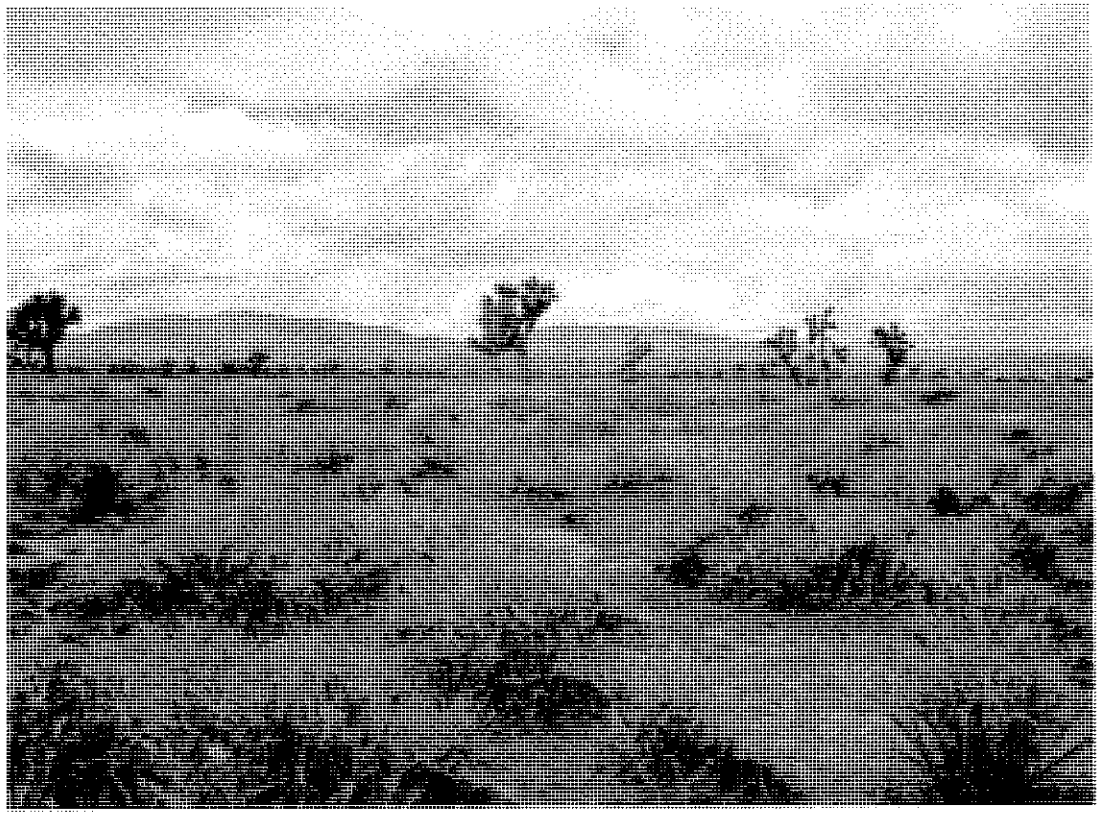

Photo 3. From the northeast corner of the study area towards the southwest.

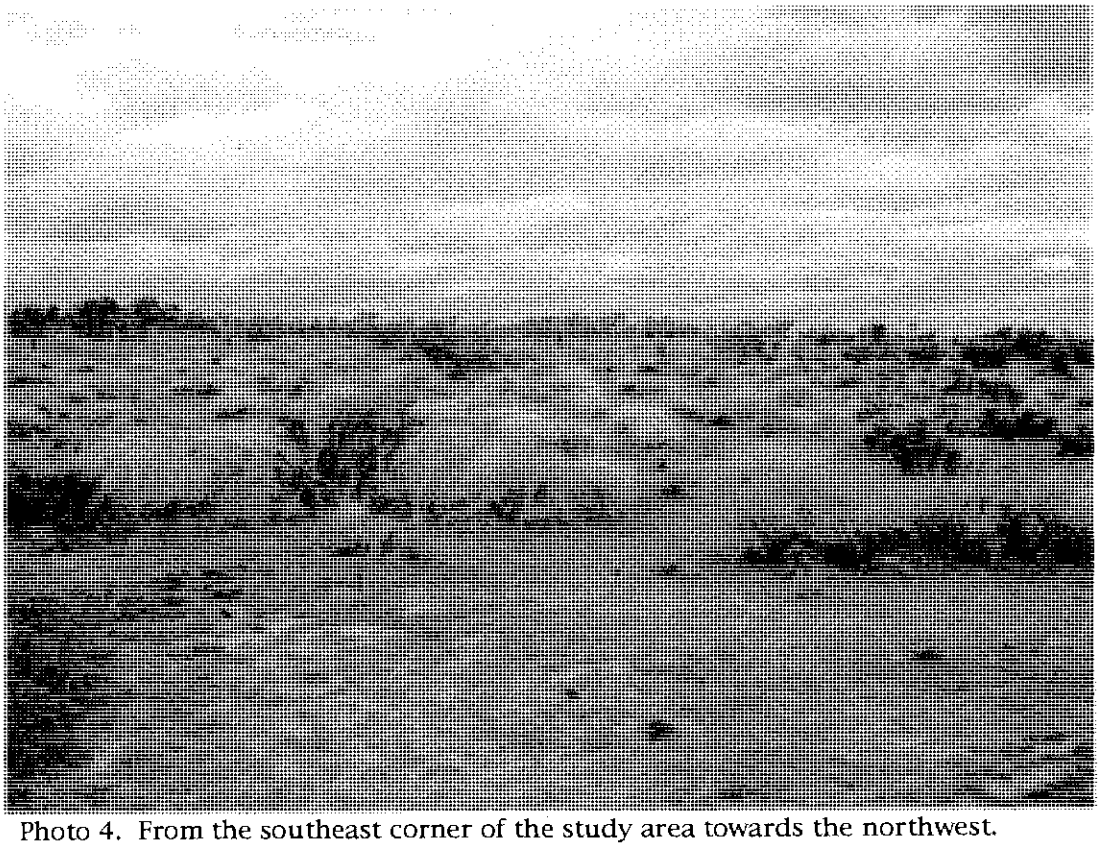

Photo 4. From the southeast corner of the study area towards the northwest.

APPENDIX B

MOHAVE GROUND SQUIRREL SURVEY AND TRAPPING SUMMARY FORMS

MOHAVE GROUND SQUIRREL (MGS) SURVEY AND TRAPPING FORM

PART 1 – PROJECT INFORMATION

Project Name: Palmdale Power Project, 150-ac portion **Developer:** Inland Energy, Inc.

Location (Township, Range, Section): Section 1 (northwest quarter and the north half of the southwest quarter) and Section 2 (a portion of the north half, the north half of the southeast quarter, and a portion of the north half of the southwest quarter), Township 6 North, Range 12 West, SBM.

Quad Map/Series: Lancaster East, Calif, 7.5 Minute Series

UTM Coordinates of Trapping Grid Corners: (NAD 27, Zone 11S) GRID 1 - NW Corner 0396937E, 3833500N; NE Corner 0397243, 3833503N; SE Corner 0397250, 3833201N; SW Corner 0396944E, 3833193N. GRID 2 - NW Corner 0397326E, 3833466N; NE Corner 0397662E, 3833464N; SE Corner 0397328E, 3833149N; SW Corner 0397671E, 03833149N.

Acreage of Project Site: 450 acres **Acreage of Potential MGS Habitat on Site:** 450 acres

Total Acreage Visually Surveyed on Project Site: 150 acres **Date(s) of Visual Survey:** 11 April 2006

Visual Survey Conducted By: Denise LaBerteaux

Total Acres Trapped: 150 acres **Number of Sampling Grids:** 2

Trapping Conducted By: William A. Clark

Dates of Sampling Term(s): GRID 1: **FIRST** 15-19 April 2006 **SECOND** 18-22 May 2006 **THIRD** 3-7 July 2006
GRID 2: **FIRST** 21-26 April 2006 **SECOND** 23-27 May 2006 **THIRD** 10-14 July 2006

PART II – GENERAL HABITAT DESCRIPTION

Vegetation Type: Joshua tree woodland

Dominant Perennials: *Yucca brevifolia, Hymenoclea salsola, Krascheninnikovia lanata, Ephedra nevadensis*

Other Perennials: *Juniperus californica, Acamptopappus sphaerocephalus* var. *hirtellus, Ambrosia dumosa, Artemisia tridentata, Chrysothamnus nauseosus, Stephanomeria pauciflora, Tetradymia axillaris* var. *longispina, Tetradymia stenolepis, Xylorhiza tortifolia* var. *tortifolia, Tiquilia plicata, Cylindropuntia echinocarpa, Atriplex canescens, Atriplex polycarpa, Grayia spinosa, Chamaesyce albomarginata, Stillingia paucidentata, Salazaria mexicana, Sphaeralcea ambigua* ssp. *ambigua, Eriastrum densifolium, Eriogonum inflatum* var. *inflatum, Rumex hymenosepalus, Datura wrightii, Lycium andersonii, Lycium cooperi, Tamarix ramosissima, Larrea tridentata, Achnatherum hymenoides, Achnatherum speciosum.*

Dominant Annuals: *Pectocarya penicillata, Erodium cicutarium, Schismus arabicus, Schismus barbatus*

Other Annuals: *Ambrosia acanthicarpa, Eriophyllum pringlei, Eriophyllum wallacei, Filago depressa, Lasthenia californica, Layia glandulosa, Lessingia lemmonii, Rafinesquia neomexicana, Stephanomeria exigua* ssp. *exigua, Stylocline psilocarphoides, Uropappus lindleyi, Amsinckia tessellata* var. *tessellata, Cryptantha circumscissa, Cryptantha micrantha, Plagiobothrys arizonicus, Brassica tournefortii, Descurainia pinnata, Nemacladus* sp., *Loeflingia squarrosa* var. *squarrosa, Salsola tragus, Eremocarpus setigerus, Lotus strigosus, Nama demissum, Phacelia fremontii, Monardella exilis, Mentzelia* sp., *Abonia pogonantha, Camissonia boothii* ssp. *desertorum, Camissonia campestris* ssp. *campestris, Camissonia palmeri, Oenothera deltoides, Eriastrum* sp., *Linanthus aureus, Linanthus parryae, Loeseliastrum matthewsii Eriogonum deflexum* var. *deflexum, Eriogonum mohavense, Eriogonum palmerianum, Bromus madritensis* ssp. *rubens, Bromus tectorum, Hordeum murinum* ssp. *leporinum, Vulpia octoflora* var. *octoflora.*

Land Form: alluvial plain

Soils Description: sand

Elevation: 2,020-2,080 ft **Slope Aspect:** Northeast **Percent Slope:** 0-1%

PART III – WEATHER

Project Name: Palmdale Power Project, 150-acre portion
Developer: Inland Energy, Inc.

Year: 2006 (Trapping Period 1)

Grid Number: 1

WEATHER (temperature = °C; cloud cover = %; wind speed = kph)

DATE: 11 April 2006 ACTIVITY: visual survey G1,G2

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	14	0930
AIR TEMPERATURE, MAX.	18	1130
SOIL TEMPERATURE, MIN.	13.5	0930
SOIL TEMPERATURE, MAX.	17.5	1130
CLOUD COVER, AM	90	0930
CLOUD COVER, PM		
WIND SPEED, AM	3	0930
WIND SPEED, PM		

DATE: 15 April 2006 ACTIVITY: trapping DAY 1

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	9.9	0700
AIR TEMPERATURE, MAX.	20.7	1500
SOIL TEMPERATURE, MIN.	9.7	0700
SOIL TEMPERATURE, MAX.	20	1500
CLOUD COVER, AM	25	0800
CLOUD COVER, PM	10	1700
WIND SPEED, AM	13.1 SW	0800
WIND SPEED, PM	14.8 W	1700

DATE: 16 Apr 2006 ACTIVITY: trapping DAY 2

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	8.6	0700
AIR TEMPERATURE, MAX.	19.2	1500
SOIL TEMPERATURE, MIN.	10.5	0700
SOIL TEMPERATURE, MAX.	17.5	1500
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	60	1700
WIND SPEED, AM	13.7 W	0800
WIND SPEED, PM	17.8 W	1700

DATE: 17 Apr 2006 ACTIVITY: trapping DAY 3

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	6	0700
AIR TEMPERATURE, MAX.	15.8	1600
SOIL TEMPERATURE, MIN.	5.5	0700
SOIL TEMPERATURE, MAX.	17	1400
CLOUD COVER, AM	15	0800
CLOUD COVER, PM	0	1700
WIND SPEED, AM	13.8 W	0800
WIND SPEED, PM	14.2 NW	1700

DATE: 18 Apr 2006 ACTIVITY: trapping DAY 4

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	2.6	0700
AIR TEMPERATURE, MAX.	20.9	1500
SOIL TEMPERATURE, MIN.	4.5	0700
SOIL TEMPERATURE, MAX.	19.5	1500
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	15	1700
WIND SPEED, AM	3.4 NW	0800
WIND SPEED, PM	6.8 NE	1700

DATE: 19 Apr 2006 ACTIVITY: trapping DAY 5

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	6	0700
AIR TEMPERATURE, MAX.	25.3	1600
SOIL TEMPERATURE, MIN.	6.5	0700
SOIL TEMPERATURE, MAX.	20	1600
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	0	1700
WIND SPEED, AM	< 1 var.	0800
WIND SPEED, PM	4.9 N	1700

PART III – WEATHER

Project Name: Palmdale Power Project, 150-acre portion
Developer: Inland Energy, Inc.

Year: 2006 (Trapping Period 2)

Grid Number: 1

WEATHER (temperature = °C; cloud cover = %; wind speed = kph)

DATE: 18 May 2006 **ACTIVITY:** trapping DAY 1

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	18	0600
AIR TEMPERATURE, MAX.	37.5	1500
SOIL TEMPERATURE, MIN.	19	0600
SOIL TEMPERATURE, MAX.	34	1500
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	40	1700
WIND SPEED, AM	< 1 var.	0800
WIND SPEED, PM	12.8 SW	1700

DATE: 19 May 2006 **ACTIVITY:** trapping DAY 2

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	18.8	0600
AIR TEMPERATURE, MAX.	34.5	1200
SOIL TEMPERATURE, MIN.	21	0600
SOIL TEMPERATURE, MAX.	33.3	1200
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	15	1700
WIND SPEED, AM	< 2 var.	0800
WIND SPEED, PM	13.2 W	1700

DATE: 20 May 2006 **ACTIVITY:** trapping DAY 3

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	15.8	0600
AIR TEMPERATURE, MAX.	28.7	1300
SOIL TEMPERATURE, MIN.	16	0600
SOIL TEMPERATURE, MAX.	27.5	1300
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	7	1700
WIND SPEED, AM	1.9 NE	0800
WIND SPEED, PM	14,9 SW	1700

DATE: 21 May 2006 **ACTIVITY:** trapping DAY 4

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	14.9	0600
AIR TEMPERATURE, MAX.	26.6	1400
SOIL TEMPERATURE, MIN.	17	0600
SOIL TEMPERATURE, MAX.	25.5	1400
CLOUD COVER, AM	100	0800
CLOUD COVER, PM	100	1700
WIND SPEED, AM	< 1 var.	0800
WIND SPEED, PM	11.8 W	1700

DATE: 22 May 2006 **ACTIVITY:** trapping DAY 5

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	10.7	0600
AIR TEMPERATURE, MAX.	19.2	1630
SOIL TEMPERATURE, MIN.	13.5	0600
SOIL TEMPERATURE, MAX.	20	1630
CLOUD COVER, AM	90	0800
CLOUD COVER, PM	15	1700
WIND SPEED, AM	14.6 SW	0800
WIND SPEED, PM	12.5 SW	1700

PART III – WEATHER

Project Name: Palmdale Power Project, 150-acre portion
Developer: Inland Energy, Inc.

Year: 2006 (Trapping Period 3)

Grid Number: 1

WEATHER (temperature = °C; cloud cover = %; wind speed = kph)

DATE: 3 July 2006 **ACTIVITY:** trapping DAY 1

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	20.3	0600
AIR TEMPERATURE, MAX.	42.7	1600
SOIL TEMPERATURE, MIN.	24	0600
SOIL TEMPERATURE, MAX.	36.5	1100
CLOUD COVER, AM	10 low	0600
CLOUD COVER, PM	80	1100
WIND SPEED, AM	2.1 W	0600
WIND SPEED, PM	5.3 SE	1000

DATE: 4 July 2006 **ACTIVITY:** trapping DAY 2

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	19.9	0600
AIR TEMPERATURE, MAX.	40	1600
SOIL TEMPERATURE, MIN.	23	0600
SOIL TEMPERATURE, MAX.	34	1100
CLOUD COVER, AM	10 E	0600
CLOUD COVER, PM	5	1100
WIND SPEED, AM	2.4 NE	0600
WIND SPEED, PM	6.4 S	1000

DATE: 5 July 2006 **ACTIVITY:** trapping DAY 3

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	19.3	0600
AIR TEMPERATURE, MAX.	36.3	1600
SOIL TEMPERATURE, MIN.	23	0600
SOIL TEMPERATURE, MAX.	33	1200
CLOUD COVER, AM	0	0600
CLOUD COVER, PM	0	1200
WIND SPEED, AM	< 2 var.	0600
WIND SPEED, PM	3.4 W	1000

DATE: 6 July 2006 **ACTIVITY:** trapping DAY 4

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	13.6	0600
AIR TEMPERATURE, MAX.	38	1600
SOIL TEMPERATURE, MIN.	16	0600
SOIL TEMPERATURE, MAX.	32.5	1200
CLOUD COVER, AM	0	0600
CLOUD COVER, PM	0	1000
WIND SPEED, AM	1.8 S	0600
WIND SPEED, PM	9.7 SW	1000

DATE: 7 July 2006 **ACTIVITY:** trapping DAY 5

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	12.6	0600
AIR TEMPERATURE, MAX.	37.2	1400
SOIL TEMPERATURE, MIN.	19.5	0600
SOIL TEMPERATURE, MAX.	34	1400
CLOUD COVER, AM	0	0600
CLOUD COVER, PM	7 E	1400
WIND SPEED, AM	< 2 var.	0600
WIND SPEED, PM	6.4 W	1400

PART III – WEATHER

Project Name: Palmdale Power Project, 150-acre portion
Developer: Inland Energy, Inc.

Year: 2006 (Trapping Period 1)

Grid Number: 2

WEATHER (temperature = °C; cloud cover = %; wind speed = kph)

DATE: 21 Apr. 2006 **ACTIVITY:** trapping DAY 1

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	11.8	0700
AIR TEMPERATURE, MAX.	25.4	1200
SOIL TEMPERATURE, MIN.	13	0700
SOIL TEMPERATURE, MAX.	25	1400
CLOUD COVER, AM	97	0800
CLOUD COVER, PM	0	1700
WIND SPEED, AM	'< 1 var.	0800
WIND SPEED, PM	14.8 W	1900

DATE: 22 Apr 2006 **ACTIVITY:** trapping DAY 2

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	10.5	1900
AIR TEMPERATURE, MAX.	16.2	1400
SOIL TEMPERATURE, MIN.	11	0800
SOIL TEMPERATURE, MAX.	18	1400
CLOUD COVER, AM	< 5 low	0800
CLOUD COVER, PM	15	1500
WIND SPEED, AM	10.2 W	0800
WIND SPEED, PM	13.4 W	1500

DATE: 23 Apr 2006 **ACTIVITY:** trapping DAY 3

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	6.8	0700
AIR TEMPERATURE, MAX.	17.4	1300
SOIL TEMPERATURE, MIN.	9.5	0700
SOIL TEMPERATURE, MAX.	19.5	1300
CLOUD COVER, AM	75	0800
CLOUD COVER, PM	5 low	1700
WIND SPEED, AM	12.4 W	0800
WIND SPEED, PM	18.8 W	1700

DATE: 24 Apr 2006 **ACTIVITY:** trapping DAY 4

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	9.6	0700
AIR TEMPERATURE, MAX.	22.9	1500
SOIL TEMPERATURE, MIN.	9	0700
SOIL TEMPERATURE, MAX.	21	1300
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	5	1700
WIND SPEED, AM	2.5 W	0800
WIND SPEED, PM	15.8 W	1700

DATE: 25 Apr 2006 **ACTIVITY:** trapping DAY 5

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	10.9	0700
AIR TEMPERATURE, MAX.	24.2	1500
SOIL TEMPERATURE, MIN.	10	0700
SOIL TEMPERATURE, MAX.	23.9	1300
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	100	1700
WIND SPEED, AM	< 2 E/NE	0800
WIND SPEED, PM	13.1 SW	1700

DATE: 26 Apr 2006 **ACTIVITY:** trapping DAY 6

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	9	0700
AIR TEMPERATURE, MAX.	17.1	1200
SOIL TEMPERATURE, MIN.	10.5	0700
SOIL TEMPERATURE, MAX.	18.2	1200
CLOUD COVER, AM	95	0800
CLOUD COVER, PM	95	1700
WIND SPEED, AM	6.4 S	0800
WIND SPEED, PM	13.5 S	1700

PART III – WEATHER

Project Name: Palmdale Power Project, 150-acre portion
Developer: Inland Energy, Inc.

Year: 2006 (Trapping Period 2)

Grid Number: 2

WEATHER (temperature = °C; cloud cover = %; wind speed = kph)

DATE: 23 May 2006 **ACTIVITY:** trapping DAY 1

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	6.5	0600
AIR TEMPERATURE, MAX.	31.4	1600
SOIL TEMPERATURE, MIN.	12	0600
SOIL TEMPERATURE, MAX.	27	1700
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	0	1700
WIND SPEED, AM	2.4 SW	0800
WIND SPEED, PM	11.5 W	1700

DATE: 24 May 2006 **ACTIVITY:** trapping DAY 2

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	11.8	0600
AIR TEMPERATURE, MAX.	33.5	1400
SOIL TEMPERATURE, MIN.	13.5	0600
SOIL TEMPERATURE, MAX.	30	1500
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	5	1700
WIND SPEED, AM	7.8 NE	0800
WIND SPEED, PM	10.6 W	1700

DATE:25 May 2006 **ACTIVITY:** trapping DAY 3

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	8.5	0600
AIR TEMPERATURE, MAX.	34.1	1500
SOIL TEMPERATURE, MIN.	13	0600
SOIL TEMPERATURE, MAX.	29.5	1500
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	0	1700
WIND SPEED, AM	< 2 var.	0800
WIND SPEED, PM	11.1 W	1700

DATE: 26 May 2006 **ACTIVITY:** trapping DAY 4

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	9.8	0600
AIR TEMPERATURE, MAX.	29.2	1400
SOIL TEMPERATURE, MIN.	12	0600
SOIL TEMPERATURE, MAX.	27.5	1300
CLOUD COVER, AM	0	0800
CLOUD COVER, PM	20	1700
WIND SPEED, AM	< 2 var.	0800
WIND SPEED, PM	18.2 W	1700

DATE: 27 May 2006 **ACTIVITY:** trapping DAY **5**

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	8.8	0630
AIR TEMPERATURE, MAX.	19.8	1500
SOIL TEMPERATURE, MIN.	12	0630
SOIL TEMPERATURE, MAX.	18	1400
CLOUD COVER, AM	60	0800
CLOUD COVER, PM	< 5	1700
WIND SPEED, AM	14.6 W	0800
WIND SPEED, PM	15.7 NW	1700

PART III – WEATHER

Project Name: Palmdale Power Project, 150-acre portion
Developer: Inland Energy, Inc.

Year: 2006 (Trapping Period 3)

Grid Number: 2

WEATHER (temperature = °C; cloud cover = %; wind speed = kph)

DATE: 10 July 2006 **ACTIVITY:** trapping DAY 1

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	16.8	0600
AIR TEMPERATURE, MAX.	37	1100
SOIL TEMPERATURE, MIN.	21.5	0600
SOIL TEMPERATURE, MAX.	34.5	1100
CLOUD COVER, AM	0	0600
CLOUD COVER, PM	0	1100
WIND SPEED, AM	calm	0600
WIND SPEED, PM	5.7 SW	1100

DATE: 11 July 2006 **ACTIVITY:** trapping DAY 2

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	20.1	0600
AIR TEMPERATURE, MAX.	34	1100
SOIL TEMPERATURE, MIN.	24	0600
SOIL TEMPERATURE, MAX.	32.5	1100
CLOUD COVER, AM	0	0600
CLOUD COVER, PM	0	1100
WIND SPEED, AM	Calm	0600
WIND SPEED, PM	16.3 SW	1100

DATE: 12 July 2006 **ACTIVITY:** trapping DAY 3

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	18.4	0600
AIR TEMPERATURE, MAX.	35.8	1200
SOIL TEMPERATURE, MIN.	22	0600
SOIL TEMPERATURE, MAX.	34.5	1200
CLOUD COVER, AM	0	0600
CLOUD COVER, PM	0	1200
WIND SPEED, AM	calm	0600
WIND SPEED, PM	7.8 SW	1200

DATE: 13 July 2006 **ACTIVITY:** trapping DAY 4

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	12.2	0600
AIR TEMPERATURE, MAX.	37	1100
SOIL TEMPERATURE, MIN.	18	0600
SOIL TEMPERATURE, MAX.	33	1100
CLOUD COVER, AM	0	0600
CLOUD COVER, PM	0	1100
WIND SPEED, AM	< 1 var.	0600
WIND SPEED, PM	8.4 W	1100

DATE: 14 July 2006 **ACTIVITY**: trapping DAY 5

WEATHER CONDITION	VALUE	TIME
AIR TEMPERATURE, MIN.	17.6	0600
AIR TEMPERATURE, MAX.	39.5	1230
SOIL TEMPERATURE, MIN.	23	0600
SOIL TEMPERATURE, MAX.	37	1230
CLOUD COVER, AM	0	0600
CLOUD COVER, PM	30 thin E	1230
WIND SPEED, AM	calm	0600
WIND SPEED, PM	8.6 SW	1230

APPENDIX C

CALIFORNIA NATIVE SPECIES FIELD FORM

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: WHDAB@dfg.ca.gov

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work *mm/dd/yyyy:* 07/14/2006

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Spermophilus mohavensis*

Common Name: Mohave Ground Squirrel

Species Found? ☐ Yes ☑ No _____ If not, why?

Total No. Individuals 0 Subsequent Visit? ☐ yes ☑ no
Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Denise L. LaBerteaux
Address: 211 Snow Street
Weldon, CA 93283
E-mail Address: eremico@aol.com
Phone: (760) 378-3021

Plant Information

Phenology: ____ % vegetative ____ % flowering ____ % fruiting

Animal Information

0	0	0	0	0
# adults	# juveniles	# larvae	# egg masses	# unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

South of intersection of Avenue M and 10th Street East, Palmdale

County: Los Angeles Landowner / Mgr.: Private
Quad Name: Lancaster East Elevation: 2,050 ft
T 6N R 12W Sec 1 , ____ ¼ of W1/2 ¼, Meridian: H☐ M☐ S☑ Source of Coordinates (GPS, topo. map & type): GPS
T 6N R 12W Sec 2 , ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☑ GPS Make & Model Garmin Etrex Vista
Datum: NAD27☑ NAD83☐ WGS84 ☐ Horizontal Accuracy 3 meters meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ *OR* Geographic (Latitude & Longitude) ☐
Coordinates: Easting/Longitude *Grid 1:396937E; Grid 2:397326E Northing/Latitude Grid 1:3833500N;Grid 2:3833466N

Habitat Description *(plant communities, dominants, associates, substrates/soils, aspects/slope):*

Joshua tree woodland with Yucca brevifolia, Hymenoclea salsola, Krascheninnikovia lanata, Ephedra nevadensis dominating. Associates include Juniperus californica, Acamptopappus sphaerocephalus var. hirtellus, Ambrosia dumosa, Artemisia tridentata, Chrysothamnus nauseosus, Tetradymia axillaris var. longispina, Tetradymia stenolepis, Xylorhiza tortifolia var. tortifolia, Atriplex canescens, Atriplex polycarpa, Grayia spinosa, Salazaria mexicana, Lycium andersonii, Lycium cooperi, Larrea tridentata, Achnatherum hymenoides, Achnatherum speciosum. Alluvial plain. Soils: sands. Aspect: Northeast. Slope: 0-1%

Other rare taxa seen at THIS site on THIS date:
none

Site Information Overall site quality: ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Current / surrounding land use: open desert on site and on adjacent parcels. Air Force Plant 42 towards S and E.

Visible disturbances: some dumped and wind-blown trash

Threats: energy development is proposed for site

Comments: *Coordinates are NW corner of each trapping grid. 150-acre site trapped for Mohave ground squirrels on 15-26 April, 18-27 May, and 3-14 July 2006 by William A. Clark. 2 grids.

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ☑ yes ☐ no

FINAL REPORT OF MOHAVE GROUND SQUIRREL SURVEYS CONDUCTED FOR THE PALMDALE POWER PROJECT BY THE CSU STANISLAUS—ENDANGERED SPECIES RECOVERY PROGRAM, MARCH THROUGH JULY, 2006

PREPARED FOR ENSR CORPORATION
1220 AVENIDA ACASO
CAMARILLO, CA 93012

Prepared by:
Darren P. Newman and Patrick A. Kelly
California State University, Stanislaus
Endangered Species Recovery Program
1900 N. Gateway BLVD. STE 101
Fresno, CA 93727

August 22, 2006

This report covers survey-trapping for Mohave ground squirrels (*Spermophilus mohavensis*) in Palmdale, California, executed under a Purchase Order agreement (DATE) with ENSR of Camarillo, California. The work was conducted under a Memorandum of Understanding (MOU) issued to Dr. Patrick A. Kelly of the California State University, Stanislaus—Endangered Species Recovery Program (ESRP) by the California Department of Fish and Game (CDFG). The parcel (300 ac; 121 ha) is located northwest of Palmdale Air Force Plant 42, between Avenue M-12 and East Avenue M, and west of 15th Street (Site 1 Road) in northern Los Angeles County, California (Figure 1).

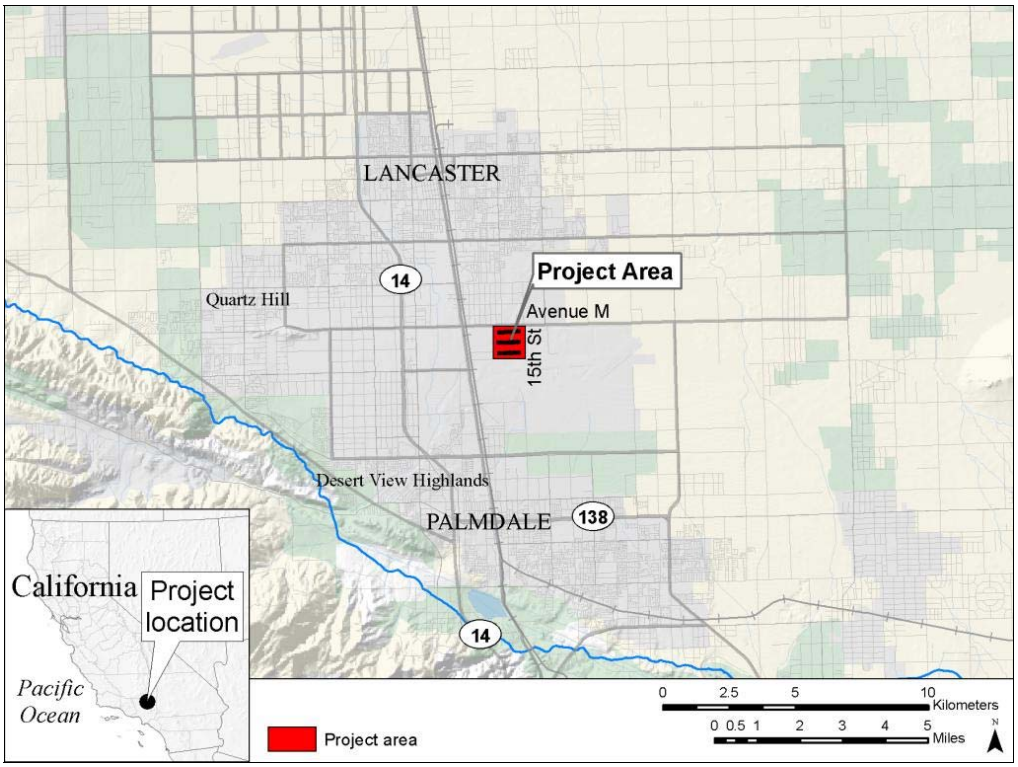

Figure 1. Location of parcel trapped for Mohave ground squirrels by California State University, Stanislaus—Endangered Species Recovery Program, March to July 2006.

The project site supports habitat for and is within the historic range of the Mohave ground squirrel (MGS), a species that is listed by the State of California as "threatened" throughout its range. If development of potential habitat is proposed and it is not known whether MGS inhabit the site, CDFG requires adherence to protocol-level surveys.

A visual survey of the site was conducted on March 14-15, 2006 by Patrick Kelly and Darren Newman. The habitat appeared suitable for MGS but none were observed (Appendix A). Mohave ground squirrels have not been captured in northern Los Angeles County for about 20 years (Phil Leitner[1] pers. comm.) although they were observed in the vicinity of Air Force Plant 42 in the early 1980's (Ms. Becky Jones[2] pers. comm.).

[1] Dr. Philip Leitner, Professor of Biology, St. Mary's College, Moraga, California.
[2] Ms. Becky Jones, Biologist, California Department of Fish and Game, Palmdale, California.

In consultation with Mr. Scott Harris of the California Department of Fish and Game, and following the current CDFG protocol for MGS surveys[3], three 4x25 trapping grids with 35-m (115 ft) trap-spacing were constructed in March 2006 to effectively survey the project site for MGS presence (Figure 2). A parallel trapping survey was conducted also on two grids established west of our Grid 1 by biologists from EREMICO Biological Services of Onyx, California.

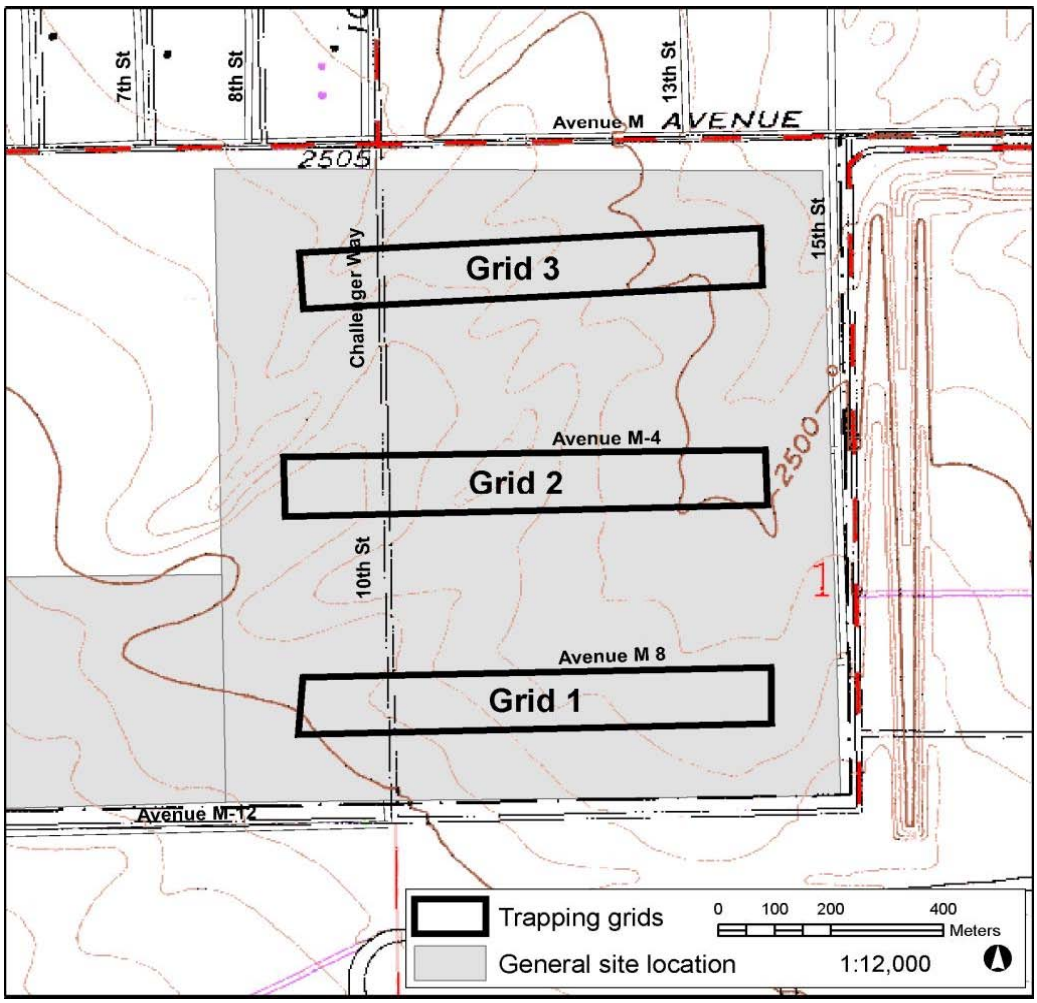

Figure 2. Locations of Mohave ground squirrel survey grids in Palmdale, California, trapped March/April, May, and June/July 2006 by the CSU Stanislaus—Endangered Species Recovery Program.

The project site contains vegetation elements characteristic of the Mojavean plant community, with elements of Creosote bush scrub, Saltbush scrub and Joshua-tree woodland represented throughout the site. Dominant perennial plant species include creosote bush (*Larrea tridentata*), all-scale (*Atriplex polycarpa*), burro bush (*Hymenoclea salsola*), Joshua tree (*Yucca brevifolia*), silver cholla *(Opuntia echinocarpa*), Nevada ephedra (*Ephedra nevadensis*), rabbit brush

[3] *California Department of Fish and Game Mohave Ground Squirrel Survey Guidelines* (January 2003) If no MGS are captured between March 15 and April 30, 2006 (Session I), the process is to be repeated in May 2006 (Session II), and, if necessary, between June 15 and July 15, 2006 (Session III).

(*Chrysothamnus nauseosus*), hop sage (*Grayia spinosa*), eastern Mojave buckwheat (*Eriogonum fasciculatum*), and winterfat (*Krascheninnikovia lanata*).

Trapping Sessions were conducted over 3 sessions between March 16 and April 8 (Session I); May 1 and 28 (Session II); and June 19 and July 14, 2006 (Session III). Trapping was mainly conducted by Darren Newman, although Patrick Kelly assisted in trapping Grid 1 during Session I. Trapping was performed during daylight hours and other conditions in accordance with the CDFG Mohave ground squirrel survey protocol. During Session I, inclement weather interrupted trapping for half of one day while trapping Grid 1, for one day while trapping Grid 2, and for three days while trapping Grid 3. High winds prevented trapping for one day during Session II.

No Mohave ground squirrels were captured or observed during the survey. Eight other species were captured and all were released unharmed at their points of capture (Appendix B, Appendix D). Only antelope ground squirrels (*Ammospermophilus leucurus*), California ground squirrels (*Spermophilus beechyi*) and desert cottontails (*Sylvilagus audubonii*) were captured frequently. In addition, 35 species of wildlife were observed incidental to trapping (Appendix C, Appendix D).

APPENDIX A. GENERAL HABITAT PHOTOS

Looking west over Grid 1 (14 July 2006)

Looking east over Grid 1 (14 July 2006)

Looking west over Grid 2 (14 July 2006)

Looking east over Grid 2 (14 July 2006)

Looking west over Grid 3 (14 July 2006)

Looking east over Grid 3 (14 July 2006)

APPENDIX B. WILDLIFE SPECIES CAPTURED

Captures of non-target species during MGS trapping surveys in Palmdale, California, in March/April, May, and June/July 2006; includes recaptures since animals were not individually marked. Species codes: SYAU = desert cottontail (*Sylvilagus audubonii*), LECA = black-tailed hare (*Lepus californicus*), AMLE = Antelope ground squirrel (*Ammospermophilus leucurus*); SPBE = California ground squirrel (*Spermophilus beecheyi*); DIPA = Panamint kangaroo rat (*Dipodomys panamintinus*); NELE = desert woodrat (*Neotoma lepida*); CAWR = cactus wren (*Campylorhynchus brunneicapillus*), EUST = European starling (*Sturnis vulgaris*).

			Species Captured							
Trapping Session	**Grid**	**Date**	**SYAU**	**LECA**	**AMLE**	**SPBE**	**DIPA**	**NELE**	**CAWR**	**EUST**
Session I	Grid 1	16-Mar	-	-	38	-	-	-	-	-
Session I	Grid 1	17-Mar	-	-	45	-	-	-	-	-
Session I	Grid 1	18-Mar	-	-	18	-	-	-	-	-
Session I	Grid 1	19-Mar	-	-	59	-	-	-	-	-
Session I	Grid 1	20-Mar	-	-	72	-	1	-	1	-
Session I	Grid 1	21-Mar	-	-	34	-	-	-	2	-
Session I	Grid 1	**Subtotal**	0	0	266	0	1	0	3	0
Session I	Grid 2	24-Mar	-	-	71	-	-	-	-	-
Session I	Grid 2	25-Mar	-	-	54	1	-	-	-	-
Session I	Grid 2	26-Mar	-	-	118	2	-	-	-	-
Session I	Grid 2	27-Mar	-	-	126	1	-	-	1	-
Session I	Grid 2	29-Mar	-	-	131	2	-	1	-	-
Session I	Grid 2	**Subtotal**	0	0	500	6	0	1	1	0
Session I	Grid 3	1-Apr	-	-	35	1	-	-	-	-
Session I	Grid 3	2-Apr	-	-	79	-	-	-	-	-
Session I	Grid 3	3-Apr	-	-	74	2	-	-	-	-
Session I	Grid 3	7-Apr	-	-	95	3	-	-	1	-
Session I	Grid 3	8-Apr	-	-	104	1	-	-	-	-
Session I	Grid 3	**Subtotal**	0	0	387	7	0	0	1	0
Session I	**Grids 1-3**	**Total**	**0**	**0**	**1153**	**13**	**1**	**1**	**5**	**0**
Session II	Grid 1	1-May	-	-	10	-	-	-	-	-
Session II	Grid 1	2-May	-	-	52	-	-	-	-	1
Session II	Grid 1	3-May	-	-	37	-	-	-	-	-
Session II	Grid 1	4-May	-	-	38	-	-	-	1	-
Session II	Grid 1	5-May	-	-	36	-	-	-	-	1
Session II	Grid 1	**Subtotal**	0	0	173	0	0	0	1	2
Session II	Grid 2	8-May	-	-	8	-	-	-	-	-
Session II	Grid 2	9-May	-	-	45	1	-	-	-	-
Session II	Grid 2	10-May	2	-	36	1	-	-	-	-
Session II	Grid 2	11-May	1	-	27	1	-	-	2	-
Session II	Grid 2	12-May	-	-	26	2	-	-	1	-
Session II	Grid 2	**Subtotal**	3	0	142	5	0	0	3	0

			Species Captured							
Trapping Session	**Grid**	**Date**	**SYAU**	**LECA**	**AMLE**	**SPBE**	**DIPA**	**NELE**	**CAWR**	**EUST**
Session II	Grid 3	23-May	2	-	52	1	1	1	-	-
Session II	Grid 3	24-May	1	-	60	2	-	-	-	-
Session II	Grid 3	25-May	2	-	67	5	-	1	-	-
Session II	Grid 3	26-May	5	-	76	3	1	-	-	-
Session II	Grid 3	27-May	-	-	2	-	-	-	-	-
Session II	Grid 3	28-May	5	1	72	5	-	6	-	-
Session II	Grid 3	**Subtotal**	15	1	329	16	2	8	0	0
Session II	**Grids 1-3**	**Total**	**18**	**1**	**644**	**21**	**2**	**8**	**4**	**2**
Session III	Grid 1	19-Jun	-	-	26	-	-	-	-	-
Session III	Grid 1	20-Jun	1	-	49	1	-	1	-	-
Session III	Grid 1	21-Jun	1	-	52	2	-	-	-	-
Session III	Grid 1	22-Jun	1	-	51	2	-	-	-	-
Session III	Grid 1	23-Jun	-	-	47	2	-	-	1	-
Session III	Grid 1	**Subtotal**	3	0	225	7	0	1	1	0
Session III	Grid 2	27-Jun	4	-	72	-	-	-	-	-
Session III	Grid 2	28-Jun	-	-	59	1	-	-	2	-
Session III	Grid 2	29-Jun	-	-	45	2	-	-	-	-
Session III	Grid 2	30-Jun	-	-	63	1	-	-	1	-
Session III	Grid 2	1-Jul	1	-	62	-	-	-	-	-
Session III	Grid 2	**Subtotal**	5	0	301	4	0	0	3	0
Session III	Grid 3	10-Jul	2	-	35	-	-	-	-	-
Session III	Grid 3	11-Jul	-	-	51	1	-	-	1	-
Session III	Grid 3	12-Jul	2	-	56	-	-	-	1	-
Session III	Grid 3	13-Jul	1	-	47	-	-	1	1	-
Session III	Grid 3	14-Jul	-	-	48	1	-	1	-	-
Session III	Grid 3	**Subtotal**	5	0	237	2	0	2	3	0
Session III	**Grids 1-3**	**Total**	**13**	**0**	**763**	**13**	**0**	**3**	**7**	**0**
Sessions I-III	**Grids 1-3**	**Grand Total**	**31**	**1**	**2560**	**47**	**3**	**12**	**16**	**2**

APPENDIX C. INCIDENTAL WILDLIFE SPECIES OBSERVED

Scientific name	Common name
Accipiter striatus	Sharp-shinned hawk
Aimophila ruficeps	Rufous-crowned sparrow
Anas platyrhynchos	Mallard
Anthus rubescens	American pipit
Aphelocoma californica	Western scrubjay
Baeolophus ridgwayi	Juniper titmouse
Buteo jamaicensis	Red-tailed hawk
Buteo regalis	Ferruginous hawk
Callipepla californica	California quail
Campylorhynchus brunneicapillus	Cactus wren
Canis latrans	Coyote
Carpodacus mexicanus	House finch
Circus cyaneus	Northern harrier
Cnemidopherus tigris	Western whiptail
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
Dipodomys panamintinus	Panamint kangaroo rat
Elgaria multicarinata	Southern alligator lizard
Eremophila alpestris	Horned lark
Falco sparverius	American kestrel
Gambelia wislizenii	Long-nosed leopard lizard
Lanius ludovicianus [1]	Loggerhead shrike
Lepus californicus	Black-tailed hare
Masticophis flagellum	Coachwhip
Mimus polyglottis	Mockingbird
Oreoscoptes montanus	Sage thrasher
Passerculus sandwichensis	Savannah sparrow
Pituophis catenifer	Gopher snake
Polioptila caerulea	Blue-gray gnatcatcher
Sceloperous magister	Desert spiny lizard
Sialia currucoides	Mountain bluebird
Sialia mexicana	Western bluebird
Spizella atrogularis	Black-chinned sparrow
Sturnella neglecta	Western meadowlark
Zenaida macroura	Mourning dove

[1] Listed as a California species of special concern

APPENDIX D. PHOTOS OF WILDLIFE CAPTURED OR OBSERVED

Antelope ground squirrel (*Ammospermophilus leucurus*), 3 Apr 2006

Cactus wren (*Campylorhynchus brunneicapillus*), 21 Mar 2006

Desert woodrat (*Neotoma lepida*), 29 Mar 2006

California ground squirrel (*Spermophilus beecheyi*), 3 Apr 2006

Coachwhip (*Masticophis flagellum*), 29 March 2006

APPENDIX 3

REPRESENTATIVE SITE PHOTOS FOR THE PHPP

Photograph 1. Mojave Creosote Bush Scrub

Photograph 2. Joshua Tree Woodland

Photograph 3. Desert Saltbush Scrub

Photograph 4. Rabbitbrush Scrub

Photograph 5. Mojavean Juniper Woodland and Scrub

Photograph 6. Mojave Riparian Forest

Photograph 7. Mojave Desert Wash Scrub (light strip in background)

Photograph 8. Fallow Agricultural Land

Photograph 9. Disturbed Land (trash dump)

Photograph 10. Class 5 burrow located on 3,960' ZOI west of Power Plant site

Photograph 11. Class 5 burrow located on 3,960’ ZOI west of Power Plant site

APPENDIX 4

OBSERVED PLANT SPECIES LIST FOR THE PHPP

APPENDIX 4

Vascular Plants Observed on the Palmdale Hybrid Power Plant Project Sites
Los Angeles County, California

This list reports only the plants observed on this site by this study. Other species may have been overlooked or undetectable due to their growing season. Plants were identified from keys, descriptions and drawings in Hickman (ed.) 1993. Some specimens were identified or confirmed by Andrew C. Sanders (University of California Riverside Herbarium). Unless noted otherwise, nomenclature and systematics follow Hickman (ed.) 1993.

SYMBOLS AND ABBREVIATIONS:

* Non-native (introduced) species
** Special-Status species (see text).
cf. Uncertain identification, but plant specimen "compares favorably" to named species
sp. Identified only to genus; species unknown (plural = spp.)

GYMNOSPERMS	
Cupressaceae	**Cypress Family**
Cupressus sp.	Cypress
Juniperus californica	California Juniper
Ephedraceae	**Ephedra Family**
Ephedra nevadensis	Nevada joint fir
DICOTS	
Apiaceae	**Carrot Family**
Lomatium mohavense	Mojave Lomatium
Asclepiadaceae	**Milkweed Family**
Asclepias vestita	Woolly Milkweed
Asteraceae	**Sunflower Family**
Ambrosia acanthicarpa	Annual Bursage
Ambrosia dumosa	White Bursage
Amphipappus fremontii	Chaff-bush
Anisocoma acaulis	Scale Bud
Artemisia tridentata	Big Sagebrush
Baccharis salicifolia	Mule Fat
Chaenactis fremontii	Desert Pincushion
Chrysothamnus nauseosus	Rubber Rabbitbrush
Coreopsis bigelovii	Bigelow’s Tickseed
Encelia actoni	Acton Encelia
Ericameria cooperi	Cooper’s Goldenbush
Ericameria linearifolia	Interior Goldenbush
Eriophyllum ambiguum	Beautiful Woolly Sunflower

Eriophyllum pringlei	Pringle's Woolly Sunflower
Eriophyllum wallacei	Wallace's Woolly Sunflower
Filago depressa	Dwarf Cottonrose
Gutierrezia sp.	Snakeweed, Matchweed
Hymenoclea salsola	Cheesebush
Lasthenia californica	California Goldfields
Layia glandulosa	White Layia
Layia platyglossa	Tidy-tips
Lessingia sp.	Lessingia
Malacothrix glabrata	Desert Dandelion
Nicolletia occidentalis	Mojave Hole-in-the-sand Plant
Psilostrophe cooperi	Paper-daisy
Rafinesquia neomexicana	Desert Chicory
Stephanomeria exigua	Small Wire-lettuce
Syntrichopappus fremontii	Fremont's Syntrichopappus
Tetradymia axillaris var. *longispina*	Longspine Cotton-thorn
Tetradymia glabrata	Littleleaf Cotton-thorn
Xylorhiza tortifolia var. *tortifolia*	Mojave-aster
Boraginaceae	**Borage Family**
Amsinckia menziesii var. *menziesii*	Rancher's Fireweed
Amsinckia tessellata	Devil's Lettuce
Cryptantha cf. *barbigera*	Bearded Cryptantha
Cryptantha circumscissa	Cushion Cryptantha
Cryptantha dumetorum	Bushloving Cryptantha
Cryptantha micrantha	Purple-root Cryptantha
Cryptantha sp.	Cryptantha
Pectocarya penicillata	Sleeping Combseed
Pectocarya recurvata	Curvenut Combseed
Pectocarya setosa	Moth Combseed
Plagiobothrys arizonicus	Arizona Popcornflower
Tiquilia plicata	Fanleaf Crinklemat
Brassicaceae	**Mustard Family**
**Brassica tournefortii*	Sahara Mustard
Descurainia pinnata	Western Tansy Mustard
Guillenia lasiophylla	California Mustard
**Hirschfeldia incana*	Shortpod Mustard
Lepidium flavum	Yellow Peppergrass
Lepidium fremontii	Desert Peppergrass
**Sisymbrium orientale*	Indian Hedge Mustard
Stanleya pinnata	Prince's Plume
Tropidocarpum gracile	Dobie Pod
Cactaceae	**Cactus Family**
Cylindropuntia echinocarpa	Golden Cholla
Opuntia basilaris	Beavertail Cactus
Caprifoliaceae	**Honeysuckle Family**
Sambucus mexicana	Blue Elderberry

Chenopodiaceae	**Goosefoot Family**
Atriplex canescens	Four-winged Saltbush
Atriplex phyllostegia	Arrowscale
Atriplex polycarpa	Allscale
Grayia spinosa	Spiny Hop-sage
Krascheninnikovia lanata	Winter Fat
**Salsola tragus*	Russian Thistle
Crassulaceae	**Stonecrop Family**
Dudleya saxosa	Panamint Liveforever
Cucurbitaceae	**Gourd Family**
Brandegea bigelovii	Desert Starvine
Cuscutaceae	**Dodder Family**
Cuscuta sp.	Dodder
Ericaceae	**Heath Family**
Arctostaphylos sp.	Manzanita
Euphorbiaceae	**Spurge Family**
Chamaesyce albomarginata	Rattlesnake Weed
Croton californicus	California Croton
Stillingia paucidentata	Mojave Toothleaf
Fabaceae	**Legume Family**
Astragalus layneae	Layne's Milkvetch
Astragalus lentiginosus	Freckled Milkvetch
Lupinus concinnus	Bajada Lupine
Lupinus odoratus	Mojave Lupine
Senna armata	Spiny Senna
Trifolium albopurpureum	Rancheria Clover
Fagaceae	**Oak Family**
Quercus john-tuckeri	Tucker's Oak
Geraniaceae	**Geranium Family**
**Erodium cicutarium*	Red-stemmed Filaree
Hydrophyllaceae	**Waterleaf Family**
Emmenanthe penduliflora	Whispering Bells
Nama demissum	Purple Mat
Phacelia crenulata	Notch-leaved Phacelia
Phacelia distans	Wild Heliotrope
Phacelia fremontii	Fremont's Phacelia
Lamiaceae	**Mint Family**
Monardella exilis	Mojave Monardella
Salazaria mexicana	Bladder Sage
Salvia carduacea	Thistle Sage
Salvia columbariae	Chia

Salvia dorrii	Purple Sage
Loasaceae	**Loasa Family**
Mentzelia albicaulis	White Stemmed Blazing Star
Malvaceae	**Mallow Family**
Eremalche exilis	White Mallow
Sphaeralcea ambigua	Apricot Mallow
Nyctaginaceae	**Four O'Clock Family**
Abronia pogonantha	Mojave Sand Verbena
Abronia villosa	Desert Sand Verbena
Allionia incarnata	Windmills
Mirabilis bigelovii (*laevis*)	Desert Wishbone Bush
Oleaceae	**Olive Family**
Fraxinus velutina	Velvet Ash
**Olea europaea*	Olive Tree
Onagraceae	**Evening Primrose Family**
Camissonia boothii	Booth's Evening Primrose
Camissonia campestris	Mojave Sun Cup
Camissonia claviformis	Brown-eyed Primrose
Camissonia pallida	Paleyellow Sun Cup
Camissonia palmeri	Palmer Evening Primrose
Oenothera californica	California Evening Primrose
Oenothera deltoides	Devil's Lantern
Papaveraceae	**Poppy Family**
Eschscholzia californica	California Poppy
Eschscholzia minutiflora	Pygmy Poppy
Platystemon californicus	Cream Cups
Polemoniaceae	**Phlox Family**
Eriastrum densifolium	Giant Woollystar
Eriastrum sp.	Eriastrum
Gilia latiflora	Broad-flowered Gilia
Gilia sp.	Gilia
Linanthus aureus	Golden Desert-trumpets
Linanthus parryae	Parry's Linanthus
Loeseliastrum matthewsii	Desert Calico
Polygonaceae	**Buckwheat Family**
Centrostegia thurberi	Thurber's Spineflower
Chorizanthe brevicornu	Brittle Spineflower
Chorizanthe rigida	Spiny-herb
Eriogonum fasciculatum	California Buckwheat
Eriogonum inflatum	Desert Trumpet
Eriogonum cf. *maculatum*	Spotted Buckwheat
Eriogonum palmerianum	Palmer's Buckwheat
Eriogonum plumatella	Flat-topped Buckwheat

Eriogonum sp.	Buckwheat
Eriogonum cf. *viridescens*	Two-tooth Buckwheat
Oxytheca perfoliata	Roundleaf Puncturebract
Rumex hymenosepalus	Wild-rhubarb
Portulacaceae	**Purslane Family**
Calandrinia ciliata	Red Maids
Calyptridium monandrum	Sand Cress
Claytonia perfoliata	Miner's Lettuce
Rosaceae	**Rose Family**
Purshia stansburiana	Stansbury Cliffrose
Salicaceae	**Willow Family**
Populus fremontii	Fremont Cottonwood
Salix sp.	Willow
Scrophulariaceae	**Figwort Family**
Castilleja angustifolia	Desert Indian Paintbrush
Castilleja exserta	Purple Owl's-clover
Collinsia bartsiifolia	Chinese Houses
Mimulus bigelovii	Bigelow's Monkeyflower
Penstemon utahensis	Utah Penstemon
Solanaceae	**Nightshade Family**
Datura wrightii	Jimson Weed
Lycium andersonii	Anderson Box Thorn
Lycium cooperi	Cooper's Box Thorn
Tamaricaceae	**Tamarisk Family**
**Tamarix ramosissima*	Salt Cedar
Zygophyllaceae	**Caltrop Family**
Larrea tridentata	Creosote Bush
MONOCOTS	
Liliaceae	**Lily Family**
Agave sp.	Agave
Allium fimbriatum	Fringed Onion
Calochortus kennedyi	Desert Mariposa Lily
Dichelostemma capitatum	Blue Dicks
Muilla coronata	Crowned Muilla
Yucca brevifolia	Joshua Tree
Yucca schidigera	Mohave Yucca
Yucca whipplei	Our Lord's Candle
Zigadenus brevibracteatus	Desert Death Camas
Poaceae	**Grass Family**
Achnatherum hymenoides	Indian Ricegrass
Achnatherum speciosum	Desert Needlegrass
**Bromus madritensis* ssp. *rubens*	Red Brome

**Bromus tectorum*	Cheat Grass
Distichlis spicata	Saltgrass
**Hordeum murinum* ssp. *leporinum*	Hare Barley
**Schismus barbatus*	Mediterranean Grass
Vulpia octoflora	Six Weeks Fescue

APPENDIX 5

OBSERVED VERTEBRATE SPECIES LIST FOR THE PHPP

APPENDIX 5

Vertebrates Observed on the Palmdale Hybrid Power Plant Project Sites
Los Angeles County, California

This list reports only animals or their sign observed on the site by this study. Other species may have been overlooked or undetectable due to their nocturnal, subterranean, and/or migratory activity patterns. Nomenclature and taxonomy for fauna observed on site generally follows the American Ornithologists' Union Checklist and its supplements (1998) for avifauna, and CDFG (2006) for herpetofauna and mammals.

SYMBOLS AND ABBREVIATIONS:

*	Non-native (introduced) species
**	Special-Status Species species (see text)
sp.	Identified only to genus; species unknown (plural = spp.)

REPTILIA	**REPTILES**
Iguanidae	**Iguanids**
Dipsosaurus dorsalis	Desert Iguana
Crotaphytidae	**Collared and Leopard Lizards**
Gambelia wislizenii	Long-nosed Leopard Lizard
Phrynosomatidae	**Zebra-tailed, Earless, Fringe-toed, Spiny, Tree, Side-blotched, and Horned Lizards**
Sceloporus magister	Desert Spiny Lizard
Sceloporus occidentalis	Western Fence Lizard
Uta stansburiana	Side-blotched Lizard
Phrynosoma platyrhinos	Desert Horned Lizard
Xantusiidae	**Night Lizards**
Xantusia vigilis	Desert Night Lizard
Teiidae	**Whiptails, Allies**
Aspidoscelis tigris	Western Whiptail
Colubridae	**Colubrids**
Masticophis flagellum	Coachwhip
Pituophis catenifer	Gopher Snake
Viperidae	**Vipers**
Crotalus scutulatus	Mojave Rattlesnake
AVES	**BIRDS**

Anatidae	**Ducks, Geese, Swans**
Anas platyrhynchos	Mallard
Odontophoridae	**New World Quail**
Callipepla gambelii	Gambel's quail
Callipepla californica	California Quail
Cathartidae	**New World Vultures**
Cathartes aura	Turkey Vulture
Accipitridae	**Hawks, Kites, Eagles, Allies**
***Accipter cooperii*	Cooper's Hawk
Buteo jamaicensis	Red-tailed Hawk
***Buteo regalis*	Ferruginous Hawk
Falconidae	**Caracaras, Falcons**
Falco sparverius	American Kestrel
Charadriidae	**Lapwings, Plovers**
Charadrius vociferus	Killdeer
Scolopacidae	**Sandpipers, Phalaropes, Allies**
Calidris mauri	Western Sandpiper
Gallinago delicata	Wilson's Snipe
Laridae	**Gulls, Terns, Skimmers**
Larus californicus	California Gull
Columbidae	**Pigeons, Doves**
Columba livia	Rock Pigeon
Zenaida macroura	Mourning Dove
Strigidae	**Typical Owls**
Bubo virginianus	Great Horned Owl
***Athene cunicularia*	Burrowing Owl
Caprimulgidae	**Goatsuckers**
Chordeiles acutipennis	Lesser Nighthawk
Apodidae	**Swifts**
***Chaetura vauxi*	Vaux's Swift
Trochilidae	**Hummingbirds**
Archilochus alexandri	Black-chinned Hummingbird
Calypte anna	Anna's Hummingbird

Alcedinidae	**Kingfishers**
Ceryle alcyon	Belted Kingfisher
Picidae	**Woodpeckers, Allies**
Picoides scalaris	Ladder-backed Woodpecker
Tyrannidae	**Tyrant Flycatchers**
Sayornis saya	Say's Phoebe
Myiarchus cinerascens	Ash-throated Flycatcher
Tyrannus verticalis	Western Kingbird
Laniidae	**Shrikes**
***Lanius ludovicianus*	Loggerhead Shrike
Corvidae	**Crows, Jays**
Aphelocoma californica	Western Scrub-Jay
Corvus corax	Common Raven
Alaudidae	**Larks**
Eremophila alpestris	Horned Lark
Hirundinidae	**Swallows**
Tachycineta thalassina	Violet-green Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Hirundo rustica	Barn Swallow
Remizidae	**Penduline Tits, Verdins**
Auriparus flaviceps	Verdin
Troglodytidae	**Wrens**
Thryomanes bewickii	Bewick's Wren
Campylorhynchus brunneicapillus	Cactus Wren
Salpinctes obsoletus	Rock Wren
Mimidae	**Mockingbirds, Thrashers**
Mimus polyglottos	Northern Mockingbird
Toxostoma redivivum	California Thrasher
***Toxostoma lecontei*	Le Conte's Thrasher
Sturnidae	**Starlings**
Sturnus vulgaris	European Starling
Ptilogonatidae	**Silky-flycatchers**
Phainopepla nitens	Phainopepla

Parulidae	**Wood-Warblers**
Vermivora celata	Orange-crowned Warbler
Dendroica coronata	Yellow-rumped Warbler
Dendroica occidentalis	Hermit Warbler
Wilsonia pusillla	Wilson's Warbler
Thraupidae	**Tanagers**
Piranga ludoviciana	Western Tanager
Emberizidae	**Emberizids**
Pipilo crissalis	California Towhee
Pipilo maculates	Spotted Towhee
Spizella breweri	Brewer's Sparrow
Chondestes grammacus	Lark Sparrow
Amphispiza bilineata	Black-throated Sparrow
Amphispiza belli	Sage Sparrow
Passerculus sandwichensis	Savannah Sparrow
Zonotrichia leucophrys	White-crowned Sparrow
Cardinalidae	**Cardinals, Saltators, Allies**
Pheucticus melanocephalus	Black-headed Grosbeak
Icteridae	**Blackbirds and Allies**
Sturnella neglecta	Western Meadowlark
Agelaius phoeniceus	Red-winged Blackbird
Quiscalus mexicanus	Great-tailed Grackle
Euphagus cyanocephalus	Brewer's Blackbird
Icterus bullockii	Bullock's Oriole
Icterus parisorum	Scott's Oriole
Fringillidae	**Fringilline and Cardueline Finches, Allies**
Carpodacus mexicanus	House Finch
Carduelis tristis	American Goldfinch
Carduelis psaltria	Lesser Goldfinch
Passeridae	**Old World Sparrows**
Passer domesticus	House Sparrow
MAMMALIA	**MAMMALS**
Leporidae	**Rabbits, Hares**
Sylvilagus audubonii	Desert Cottontail
Lepus californicus	Black-tailed Jackrabbit
Sciuridae	**Squirrels**
Ammospermophilus leucurus	White-tailed Antelope Squirrel
Spermophilus beecheyi	California Ground Squirrel

Muridae	**Rats, Mice, Voles**
Neotoma lepida	Desert Woodrat
Canidae	**Wolves, Foxes, Coyote**
Canis familiaris	Domestic Dog
Canis latrans	Coyote
Vulpes macrotis	Kit Fox
Felidae	**Cats**
Lynx rufus	Bobcat
Bovidae	**Goats, Sheep, Cattle**
Ovis aries	Domestic Sheep

APPENDIX 6

CNDDB REPORT FOR 10-MILE RADIUS AROUND THE PHPP

Accipiter cooperii

Cooper's hawk

Element Code: ABNKC12040

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G5	**CDFG Status:**	
State:	None	**State:**	S3		

Habitat Associations

General: WOODLAND, CHIEFLY OF OPEN, INTERRUPTED OR MARGINAL TYPE.

Micro: NEST SITES MAINLY IN RIPARIAN GROWTHS OF DECIDUOUS TREES, AS IN CANYON BOTTOMS ON RIVER FLOOD-PLAINS; ALSO, LIVE OAKS.

Occurrence No. 35 **Map Index:** 02212 **EO Index:** 27351

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1921-01-06
Site: 1921-01-06
Record Last Updated: 1989-08-10

Quad Summary: Palmdale (3411851/161D)
County Summary: Los Angeles

Lat/Long: 34.58637º / -118.11591º
UTM: Zone-11 N3827740 E397658
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 12W
Section: 26 **Qtr:** E
Meridian: S
Elevation: 2,650 ft

Location: PALMDALE.
Location Detail:
Ecological:
Threat:
General: UCLA #J24.
Owner/Manager: UNKNOWN

Actinemys marmorata pallida

southwestern pond turtle

Element Code: ARAAD02032

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G3G4T2T	**CDFG Status:**	SC
State:	None	**State:**	3Q S2		

Habitat Associations

General: INHABITS PERMANENT OR NEARLY PERMANENT BODIES OF WATER IN MANY HABITAT TYPES; BELOW 6000 FT ELEV.

Micro: REQUIRE BASKING SITES SUCH AS PARTIALLY SUBMERGED LOGS, VEGETATION MATS, OR OPEN MUD BANKS. NEED SUITABLE NESTING SITES.

* SENSITIVE *

Occurrence No. 149 **Map Index:** 17287 **EO Index:** 9696

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-09-15
Site: 1999-09-15

Record Last Updated: 2000-01-18

Quad Summary: Ritter Ridge (3411852/161C), Sleepy Valley (3411853/162D)

County Summary: Los Angeles

* SENSITIVE *

Lat/Long:		**Township:**	
UTM:		**Range:**	
Mapping Precision:		**Section:**	**Qtr:**
Symbol Type:		**Meridian:**	
Radius:		**Elevation:**	

Location: *SENSITIVE* Location information suppressed.

Location Detail: Please contact the California Natural Diversity Database, California Department of Fish and Game, for more information:
(916) 324-3812.

Ecological: HABITAT CONSISTS OF RIPARIAN; CREEK CONTAINS SMALL PONDED AREAS OF WATER. THE MAIN POOL IS LOCATED NEXT TO THE ROADWAY WHERE IT CROSSES BENEATH THE ROAD. THIS AREA CONTAINS SMALL REEDS BUT NO TREES.

Threat: POSSIBLE THREAT OF DEVELOPMENT AND HUMAN DISTURBANCE DUE TO THE POOL'S PROXIMITY TO THE ROADWAY.
General:

Owner/Manager:

Actinemys marmorata pallida

southwestern pond turtle

Element Code: ARAAD02032

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3G4T2T
State: 3Q
S2

Other Lists

CDFG Status: SC

Habitat Associations

General: INHABITS PERMANENT OR NEARLY PERMANENT BODIES OF WATER IN MANY HABITAT TYPES; BELOW 6000 FT ELEV.

Micro: REQUIRE BASKING SITES SUCH AS PARTIALLY SUBMERGED LOGS, VEGETATION MATS, OR OPEN MUD BANKS. NEED SUITABLE NESTING SITES.

* SENSITIVE *

Occurrence No. 284 **Map Index:** 33483 **EO Index:** 31714

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1995-06-XX
Site: 1995-06-XX

Record Last Updated: 1997-09-15

Quad Summary: Ritter Ridge (3411852/161C)

County Summary: Los Angeles

* SENSITIVE *

Lat/Long: 34.59663º / -118.23072º
UTM: Zone-11 N3829000 E387143
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 06N
Range: 13W
Section: 23 **Qtr:** NW
Meridian: M
Elevation: 2,020 ft

Location: *SENSITIVE* Location information suppressed.

Location Detail: Please contact the California Natural Diversity Database, California Department of Fish and Game, for more information:
(916) 324-3812.

Ecological: HABITAT CONSISTS OF AN INTERMITTENT CREEK WITH AREAS OF DENSE RIPARIAN, PRIMARILY WILLOW AND COTTONWOOD. THAMNOPHIS HAMMONDII ALSO FOUND AT THIS SITE.

Threat: THREATENED BY FLOOD CONTROL MEASURES.

General:

Owner/Manager:

Agelaius tricolor

tricolored blackbird

Element Code: ABPBXB0020

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2G3	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: HIGHLY COLONIAL SPECIES, MOST NUMBEROUS IN CENTRAL VALLEY & VICINITY. LARGELY ENDEMIC TO CALIFORNIA.

Micro: REQUIRES OPEN WATER, PROTECTED NESTING SUBSTRATE, & FORAGING AREA WITH INSECT PREY WITHIN A FEW KM OF THE COLONY.

Occurrence No. 401 **Map Index:** 55406 **EO Index:** 55406

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-04-27
Site: 1994-04-27

Record Last Updated: 2004-05-10

Quad Summary: Palmdale (3411851/161D), Ritter Ridge (3411852/161C)

County Summary: Los Angeles

Lat/Long: 34.55143º / -118.12102º
UTM: Zone-11 N3823871 E397147
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 05N
Range: 12W
Section: 03 **Qtr:** XX
Meridian: S
Elevation: 2,815 ft

Location: LAKE PALMDALE, ABOUT 1.5 MILES SOUTH OF PALMDALE. SOUTHEAST OF HWY 14 INTERSECTION WITH AVENUE S.

Location Detail: PRIVATE HUNTING CLUB.

Ecological:

Threat:

General: 20 BIRDS NESTING IN 1994. COLONY WAS LARGER IN PAST YEARS. GREAT-TAILED GRACKLE AND YELLOW-HEADED BLACKBIRD POPULATIONS INCREASING.

Owner/Manager: PVT

Anniella pulchra pulchra

silvery legless lizard

Element Code: ARACC01012

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3G4T3T
State: 4Q
S3

Other Lists

CDFG Status: SC

Habitat Associations

General: SANDY OR LOOSE LOAMY SOILS UNDER SPARSE VEGETATION.

Micro: SOIL MOISTURE IS ESSENTIAL. THEY PREFER SOILS WITH A HIGH MOISTURE CONTENT.

Occurrence No. 4 **Map Index:** 36347 **EO Index:** 31344

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1995-05-XX
Site: 1995-05-XX

Record Last Updated: 1997-08-12

Quad Summary: Ritter Ridge (3411852/161C)

County Summary: Los Angeles

Lat/Long: 34.59403º / -118.21813º
UTM: Zone-11 N3828698 E388294
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 06N
Range: 13W
Section: 23 **Qtr:** SE
Meridian: S
Elevation: 2,880 ft

Location: LEONA VALLEY, 5 AIR MILES WEST OF PALMDALE ALONG ELIZABETH LAKE PINE CANYON ROAD.

Location Detail: AMARGOSA CREEK, SANDY AREAS IN AND AROUND RIPARIAN.

Ecological: INTERMITTENT CREEK WITH AREAS OF DENSE RIPARIAN VEGETATION, PRIMARILY WILLOW AND COTTONWOOD AND OPEN SANDY BANKS WITH PATCHY SHRUB COVER.

Threat: FLOOD CONTROL MEASURES.

General: ONE ADULT FOUND DEAD IN CREEK (1995). ELEVATION WAS GIVEN AS 2020 FEET BUT THE POINT MAPPED WAS AT 2880 FEET.

Owner/Manager: PVT

Anniella pulchra pulchra

silvery legless lizard

Element Code: ARACC01012

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3G4T3T
State: 4Q
S3

Other Lists

CDFG Status: SC

Habitat Associations

General: SANDY OR LOOSE LOAMY SOILS UNDER SPARSE VEGETATION.

Micro: SOIL MOISTURE IS ESSENTIAL. THEY PREFER SOILS WITH A HIGH MOISTURE CONTENT.

Occurrence No. 8 **Map Index:** 38704 **EO Index:** 33711

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1988-03-28
Site: 1988-03-28

Record Last Updated: 1998-05-05

Quad Summary: Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.64328º / -118.16114º
UTM: Zone-11 N3834098 E393583
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 06N
Range: 12W
Section: 04 **Qtr:** XX
Meridian: S
Elevation: 2,530 ft

Location: 6.4 KILOMETERS SSW OF LANCASTER (LOCATION DISTANCE TAKEN FROM LANCASTER POST OFFICE), NOT ABLE TO DETERMINE ACTUAL SITE.

Location Detail: LOCATION MAPPED AS A 1 MILE CIRCLE DUE TO NON-SPECIFIC DIRECTIONS.

Ecological:

Threat:

General: ID VERIFIED BY LAWRENCE E. HUNT, SPECIMENS IN SANTA BARBARA VERTEBRATE MUSEUM (UCSBVM 21272-21274). PREVIOUSLY NOT KNOWN FROM DESERT FLOOR OF ANTELOPE VALLEY. PROBABLY REPRESENTS EASTERN LIMIT OF SPECIES, LIMITING CLIMATIC CONDITIONS.

Owner/Manager: UNKNOWN

Anniella pulchra pulchra

silvery legless lizard

Element Code: ARACC01012

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3G4T3T
State: 4Q
S3

Other Lists

CDFG Status: SC

Habitat Associations

General: SANDY OR LOOSE LOAMY SOILS UNDER SPARSE VEGETATION.

Micro: SOIL MOISTURE IS ESSENTIAL. THEY PREFER SOILS WITH A HIGH MOISTURE CONTENT.

Occurrence No. 9 **Map Index:** 38705 **EO Index:** 33712

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1988-01-22
Site: 1988-01-22

Record Last Updated: 1998-05-05

Quad Summary: Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.69822º / -118.21855º
UTM: Zone-11 N3840253 E388395
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 07N
Range: 13W
Section: 13 **Qtr:** XX
Meridian: S
Elevation: 2,345 ft

Location: 7.2 KILOMETERS W OF LANCASTER, MIRA LOMA DETENTION FACILITY (LOCATION DISTANCE MEASURED FROM LANCASTER POST OFFICE).

Location Detail: LOCATION MAPPED AS A 1 MILE CIRCLE DUE TO NON-SPECIFIC DIRECTIONS, UNCERTAIN IF SPECIMEN WAS FOUND IN THE FACILITY.

Ecological:

Threat:

General: JUVENILE CAPTURED & RELEASED. PREVIOUSLY NOT KNOWN FROM DESERT FLOOR OF ANTELOPE VALLEY. PROBABLY REPRESENTS EASTERN LIMIT OF SPECIES RANGE AS CLIMATIC CONDITIONS RAPIDLY BECOME LIMITING TO THE EAST IN THE MOJAVE DESERT.

Owner/Manager: UNKNOWN

Anniella pulchra pulchra

silvery legless lizard

Element Code: ARACC01012

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3G4T3T
State: 4Q
S3

Other Lists

CDFG Status: SC

Habitat Associations

General: SANDY OR LOOSE LOAMY SOILS UNDER SPARSE VEGETATION.

Micro: SOIL MOISTURE IS ESSENTIAL. THEY PREFER SOILS WITH A HIGH MOISTURE CONTENT.

Occurrence No. 34 **Map Index:** 61960 **EO Index:** 61996

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 2005-06-22
Site: 2005-06-22

Record Last Updated: 2005-07-12

Quad Summary: Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.66998º / -118.19605º
UTM: Zone-11 N3837096 E390419
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 07N
Range: 12W
Section: 30 **Qtr:** NW
Meridian: S
Elevation: 2,400 ft

Location: 0.45 MILE SE OF THE INTERSECTION OF AVENUE K AND 40TH STREET WEST, SW OF LANCASTER

Location Detail:

Ecological: HABITAT CONSISTS OF SALTBUSH SCRUB AND JUNIPER/JOSHUA TREE WOODLAND; SOILS VERY SANDY, ALMOST DUNE-LIKE, WITH SOME WINTERFAT AND SPINY HOPSAGE PRESENT.

Threat:

General: 2 SLL'S DETECTED WHILE TRAPPING FOR MOJAVE GROUND SQUIRRELS, ON 22 JUN 2005.

Owner/Manager: CITY OF LANCASTER

Anniella pulchra pulchra

silvery legless lizard

Element Code: ARACC01012

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3G4T3T
State: 4Q
S3

Other Lists

CDFG Status: SC

Habitat Associations

General: SANDY OR LOOSE LOAMY SOILS UNDER SPARSE VEGETATION.

Micro: SOIL MOISTURE IS ESSENTIAL. THEY PREFER SOILS WITH A HIGH MOISTURE CONTENT.

Occurrence No. 37 **Map Index:** 63769 **EO Index:** 63864

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 2003-02-19
Site: 2003-02-19

Record Last Updated: 2006-01-25

Quad Summary: Palmdale (3411851/161D)

County Summary: Los Angeles

Lat/Long: 34.54333º / -118.06500º
UTM: Zone-11 N3822917 E402277
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 11W
Section: 06 **Qtr:** SE
Meridian: S
Elevation: 2,785 ft

Location: JUST NORTH OF PEARBLOSSOM HIGHWAY AND 0.1 MILE WEST OF 37TH STREET EAST, PALMDALE

Location Detail: SITE HAS BEEN DEVELOPED INTO A SCHOOL.

Ecological: HABITAT CONSISTS OF DISTURBED JUNIPER/DESERT SCRUB/JOSHUA TREES ON ALLUVIAL SOIL.

Threat: THREATENED BY DEVELOPMENT.

General: 1 FOUND INJURED AND ANOTHER OBSERVED DEAD DURING BIOMONITORING OF MOHAVE GROUND SQUIRRELS ON 19 FEB 2003.

Owner/Manager: PALMDALE SCHOOL DISTRICT

Anniella pulchra pulchra

silvery legless lizard

Element Code: ARACC01012

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3G4T3T
State: 4Q
S3

Other Lists

CDFG Status: SC

Habitat Associations

General: SANDY OR LOOSE LOAMY SOILS UNDER SPARSE VEGETATION.

Micro: SOIL MOISTURE IS ESSENTIAL. THEY PREFER SOILS WITH A HIGH MOISTURE CONTENT.

Occurrence No. 38 **Map Index:** 63774 **EO Index:** 63869

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 2005-02-17
Site: 2005-02-17

Record Last Updated: 2006-01-25

Quad Summary: Ritter Ridge (3411852/161C)

County Summary: Los Angeles

Lat/Long: 34.57367º / -118.13179º
UTM: Zone-11 N3826348 E396186
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 06N
Range: 12W
Section: 27 **Qtr:** SE
Meridian: S
Elevation: 2,730 ft

Location: NORTH OF RAYBURN ROAD, BETWEEN DIVISION STREET AND HIGHWAY 14, PALMDALE

Location Detail:

Ecological: HABITAT CONSISTS OF DISTURBED DESERT SCRUB ON ALLUVIAL SOIL.

Threat:

General: DURING MOHAVE GROUND SQUIRREL BIOMONITORING, 2 WERE FOUND DEAD AND 2 WERE FOUND INJURED ON 17 FEB 2005, FOLLOWING SITE "GRUBBING" FOR A SCHOOL SITE.

Owner/Manager: PALMDALE SCHOOL DISTRICT

Antrozous pallidus

pallid bat

Element Code: AMACC10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERTS, GRASSLANDS, SHRUBLANDS, WOODLANDS & FORESTS. MOST COMMON IN OPEN, DRY HABITATS WITH ROCKY AREAS FOR ROOSTING.

Micro: ROOSTS MUST PROTECT BATS FROM HIGH TEMPERATURES. VERY SENSITIVE TO DISTURBANCE OF ROOSTING SITES.

Occurrence No. 184 **Map Index:** 66526 **EO Index:** 66647

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1942-09-11
Site: 1942-09-11
Record Last Updated: 2006-10-23

Quad Summary: Acton (3411842/136B)
County Summary: Los Angeles

Lat/Long: 34.44325º / -118.21484º
UTM: Zone-11 N3811974 E388394
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 04N
Range: 13W
Section: 11 **Qtr:** XX
Meridian: S
Elevation: 2,680 ft

Location: 2 MI SOUTH OF ACTON, SOLEDAD CANYON.

Location Detail: COLLECTED AT AN OLD MINE. LOCATION OF MINE UNKNOWN. MAPPED IN THE GENERAL VICINITY OF 2 MI SOUTH OF ACTON. INCLUDES "OLD MINES NEAR ACTON" AND "6 MI NE OF SAUGUS, SOLEDAD CANYON."

Ecological:

Threat:

General: 4 FEMALES COLL. BY COUFFER 17, 25 & 27 APR 1942, LACM #19541-19544. 1 MALE & 1 FEMALE COLL. BY COUFFER & VAN NORDHEIM 26 APR 1942 LACM #8022-8023. 1 FEMALE COLL. 3 MAY LACM #22022, 3 MALES COLL. 11 SEP 1942, LACM #21605-21607 BY NORDHEIM.

Owner/Manager: UNKNOWN

Arctostaphylos gabrielensis

San Gabriel manzanita

Element Code: PDERI042P0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL.

Micro: ROCKY OUTCROPS; CAN BE DOMINANT SHRUB WHERE IT OCCURS. 1500M.

Occurrence No. 1 **Map Index:** 26514 **EO Index:** 1588

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-03-XX
Site: 1986-03-XX
Record Last Updated: 1995-11-22

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.39186º / -118.08163º
UTM: Zone-11 N3806136 E400572
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 12W
Section: XX **Qtr:** XX
Meridian: S
Elevation: 5,000 ft

Location: MILL CREEK SUMMIT DIVIDE.

Location Detail: EXTENDING A FEW KILOMETERS AT SIMILAR ELEVATION IN THE VICINITY AND CONSTITUTING A SUBSTATIALLY LARGE POPULATION.

Ecological: DOMINANT COMPONENT OF CHAPARRAL. ASSOCIATED WITH A. GLAUCA WITH SCATTERED PINUS COULTERI. THE SUMMIT IN THIS AREA IS UNDERLAIN BY CRYSTALLINE METAMORPHICS, PRINCIPALLY GNEISSIC.

Threat:

General: TYPE LOCALITY.

Owner/Manager: USFS-ANGELES NF

Astragalus lentiginosus var. antonius

San Antonio milk-vetch

Element Code: PDFAB0FB92

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.3
State: None	**State:** S1?	

Habitat Associations

General: LOWER MONTANE CONIFEROUS FOREST, UPPER MONTANE CONIFEROUS FOREST.

Micro: DRY SLOPES IN OPEN YELLOW PINE FOREST. 1500-2600M.

Occurrence No. 4 **Map Index:** 34633 **EO Index:** 485

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1927-05-14
Site: 2003-06-13
Record Last Updated: 2004-10-18

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.40216º / -117.78523º
UTM: Zone-11 N3807027 E427828
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 09W
Section: 26 **Qtr:** XX
Meridian: S
Elevation: 6,000 ft

Location: PINON RIDGE, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED AS PER BEST GUESS AT CNDDB IN CENTER OF PINON RIDGE. EXACT LOCATION UNKNOWN; RIDGE EXTENDS TO NW AND SE OF MAPPED CIRCLE.

Ecological:

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1927 COLLECTION BY STASON. PLANTS NOT SEEN IN 2003 SURVEY.

Owner/Manager: UNKNOWN

Astragalus preussii var. laxiflorus

Lancaster milk-vetch

Element Code: PDFAB0F721

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4T2T3	**CNPS List:** 1B.1
State: None	**State:** S1.1	

Habitat Associations

General: CHENOPOD SCRUB.

Micro: ALKALINE CLAY FLATS OR GRAVELLY OR SANDY WASHES AND ALONG DRAWS IN GULLIED BADLANDS. 725M IN CALIFORNIA.

Occurrence No. 1 **Map Index:** 27633 **EO Index:** 13967

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Possibly Extirpated
Trend: Unknown

Dates Last Seen
Element: 1902-06-XX
Site: 1902-06-XX

Record Last Updated: 2002-07-01

Quad Summary: Lancaster East (3411861/161A), Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.69828º / -118.13809º
UTM: Zone-11 N3840173 E395765
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 07N
Range: 12W
Section: 15 **Qtr:** XX
Meridian: S
Elevation: 2,400 ft

Location: LANCASTER, ANTELOPE VALLEY.

Location Detail:

Ecological:

Threat:

General: VICINITY REPORTED IN TWO COLLECTIONS; ELMER #3669 POM IN 1902 AND DAVIDSON SN RSA, UNDATED. SITE IS PROBABLY NO LONGER EXTANT ACCORDING TO LAPRE (1999).

Owner/Manager: UNKNOWN

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 353 **Map Index:** 42528 **EO Index:** 42528

Occ Rank: Poor
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-10-07
Site: 1999-10-07

Record Last Updated: 2000-03-13

Quad Summary: Ritter Ridge (3411852/161C)

County Summary: Los Angeles

Lat/Long: 34.55932º / -118.17288º
UTM: Zone-11 N3824799 E392399
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 06N
Range: 12W
Section: 32 **Qtr:** SE
Meridian: S
Elevation: 3,120 ft

Location: SOUTH SIDE OF ANAVERDE VALLEY, 2 MILES WEST OF THE AVENUE S INTERCHANGE ON HIGHWAY 14, PALMDALE.

Location Detail:

Ecological: BURROW IS LOCATED ON THE WEST-FACING SLOPE OF A BROAD, SHALLOW CANYON (DEEPLY SCOURED BOTTOM); SURROUNDED BY GRAZED NON-NATIVE GRASSLAND.

Threat: THREATENED BY DEVELOPMENT.

General: 1 ADULT OWL OBSERVED AT THE BURROW SITE ON 7 OCT 2000.

Owner/Manager: PVT

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 557 **Map Index:** 50574 **EO Index:** 50574

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Possibly Extirpated
Trend: Unknown

Dates Last Seen
Element: 2006-01-20
Site: 2006-01-20

Record Last Updated: 2007-05-24

Quad Summary: Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.67516º / -118.20192º
UTM: Zone-11 N3837677 E389888
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 07N
Range: 13W
Section: 24 **Qtr:** SE
Meridian: S
Elevation: 2,365 ft

Location: NW CORNER OF THE INTERSECTION OF AVENUE K AND 40TH STREET WEST, LANCASTER.

Location Detail: STANDING IRRIGATION PIPES WERE USED FOR NESTING.

Ecological: HABITAT CONSISTS OF DISTURBED ALKALI SINK SCRUB/EXOTIC ANNUALS, ON AN OLD AGRICULTURAL FIELD. SURROUNDING AREA CONSISTS OF RESIDENTIAL TO THE NORTH, EAST, AND WEST, AND DISTURBED JOSHUA TREE WOODLAND/ALKALI SCRUB TO THE SOUTH.

Threat: THREATENED BY PENDING DEVELOPMENT AND DUMPING.

General: BREEDING OBSERVATIONS MADE DURING 2001. 1 BIRD OBSERVED DURING DEC 2002 (XMAS BIRD COUNT) AND AGAIN ON 11 JAN 2003. 1 PAIR LAST OBSERVED AT THIS SITE ON 20 JAN 2006, BEFORE PIPES (USED FOR NESTING) WERE REMOVED AND FILLED WITH DIRT.

Owner/Manager: PVT

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 709 **Map Index:** 56799 **EO Index:** 56815

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2004-09-01
Site: 2004-09-01
Record Last Updated: 2004-09-15

Quad Summary: Lancaster East (3411861/161A)
County Summary: Los Angeles

Lat/Long: 34.68784º / -118.06771º
UTM: Zone-11 N3838945 E402198
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 07N
Range: 11W
Section: 20 **Qtr:** N
Meridian: S
Elevation: 2,420 ft

Location: AREA BOUNDED BY 30TH STREET EAST TO 40TH STREET EAST AND AVENUES J TO J-8, EAST OF LANCASTER

Location Detail:

Ecological: HABITAT CONSISTS OF RUDERAL AGRICULTURAL FIELDS/SPARSE DESERT SCRUB WITH SCATTERED JOSHUA TREES; FLAT TOPOGRAPHY.

Threat: THREATENED BY DEVELOPMENT, ORV'S, DUMPING, AND HUMAN INTRUSION.

General: AS MANY AS 8 OWLS OCCUPYING BURROWS ON 1 SEP 2004.

Owner/Manager: PVT

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 710 **Map Index:** 56802 **EO Index:** 56818

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Extirpated
Trend: Decreasing

Dates Last Seen
Element: 2004-09-03
Site: 2005-11-21
Record Last Updated: 2007-06-04

Quad Summary: Lancaster West (3411862/161B)
County Summary: Los Angeles

Lat/Long: 34.67639º / -118.21055º
UTM: Zone-11 N3837824 E389098
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 07N
Range: 13W
Section: 24 **Qtr:** SW
Meridian: S
Elevation: 2,370 ft

Location: WEST SIDE OF 45TH AVENUE WEST AND NORTH OF AVENUE K, 3.5 MILES WSW OF LANCASTER.
Location Detail:
Ecological: HABITAT CONSISTED OF DISTURBED FALLOW AGRICULTURAL FIELDS/SPARSE RUDERAL VEGETATION, WITH SCATTERED RUDERAL WOODY SCRUB; IRRIGATION PIPES PROVIDE BURROW SITE AVAILABILITY.
Threat: THREATENED BY ONGOING DEVELOPMENT ON LAND SURROUNDING THIS SITE.
General: 3 INDIVIUALS/BURROWS OBSERVED ON 3 SEP 2004. OWLS WERE GONE BY 21 NOV 2005, FOLLOWING THE GRADING OF THE SITE FOR DEVELOPMENT.
Owner/Manager: PVT

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 788 **Map Index:** 64577 **EO Index:** 64656

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Extirpated
Trend: Unknown

Dates Last Seen
Element: 2006-03-17
Site: 2006-04-XX

Record Last Updated: 2006-05-02

Quad Summary: Palmdale (3411851/161D)
County Summary: Los Angeles

Lat/Long: 34.55248º / -118.04469º
UTM: Zone-11 N3823912 E404151
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 11W
Section: 04 **Qtr:** NW
Meridian: S
Elevation: 2,700 ft

Location: SE OF THE CORNER OF 47TH ST EAST AND ROUTE 138, APPROXIMATELY 4 MILES SE OF PALMDALE.

Location Detail: MAPPED ACCORDING TO LOCATION SHOWN ON ATTACHED MAP.

Ecological: HABITAT CONSISTS OF OLD FIELD WITH SPARSE VEGETATION GROWTH.

Threat: THREATENED BY PROPOSED DEVELOPMENT.

General: 1 PAIR OBSERVED EXHIBITING COURTSHIP BEHAVIOR AT BURROW SITE ON 17 MAR 2006. BY MISTAKE BURROW WAS DESTROYED (FILLED WITH DIRT, CONCRETE) SOMETIME PRIOR TO 31 APR 2006.

Owner/Manager: PVT

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G4	**CDFG Status:**	SC
State:	None	**State:**	S2		

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 798 **Map Index:** 64733 **EO Index:** 64812

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-06-16
Site: 2005-06-16
Record Last Updated: 2006-05-25

Quad Summary: Alpine Butte (3411768/160B)
County Summary: Los Angeles

Lat/Long:	34.73499º / -117.96559º	**Township:**	08N		
UTM:	Zone-11 N3844079 E411603	**Range:**	10W		
Mapping Precision:	SPECIFIC	**Section:**	32	**Qtr:**	SW
Symbol Type:	POINT	**Meridian:**	S		
Radius:	80 meters	**Elevation:**	2,380 ft		

Location: NORTH SIDE OF AVENUE G, 0.3 MILE EAST OF 90TH STREET EAST, 9 MILES ENE OF LANCASTER.

Location Detail: IN 2005, OWLS WERE USING AN IRRIGATION STANDPIPE FOR A BURROW; NO NATURAL BURROWS WERE OBSERVED IN THIS AREA.

Ecological: HABITAT CONSISTS OF AN ABANDONED AGRICULTURAL FIELD SUPPORTING NON-NATIVE GRASSES AND SPARSE RUDERAL VEGATATION.

Threat: THREATENED BY HUMAN ACTIVITY.

General: 2 ADULTS AND 2 JUVENILES (~5 WEEKS OLD) OBSERVED ON 16 JUN 2005.

Owner/Manager: UNKNOWN

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 799 **Map Index:** 64737 **EO Index:** 64816

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-06-16
Site: 2005-06-16
Record Last Updated: 2006-05-25

Quad Summary: Lancaster East (3411861/161A)
County Summary: Los Angeles

Lat/Long: 34.74208º / -118.00882º
UTM: Zone-11 N3844905 E407653
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 08N
Range: 11W
Section: 35 **Qtr:** NE
Meridian: S
Elevation: 2,355 ft

Location: NORTH SIDE OF AVENUE F-8, 0.4 MILE WEST OF 70TH STREET EAST, 7 MILES NE OF LANCASTER.

Location Detail: IN 2005, OWLS WERE OBSERVED AT AN IRRIGATION STANDPIPE, POSSIBLY USING A BROKEN PIPE AT GROUND SURFACE FOR A BURROW; NO NATURAL BURROWS WERE OBSERVED IN THIS AREA.

Ecological: HABITAT CONSISTS OF AN ABANDONED AGRICULTURAL FIELD SUPPORTING NON-NATIVE GRASSES AND SPARSE RUDERAL VEGATATION.

Threat: THREATENED BY HUMAN ACTIVITY.

General: 2 ADULTS OBSERVED ON 16 JUN 2005.

Owner/Manager: UNKNOWN

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 805 **Map Index:** 64814 **EO Index:** 64893

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2006-05-30
Site: 2006-05-30

Record Last Updated: 2006-06-06

Quad Summary: Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.69383º / -118.19846º
UTM: Zone-11 N3839744 E390229
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 07N
Range: 12W
Section: 18 **Qtr:** SW
Meridian: S
Elevation: 2,335 ft

Location: SE CORNER OF LANCASTER BOULEVARD AND 40TH STREET WEST, ALONG THE WEST EDGE OF LANCASTER.

Location Detail: NUMEROUS CALIFORNIA GROUND SQUIRRELS WERE LOCATED ALONG THE PERIMETER OF THE 80-ACRE PARCEL IN WHICH THE BURROW SITE IS FOUND. LARGE NUMBERS OF DIPODOMYS MERRIAMI ALSO PRESENT.

Ecological: HABITAT CONSISTS OF ALKALI SINKS WITH SALTBUSH SCRUB MIXED WITH LOW-DENSITY CALIFORNIA JUNIPER; DOMINATED BY YUCCA BREVIFOLIA, JUNIPERUS CALIFORNICA, ATRIPLEX CANESCENS, PRUNUS FASCICULATA, SCHISMUS SP, SUAEDA SP, AND ATRIPLEX PHYLLOSTEGIA.

Threat: THREATENED BY RAPID URBAN ENCROACHMENT; AREA IS LIKELY TO BE DEVELOPED WITH A YEAR.

General: 2 ADULTS AND 8 YOUNG WERE DETECTED ON 30 MAY 2006 DURING MOHAVE GROUND SQUIRREL TRAPPING.

Owner/Manager: PVT

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 939 **Map Index:** 69378 **EO Index:** 70156

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2006-03-03
Site: 2006-03-03

Record Last Updated: 2007-05-24

Quad Summary: Lancaster East (3411861/161A)

County Summary: Los Angeles

Lat/Long: 34.69083º / -118.04500º
UTM: Zone-11 N3839255 E404282
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 07N
Range: 11W
Section: 16 **Qtr:** SE
Meridian: S
Elevation: 2,421 ft

Location: NORTH SIDE OF AVENUE J, 0.2 MILE WEST OF 40TH STREET EAST, EAST OF LANCASTER.

Location Detail: STANDING IRRIGATION PIPES WERE LIKELY USED FOR NESTING.

Ecological: HABITAT CONSISTS OF AN OLD AGRICULTURAL FIELD WITH CEMENT IRRIGATION PIPES; SURROUNDED BY OLD AGRICULTURAL FIELDS WITH RESIDENTIAL DEVELOPMENT ENCROACHING FROM THE WEST.

Threat: THREATENED BY PROPOSED RESIDENTIAL DEVELOPMENT.

General: PAIR OF OWLS OBSERVED ON 3 MAR 2006, OCCUPYING A CONCRETE IRRIGATION PIPE "BURROW." THEY WILL LIKELY BE EVICTED.

Owner/Manager: PVT

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 951 **Map Index:** 69411 **EO Index:** 70187

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Extirpated
Trend: Unknown

Dates Last Seen
Element: 2006-01-20
Site: 2006-01-20

Record Last Updated: 2007-05-29

Quad Summary: Ritter Ridge (3411852/161C)
County Summary: Los Angeles

Lat/Long: 34.59195º / -118.14612º
UTM: Zone-11 N3828390 E394895
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 06N
Range: 12W
Section: 22 **Qtr:** SW
Meridian: S
Elevation: 2,692 ft

Location: NORTH SIDE OF AUTO CENTER DRIVE AND WEST OF 10TH STREET, PALMDALE.
Location Detail:
Ecological: HABITAT CONSISTS OF A DISTURBED VACANT LOT SUPPORTING CALIFORNIA GROUND SQUIRRELS, RABBIBRUSH, AND SPARSE RUDERAL VEGETATION.
Threat: THREATENED BY DEVELOPMENT (OWLS WERE EVICTED TO MAKE WAY FOR A PLANNED MEDICAL FACILITY).
General: 2 OWLS WERE OBSERVED ON 20 JAN 2006, USING GROUND SQUIRREL BURROWS ON THE EAST-FACING SIDE OF AN EARTHEN FILL SLOPE; OWLS WERE PASSIVELY EVICTED AFTER ONE WAS BANDED WITH A COLOR BAND.
Owner/Manager: PVT

Athene cunicularia

burrowing owl

Element Code: ABNSB10010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.

Micro: SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No. 964 **Map Index:** 69453 **EO Index:** 70231

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-06-12
Site: 2005-06-12

Record Last Updated: 2007-05-31

Quad Summary: Lancaster East (3411861/161A)

County Summary: Los Angeles

Lat/Long: 34.69667º / -118.06833º
UTM: Zone-11 N3839925 E402152
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 07N
Range: 11W
Section: 17 **Qtr:** SW
Meridian: S
Elevation: 2,404 ft

Location: SOUTH OF LANCASTER BOULEVARD, 0.5 MILE WEST OF 32ND STREET EAST, 2 MILES EAST OF LANCASTER.

Location Detail: LOCATED ON A 10-ACRE SITE. MAPPED IN THE NE1/4 OF THE SW1/4 SEC 17.

Ecological: HABITAT CONSISTS OF AN HISTORIC AGRICULTURAL FIELD DOMINATED BY RED-STEMMED FILAREE, WITH SCATTERED RABBITBRUSH. IRRIGATION PIPES ARE FOUND THROUGHT THE SITE.

Threat: THREATENED BY A PROPOSED RESIDENTIAL DEVELOPMENT.

General: AT LEAST 1 OWL WAS OBSERVED AT THIS SITE ON 12 MAY; 1 OWL AGAIN OBSERVED ON 21NOV 2005 AT AN ACTIVE BURROW SITE.

Owner/Manager: PVT

Bufo californicus

arroyo toad

Element Code: AAABB01230

Status		NDDB Element Ranks		Other Lists	
Federal:	Endangered	**Global:**	G2G3	**CDFG Status:**	SC
State:	None	**State:**	S2S3		

Habitat Associations

General: SEMI-ARID REGIONS NEAR WASHES OR INTERMITTENT STREAMS, INCLUDING VALLEY-FOOTHILL AND DESERT RIPARIAN, DESERT WASH, ETC.

Micro: RIVERS WITH SANDY BANKS, WILLOWS, COTTONWOODS, AND SYCAMORES; LOOSE, GRAVELLY AREAS OF STREAMS IN DRIER PARTS OF RANGE.

Occurrence No. 35 **Map Index:** 33418 **EO Index:** 29202

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2001-05-06
Site: 2001-05-06
Record Last Updated: 2005-01-03

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.45882º / -118.01803º
UTM: Zone-11 N3813501 E406493
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 141.4 acres

Township: 04N
Range: 11W
Section: 03 **Qtr:** XX
Meridian: S
Elevation: 3,300 ft

Location: LITTLE ROCK CREEK, FROM THE CONFLUENCE OF SANTIAGO CANYON CREEK UPSTREAM TO 1 MILE ABOVE BASIN CAMPGROUND, ANGELES NF.

Location Detail:

Ecological: HABITAT CONSISTS OF SOUTHERN SYCAMORE ALDER RIPARIAN WITH OPENINGS OF COBBLE AND SAND BAR; SEVERAL ARTIFICIAL SWIMMING HOLES CREATED BY RECREATIONAL USERS. TWO-STRIPED GARTER SNAKE ALSO FOUND IN A PORTION OF THIS SITE.

Threat: MAIN THREATS INCLUDE RECREATIONAL IMPACTS AND ORV USE.

General: 6 ADULTS OBSERVED 25 APR 1996; 16 ADULTS & 1 JUVENILE OBS 2 MAY 1996; AN AMPLEXING PAIR OBS 30 MAY 1996 AT 1630 HRS; FRESH EGG MASS & MALE TOAD AT 1900 HRS; 2 ADULTS & 1 JUV OBS JUN 1996. APR-MAY 2001: 5 MALES, 1 FEMALE, & 3 JUVENILES OBS.

Owner/Manager: USFS-ANGELES NF

Bufo californicus

arroyo toad

Element Code: AAABB01230

Status

Federal: Endangered
State: None

NDDB Element Ranks

Global: G2G3
State: S2S3

Other Lists

CDFG Status: SC

Habitat Associations

General: SEMI-ARID REGIONS NEAR WASHES OR INTERMITTENT STREAMS, INCLUDING VALLEY-FOOTHILL AND DESERT RIPARIAN, DESERT WASH, ETC.

Micro: RIVERS WITH SANDY BANKS, WILLOWS, COTTONWOODS, AND SYCAMORES; LOOSE, GRAVELLY AREAS OF STREAMS IN DRIER PARTS OF RANGE.

Occurrence No. 53 **Map Index:** 02339 **EO Index:** 44188

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Possibly Extirpated
Trend: Unknown

Dates Last Seen

Element: 1970-05-XX
Site: 1970-05-XX

Record Last Updated: 2000-11-02

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.48986º / -118.02504º
UTM: Zone-11 N3816949 E405884
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 51.2 acres

Township: 05N
Range: 11W
Section: 27 **Qtr:** W
Meridian: S
Elevation: 3,080 ft

Location: LITTLE ROCK CREEK BELOW LITTLE ROCK RESERVOIR, ANGELES NATIONAL FOREST.

Location Detail: MAPPED TO COMMUNITY BELOW DAM DUE TO INSUFFICIENT SITE SPECIFIC INFORMATION.

Ecological: THIS AREA IS MAPPED AS MOJAVE RIPARIAN FOREST BY THE CCCNDDB

Threat:

General: AT LEAST 1 TOAD OBSERVED, INDICATED AS PROBABLY EXTINCT.

Owner/Manager: USFS-ANGELES NF

Buteo regalis

ferruginous hawk

Element Code: ABNKC19120

Status

Federal: None
State: None

NDDB Element Ranks

Global: G4
State: S3S4

Other Lists

CDFG Status:

Habitat Associations

General: OPEN GRASSLANDS, SAGEBRUSH FLATS, DESERT SCRUB, LOW FOOTHILLS & FRINGES OF PINYON-JUNIPER HABITATS.

Micro: EATS MOSTLY LAGOMORPHS, GROUND SQUIRRELS, AND MICE. POPULATION TRENDS MAY FOLLOW LAGOMORPH POPULATION CYCLES.

Occurrence No. 18 **Map Index:** 66005 **EO Index:** 66084

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1998-12-21
Site: 1998-12-21

Record Last Updated: 2006-08-23

Quad Summary: Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.73339º / -118.24584º
UTM: Zone-11 N3844184 E385943
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 08N
Range: 13W
Section: 34 **Qtr:** XX
Meridian: S
Elevation: 2,370 ft

Location: ABOUT 5.8 MI NW OF LANCASTER, MIDWAY BETWEEN 60TH ST WEST AND 70TH ST WEST ON AVENUE G.

Location Detail: BIRD PERCHED ON TELEPHONE POLE.

Ecological: OLD AGRICULTURAL FIELD.

Threat: MUCH OF THIS AREA IS FOR SALE.

General: WINTERING SITE. 1 ADULT OBSERVED ON 21 DEC 1998.

Owner/Manager: UNKNOWN

Buteo regalis

ferruginous hawk

Element Code: ABNKC19120

Status

Federal: None
State: None

NDDB Element Ranks

Global: G4
State: S3S4

Other Lists

CDFG Status:

Habitat Associations

General: OPEN GRASSLANDS, SAGEBRUSH FLATS, DESERT SCRUB, LOW FOOTHILLS & FRINGES OF PINYON-JUNIPER HABITATS.

Micro: EATS MOSTLY LAGOMORPHS, GROUND SQUIRRELS, AND MICE. POPULATION TRENDS MAY FOLLOW LAGOMORPH POPULATION CYCLES.

Occurrence No. 20 **Map Index:** 66009 **EO Index:** 66088

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1999-01-29
Site: 1999-01-29

Record Last Updated: 2006-08-23

Quad Summary: Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.70376º / -118.24904º
UTM: Zone-11 N3840902 E385610
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 07N
Range: 13W
Section: 15 **Qtr:** NW
Meridian: S
Elevation: 2,360 ft

Location: ABOUT 5 MI WEST OF LANCASTER ON AVENUE I, ~0.25 MI EAST OF 70TH ST WEST.

Location Detail:

Ecological: AGRICULTURE LAND, ALFALFA FIELDS. THIS IS A KNOWN WINTERING AREA FOR MANY RAPTORS.

Threat:

General: WINTERING & FORAGING SITE. 1 JUVENILE OBSERVED ON 29 JAN 1999.

Owner/Manager: UNKNOWN

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G5	**CDFG Status:**	
State:	Threatened	**State:**	S2		

Habitat Associations

General: BREEDS IN GRASSLANDS WITH WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 7 **Map Index:** 02503 **EO Index:** 27302

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1979-05-15
Site: 1979-05-15

Record Last Updated: 2003-08-06

Quad Summary: Alpine Butte (3411768/160B)

County Summary: Los Angeles

Lat/Long: 34.66692º / -117.89701º
UTM: Zone-11 N3836472 E417814
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 10W
Section: 25 **Qtr:** SW
Meridian: S
Elevation: 2,500 ft

Location: 0.5 MILE SOUTH OF THE JUNCTION OF AVENUE K & 130TH STREET EAST, EAST OF LANCASTER

Location Detail: NEST TREE LOCATED 75 YARDS EAST OFF OF A DIRT ROAD.

Ecological: NEST TREE IS A JOSHUA TREE.

Threat:

General: DFG SWHA #LA001. ONE ADULT OBSERVED AT THE NEST ON 15 MAY 1979; FORAGING OBSERVED IN SEC 25 AND 26.

Owner/Manager: PVT

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G5	**CDFG Status:**	
State:	Threatened	**State:**	S2		

Habitat Associations

General: BREEDS IN GRASSLANDS WITH WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 800 **Map Index:** 42305 **EO Index:** 42305

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-07-06
Site: 1999-07-06

Record Last Updated: 2000-05-10

Quad Summary: Lancaster East (3411861/161A)

County Summary: Los Angeles

Lat/Long:	34.70507º / -118.03269º	**Township:**	07N		
UTM:	Zone-11 N3840822 E405426	**Range:**	11W		
Mapping Precision:	NON-SPECIFIC	**Section:**	10	**Qtr:**	XX
Symbol Type:	POLYGON	**Meridian:**	S		
Area:		**Elevation:**	2,400 ft		

Location: ALONG AVENUE I, EAST OF 50TH STREET EAST, ANTELOPE VALLEY, 4 MILES EAST OF LANCASTER.

Location Detail: RANCH HOUSE LOCATED DIRECTLY ACROSS THE STREET.

Ecological: NEST TREE IS A LOCUST, SURROUNDED BY AGRICULTURAL FIELDS.

Threat:

General: NEST DISCOVERED ON 5 MAY 1996. 2 ADULTS AND 2 YOUNG OBSERVED AT THE NEST ON 4 JUL 1996. ADULT OBSERVED ON THE NEST ON 6 JUL 1999.

Owner/Manager: UNKNOWN

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: Threatened	**State:** S2	

Habitat Associations

General: BREEDS IN GRASSLANDS WITH WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 801 **Map Index:** 42483 **EO Index:** 42483

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-06-09
Site: 1999-06-09

Record Last Updated: 2000-03-02

Quad Summary: Alpine Butte (3411768/160B)
County Summary: Los Angeles

Lat/Long: 34.70473º / -117.91643º
UTM: Zone-11 N3840681 E416073
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 07N
Range: 10W
Section: 14 **Qtr:** XX
Meridian: S
Elevation: 2,440 ft

Location: AVENUE I EAST AT 120TH STREET EAST, ANTELOPE VALLEY, EAST OF PALMDALE
Location Detail:
Ecological: HABITAT CONSISTS OF AGRICULTURAL FIELDS.
Threat:
General: ADULT OBSERVED DISPLAYING AGITATED BEHAVIOR ON 18 MAY 1999, AND AN ADULT OBSERVED NEAR THE SAME AREA ON 9 JUN 1999; NESTING PRESUMED, BUT EXACT NEST TREE LOCATION NOT KNOWN.
Owner/Manager: UNKNOWN

Calochortus striatus

alkali mariposa-lily

Element Code: PMLIL0D190

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.2
State: None	**State:** S2.2	

Habitat Associations

General: CHAPARRAL, CHENOPOD SCRUB, MOJAVEAN DESERT SCRUB, MEADOWS.

Micro: ALKALINE MEADOWS AND EPHEMERAL WASHES. 90-1595M.

Occurrence No. 22 **Map Index:** 02210 **EO Index:** 18062

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1988-05-01
Site: 1988-05-01
Record Last Updated: 1993-10-13

Quad Summary: Lancaster East (3411861/161A)
County Summary: Los Angeles

Lat/Long: 34.71280º / -118.11490º
UTM: Zone-11 N3841760 E397907
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 07N
Range: 12W
Section: 11 **Qtr:** NE
Meridian: S
Elevation: 2,350 ft

Location: LANCASTER, 1.5 KM NORTHEAST OF ANTELOPE VALLEY COLLEGE.

Location Detail: 0.7 MI NORTH OF "I" AVE ON CHALLENGER RD, 250 WEST OF ROAD ON VEGETATED CLAY PAN.

Ecological: FOUND ON ALKALINE CLAY FLATS. ASSOCIATED WITH ATRIPLEX, SPOROBOLUS, AND DISTICHLIS. BROMUS RUBENS COMMON IN AREA.

Threat: PRESENTLY A VACANT LOT BUT DEVELOPMENT SURROUNDS THE SITE.

General: 189 PLANTS OBSERVED IN 1988 OVER AN AREA OF APPROX. 1 ACRE. POPULATION DESCRIBED AS VERY HEALTHY AND IN GOOD CONDITION. PRESENCE OF SHRUBS AT THE SITE MAY DETER OFF ROAD USE AND TRAMPLING.

Owner/Manager: PVT

Calochortus striatus

alkali mariposa-lily

Element Code: PMLIL0D190

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.2
State: None	**State:** S2.2	

Habitat Associations

General: CHAPARRAL, CHENOPOD SCRUB, MOJAVEAN DESERT SCRUB, MEADOWS.

Micro: ALKALINE MEADOWS AND EPHEMERAL WASHES. 90-1595M.

Occurrence No. 23 **Map Index:** 02152 **EO Index:** 29484

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-05-02
Site: 2005-05-02
Record Last Updated: 2006-05-12

Quad Summary: Rosamond Lake (3411871/186D), Lancaster West (3411862/161B), Rosamond (3411872/186C)

County Summary: Kern, Los Angeles

Lat/Long: 34.77934º / -118.14915º
UTM: Zone-11 N3849174 E394855
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 1,032.1 acres

Township: 08N
Range: 12W
Section: 16 **Qtr:** E
Meridian: S
Elevation: 2,310 ft

Location: ALONG THE SIERRA HIGHWAY NORTH OF LANCASTER, FROM JUST SOUTH OF AVENUE G NORTH PAST PATTERSON ROAD.

Location Detail: FREQUENT FOR ABOUT 8 MILES ALONG THE HIGHWAY, MOSTLY ALONG THE EAST SIDE OF THE SOUTHERN PACIFIC RAIL ROAD RIGHT OF WAY, WITH A FEW PLANTS TO THE WEST. ALSO FOUND ALONG AT&T RIGHT-OF-WAY (10TH STREET) FROM PATTERSON ROAD TO AVENUE G.

Ecological: FOUND ON SILT/CAKED MUD, IN OPEN SPACES BETWEEN SHRUBS AND ON EDGES OF SALT PANS AND MINI ALKALI PLAYAS. ASSOCIATED WITH ANNUAL GRASSES, ATRIPLEX CANESCENS, CHRYSOTHAMNUS NAUSEOSUS, DISTICHLIS SPICATA, LASTHENIA CALIFORNICA, AND WEEDY SPP.

Threat: MOSTLY IN ROAD AND RR RIGHT OF WAY, SOME GRADING AND TRASH DUMPING, POSSIBLE DEVELOPMENT.

General: 1000'S OF PLANTS IN 1995 & 2003. INCLUDES FORMER OCCURRENCES #20 & #24. 2500 PLANTS IN SMALL CLUMPS IN 1998 ALONG AT&T ROW. 25+ PLANTS IN 2000 AT SIERRA HWY & AVE G AND 100+ ALONG AT&T ROW.

Owner/Manager: PVT, PVT-AT&T

Calochortus striatus

alkali mariposa-lily

Element Code: PMLIL0D190

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.2
State: None	**State:** S2.2	

Habitat Associations

General: CHAPARRAL, CHENOPOD SCRUB, MOJAVEAN DESERT SCRUB, MEADOWS.

Micro: ALKALINE MEADOWS AND EPHEMERAL WASHES. 90-1595M.

Occurrence No. 39 **Map Index:** 24272 **EO Index:** 7179

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1988-06-05
Site: 1988-06-05
Record Last Updated: 1993-10-13

Quad Summary: Lancaster West (3411862/161B)
County Summary: Los Angeles

Lat/Long: 34.69047º / -118.22484º
UTM: Zone-11 N3839401 E387809
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 117.8 acres

Township: 07N
Range: 13W
Section: 14 **Qtr:** S
Meridian: S
Elevation: 2,340 ft

Location: ANTELOPE VALLEY; JUST SOUTH OF THE MIRA LOMA DETENTION CENTER, WEST OF LANCASTER.

Location Detail: LOCATED BETWEEN 50TH AND 60TH STREETS AND ALONG EITHER SIDE OF AVENUE J.

Ecological: SHADSCALE SCRUB ON ALKALI SOILS. ASSOCIATES INCLUDE ATRIPLEX CONFERTIFOLIA, CHRYSOTHAMNUS, EPHEDRA, LYCIUM, AND CHORIZANTHE SPINOSA.

Threat: TWO CONSTRUCTION PROJECTS TARGETED FOR THIS SITE; MIRA LOMA BOYS CAMP AND NEW L.A. COUNTY PRISON.

General: APPROX. 200 PLANTS OBSERVED IN 1988. ONLY 15% OF POPULATION FLOWERED, DUE IN PART TO APPARENT GRAZING (RABBITS?). NO ADDITIONAL INFORMATION ON THE STATUS OF THIS SITE SINCE 1988, NEEDS FIELDWORK.

Owner/Manager: LOS ANGELES COUNTY?

Calochortus striatus

alkali mariposa-lily

Element Code: PMLIL0D190

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.2
State: None	**State:** S2.2	

Habitat Associations

General: CHAPARRAL, CHENOPOD SCRUB, MOJAVEAN DESERT SCRUB, MEADOWS.

Micro: ALKALINE MEADOWS AND EPHEMERAL WASHES. 90-1595M.

Occurrence No. 43 **Map Index:** 48060 **EO Index:** 48060

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1998-06-16
Site: 1998-06-16

Record Last Updated: 2002-06-06

Quad Summary: Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.74475º / -118.24057º
UTM: Zone-11 N3845438 E386442
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 08N
Range: 13W
Section: 34 **Qtr:** NE
Meridian: S
Elevation: 2,360 ft

Location: WEST OF GENERAL WILLIAMS J. FOX AIRFIELD, ABOUT 3 MILES NORTH OF MIRA LOMA DETENTION CENTER, NORTHWEST OF LANCASTER.

Location Detail: MAPPED WITHIN THE NE 1/4 OF THE N1/4 OF SECTION 22.

Ecological: IN CHENOPOD SCRUB WITH ATRIPLEX HYMENOLYTRA, A. POLYCARPA, AND A. CONFERTIFOLIA. ON FLAT MUD-FLTA OPEN AREA WITH OCCASIONAL MOUNDS OF VEGETATION.

Threat: ROAD USE, AGRICULTURE.

General: MORE THAN 30 HEALTHY PLANTS OBSERVED IN 1998.

Owner/Manager: LOS ANGELES COUNTY, DPR

Calochortus striatus

alkali mariposa-lily

Element Code: PMLIL0D190

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.2
State: None	**State:** S2.2	

Habitat Associations

General: CHAPARRAL, CHENOPOD SCRUB, MOJAVEAN DESERT SCRUB, MEADOWS.

Micro: ALKALINE MEADOWS AND EPHEMERAL WASHES. 90-1595M.

Occurrence No. 94 **Map Index:** 64430 **EO Index:** 64509

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1934-05-19
Site: 1934-05-19

Record Last Updated: 2006-04-06

Quad Summary: Lovejoy Buttes (3411757/160D)

County Summary: Los Angeles

Lat/Long: 34.60683º / -117.83133º
UTM: Zone-11 N3829757 E423777
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 09W
Section: 16 **Qtr:** XX
Meridian: S
Elevation:

Location: LOVE JOY DAM, WEST MOHAVE DESERT REGION.

Location Detail: MAPPED IN VICINITY OF DAM LABELED ON TOP NEAR LOVEJOY SPRING, NO LAKE APPEARS ON TOPO MAP.

Ecological:

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1934 COLLECTION BY PEIRSON. MUCH OF AREA IS NOT DEVELOPED.

Owner/Manager: UNKNOWN

Calochortus striatus

alkali mariposa-lily

Element Code: PMLIL0D190

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.2
State: None	**State:** S2.2	

Habitat Associations

General: CHAPARRAL, CHENOPOD SCRUB, MOJAVEAN DESERT SCRUB, MEADOWS.

Micro: ALKALINE MEADOWS AND EPHEMERAL WASHES. 90-1595M.

Occurrence No. 95 **Map Index:** 27633 **EO Index:** 64511

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1939-05-14
Site: 1939-05-14

Record Last Updated: 2006-04-06

Quad Summary: Lancaster East (3411861/161A), Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.69828º / -118.13809º
UTM: Zone-11 N3840173 E395765
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 07N
Range: 12W
Section: 15 **Qtr:** XX
Meridian: S
Elevation: 2,400 ft

Location: LANCASTER, LOS ANGELES COUNTY.

Location Detail:

Ecological:

Threat:

General: COLLECTED IN THIS VICINITY BY HOFFMANN IN 1929 AND 1930, AND HOLT IN 1939. FIELDWORK NEEDED. MUCH OF AREA IS NOW DEVELOPED.

Owner/Manager: UNKNOWN

Calystegia peirsonii

Peirson's morning-glory

Element Code: PDCON040A0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CNPS List:** 4.2
State: None	**State:** S3.2	

Habitat Associations

General: CHAPARRAL, COASTAL SCRUB, CHENOPOD SCRUB, CISMONTANE WOODLAND, LOWER MONTANE CONIFEROUS FOREST.

Micro: OFTEN IN DISTURBED AREAS OR ALONG ROADSIDES OR IN GRASSY, OPEN AREAS. 390-1470M.

Occurrence No. 18 **Map Index:** 02644 **EO Index:** 18549

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1982-06-11
Site: 1982-06-11
Record Last Updated: 2007-09-10

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.41266º / -117.82443º
UTM: Zone-11 N3808220 E424234
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 09W
Section: 21 **Qtr:** SW
Meridian: S
Elevation: 4,200 ft

Location: BIG ROCK CREEK ROAD FROM VIC OF OLD POINT COMFORT SOUTH TO SYCAMORE FLAT AND TO ABOUT 2.2 MI S OF JCT WITH VALYERMO RD.

Location Detail: MAPPED ALONG ROAD IN SECTIONS 21 AND 28.

Ecological: DISTURBED ROAD CUTS, WEST FACING SLOPES, IN OPEN AREAS WITH ROCKY SOIL. WITH CERCOCARPUS BETULOIDES, PURSHIA GLANDULOSA, ERIOGONUM FASCICULATUM, YUCCA WHIPPLEI, ETC.

Threat:

General: TYPE LOCALITY. EOS 19 AND 20 LUMPED HERE.

Owner/Manager: USFS-ANGELES NF

Canbya candida

white pygmy-poppy

Element Code: PDPAP05020

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3
State: S3.2

Other Lists

CNPS List: 4.2

Habitat Associations

General: JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB.
Micro: SANDY PLACES. 725-1250M.

Occurrence No. 11 **Map Index:** 27633 **EO Index:** 13969

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: XXXX-XX-XX
Site: XXXX-XX-XX

Record Last Updated: 1995-12-15

Quad Summary: Lancaster East (3411861/161A), Lancaster West (3411862/161B)
County Summary: Los Angeles

Lat/Long: 34.69828º / -118.13809º
UTM: Zone-11 N3840173 E395765
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 07N
Range: 12W
Section: 15 **Qtr:** XX
Meridian: S
Elevation: 2,400 ft

Location: LANCASTER.
Location Detail:
Ecological:
Threat:
General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS UNDATED COLLECTION BY DAVIDSON (SN, UNKNOWN HERB) CITED IN 1922 JEPSON FLORA.
Owner/Manager: UNKNOWN

Canbya candida

white pygmy-poppy

Element Code: PDPAP05020

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3
State: S3.2

Other Lists

CNPS List: 4.2

Habitat Associations

General: JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB.
Micro: SANDY PLACES. 725-1250M.

Occurrence No. 30 **Map Index:** 33418 **EO Index:** 32983

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1926-04-26
Site: 1926-04-26

Record Last Updated: 2007-11-20

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.45882º / -118.01803º
UTM: Zone-11 N3813501 E406493
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 141.4 acres

Township: 04N
Range: 11W
Section: 03 **Qtr:** XX
Meridian: S
Elevation: 3,300 ft

Location: LITTLE ROCK CREEK.

Location Detail: COLLECTION MADE ON SAND FLAT ALONG LITTLE ROCK CREEK AT 3400' ELEVATION. SITE MAPPED BY CNDDB ALONG LITTLE ROCK CREEK FROM LITTLE ROCK RESERVOIR SOUTH FOR ABOUT 1.8 MILES.

Ecological:

Threat:

General: TWO COLLECTIONS ATTRIBUTED TO THIS SITE: PEIRSON (#2412 UNKNOWN HERB) IN 1921 AND MASON (#3020 UC) IN 1926. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Canyon Live Oak Ravine Forest

Element Code: CTT61350CA

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3
State: S3.3

Other Lists

Habitat Associations

General:
Micro:

Occurrence No. 43 **Map Index:** 02605 **EO Index:** 15696

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-08-02

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.39744º / -117.84237º
UTM: Zone-11 N3806546 E422572
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 118.4 acres

Township: 04N
Range: 09W
Section: 29 **Qtr:** E
Meridian: S
Elevation: 4,720 ft

Location: HOLCOMB CANYON.
Location Detail: EXTENT PER INTERPRETATION OF AERIAL PHOTOS.
Ecological: APPERS TO BE CLOSED CANOPY QUERCUS CHRYSOLEPIS AND LNUS RHOMBIFOLIA.
Threat:
General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. THIS WAS OCC #043 OF CTT61350CA.
Owner/Manager: USFS-ANGELES NF

Carex vulpinoidea

brown fox sedge

Element Code: PMCYP03EN0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CNPS List:** 2.2
State: None	**State:** S2.2	

Habitat Associations

General: MARSHES AND SWAMPS, RIPARIAN WOODLAND.

Micro: WET PLACES. 30-1200M.

Occurrence No. 9 **Map Index:** 27633 **EO Index:** 66570

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1902-07-XX
Site: 1902-07-XX

Record Last Updated: 2006-09-28

Quad Summary: Lancaster East (3411861/161A), Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.69828º / -118.13809º
UTM: Zone-11 N3840173 E395765
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 07N
Range: 12W
Section: 15 **Qtr:** XX
Meridian: S
Elevation: 2,400 ft

Location: NEAR LANCASTER.

Location Detail: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB CENTERED ON THE CITY OF LANCASTER.

Ecological:

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1902 COLLECTION BY ELMER. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Castilleja gleasonii

Mt. Gleason paintbrush

Element Code: PDSCR0D140

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2Q	**CNPS List:** 1B.2
State: Rare	**State:** S2.2	

Habitat Associations

General: LOWER MONTANE CONIFEROUS FOREST.

Micro: ON OPEN FLATS OR SLOPES IN GRANITIC SOIL. RESTRICTED TO THE SAN GABRIEL MOUNTAINS. 1650-1830M.

Occurrence No. 2 **Map Index:** 02131 **EO Index:** 13641

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-05-11
Site: 1986-05-11

Record Last Updated: 2002-06-05

Quad Summary: Acton (3411842/136B), Condor Peak (3411832/136C)

County Summary: Los Angeles

Lat/Long: 34.37388º / -118.17168º
UTM: Zone-11 N3804234 E392271
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 41.5 acres

Township: 03N
Range: 12W
Section: 06 **Qtr:** NE
Meridian: S
Elevation: 6,400 ft

Location: MT GLEASON ROAD ABOUT 0.8 MI SOUTHEAST TO ABOUT 1 MILE EAST OF MT. GLEASON SUMMIT, ANGELES NATIONAL FOREST.

Location Detail: FIVE COLONIES ALONG ROAD FROM JUST NORTH OF MICROWAVE TOWER TO 0.6 AIRMILE NE OF MICROWAVE TOWER.

Ecological: IN SHADE AND EDGES OF OPENINGS IN MIXED CONIFER FOREST OF PINUS PONDEROSA, P. COULTERI, ABIES CONCOLOR, PSEUDOTSUGA MACROCARPA. MOSTLY ON EAST SLOPE IN UNDERSTORY. 5900-6400 FT.

Threat: AREA OPEN TO ORVS. ALSO SUBJECT TO TIMBER SALES; REMOVAL OF COVER SPECIES WOULD THREATEN.

General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 1979 AND 1986. 1200 PLANTS OBSERVED IN 1987.

Owner/Manager: USFS-ANGELES NF

Castilleja gleasonii

Mt. Gleason paintbrush

Element Code: PDSCR0D140

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2Q	**CNPS List:** 1B.2
State: Rare	**State:** S2.2	

Habitat Associations

General: LOWER MONTANE CONIFEROUS FOREST.

Micro: ON OPEN FLATS OR SLOPES IN GRANITIC SOIL. RESTRICTED TO THE SAN GABRIEL MOUNTAINS. 1650-1830M.

Occurrence No. 5 **Map Index:** 02105 **EO Index:** 17880

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1987-07-XX
Site: 1987-07-XX

Record Last Updated: 2002-06-04

Quad Summary: Acton (3411842/136B)

County Summary: Los Angeles

Lat/Long: 34.38249º / -118.19570º
UTM: Zone-11 N3805214 E390074
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 22.2 acres

Township: 04N
Range: 13W
Section: 36 **Qtr:** SW
Meridian: S
Elevation: 5,800 ft

Location: NORTH SLOPE OF MESSENGER PEAK EXTENDING EAST TO VICINITY OF MESSENGER FLATS, RIDGE WEST OF MT. GLEASON.

Location Detail: MOSTLY ALONG THE PACIFIC CREST TRAIL. MAPPED WITHIN THE S 1/2 OF THE SW 1/4 OF SECTION 36.

Ecological: IN OPEN CONIFER, LIVE OAK, CHAPARRAL MOSAIC WITH INTERVEINING OPEN AREAS OF GRASSLAND. ASSOCIATES INCLUDE PINUS PONDEROSA, P. COULTERI, P. LAMBERTIANA, PSEUDOTSUGA MACROCARPA, QUERCUS CHRYOLEPIS, CHRYSOTHAMNUS SPP., ERIOGONUM SPP., ET AL.

Threat: LOCALIZED BULLDOZER ACTIVITY AND SUBSEQUENT TREE AND SHURB REMOVAL. MINOR ORV USE.

General: 200 PLANTS OBSERVED IN 1987.

Owner/Manager: USFS-ANGELES NF

Castilleja gleasonii

Mt. Gleason paintbrush

Element Code: PDSCR0D140

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2Q	**CNPS List:** 1B.2
State: Rare	**State:** S2.2	

Habitat Associations

General: LOWER MONTANE CONIFEROUS FOREST.

Micro: ON OPEN FLATS OR SLOPES IN GRANITIC SOIL. RESTRICTED TO THE SAN GABRIEL MOUNTAINS. 1650-1830M.

Occurrence No. 9 **Map Index:** 38973 **EO Index:** 48045

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-05-10
Site: 1995-05-10
Record Last Updated: 2002-06-05

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.42201º / -118.01296º
UTM: Zone-11 N3809414 E406918
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 22 **Qtr:** NE
Meridian: S
Elevation: 4,400 ft

Location: NORTH SLOPE OF WEST FORK BARE MTN CANYON, ABOUT 0.25 MI WEST OF CONFLUENCE WITH BARE MTN CANYON, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ABOUT 0.15 MILE UPSLOPE (NORTH) OF WEST FORK CANYON.

Ecological: LOCATED ON DRY BENCH IN FULL SUN ON COARSE GRANITIC LOAM WITH LINANTHUS BREVICULUS, ERIOPHYLLUM PRINGLEI, POA SECUNDA SSP. JUNCIFOLIA, RHUS TRILOBATA, CAMISSONIA STRIGULOSA, SENECIO FLACCIDUS VAR. MONENSIS. PLANTS ARE FEW AND SCATTERED.

Threat: NONE APPARENT IN 1995.

General: PLANTS FEW AND SCATTERED IN 1995.

Owner/Manager: USFS-ANGELES NF

Catostomus santaanae

Santa Ana sucker

Element Code: AFCJC02190

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G1	**CDFG Status:** SC
State: None	**State:** S1	

Habitat Associations

General: ENDEMIC TO LOS ANGELES BASIN SOUTH COASTAL STREAMS.

Micro: HABITAT GENERALISTS, BUT PREFER SAND-RUBBLE-BOULDER BOTTOMS, COOL, CLEAR WATER, & ALGAE.

Occurrence No. 13 **Map Index:** 01944 **EO Index:** 14833

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Decreasing

Dates Last Seen
Element: 1993-08-04
Site: 1993-08-04

Record Last Updated: 2006-09-06

Quad Summary: Agua Dulce (3411843/137A), Acton (3411842/136B)

County Summary: Los Angeles

Lat/Long: 34.43990º / -118.29916º
UTM: Zone-11 N3811699 E380642
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 701.0 acres

Township: 04N
Range: 14W
Section: 12 **Qtr:** SW
Meridian: S
Elevation: 2,000 ft

Location: SANTA CLARA RIVER, FROM LANG TO ARRASTRE CYN (1978). 2.5 MILES EAST FROM LANG & THE ANELOPE VALLEY FREEWAY (1993).

Location Detail: COLLECTED AT 8 SITES ALONG STREAM LENGTH SEARCHED (1978).

Ecological: WILLOW/ BACCHARIS RIPARIAN WITH OVERSTORY OF COTTONWOOD AND LIVE OAK. RECENTLY SCOURED BY HEAVY RAINS AND HIGH WATER FLOWS IN PREVIOUS 2 WINTERS (1993).

Threat: (1993) WATER DIVERSIONS & IMPOUNDMENTS FROM PVT CAMPGROUNDS, URBANIZATION, HAZARDOUS WASTE FROM SP RAILROAD & RECREATION

General: 1993 SAMPLE SITE WAS LOCATED, T4N, R14W, SECTION 11. THERE WERE 15 SAMPLE POINTS WITH A TOTAL OF 4 FISH OBSERVED AT 3 OF THOSE POINTS. OTHER RARE SPECIES SEEN GASTEROSTEUS ACULEATUS WILLIAMSONI & GILA ORCUTTI

Owner/Manager: PVT

Chaetodipus fallax pallidus

pallid San Diego pocket mouse

Element Code: AMAFD05032

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT BORDER AREAS IN EASTERN SAN DIEGO CO. IN DESERT WASH, DESERT SCRUB, DESERT SUCCULENT SCRUB, PINYON-JUNIPER, ETC.

Micro: SANDY HERBACEOUS AREAS, USUALLY IN ASSOCIATION WITH ROCKS OR COARSE GRAVEL.

Occurrence No. 14 **Map Index:** 60381 **EO Index:** 60417

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1951-10-29
Site: 1951-10-29

Record Last Updated: 2005-03-07

Quad Summary: Mescal Creek (3411746/134B), Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.42265º / -117.76592º
UTM: Zone-11 N3809286 E429620
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 09W
Section: 24 **Qtr:** XX
Meridian: S
Elevation: 4,750 ft

Location: MOUTH OF GRANDVIEW CANYON, SAN GABRIEL MOUNTAINS. NEAR LARGO VISTA.

Location Detail: MAPPED IN THE MOUTH OF GRANDVIEW CANYON. GRANDVIEW CANYON IS ABOUT 5.6 MILES S & 3.3 MILES E OF LLANO (SITE A). SPECIMEN VOUCHER INDICATES IT IS 4 MILES S & 5 MILES E OF LLANO. ALSO COLLECTED AT 5 MI SE OF VALYERMO (SITE B).

Ecological:

Threat:

General: SITE A: 1 MALE SPECIMEN COLLECTED 29 OCT 1951 BY T. VAUGHAN (KU #45251). SITE B: 3 MALE & 5 FEMALE SPECIMENS COLLECTED 21-29 OCT & 13 NOV 1951 BY T. VAUGHAN (KU 45244, 45252, 45254-45257, 45260 & 45261).

Owner/Manager: UNKNOWN

Chaetodipus fallax pallidus

pallid San Diego pocket mouse

Element Code: AMAFD05032

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT BORDER AREAS IN EASTERN SAN DIEGO CO. IN DESERT WASH, DESERT SCRUB, DESERT SUCCULENT SCRUB, PINYON-JUNIPER, ETC.

Micro: SANDY HERBACEOUS AREAS, USUALLY IN ASSOCIATION WITH ROCKS OR COARSE GRAVEL.

Occurrence No. 16 **Map Index:** 60383 **EO Index:** 60419

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1967-09-09
Site: 1967-09-09

Record Last Updated: 2005-03-07

Quad Summary: Juniper Hills (3411748/135B)

County Summary: Los Angeles

Lat/Long: 34.44089º / -117.90870º
UTM: Zone-11 N3811418 E416517
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 10W
Section: 15 **Qtr:** XX
Meridian: S
Elevation: 4,150 ft

Location: LOCATED ABOUT 4.5 MILES SOUTH OF PEARBLOSSOM AND 1.5 MILES ESE OF JUNIPER HILLS.

Location Detail: EXACT LOCATION NOT KNOWN. LOCALITY DESCRIPTION INDICATES SPECIMEN WAS COLLECTED 4-5 MILES SOUTH OF PEARBLOSSOM. THUS MAPPED AT ABOUT 4.5 MILES SOUTH OF PEARBLOSSOM.

Ecological:

Threat:

General: ONE FEMALE SPECIMEN COLLECTED 9 SEP 1967 BY R. PLATTE AT "PEARBLOSSOM, 4-5 MI S." DEPOSITED AT LACM #32880.

Owner/Manager: UNKNOWN

Chaetodipus fallax pallidus

pallid San Diego pocket mouse

Element Code: AMAFD05032

Status

Federal: None
State: None

NDDB Element Ranks

Global: G5T3
State: S3

Other Lists

CDFG Status: SC

Habitat Associations

General: DESERT BORDER AREAS IN EASTERN SAN DIEGO CO. IN DESERT WASH, DESERT SCRUB, DESERT SUCCULENT SCRUB, PINYON-JUNIPER, ETC.

Micro: SANDY HERBACEOUS AREAS, USUALLY IN ASSOCIATION WITH ROCKS OR COARSE GRAVEL.

Occurrence No. 18 **Map Index:** 60385 **EO Index:** 60421

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1966-07-14
Site: 1966-07-14

Record Last Updated: 2005-03-07

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.44500º / -117.81768º
UTM: Zone-11 N3811802 E424883
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 09W
Section: 09 **Qtr:** XX
Meridian: S
Elevation: 4,100 ft

Location: ABOUT 2 MILES EAST OF VALYERMO.

Location Detail:

Ecological:

Threat:

General: ONE FEMALE SPECIMEN COLLECTED 14 JUL 1966 BY N. KARAAZISSIS AT "VALYERMO, 2 MI E." DEPOSITED AT LACM #28083.

Owner/Manager: UNKNOWN

Charadrius montanus

mountain plover

Element Code: ABNNB03100

Status

Federal: None
State: None

NDDB Element Ranks

Global: G2
State: S2?

Other Lists

CDFG Status: SC

Habitat Associations

General: SHORT GRASSLANDS, FRESHLY PLOWED FIELDS, NEWLY SPROUTING GRAIN FIELDS, & SOMETIMES SOD FARMS

Micro: SHORT VEGETATION, BARE GROUND & FLAT TOPOGRAPHY. PREFERS GRAZED AREAS & AREAS WITH BURROWING RODENTS.

Occurrence No. 37 **Map Index:** 54401 **EO Index:** 54401

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 2004-01-10
Site: 2004-01-10

Record Last Updated: 2004-02-10

Quad Summary: Lancaster East (3411861/161A)

County Summary: Los Angeles

Lat/Long: 34.64686º / -118.04194º
UTM: Zone-11 N3834376 E404512
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 07N
Range: 11W
Section: 33 **Qtr:** SE
Meridian: S
Elevation: 2,483 ft

Location: NORTHWEST CORNER OF 50TH STREET EAST AND AVENUE "M," CITY OF PALMDALE, ANTELOPE VALLEY.

Location Detail:

Ecological: PLOVERS WERE FEEDING IN A MOWED ALFALFA FIELD; SURROUNDING AREA IS AGRICULTURE

Threat: THREATENED BY URBAN SPRAWL AND FUTURE AIRPORT EXPANSION

General: BIRDS SIGHTED DURING LANCASTER CHRISTMAS BIRD COUNT ON 20 DEC 2003. ~90 BIRDS OBSERVED ON 10 JAN 2004.

Owner/Manager: PALMDALE AIRPORT

Chorizanthe parryi var. parryi

Parry's spineflower

Element Code: PDPGN040J2

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2T2	**CNPS List:**	3.2
State:	None	**State:**	S2.1		

Habitat Associations

General: COASTAL SCRUB, CHAPARRAL.

Micro: DRY SLOPES AND FLATS; SOMETIMES AT INTERFACE OF 2 VEG TYPES, SUCH AS CHAP AND OAK WDLAND; DRY, SANDY SOILS. 40-1705M.

Occurrence No. 38 **Map Index:** 42078 **EO Index:** 42078

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1896-06-XX
Site: 1896-06-XX
Record Last Updated: 1999-12-23

Quad Summary: Lancaster East (3411861/161A), Lancaster West (3411862/161B), Rosamond Lake (3411871/186D), Rosamond (3411872/186C)

County Summary: Los Angeles

Lat/Long: 34.69883º / -118.13787º
UTM: Zone-11 N3840234 E395785
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 5 mile

Township: 07N
Range: 12W
Section: 15 **Qtr:** XX
Meridian: S
Elevation: 2,350 ft

Location: LANCASTER.

Location Detail: EXACT LOCATION NOT KNOWN; MAPPED IN GENERAL VICINITY OF LANCASTER.

Ecological:

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1892 COLLECTION BY A. DAVIDSON.

Owner/Manager: UNKNOWN

Clarkia xantiana ssp. parviflora

Kern Canyon clarkia

Element Code: PDONA05181

Status

Federal: None
State: None

NDDB Element Ranks

Global: G4T1
State: S1.2

Other Lists

CNPS List: 4.2

Habitat Associations

General: CISMONTANE WOODLAND, GREAT BASIN SCRUB.
Micro: DRY SLOPES. 800-3620M.

Occurrence No. 8 **Map Index:** 65089 **EO Index:** 65168

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1995-06-06
Site: 1995-06-06

Record Last Updated: 2006-07-12

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.43230º / -117.84183º
UTM: Zone-11 N3810412 E422653
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 04N
Range: 09W
Section: 17 **Qtr:** XX
Meridian: S
Elevation:

Location: ABOUT 2 KM SOUTHEAST OF VALYERMO POST OFFICE, OFF L.A. COUNTY ROAD JUST WEST OF MOUTH OF CANYON OF BIG ROCK CREEK.

Location Detail:

Ecological: ON E-FACING SLOPE IN LOOSE SOIL; UNDER AND BETWEEN SHRUBS INCLUDING ARTEMISIA, JUNIPERUS, AND PURSHIA.

Threat:

General: A FEW HUNDRED INDIVIDUALS SEEN. 1995 GEBER COLLECTION IS THE ONLY SOURCE FOR THIS OCCURRENCE. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Eumops perotis californicus

western mastiff bat

Element Code: AMACD02011

Status

Federal: None
State: None

NDDB Element Ranks

Global: G5T4
State: S3?

Other Lists

CDFG Status: SC

Habitat Associations

General: MANY OPEN, SEMI-ARID TO ARID HABITATS, INCLUDING CONIFER & DECIDUOUS WOODLANDS, COASTAL SCRUB, GRASSLANDS, CHAPARRAL ETC

Micro: ROOSTS IN CREVICES IN CLIFF FACES, HIGH BUILDINGS, TREES & TUNNELS.

Occurrence No. 170 **Map Index:** 66429 **EO Index:** 66528

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1929-10-24
Site: 1929-10-24

Record Last Updated: 2006-09-26

Quad Summary: Lovejoy Buttes (3411757/160D)

County Summary: Los Angeles

Lat/Long: 34.50563º / -117.81886º
UTM: Zone-11 N3818526 E424829
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 05N
Range: 09W
Section: 21 **Qtr:** E
Meridian: S
Elevation:

Location: LLANO.

Location Detail: EXACT LOCATION UNKNOWN. MAPPED IN THE GENERAL VICINITY OF LLANO. LAT/LONG COORDINATES PROVIDED BY PIERSON AND RAINEY ARE APPROX. 3 MI ESE OF LLANO.

Ecological:

Threat:

General: SPECIMEN COLLECTED 24 OCT 1929 AND DEPOSITED AT LACM.

Owner/Manager: UNKNOWN

Falco mexicanus

prairie falcon

Element Code: ABNKD06090

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: None	**State:** S3	

Habitat Associations

General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.

Micro: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.

* SENSITIVE *

Occurrence No. 241 **Map Index:** 02577 **EO Index:** 26170

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-06-16
Site: 1978-06-16

Record Last Updated: 2005-02-23

Quad Summary: Hi Vista (3411767/160A)

County Summary: Los Angeles

* SENSITIVE *

Lat/Long:
UTM:
Mapping Precision:
Symbol Type:
Radius:

Township:
Range:
Section: **Qtr:**
Meridian:
Elevation:

Location: *SENSITIVE* Location information suppressed.

Location Detail: Please contact the California Natural Diversity Database, California Department of Fish and Game, for more information:
(916) 324-3812.

Ecological:
Threat:
General:
Owner/Manager:

Falco mexicanus

prairie falcon

Element Code: ABNKD06090

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: None	**State:** S3	

Habitat Associations

General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.

Micro: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.

* SENSITIVE *

Occurrence No. 242 **Map Index:** 02570 **EO Index:** 26171

Dates Last Seen

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Element: 1978-06-16
Site: 1978-06-16
Record Last Updated: 2005-02-23

Quad Summary: Lovejoy Buttes (3411757/160D)
County Summary: Los Angeles

* SENSITIVE *

Lat/Long:
UTM:
Mapping Precision:
Symbol Type:
Radius:

Township:
Range:
Section: **Qtr:**
Meridian:
Elevation:

Location: *SENSITIVE* Location information suppressed.

Location Detail: Please contact the California Natural Diversity Database, California Department of Fish and Game, for more information:
(916) 324-3812.

Ecological:
Threat:
General:
Owner/Manager:

Falco mexicanus

prairie falcon

Element Code: ABNKD06090

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: None	**State:** S3	

Habitat Associations

General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.

Micro: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.

* SENSITIVE *

Occurrence No. 243 **Map Index:** 02569 **EO Index:** 26167

Dates Last Seen

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Element: 1983-06-23
Site: 1984-XX-XX

Record Last Updated: 2005-02-23

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

* SENSITIVE *

Lat/Long:
UTM:
Mapping Precision:
Symbol Type:
Radius:

Township:
Range:
Section: **Qtr:**
Meridian:
Elevation:

Location: *SENSITIVE* Location information suppressed.

Location Detail: Please contact the California Natural Diversity Database, California Department of Fish and Game, for more information:
(916) 324-3812.

Ecological:

Threat:

General:

Owner/Manager:

Falco mexicanus

prairie falcon

Element Code: ABNKD06090

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: None	**State:** S3	

Habitat Associations

General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.

Micro: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.

* SENSITIVE *

Occurrence No. 250 **Map Index:** 02574 **EO Index:** 26165

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1977-05-15
Site: 1977-05-15
Record Last Updated: 1996-10-03

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

* SENSITIVE *

Lat/Long:
UTM:
Mapping Precision:
Symbol Type:
Radius:

Township:
Range:
Section: **Qtr:**
Meridian:
Elevation:

Location: *SENSITIVE* Location information suppressed.

Location Detail: Please contact the California Natural Diversity Database, California Department of Fish and Game, for more information:
(916) 324-3812.

Ecological: HABITAT IS PINE-YUCCA-OAK, CREOSOTE-YUCCA-JUNIPER-JOSHUA.

Threat:

General:

Owner/Manager:

Falco mexicanus

prairie falcon

Element Code: ABNKD06090

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: None	**State:** S3	

Habitat Associations

General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.

Micro: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.

* SENSITIVE *

Occurrence No. 433 **Map Index:** 02560 **EO Index:** 26003

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1983-04-16
Site: 1983-04-16
Record Last Updated: 1996-02-22

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

* SENSITIVE *

Lat/Long:
UTM:
Mapping Precision:
Symbol Type:
Radius:

Township:
Range:
Section: **Qtr:**
Meridian:
Elevation:

Location: *SENSITIVE* Location information suppressed.

Location Detail: Please contact the California Natural Diversity Database, California Department of Fish and Game, for more information:
(916) 324-3812.

Ecological:
Threat:
General:
Owner/Manager:

Falco mexicanus

prairie falcon

Element Code: ABNKD06090

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: None	**State:** S3	

Habitat Associations

General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.

Micro: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.

Occurrence No. 463 **Map Index:** 60162 **EO Index:** 60198

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1997-XX-XX
Site: 1997-XX-XX

Record Last Updated: 2005-02-23

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.40084º / -117.84444º
UTM: Zone-11 N3806925 E422384
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 04N
Range: 09W
Section: 29 **Qtr:** XX
Meridian: S
Elevation: 1,500 ft

Location: VICINITY OF DEVILS CHAIR, DEVILS PUNCHBOWL COUNTY PARK
Location Detail:
Ecological: HABITAT CONSISTS OF A ROCKY OUTCROPPING.
Threat:
General: 2 PAIRS CONFIRMED NESTING IN THIS AREA IN 1997 (FROM LOS ANGELES COUNTY BREEDING BIRD ATLAS STUDY).
Owner/Manager: LOS ANGELES COUNTY

Falco mexicanus

prairie falcon

Element Code: ABNKD06090

Status

Federal: None
State: None

NDDB Element Ranks

Global: G5
State: S3

Other Lists

CDFG Status:

Habitat Associations

General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.
Micro: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.

Occurrence No. 464 **Map Index:** 60180 **EO Index:** 60216

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1976-XX-XX
Site: 1976-XX-XX

Record Last Updated: 2005-02-23

Quad Summary: Acton (3411842/136B)
County Summary: Los Angeles

Lat/Long: 34.45080º / -118.22273º
UTM: Zone-11 N3812819 E387679
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 04N
Range: 13W
Section: 10 **Qtr:** NE
Meridian: S
Elevation: 3,400 ft

Location: ABOUT 1 MILE NORTH OF RAVENNA
Location Detail: DFG EYRIE LA006
Ecological:
Threat:
General: ACTIVE NEST SITE IN 1976 AND 1977.
Owner/Manager: UNKNOWN

Gasterosteus aculeatus williamsoni

unarmored threespine stickleback

Element Code: AFCPA03011

Status		NDDB Element Ranks		Other Lists	
Federal:	Endangered	**Global:**	G5T1	**CDFG Status:**	
State:	Endangered	**State:**	S1		

Habitat Associations

General: WEEDY POOLS, BACKWATERS, AND AMONG EMERGENT VEGETATION AT THE STREAM EDGE IN SMALL SOUTHERN CALIFORNIA STREAMS.

Micro: COOL (<24 C), CLEAR WATER WITH ABUNDANT VEGETATION.

Occurrence No. 4 **Map Index:** 02048 **EO Index:** 5409

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2007-12-13
Site: 2007-12-13
Record Last Updated: 2008-01-24

Quad Summary: Acton (3411842/136B), Agua Dulce (3411843/137A)

County Summary: Los Angeles

Lat/Long: 34.43811º / -118.33058º
UTM: Zone-11 N3811537 E377754
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 13W
Section: 08 **Qtr:** XX
Meridian: S
Elevation: 2,440 ft

Location: SANTA CLARA RIVER IN SOLEDAD CANYON, FROM 1.25 MILES EAST OF LANG TO 1 MILE UP CREEK IN ARRASTRE CANYON

Location Detail: FLOODS IN 1993 ELIMINATED MOST BREEDING POOLS; WATERFALL CREATED BY DYNAMITING RIVER HAS PREVENTED UPSTREAM RECOLONIZATION, FURTHER ISOLATING THE POPULATION. HISTORIC INFO IN1996 REPORT.

Ecological: EMERGENT VEGETATION (GRASSES) GROWING OUT FROM SHORE LEAVING ONLY ABOUT A 3' CHANNEL. SANTA ANA SUCKER AND ARROYO CHUB ALSO AT THIS SITE. 2007: CREEK UNDERGOING RESTORATION AFTER CLEAN WATER ACT SEC 404 VIOLATION.

Threat: THREATS INCLUDE STREAM ALTERATION, FLOODS, RECREATION, AND THE PRESENCE OF AFRICAN CLAWED FROGS.

General: 1987: 51 COLLECTED & DEPOSITED UCLA. 1981-1995: UTS SAMPLING (SOLEDAD CAMPGROUND): HIGH OF 784 FISH IN 1991, LOW OF 13 IN 1995. RESULTS OF SEINING-VIC OF RUSS: 57 IN 1999, 123 IN 2000 & 80 IN 2001. 6 OBSERVED 6 MAY 2005. 1 OBS 13 DEC 2007.

Owner/Manager: PVT, USFS-ANGELES NF

Gopherus agassizii

desert tortoise

Element Code: ARAAF01010

Status		NDDB Element Ranks		Other Lists	
Federal:	Threatened	**Global:**	G4	**CDFG Status:**	
State:	Threatened	**State:**	S2		

Habitat Associations

General: MOST COMMON IN DESERT SCRUB, DESERT WASH, AND JOSHUA TREE HABITATS; OCCURS IN ALMOST EVERY DESERT HABITAT.

Micro: REQUIRE FRIABLE SOIL FOR BURROW AND NEST CONSTRUCTION. CREOSOTE BUSH HABITAT WITH LG ANNUAL WILDFLOWER BLOOMS PREFERRED.

Occurrence No. 1 **Map Index:** 03129 **EO Index:** 14806

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Decreasing

Dates Last Seen
Element: 2004-04-12
Site: 2004-04-12
Record Last Updated: 2006-08-04

Quad Summary: Minneola (3411677/181D), Adelanto (3411754/158C), Helendale (3411763/158A), Wild Crossing (3411773/183D), Redman (3411778/185C), Barstow (3411781/182A), Twelve Gauge Lake (3411783/183A), Edwards (3411788/185B),

County Summary: Williams Well (3511628/206B), Water Valley (3511712/207C), Boron NW (3511726/209B), Johannesburg (3511736/234C), Saltdale NW (3511748/235B), Mojave NE (3511821/211A), Cinco (3511831/236D), Harvard Hill (3411686/180B), Yermo (3411687/181A), Hinkley (3411782/182B), Rosamond Lake (3411871/186D), Bissell (3411881/186A), Lane Mountain (3511618/206C), The Buttes (3511714/208C), Saddleback Mtn. (3511715/209D), Boron (3511716/209C), North Edwards (3511717/210D), Fremont Peak (3511724/208B), Boron NE (3511725/209A), Cuddeback Lake (3511734/233C), Red Mountain (3511735/234D), Saltdale SE (3511737/235D), Shadow Mountains SE (3411755/159D), Turtle Valley (3411762/157B), Hodge (3411772/182C), Red Buttes (3411775/184D), Leuhman Ridge (3411786/184B), Coyote Lake (3511617/206D), Mud Hills (3511711/207D), Lockhart (3511713/208D), California City South (3511718/210C), Superior Lake (3511721/207A), Galileo Hill (3511727/210A), California City North (3511728/210B), Superior Valley (3511731/232D), Blackwater Well (3511733/233D), Cantil (3511738/235C), West Ord Mountain (3411668/156B), Daggett (3411678/181C), Nebo (3411688/181B), Victorville (3411753/158D), Stoddard Well (3411761/157A), Victorville NW (3411764/158B), Shadow Mountains (3411765/159A), Adobe Mountain (3411766/159B), Hi Vista (3411767/160A), Barstow SE (3411771/182D), Astley Rancho (3411774/183C), Jackrabbit Hill (3411776/184C), Rogers Lake South (3411777/185D), Kramer Hills (3411784/183B), Kramer Junction (3411785/184A), Rogers Lake North (3411787/185A), Alvord Mtn. West (3511616/205C), Langford Well (3511626/205B), Paradise Range (3511627/206A), Opal Mountain (3511722/207B), Bird Spring (3511723/208A), Slocum Mtn. (3511732/232C), West of Black Hills (3511744/233B), Klinker Mtn. (3511745/234A), El Paso Peaks (3511746/234B), Garlock (3511747/235A), Ridgecrest South (3511756/257C), Inyokern SE (3511757/258D), Sanborn (3511811/211D)

Los Angeles, Kern, San Bernardino

Lat/Long: 35.02758º / -117.38310º
UTM: Zone-11 N3876168 E465052
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 1,782,558.0 acres

Township: 11N
Range: 06W
Section: 34 **Qtr:** XX
Meridian: S
Elevation:

Location: FREMONT-STODDARD; FREMONT VALLEY SOUTH TO THE VICINITY OF ADELANTO AND HWY 14 EAST TO CALICO MOUNTAINS, W MOJAVE DESERT.

Location Detail: LARGEST OF 4 PRIMARY POPS IN CALIF. IN 1977, ESTIMATED DENSITIES WERE 20 TO >250 TORTOISES/SQ MI. AS OF 1987, EVIDENCE SUGGESTS MAJOR DECLINES IN ESTIMATED DENSITY IN MOST AREAS.

Ecological: AREA COVERS APPROX. 1700 SQ MILES, FROM 2000 TO >4000 FT ELEV W/SEVERAL VEG COMMUNITIES INCLUDED.

Threat: INCREASING HUMAN DISTURBANCE, GRAZING, DEVELOPMENT AND HABITAT FRAGMENTATION.

General:

Owner/Manager: BLM, PVT, DFG, DOD, STATE

Layia heterotricha

pale-yellow layia

Element Code: PDAST5N070

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2G3	**CNPS List:** 1B.1
State: None	**State:** S2S3.1	

Habitat Associations

General: CISMONTANE WOODLAND, PINYON-JUNIPER WOODLAND, VALLEY AND FOOTHILL GRASSLAND.

Micro: ALKALINE OR CLAY SOILS; OPEN AREAS. 270-1365 (2675)M.

Occurrence No. 35 **Map Index:** 27633 **EO Index:** 67357

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1895-05-08
Site: 1895-05-08

Record Last Updated: 2006-11-22

Quad Summary: Lancaster East (3411861/161A), Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.69828º / -118.13809º
UTM: Zone-11 N3840173 E395765
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 07N
Range: 12W
Section: 15 **Qtr:** XX
Meridian: S
Elevation: 2,400 ft

Location: LANCASTER.

Location Detail: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS NEAR LANCASTER.

Ecological:

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS AN 1895 COLLECTION BY DAVIDSON. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Lilium parryi

lemon lily

Element Code: PMLIL1A0J0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CNPS List:** 1B.2
State: None	**State:** S2.1	

Habitat Associations

General: LOWER MONTANE CONIFEROUS FOREST, MEADOWS AND SEEPS, RIPARIAN FOREST, UPPER MONTANE CONIFEROUS FOREST.

Micro: WET, MOUNTAINOUS TERRAIN; GEN IN FORESTED AREAS; ON SHADY EDGES OF STREAMS, IN OPEN BOGGY MEADOWS & SEEPS. 1300-2790M.

Occurrence No. 68 **Map Index:** 48441 **EO Index:** 48441

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Possibly Extirpated
Trend: Unknown

Dates Last Seen
Element: 1967-08-02
Site: 1994-07-01
Record Last Updated: 2007-03-14

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.38599º / -118.03704º
UTM: Zone-11 N3805442 E404664
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 04N
Range: 11W
Section: 33 **Qtr:** XX
Meridian: S
Elevation: 6,367 ft

Location: SHEEP CAMP SPRING.
Location Detail: EXACT LOCATION UNKNOWN, MAPPED IN THE VICINITY OF SHEEP CAMP SPRING.
Ecological:
Threat:
General: 1967 COLLECTION BY WHEELER ATTRIBUTED TO THIS SITE. SITE MAY BE EXTIRPATED AS NO INDIVIDUALS WERE OBSERVED IN 1994 SURVEYS.
Owner/Manager: USFS-ANGELES NF

Linanthus concinnus

San Gabriel linanthus

Element Code: PDPLM090D0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2?	**CNPS List:** 1B.2
State: None	**State:** S2?	

Habitat Associations

General: LOWER MONTANE CONIFEROUS FOREST, UPPER MONTANE CONIFEROUS FOREST.

Micro: DRY ROCKY SLOPES, OFTEN IN JEFFREY PINE/CANYON OAK FOREST. 1575-2545M.

Occurrence No. 4 **Map Index:** 28854 **EO Index:** 28372

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-05-16
Site: 1986-05-16
Record Last Updated: 1997-02-25

Quad Summary: Chilao Flat (3411831/136D), Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.37269º / -118.02337º
UTM: Zone-11 N3803954 E405907
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 03N
Range: 11W
Section: 03 **Qtr:** XX
Meridian: S
Elevation: 6,300 ft

Location: ROAD BETWEEN ALDER SADDLE AND PACIFICO MOUNTAIN, SAN GABRIEL MOUNTAINS.

Location Detail: ALONG UNPAVED ROAD NORTHWEST OF HIGHWAY 2.

Ecological: ROCKY ROADSIDE IN OPEN CHAPARRAL ON DECOMPOSED GRANITE SOILS.

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1986 COLLECTION BY HARPER.

Owner/Manager: UNKNOWN

Linanthus concinnus

San Gabriel linanthus

Element Code: PDPLM090D0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2?	**CNPS List:** 1B.2
State: None	**State:** S2?	

Habitat Associations

General: LOWER MONTANE CONIFEROUS FOREST, UPPER MONTANE CONIFEROUS FOREST.

Micro: DRY ROCKY SLOPES, OFTEN IN JEFFREY PINE/CANYON OAK FOREST. 1575-2545M.

Occurrence No. 6 **Map Index:** 35446 **EO Index:** 25583

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1923-05-26
Site: 1923-05-26
Record Last Updated: 1997-02-25

Quad Summary: Crystal Lake (3411737/135D), Mescal Creek (3411746/134B), Valyermo (3411747/135A), Mount San Antonio (3411736/134C)

County Summary: Los Angeles

Lat/Long: 34.37215º / -117.74980º
UTM: Zone-11 N3803675 E431060
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 03N
Range: 08W
Section: XX **Qtr:** XX
Meridian: S
Elevation: 6,700 ft

Location: VINCENT GULCH, SAN GABRIEL MOUNTAINS.
Location Detail: COLLECTED AT 6700' ELEVATION.
Ecological: OCCASIONAL ON WARM DRY SLOPES.
Threat:
General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1923 COLLECTION BY MUNZ.
Owner/Manager: UNKNOWN

Linanthus concinnus

San Gabriel linanthus

Element Code: PDPLM090D0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2?	**CNPS List:** 1B.2
State: None	**State:** S2?	

Habitat Associations

General: LOWER MONTANE CONIFEROUS FOREST, UPPER MONTANE CONIFEROUS FOREST.

Micro: DRY ROCKY SLOPES, OFTEN IN JEFFREY PINE/CANYON OAK FOREST. 1575-2545M.

Occurrence No. 13 **Map Index:** 28853 **EO Index:** 30441

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1992-XX-XX
Site: 1994-XX-XX

Record Last Updated: 1997-03-11

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.40414º / -117.86698º
UTM: Zone-11 N3807308 E420316
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 04N
Range: 09W
Section: 30 **Qtr:** NW
Meridian: S
Elevation: 5,300 ft

Location: PUNCHBOWL CANYON SOUTHWEST OF DEVILS PUNCHBOWL COUNTY PARK, NORTH SLOPE OF SAN GABRIEL MOUNTAINS.

Location Detail: SOUTHEAST SIDE OF CANYON ABOUT 500 METERS SOUTH OF THE 5270' ELEVATION MARKER. MAPPED WITHIN THE SW 1/4 OF THE NW 1/4 OF SECTION 30.

Ecological: OPEN AREA IN COULTER PINE FOREST. ASSOCIATED WITH LINANTHUS BREVICULUS. WEST-FACING SLOPE.

Threat:

General: SPECIES OBSERVED HERE IN 1992. AREA SEARCHED IN 1994 BUT NO PLANTS FOUND.

Owner/Manager: USFS-ANGELES NF?

Loeflingia squarrosa var. artemisiarum

sagebrush loeflingia

Element Code: PDCAR0E011

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T2T3	**CNPS List:** 2.2
State: None	**State:** S2.2	

Habitat Associations

General: GREAT BASIN SCRUB, SONORAN DESERT SCRUB, DESERT DUNES.

Micro: SANDY FLATS AND DUNES. SANDY AREAS AROUND CLAY SLICKS W/SARCOBATUS, ATRIPLEX, TETRADYMIA, ETC. 700-1200M.

Occurrence No. 23 **Map Index:** 64630 **EO Index:** 64709

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-07-XX
Site: 2005-07-XX
Record Last Updated: 2006-05-04

Quad Summary: Palmdale (3411851/161D)
County Summary: Los Angeles

Lat/Long: 34.53199º / -118.01410º
UTM: Zone-11 N3821611 E406935
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 11W
Section: 10 **Qtr:** SE
Meridian: S
Elevation: 2,800 ft

Location: GRAVEL QUARRY, NORTHEAST SIDE OF PEARBLOSSOM HIGHWAY (HWY 138), ABOUT 1.2 MILES SOUTHEAST OF FOUR POINTS.

Location Detail: ALONG NARROW DIRT ROAD WHICH TRAVELS FROM NW TO SE THROUGH PROJECT AREA. MAPPED ACCORDING TO UTM COORDINATES PROVIDED BY YOUNG: UTM ZONE11 NAD27 407017E/3821415N. MAPPED NEAR THE CENTER OF THE SE 1/4 OF SECTION 10.

Ecological: DOMINANTS INCLUDE ENCELIA SPP. AND BROMUS MADRITENSIS.

Threat: SITE WILL BE CLEARED FOR GRAVEL QUARRY EXPANSION. PLANTS OCCUR ALONG NARROW DIRT ROAD, MINIMAL ORV USE.

General: UNKNOWN NUMBER OF PLANTS OBSERVED BY YOUNG IN 2005.

Owner/Manager: PVT

Loeflingia squarrosa var. artemisiarum

sagebrush loeflingia

Element Code: PDCAR0E011

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T2T3	**CNPS List:** 2.2
State: None	**State:** S2.2	

Habitat Associations

General: GREAT BASIN SCRUB, SONORAN DESERT SCRUB, DESERT DUNES.

Micro: SANDY FLATS AND DUNES. SANDY AREAS AROUND CLAY SLICKS W/SARCOBATUS, ATRIPLEX, TETRADYMIA, ETC. 700-1200M.

Occurrence No. 24 **Map Index:** 64631 **EO Index:** 64710

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2005-05-04
Site: 2005-05-04
Record Last Updated: 2006-05-04

Quad Summary: Lancaster East (3411861/161A)
County Summary: Los Angeles

Lat/Long: 34.66875º / -118.10401º
UTM: Zone-11 N3836865 E398850
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 07N
Range: 12W
Section: 25 **Qtr:** NW
Meridian: S
Elevation: 2,450 ft

Location: ABOUT 0.5 MILE SOUTH OF AVENUE K, MIDWAY BETWEEN 10TH AND 20TH STREETS, EAST OF SUNRISE.

Location Detail: PLANTS MOSTLY FOUND ON ABANDONED HARD PACKED ROAD & DISTURBED SINKS THAT HAD PONDED WATER DURING WINTER & SPRING. MAPPED ACCORDING TO COORDINATES PROVIDED BY YOUNG: UTM ZONE11 NAD27 398932E/3836669N. MAPPED WITHIN THE SE 1/4 OF SECTION 10.

Ecological: JOSHUA TREE UPPERSTORY WITH SALTBUSH SCRUB UNDERSTORY. SOIL: SANDY/LOAMY. SLOPE:0. PLANTS SEEM TO BE CONCENTRATED ALONG EDGE OF SINKS AND DEPRESSIONS IN HARD PACKED SANDY AREAS.

Threat: EXCESSIVE ORV USE WITHIN AND ADJACENT TO SITE, 3-15 ORV'S PER DAY. THREATENED BY RAPID URBAN SPRAWL.

General: 40 PLANTS OBSERVED BY YOUNG IN 2005. PLANTS DETECTED DURING MOHAVE GROUND SQUIRREL TRAPPING.

Owner/Manager: PVT

Lupinus peirsonii

Peirson's lupine

Element Code: PDFAB2B330

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.3
State: None	**State:** S2.3	

Habitat Associations

General: JOSHUA TREE WOODLAND, PINYON-JUNIPER WOODLAND, UPPER MONTANE CONIFEROUS FOREST.

Micro: DECOMPOSED GRANITE SLIDE AND TALUS, ON SLOPES AND RIDGES. 1000-2000M.

Occurrence No. 3 **Map Index:** 59039 **EO Index:** 59075

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1977-06-04
Site: 1977-06-04

Record Last Updated: 2004-12-30

Quad Summary: Valyermo (3411747/135A), Crystal Lake (3411737/135D)

County Summary: Los Angeles

Lat/Long: 34.37436º / -117.77936º
UTM: Zone-11 N3803941 E428344
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 03N
Range: 09W
Section: 01 **Qtr:** XX
Meridian: S
Elevation: 7,300 ft

Location: SAN GABRIEL MOUNTAINS, FROM 2.3 TO 4.1 MILES EAST OF DAWSON SADDLE ALONG HIGHWAY 2.

Location Detail: MAPPED BASED ON THREE COLLECTIONS FROM 7100-7500 FEET ALONG HIGHWAY 2 EAST OF DAWSON SADDLE AND WEST OF VINCENT GAP.

Ecological: ALONG ROADSIDE, ON ROCKY SLOPES, AND IN YELLOW PINE FOREST.

Threat:

General: ONLY SOURCES ARE THREE COLLECTIONS FROM 1962-1977. FIELDWORK NEEDED.

Owner/Manager: USFS-ANGELES NF

Lupinus peirsonii

Peirson's lupine

Element Code: PDFAB2B330

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.3
State: None	**State:** S2.3	

Habitat Associations

General: JOSHUA TREE WOODLAND, PINYON-JUNIPER WOODLAND, UPPER MONTANE CONIFEROUS FOREST.

Micro: DECOMPOSED GRANITE SLIDE AND TALUS, ON SLOPES AND RIDGES. 1000-2000M.

Occurrence No. 4 **Map Index:** 59043 **EO Index:** 59079

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1977-06-04
Site: 1977-06-04

Record Last Updated: 2004-12-30

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.40536º / -117.81954º
UTM: Zone-11 N3807407 E424677
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 09W
Section: 28 **Qtr:** XX
Meridian: S
Elevation: 4,550 ft

Location: SAN GABRIEL MOUNTAINS, SOUTHWEST SLOPE OF PINYON RIDGE, ALONG BIG ROCK CREEK 0.7 MI SOUTH OF SYCAMORE FLAT CAMPGROUND.

Location Detail: MAPPED ALONG BIG ROCK CREEK BASED ON COLLECTION FROM "3 MILES NORTH OF BIG ROCK CREEK CAMPGROUND, 4600 FEET" (LONG & MCKERNAN SN), & TWO COLLECTIONS FROM BIG ROCK CREEK CANYON AT 4500 FEET.

Ecological: GRAVELLY SLOPES.

Threat:

General: ONLY SOURCES ARE PRE-1978 COLLECTIONS. NEEDS FIELDWORK.

Owner/Manager: USFS-ANGELES NF

Lupinus peirsonii

Peirson's lupine

Element Code: PDFAB2B330

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.3
State: None	**State:** S2.3	

Habitat Associations

General: JOSHUA TREE WOODLAND, PINYON-JUNIPER WOODLAND, UPPER MONTANE CONIFEROUS FOREST.

Micro: DECOMPOSED GRANITE SLIDE AND TALUS, ON SLOPES AND RIDGES. 1000-2000M.

Occurrence No. 5 **Map Index:** 59045 **EO Index:** 59081

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1968-07-23
Site: 1968-07-23

Record Last Updated: 2005-01-06

Quad Summary: Juniper Hills (3411748/135B)
County Summary: Los Angeles

Lat/Long: 34.38273º / -117.89424º
UTM: Zone-11 N3804956 E417789
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 10W
Section: 35 **Qtr:** SE
Meridian: S
Elevation: 6,600 ft

Location: SAN GABRIEL MOUNTAINS, JUST SOUTH OF BURKHART SADDLE.
Location Detail: MAPPED WITH T-R-S PROVIDED: T4N R10W SW 1/4 OF SE 1/4 SECTION 35.
Ecological:
Threat:
General: ONLY SOURCE IS 1968 COLLECTION. NEEDS FIELDWORK.
Owner/Manager: USFS-ANGELES NF

Lupinus peirsonii

Peirson's lupine

Element Code: PDFAB2B330

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.3
State: None	**State:** S2.3	

Habitat Associations

General: JOSHUA TREE WOODLAND, PINYON-JUNIPER WOODLAND, UPPER MONTANE CONIFEROUS FOREST.

Micro: DECOMPOSED GRANITE SLIDE AND TALUS, ON SLOPES AND RIDGES. 1000-2000M.

Occurrence No. 6 **Map Index:** 59085 **EO Index:** 59121

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 197X-XX-XX
Site: 197X-XX-XX

Record Last Updated: 2005-01-04

Quad Summary: Crystal Lake (3411737/135D), Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.37625º / -117.75609º
UTM: Zone-11 N3804134 E430484
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 03N
Range: 08W
Section: 06 **Qtr:** XX
Meridian: S
Elevation:

Location: SAN GABRIEL MOUNTAINS, ALONG UPPER ROAD INTO BIG ROCK CREEK NEAR VINCENT GAP.

Location Detail: MAPPED ALONG ROAD DESCENDING TO BIG ROCK CREEK CAMPGROUND IN VICINITY OF HIGHWAY 2 JUNCTION AT VINCENT GAP.

Ecological:

Threat:

General: ONLY SOURCE IS UNDATED OBSERVATION FROM "THE 1970S-1980S." NEEDS FIELDWORK.

Owner/Manager: USFS-ANGELES NF

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 4 **Map Index:** 02511 **EO Index:** 15593

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-23

Quad Summary: Juniper Hills (3411748/135B)
County Summary: Los Angeles

Lat/Long: 34.40773º / -117.89009º
UTM: Zone-11 N3807724 E418195
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 219.5 acres

Township: 04N
Range: 10W
Section: 26 **Qtr:** E
Meridian: S
Elevation: 5,080 ft

Location: CRUTHERS CREEK, NORTH OF BURKHART SADDLE TO NEAR FOREST BOUNDARY.
Location Detail: FROM INTERPRETATION OF 1978 AERIAL PHOTOS.
Ecological: VEG COMPOSITION UNKNOWN. UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO
Threat:
General: NEEDS FIELD CHECK.
Owner/Manager: USFS-ANGELES NF

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 5 **Map Index:** 02499 **EO Index:** 15594

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-23

Quad Summary: Juniper Hills (3411748/135B)
County Summary: Los Angeles

Lat/Long: 34.40635º / -117.90830º
UTM: Zone-11 N3807586 E416520
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 137.0 acres

Township: 04N
Range: 10W
Section: 27 **Qtr:** NE
Meridian: S
Elevation: 5,120 ft

Location: PALLETT CREEK, EAST OF PLEASANT VIEW RIDGE.
Location Detail: INTERPRETED FROM 1978 AERIAL PHOTOS.
Ecological: VEG COMPOSITION UNKNOWN. UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO
Threat:
General: NEEDS FIELD VISIT.
Owner/Manager: USFS-ANGELES NF

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 6 **Map Index:** 02339 **EO Index:** 15595

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1988-03-31
Site: 1988-03-31
Record Last Updated: 1998-07-23

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.48986º / -118.02504º
UTM: Zone-11 N3816949 E405884
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 51.2 acres

Township: 05N
Range: 11W
Section: 27 **Qtr:** W
Meridian: S
Elevation: 3,080 ft

Location: LITTLE ROCK WASH BETWEEN LITTLE ROCK-PALMDALE DAM & LITTLE ROCK STATION.
Location Detail:
Ecological: OPEN CANOPY OF POPULUS FREMONTII W/SOME PLATANUS RACEMOSA. MUCH RIVER WASH.
Threat:
General: THIS WAS OCC #006 OF CTT61700CA.
Owner/Manager: USFS-ANGELES NF

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 7 **Map Index:** 02350 **EO Index:** 15592

Occ Rank: Poor
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Decreasing

Dates Last Seen
Element: 1988-03-31
Site: 1988-03-31
Record Last Updated: 1998-07-23

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.46228º / -118.01873º
UTM: Zone-11 N3813885 E406433
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 90.4 acres

Township: 04N
Range: 11W
Section: XX **Qtr:** XX
Meridian: S
Elevation: 3,320 ft

Location: LITTLE ROCK CREEK, UPSTREAM OF LITTLE ROCK RESERVOIR FOR <1 MILE.
Location Detail:
Ecological: OPEN CANOPY OF POPULUS FREMONTII AND SALIX SPP OVER BACCHARIS GLUTINOSA; MUCH RIVER WASH.
Threat: DISTURBED BY OFF ROAD VEHICLES.
General: THIS WAS OCC #007 OF CTT61700CA.
Owner/Manager: USFS-ANGELES NF

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 8 **Map Index:** 02522 **EO Index:** 13386

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-23

Quad Summary: Valyermo (3411747/135A), Juniper Hills (3411748/135B)
County Summary: Los Angeles

Lat/Long: 34.45508º / -117.88505º
UTM: Zone-11 N3812971 E418705
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 69.8 acres

Township: 04N
Range: 10W
Section: 01 **Qtr:** S
Meridian: S
Elevation: 3,720 ft

Location: PALLETT CREEK, FROM ABOUT 0.7 MI EAST OF 131 ST, EXTENDING D/S (E) FOR ABOUT 1 MI.
Location Detail: EXTANT 1978 PER INTERPRETATION OF AERIAL PHOTOS.
Ecological: CLOSED CANOPY POPULUS FREMONTII & SALIX SPP ACCORDING TO WIESLANDER SURVEY.
Threat:
General: NEEDS FIELD VISIT. THIS WAS OCC #008 OF CTT61700CA.
Owner/Manager: UNKNOWN

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 9 **Map Index:** 02557 **EO Index:** 15591

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19

Record Last Updated: 1998-07-23

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.46131º / -117.86434º
UTM: Zone-11 N3813646 E420612
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 241.7 acres

Township: 04N
Range: 09W
Section: 06 **Qtr:** XX
Meridian: S
Elevation: 3,520 ft

Location: BIG ROCK CREEK, FROM CRYSTALAIRE COUNTRY CLUB UPSTREAM ABOUT 2 MILES.

Location Detail: EXTANT, 1978, PER INTERPRETATION OF AERIAL PHOTOS; AREA D/S OF COUNTY FIRE STATION #79 APPEARED TO HAVE MUCH DENSER CANOPY THAN REST OF BOUNDED AREA.

Ecological: WIESLANDER SURVEY MAPPED AS CLOSED CANOPY ALNUS RHOMBIFOLIA, POPULUS FREMONTII, PLATANUS RACEMOSA & SALIX SP.

Threat:

General: NEEDS FIELD VERIFICATION. THIS WAS OCC #009 OF CTT61700CA.

Owner/Manager: UNKNOWN

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 10 **Map Index:** 02617 **EO Index:** 15590

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-23

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.43734º / -117.83867º
UTM: Zone-11 N3810968 E422948
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 64.6 acres

Township: 04N
Range: 09W
Section: 17 **Qtr:** E
Meridian: S
Elevation: 3,880 ft

Location: VICINITY OF BIG ROCK SPRINGS AND DOWNSTREAM IN BIG ROCK CREEK ABOUT 0.5 MILE.
Location Detail: EXTANT, 1978, PER INTERPRETATION OF AERIAL PHOTOS.
Ecological: CLOSED CANOPY POPULUS FREMONTII & SALIX SPP ACCORDING TO WIESLANDER SURVEY. COVER SPARSE. UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO
Threat:
General: NEEDS FIELDWORK.
Owner/Manager: UNKNOWN

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 11 **Map Index:** 02584 **EO Index:** 15588

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Extirpated
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-23

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.47466º / -117.85356º
UTM: Zone-11 N3815117 E421615
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 37.7 acres

Township: 05N
Range: 09W
Section: 32 **Qtr:** S
Meridian: S
Elevation: 3,400 ft

Location: CRYSTALAIRE COUNTRY CLUB JUST SOUTH OF BIG ROCK SIPHON.
Location Detail: NOW EXTIRPATED BY GOLF COURSE PER INTERPRETATION OF 1978 AERIAL PHOTOS.
Ecological: MAPPED BY CLOSED CANOPY POPULUS FREMONTII & SALIX SPP BY WIESLANDER SURVEY. UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO
Threat:
General:
Owner/Manager: PVT?

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 12 **Map Index:** 02613 **EO Index:** 15589

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Extirpated
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-23

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.48188º / -117.84227º
UTM: Zone-11 N3815909 E422659
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 48.9 acres

Township: 05N
Range: 09W
Section: 32 **Qtr:** XX
Meridian: S
Elevation: 3,400 ft

Location: SOUTHWEST OF BIG ROCK RANCH BUILDINGS.
Location Detail: EXTIRPATED BY AGRICULTURE ACCORDING TO INTERPRETATION OF 1978 AERIAL PHOTOS.
Ecological: MAPPED AS CLOSED CANOPY POPULUS FREMONTII & SALIX ACCORDING TO WIESLANDER SURVEY. UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO
Threat:
General:
Owner/Manager: UNKNOWN

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 13 **Map Index:** 02618 **EO Index:** 15587

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-23

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.41564º / -117.83638º
UTM: Zone-11 N3808560 E423139
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 88.0 acres

Township: 04N
Range: 09W
Section: 20 **Qtr:** E
Meridian: S
Elevation: 4,120 ft

Location: BIG ROCK CREEK, FROM GAGING STATION EAST OF DEVILS PUNCHBOWL UPSTREAM TO CONFLUENCE OF SOUTH FORK BIG ROCK CREEK.

Location Detail: EXTANT, 1978, PER INTERPRETATION OF AERIAL PHOTOS, U/S PART APPEARS TO BE SCRUB.

Ecological: MAPPED BY WIESLANDER SURVEY AS CLOSED CANOPY ALNUS RHOMBIFOLIA, PLATANUS RACEMOSA & POPULUS FREMONTII.

Threat:

General: NEEDS FIELDWORK. THIS WAS OCC #013 OF CTT61700CA.

Owner/Manager: USFS-ANGELES NF

Mojave Riparian Forest

Element Code: CTT61700CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	
State: None	**State:** S1.1	

Habitat Associations

General:

Micro:

Occurrence No. 14 **Map Index:** 02685 **EO Index:** 12471

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-22

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.39598º / -117.80340º
UTM: Zone-11 N3806355 E426153
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 25.3 acres

Township: 04N
Range: 09W
Section: 27 **Qtr:** SE
Meridian: S
Elevation: 4,760 ft

Location: NEAR PARADISE SPRINGS ON BIG ROCK CREEK.
Location Detail: EXTANT, 1978, PER INTERPRETATION OF AERIAL PHOTOS.
Ecological: MAPPED BY WIESLANDER SURVEY AS CLOSED CANOPY ALNUS RHOMBIFOLIA.
Threat:
General: NEEDS FIELD VERIFICATION. THIS WAS OCC #014 OF CTT61700CA.
Owner/Manager: USFS-ANGELES NF

Muhlenbergia californica

California muhly

Element Code: PMPOA480A0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CNPS List:** 4.3
State: None	**State:** S3.3	

Habitat Associations

General: COASTAL SAGE, CHAPARRAL, LOWER MONTANE CONIFEROUS FOREST, MEADOWS.

Micro: USUALLY FOUND NEAR STREAMS OR SEEPS. 400-2000M.

Occurrence No. 3 **Map Index:** 35091 **EO Index:** 131

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1951-07-30
Site: 1951-07-30

Record Last Updated: 1996-03-07

Quad Summary: Mount San Antonio (3411736/134C), Mescal Creek (3411746/134B), Crystal Lake (3411737/135D), Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.37434º / -117.76556º
UTM: Zone-11 N3803928 E429613
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 03N
Range: 09W
Section: 01 **Qtr:** E
Meridian: S
Elevation: 6,500 ft

Location: BIG ROCK CREEK, NORTH OF MT. BADEN-POWELL, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ABOUT 1 MILE NORTH OF MT. BADEN-POWELL.

Ecological: INFREQUENT ON EXPOSED SOUTH SLOPE WITH FREMONTODENDRON CALIFORNICUM AND ARTEMISIA TRIDENTATA.

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1951 COLLECTION BY ROOS.

Owner/Manager: UNKNOWN

Muhlenbergia californica

California muhly

Element Code: PMPOA480A0

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3
State: S3.3

Other Lists

CNPS List: 4.3

Habitat Associations

General: COASTAL SAGE, CHAPARRAL, LOWER MONTANE CONIFEROUS FOREST, MEADOWS.
Micro: USUALLY FOUND NEAR STREAMS OR SEEPS. 400-2000M.

Occurrence No. 4 **Map Index:** 02622 **EO Index:** 137

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1933-08-11
Site: 1933-08-11

Record Last Updated: 2007-10-19

Quad Summary: Valyermo (3411747/135A), Crystal Lake (3411737/135D)
County Summary: Los Angeles

Lat/Long: 34.37193º / -117.83604º
UTM: Zone-11 N3803712 E423130
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 428.9 acres

Township: 03N
Range: 09W
Section: 05 **Qtr:** XX
Meridian: S
Elevation: 5,250 ft

Location: SOUTH FORK BIG ROCK CREEK, SAN GABRIEL MOUNTAINS.
Location Detail: MAPPED ALL ALONG SOUTH FORK BIG ROCK CREEK; LOCATION VAGUE.
Ecological:
Threat:
General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1933 COLLECTION BY DURAN.
Owner/Manager: USFS-ANGELES NF

Myotis evotis

long-eared myotis

Element Code: AMACC01070

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: None	**State:** S4?	

Habitat Associations

General: FOUND IN ALL BRUSH, WOODLAND & FOREST HABITATS FROM SEA LEVEL TO ABOUT 9000 FT. PREFERS CONIFEROUS WOODLANDS & FORESTS.

Micro: NURSERY COLONIES IN BUILDINGS, CREVICES, SPACES UNDER BARK, & SNAGS. CAVES USED PRIMARILY AS NIGHT ROOSTS.

Occurrence No. 37 **Map Index:** 68448 **EO Index:** 68696

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1998-08-06
Site: 1998-08-06

Record Last Updated: 2007-04-10

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.38148º / -117.77020º
UTM: Zone-11 N3804724 E429191
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 03N
Range: 09W
Section: 01 **Qtr:** NE
Meridian: S
Elevation: 5,940 ft

Location: ANGELES NF, JUST EAST OF BLUE RIDGE, ABOUT 0.3MI NORTH OF HWY 2 (ANGELES CREST HWY). VICINITY OF ICY SPRINGS & ROCK CR.

Location Detail: MAPPED ACCORDING TO UTM COORDINATES PROVIDED BY SOURCE, DATUM NOT GIVEN.

Ecological:

Threat:

General: 6 FEMALES CAPTURED BY MIST NET AND RELEASED ON 6 AUG 1998.

Owner/Manager: USFS-ANGELES NF

Myotis volans

long-legged myotis

Element Code: AMACC01110

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: None	**State:** S4?	

Habitat Associations

General: MOST COMMON IN WOODLAND & FOREST HABITATS ABOVE 4000 FT. TREES ARE IMPORTANT DAY ROOSTS; CAVES & MINES ARE NIGHT ROOSTS.

Micro: NURSERY COLONIES USUALLY UNDER BARK OR IN HOLLOW TREES, BUT OCCASIONALLY IN CREVICES OR BUILDINGS.

Occurrence No. 78 **Map Index:** 68448 **EO Index:** 68693

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1998-08-06
Site: 1998-08-06

Record Last Updated: 2007-04-10

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.38148º / -117.77020º
UTM: Zone-11 N3804724 E429191
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 03N
Range: 09W
Section: 01 **Qtr:** NE
Meridian: S
Elevation: 5,940 ft

Location: ANGELES NF, JUST EAST OF BLUE RIDGE, ABOUT 0.3MI NORTH OF HWY 2 (ANGELES CREST HWY). VICINITY OF ICY SPRINGS & ROCK CR.

Location Detail: MAPPED ACCORDING TO UTM COORDINATES PROVIDED BY SOURCE, DATUM NOT GIVEN.

Ecological:

Threat:

General: 7 FEMALES CAPTURED BY MIST NET AND RELEASED ON 6 AUG 1998.

Owner/Manager: USFS-ANGELES NF

Myotis yumanensis

Yuma myotis

Element Code: AMACC01020

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:**
State: None	**State:** S4?	

Habitat Associations

General: OPTIMAL HABITATS ARE OPEN FORESTS AND WOODLANDS WITH SOURCES OF WATER OVER WHICH TO FEED.

Micro: DISTRIBUTION IS CLOSELY TIED TO BODIES OF WATER. MATERNITY COLONIES IN CAVES, MINES, BUILDINGS OR CREVICES.

Occurrence No. 58 **Map Index:** 68427 **EO Index:** 68663

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-08-19
Site: 1999-08-19
Record Last Updated: 2007-04-10

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.48647º / -118.02150º
UTM: Zone-11 N3816570 E406205
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 05N
Range: 11W
Section: 27 **Qtr:** SW
Meridian: S
Elevation: 3,340 ft

Location: NE OF LITTLE ROCK RESERVOIR, VICINITY OF LITTLE DAM.
Location Detail: MAPPED ACCORDING TO UTM COORDINATES PROVIDED BY SOURCE, DATUM NOT GIVEN.
Ecological:
Threat:
General: 8 FEMALES CAPTURED/RELEASED BY MIST NET ON 17 JUL 1998. 3 MALES AND 12 FEMALES CAPTURED/RELEASED BY MIST NET ON 19 AUG 1999.
Owner/Manager: UNKNOWN

Onychomys torridus ramona

southern grasshopper mouse

Element Code: AMAFF06022

Status

Federal: None
State: None

NDDB Element Ranks

Global: G5T3?
State: S3?

Other Lists

CDFG Status: SC

Habitat Associations

General: DESERT AREAS, ESPECIALLY SCRUB HABITATS WITH FRIABLE SOILS FOR DIGGING. PREFERS LOW TO MODERATE SHRUB COVER.

Micro: FEEDS ALMOST EXCLUSIVELY ON ARTHROPODS, ESPECIALLY SCORPIONS & ORTHOPTERAN INSECTS.

Occurrence No. 25 **Map Index:** 58478 **EO Index:** 58514

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1988-08-06
Site: 1988-08-06

Record Last Updated: 2004-12-10

Quad Summary: Lovejoy Buttes (3411757/160D)

County Summary: Los Angeles

Lat/Long: 34.52032º / -117.79133º
UTM: Zone-11 N3820135 E427369
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 05N
Range: 09W
Section: 14 **Qtr:** XX
Meridian: S
Elevation: 3,100 ft

Location: ABOUT 1 MILE NORTH AND 6 MILES EAST OF PEARBLOSSOM.

Location Detail:

Ecological:

Threat:

General: ONE MALE SPECIMEN COLLECTED BY S. GEORGE 6 AUG 1988 AT "PEARBLOSSOM, 1 MI N, 6 MI EAST." DEPOSITED AT LACM # 86828.

Owner/Manager: UNKNOWN

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 6 **Map Index:** 02729 **EO Index:** 21482

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-03-28
Site: 1990-03-28
Record Last Updated: 1998-07-08

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.41602º / -117.76943º
UTM: Zone-11 N3808553 E429292
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 09W
Section: 24 **Qtr:** E
Meridian: S
Elevation: 4,900 ft

Location: LARGO VISTA, ALONG 204TH STREET (COUNTY ROAD N4) JUST NORTH OF BIG PINES HIGHWAY, NORTH SLOPE SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED BY MISTRETTA ALONG ROAD BETWEEN MILE HIGH AND LARGO VISTA; ADDITIONAL POPULATION WAS REPORTED ALONG BIG PINES HIGHWAY IN VICINITY OF MILE HIGH RANCH AND COUNTY ROAD N4.

Ecological: PINYON WOODLAND, JOSHUA TREE WOODLAND, AND PINYON-CHAPARRAL ECOTONE. ASSOCIATED WITH ARTEMISIA TRIDENTATA, PINUS MONOPHYLLA, STIPA, HAPLOPAPPUS, CERCOCARPUS BETULOIDES, CEANOTHUS GREGGII, YUCCA WHIPPLEI, Y. BREVIFOLIA, ARCTOSTAPHYLOS ETC.

Threat:

General: 140 PLANTS OBSERVED IN 1990. PLANTS IN THIS POPULATION EXHIBIT A VARIETY OF MORPHOLOGICAL FORMS FROM VERY VAR. BASILARIS-LIKE TO TYPICAL VAR. BRACHYCLADA, SOMETIMES ON SAME PLANT.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 7 **Map Index:** 38944 **EO Index:** 33951

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: XXXX-XX-XX
Site: XXXX-XX-XX

Record Last Updated: 1998-06-15

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.43901º / -117.84912º
UTM: Zone-11 N3811161 E421990
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 09W
Section: 17 **Qtr:** XX
Meridian: S
Elevation: 3,800 ft

Location: VALYERMO.

Location Detail: MAPPED ALONG NORTH SLOPE OF SAN GABRIEL MOUNTAINS IN VICINITY OF VALYERMO.

Ecological:

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS UNDATED COLLECTION BY WIEGAND.

Owner/Manager: UNKNOWN

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 25 **Map Index:** 38947 **EO Index:** 33954

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: XXXX-XX-XX
Site: XXXX-XX-XX

Record Last Updated: 1998-06-15

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.39220º / -117.82225º
UTM: Zone-11 N3805950 E424416
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 09W
Section: 33 **Qtr:** NE
Meridian: S
Elevation: 4,800 ft

Location: TRAILHEAD AT ENTRANCE TO SOUTH FORK CAMPGROUND, SOUTH FORK BIG ROCK CREEK, NORTH SLOPE SAN GABRIEL MOUNTAINS.

Location Detail:

Ecological:

Threat:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS UNDATED COLLECTION BY PARFITT, AS CITED IN PINKAVA ET AL., 1992. COLLECTION PROBABLY MADE CIRCA 1990.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 26 **Map Index:** 38948 **EO Index:** 33955

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-06-15
Site: 1990-06-15
Record Last Updated: 1998-06-15

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.40901º / -117.80347º
UTM: Zone-11 N3807800 E426158
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 141.6 acres

Township: 04N
Range: 09W
Section: 27 **Qtr:** NE
Meridian: S
Elevation: 5,800 ft

Location: PINYON RIDGE, ABOUT 3-4 MILES SOUTHEAST OF VALYERMO, NORTH SLOPE SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ALONG RIDGETOP WITHIN THE S 1/2 SECTION 22, NE 1/4 SECTION 27, AND NW 1/4 SECTION 26.

Ecological: PINYON WOODLAND-CHAPARRAL ECOTONE. ASSOCIATED WITH PINUS MONOPHYLLA, FREMONTODENDRON CALIFORNICA, QUERCUS TURBINELLA, CERCOCARPUS BETULOIDES, CEANOTHUS GREGGII, CHRYSOTHAMNUS NAUSEOSUS, AND YUCCA WHIPPLEI.

Threat: RIDGELINE DISTURBED BY PREVIOUS LOGGING, FUEL REDUCTION, CONTROLLED BURNING, IN ADDITION TO ORV USE.

General: 60 PLANTS ESTIMATED IN 1990. EFFECT OF DISTURBANCES NOT KNOWN.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 27 **Map Index:** 38949 **EO Index:** 33956

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-11-21
Site: 1990-11-21
Record Last Updated: 1998-06-15

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.39795º / -117.82907º
UTM: Zone-11 N3806592 E423795
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 9.5 acres

Township: 04N
Range: 09W
Section: 28 **Qtr:** SW
Meridian: S
Elevation: 4,700 ft

Location: SOUTH FORK BIG ROCK CREEK, ALONG TRAIL ABOUT 0.5 MILE NW OF SOUTH FORK CAMPGROUND, NORTH SLOPE SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ALONG USFS TRAIL 10W09 WITHIN THE SE 1/4 SW 1/4 SECTION 28, BETWEEN 4600' AND 4800' ELEVATION.

Ecological: N-FACING SLOPE IN CHAPARRAL ASSOCIATED WITH EPHEDRA, CERCOCARPUS BETULOIDES, PINUS MONOPHYLLA, FREMONTODENDRON CALIFORNICA, ERIOGONUM FASCICULATUM, YUCCA WHIPPLEI, AND ARTEMISIA TRIDENTATA.

Threat:

General: 5 PLANTS OBSERVED IN PRELIMINARY SURVEY ALONG TRAIL IN 1990; MORE PLANTS LIKELY IN THE AREA. ONE PLANT EXHIBITED CHARACTERISTICS OF O. BASILARIS VAR. BASILARIS.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 28 **Map Index:** 38950 **EO Index:** 33957

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-11-21
Site: 1990-11-21
Record Last Updated: 1998-06-15

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.40065º / -117.83829º
UTM: Zone-11 N3806899 E422950
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 12.4 acres

Township: 04N
Range: 09W
Section: 29 **Qtr:** SE
Meridian: S
Elevation: 4,600 ft

Location: HOLCOMB CANYON, ALONG TRAIL ABOUT 1 MILE UPSTREAM FROM BIG ROCK CREEK ROAD, NORTH SLOPE SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ON BOTH SIDES OF CANYON ALONG USFS TRAIL 10W09 WITHIN THE NW 1/4 SE 1/4 SECTION 29, IN DEVILS PUNCHBOWL COUNTY PARK.

Ecological: N-FACING SLOPE IN CHAPARRAL/PINYON-JUNIPER TRANSITION IN ASSOCIATION WITH CERCOCARPUS BETULOIDES, PINUS MONOPHYLLA, FREMONTODENDRON CALIFORNICA, ERIOGONUM FASCICUTLATUM, AND YUCCA WHIPPLEI.

Threat:

General: 4 PLANTS OBSERVED IN PRELIMINARY SURVEY ALONG TRAIL IN 1990; MORE PLANTS LIKELY IN THE AREA.

Owner/Manager: LAX COUNTY-PARKS & REC

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 29 **Map Index:** 38951 **EO Index:** 33958

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-03-03
Site: 1990-03-03
Record Last Updated: 1998-06-15

Quad Summary: Juniper Hills (3411748/135B)
County Summary: Los Angeles

Lat/Long: 34.40801º / -117.96370º
UTM: Zone-11 N3807817 E411430
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 04N
Range: 10W
Section: 30 **Qtr:** NE
Meridian: S
Elevation: 4,200 ft

Location: LITTLE ROCK CREEK, ABOUT 0.25 MILE UPSTREAM FROM CONFLUENCE WITH SOUTH FORK LITTLE ROCK CREEK, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ON NORTH SIDE OF CREEK WITHIN THE NW 1/4 NE 1/4 SECTION 30.

Ecological: S-FACING SLOPE IN CHAPARRAL/SAGEBRUSH TRANSITION IN ASSOCIATION WITH ATREMISIA TRIDENTATA, EPHEDRA, YUCCA WHIPPLEI, ERIOGONUM FASCICULATUM, SALVIA MELLIFERA, AND PELLAEA ANDROMEDIFOLIA.

Threat:

General: 10 PLANTS OBSERVED IN 1990. MORE FLOWER BUDS OBSERVED ON THESE PLANTS THAN AT ANY OTHER LOCATION.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 30 **Map Index:** 38954 **EO Index:** 33961

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1992-05-08
Site: 1992-05-08

Record Last Updated: 1998-06-15

Quad Summary: Juniper Hills (3411748/135B)

County Summary: Los Angeles

Lat/Long: 34.45037º / -117.99243º
UTM: Zone-11 N3812540 E408835
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 12 **Qtr:** NW
Meridian: S
Elevation: 4,700 ft

Location: ALIMONY RIDGE, ABOUT 3.6 MILES NORTH OF BARE MOUNTAIN, SAN GABRIEL MOUNTAINS.

Location Detail: ADJACENT TO ALIMONY RIDGE OHV TRAIL ABOVE CIMA MESA AND JUNIPER HILLS. MAPPED ABOUT 0.9 MILE WEST OF USFS BOUNDARY.

Ecological: IN FULL SUN/PARTIAL SHADE ON COARSE GRANITIC LOAM WITH PINUS MONOPHYLLA, JUNIPERUS CALIFORNICA, POA SECUNDA, QUERCUS JOHN-TUCKERI, AND ERIOPHYLLUM CONFERTIFOLIUM.

Threat: ORV USE AND ASSOCIATED EROSION, WEED ENCROACHMENT, AND FIRE.

General: 50 PLANTS OBSERVED ALONG RIDGE IN SMALL, INTERMITTENT GROUPS IN 1992.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 31 **Map Index:** 38955 **EO Index:** 33962

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-05-23
Site: 1994-05-23
Record Last Updated: 1998-06-15

Quad Summary: Juniper Hills (3411748/135B)
County Summary: Los Angeles

Lat/Long: 34.42589º / -117.97409º
UTM: Zone-11 N3809809 E410494
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 10W
Section: 18 **Qtr:** SW
Meridian: S
Elevation: 4,200 ft

Location: NORTHEAST OF LITTLE ROCK CREEK, ABOUT 2.1 MILES NNE OF BARE MOUNTAIN, SAN GABRIEL MOUNTAINS.

Location Detail: ADJACENT TO CANYON BOTTOM IN THE SW 1/4 SW 1/4 SECTION 18.

Ecological: DRY SITE ON GRANITIC LOAM WITH ARCTOSTAPHYLOS GLAUCA, ERIODICTYON CRASSIFOLIUM, AMSINCKIA TESSELLATA, AND ARTEMISIA TRIDENTATA.

Threat:

General: 10 PLANTS OBSERVED IN 1994. SEVERAL INDIVIDUALS MORE CLOSELY RESEMBLING VAR. BASILARIS ALSO NOTED.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 32 **Map Index:** 38956 **EO Index:** 33963

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-06-08
Site: 1994-06-08
Record Last Updated: 1998-06-15

Quad Summary: Juniper Hills (3411748/135B)
County Summary: Los Angeles

Lat/Long: 34.41313º / -117.98578º
UTM: Zone-11 N3808405 E409406
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 24 **Qtr:** S
Meridian: S
Elevation: 5,200 ft

Location: SOUTHWEST OF LITTLE ROCK CREEK, ABOUT 1 MILE NNE OF BARE MOUNTAIN, SAN GABRIEL MOUNTAINS.

Location Detail: ALONG RIDGE ABOUT 0.7 MILE SW OF LITTLE ROCK CREEK AND 1.1 MILE WNW OF MOUTH OF SOUTH FORK ROCK CREEK. MAPPED WITHIN THE S 1/2 SECTION 24.

Ecological: ON N-SLOPE IN COBBLY GRANITIC SUBSTRATE WITH QUERCUS JOHN-TUCKERI, ACNATHERUM SPECIOSUM, LESSINGIA FILAGINIFOLIA, AND ERIOGONUM FASCICULATUM.

Threat:

General: FEWER THAN 10 PLANTS OBSERVED IN 1994. SEVERAL INDIVIDUALS MORE CLOSELY RESEMBLING VAR. BASILARIS ALSO NOTED.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 33 **Map Index:** 38959 **EO Index:** 33966

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-03-30
Site: 1994-03-30

Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.48915º / -118.01547º
UTM: Zone-11 N3816862 E406762
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 05N
Range: 11W
Section: 27 **Qtr:** SE
Meridian: S
Elevation: 3,800 ft

Location: EAST OF LITTLE ROCK WASH, ABOUT 0.4 MILE ENE OF LITTLE ROCK-PALMDALE DAM (LITTLE ROCK RESERVOIR), SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED NEAR THE CENTER OF THE SE 1/4 SECTION 27.

Ecological: ON DRY W-FACING SLOPE IN FULL SUN ON GRAVELLY GRANITIC LOAM WITH ERIOGONUM FASCICULATUM, POA SECUNDA, ACHNATHERUM SPECIOSUM, AND PINUS MONOPHYLLA.

Threat:

General: FEWER THAN 12 PLANTS OBSERVED IN 1994.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 34 **Map Index:** 38960 **EO Index:** 33967

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-04-15
Site: 1994-04-15
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.46831º / -118.03382º
UTM: Zone-11 N3814568 E405054
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 04 **Qtr:** NE
Meridian: S
Elevation: 3,800 ft

Location: NORTH OF SANTIAGO CANYON, ABOUT 0.7 MILE WSW OF JOSHUA TREE CAMPGROUND ALONG LITTLE ROCK RESERVOIR, SAN GABRIEL MTNS.

Location Detail: ALONG NE SLOPE OF UNNAMED TRIBUTARY TO SANTIAGO CANYON. MAPPED WITHIN THE NW 1/4 NE 1/4 SECTION 4.

Ecological: ON DRY EAST RIDGE IN FULL SUN ON COARSE GRANITIC LOAM WITH ERIODICTYON TRICHOCALYX, ERIOGONUM FASCICULATUM, COREOPSIS BIGELOVII, AND BRICKELLIA MICROPHYLLA.

Threat: POTENTIAL ORV THREAT. NO RECENT ACTIVITY OBSERVED.

General: 2 PLANTS OBSERVED IN 1994. SEVERAL INDIVIDUALS MORE CLOSELY RESEMBLING VAR. BASILARIS ALSO NOTED.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 35 **Map Index:** 38961 **EO Index:** 33968

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-04-29
Site: 1994-04-29

Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.45048º / -118.06076º
UTM: Zone-11 N3812616 E402559
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 08 **Qtr:** NW
Meridian: S
Elevation: 4,400 ft

Location: NORTHWEST OF SANTIAGO CANYON, ABOUT 0.8 MILE SOUTHEAST OF MT. EMMA, SAN GABRIEL MOUNTAINS.

Location Detail: SOUTHWEST SLOPE OF UNNAMMED TRIBUTARY TO SANTIAGO CANYON, ABOUT 0.6 MILE NW OF CREEK IN CANYON BOTTOM. MAPPED WITHIN THE NW 1/4 SECTION 8.

Ecological: ASSOCIATED WITH PINUS MONOPHYLA, JUNIPERUS CALIFORNICA, CERCOCARPUS BETULOIDES, AND POA SECUNDA.

Threat: POTENTIAL THREAT FROM ORV TRAFFIC.

General: 50 PLANTS OBSERVED IN 1994. PLANTS INTERMITTENT ALONG THE SURVEY ROUTE IN SMALL GROUPS.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 36 **Map Index:** 38962 **EO Index:** 33969

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-05-11
Site: 1994-05-11
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.45761º / -118.01290º
UTM: Zone-11 N3813362 E406963
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 03 **Qtr:** SE
Meridian: S
Elevation: 3,800 ft

Location: EAST OF LITTLE ROCK CREEK, ABOUT 0.4 MILE ESE OF BASIN CAMPGROUND ABOVE LITTLE ROCK RESERVOIR, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ABOUT 0.2 MILE UPSLOPE FROM CREEK OPPOSITE AND JUST SOUTH OF BASIN CAMPGROUND. WITHIN THE SE 1/4 OF SECTION 3.

Ecological: ON DRY W-FACING SLOPE IN FULL SUN ON COARSE GRANITIC LOAM WITH QUERCUS JOHN-TUCKERI, ACHNATHERUM SPECIOSUM, LOTUS SCOPARIUS, CRYPTANTHA CIRCUMCISSA, AND EPHEDRA NEVADENSIS.

Threat:

General: 17 PLANT OBSERVED IN 1994. TYPICALLY GROWING IN CLUMPS OF 2-4 PLANTS.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 37 **Map Index:** 38964 **EO Index:** 33971

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-05-13
Site: 1994-05-13
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.44832º / -118.00522º
UTM: Zone-11 N3812324 E407659
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 11 **Qtr:** W
Meridian: S
Elevation: 3,900 ft

Location: EAST OF LITTLE ROCK CREEK, ABOUT 1.1 MILES SE OF BASIN CAMPGROUND ABOVE LITTLE ROCK RESERVOIR, SAN GABRIEL MOUNTAINS.

Location Detail: ALONG SOUTH SLOPE OF UNNAMED TRIBUTARY, ABOUT 0.5 MILE UPSTREAM FROM LITTLE ROCK CREEK. MAPPED NEAR THE CENTER OF THE W 1/2 OF SECTION 11.

Ecological: ON DRY W-FACING SLOPE IN FULL SUN ON COARSE GRANITIC LOAM WITH QUERCUS JOHN-TUCKERI, ACHNATHERUM SPECIOSUM, EPHEDRA VIRIDIS, ERIOOGONUM FASCICULATUM, AND PHACELIA DISTANS.

Threat:

General: 8 PLANTS OBSERVED IN 1994. SEVEARL PLANTS MORE CLOSELY RESEMBLING VAR. BASILARIS ALSO NOTED.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 38 **Map Index:** 38965 **EO Index:** 33972

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-02-28
Site: 1995-02-28
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.49759º / -118.00781º
UTM: Zone-11 N3817790 E407475
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 05N
Range: 11W
Section: 26 **Qtr:** NW
Meridian: S
Elevation: 3,400 ft

Location: CARR CANYON, ABOUT 1.1. MILES NE OF LITTLE ROCK-PALMDALE DAM (LITTLE ROCK RESERVOIR), SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED NEAR CANYON BOTTOM JUST SOUTH OF THE USFS BOUNDARY, WITHIN THE NW 1/4 SECTION 26

Ecological: ON DRY, LOW-RELIEF BENCHES ON COARSE GABBROIC SUBSTRATE WITH AMBROSIA DUMOSA, SENECIO FLACCIDUS, QUERCUS JOHN-TUCKERI, LESSINGIA FILAGINIFOLIA, AND ATRIPLEX CANESCENS.

Threat: POTENTIAL THREAT FROM ORV USE; RECENT ACTIVITIY OBSERVED.

General: 5 PLANTS OBSERVED IN 1995.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 39 **Map Index:** 38966 **EO Index:** 33973

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-03-14
Site: 1995-03-14
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.49850º / -118.04888º
UTM: Zone-11 N3817930 E403705
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 05N
Range: 11W
Section: 29 **Qtr:** NE
Meridian: S
Elevation: 3,500 ft

Location: BETWEEN HUNT CANYON AND LITTLE ROCK WASH, ABOUT 1.2 MILES WNW OF LITTLE ROCK-PALMDALE DAM, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED SOUTH OF USFS BOUNDARY AND NORTH OF POWERLINES IN THE NE CORNER OF SECTION 29.

Ecological: ON SLIGHT N-FACING SLOPE IN FULL SUN ON COBBLY GABBRO-TYPE CLAY WITH ENCELIA ACTONI, ERIOGONUM FASCICULATUM, THYSANOCARPUS LACINIATUS, ERIOPHYLLUM WALLACEI, AND POA SECUNDA.

Threat: POTENTIAL THREAT FROM ORV USE; RECENT ACTIVITIY OBSERVED.

General: 6 PLANTS OBSERVED IN 1995.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 40 **Map Index:** 38967 **EO Index:** 33974

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-03-17
Site: 1995-03-17
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.48774º / -118.03864º
UTM: Zone-11 N3816727 E404633
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 05N
Range: 11W
Section: 28 **Qtr:** SW
Meridian: S
Elevation: 4,000 ft

Location: RIDGE WEST OF LITTLE ROCK WASH, ABOUT 0.8 MI WEST OF LITTLE ROCK-PALMDALE DAM (LITTLE ROCK RESERVOIR) SAN GABRIEL MTNS.

Location Detail: MAPPED ON RIDGETOP IN THE SW 1/4 OF SECTION 28.

Ecological: ON DRY NW-FACING SLOPE IN FULL SUN ON COARSE GRANITIC SUBSTRATE WITH ERIOGONUM FASCICULATUM, ERIOPHYLLUM CONFERTIFLORUM, GALIUM ANGUSTIFOLIUM, POA SECUNDA, AND EPHEDRA NEVADENSIS.

Threat: POTENTIAL THREAT FROM ORV USE; RECENT ACTIVITIY OBSERVED.

General: 3 PLANTS OBSERVED IN 1995.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 41 **Map Index:** 38968 **EO Index:** 33975

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-03-24
Site: 1995-03-24
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.49324º / -118.00445º
UTM: Zone-11 N3817305 E407779
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 05N
Range: 11W
Section: 26 **Qtr:** NW
Meridian: S
Elevation: 3,600 ft

Location: SOUTH OF CARR CANYON, ABOUT 1.1 MILES ENE OF LITTLE ROCK-PALMDALE DAM (LITTLE ROCK RESERVOIR), SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ABOUT 0.25 MILE SOUTH OF CREEK IN CANYON BOTTOM WITHIN THE SE 1/4 NW 1/4 SECTION 26.

Ecological: ON DRY N-FACING SLOPE IN FULL SUN ON COARSE GRANITIC SUBSTRATE WITH ERICAMERIA LINEARIFOLIA, ACNATHERUM SPECIOSUM, BROMUS TECTORUM, SYNTRICHOPAPPUS LEMMONII, LUPINUS CONCINNUS, AND ERODIUM CICUTARIUM.

Threat: POTENTIAL THREAT FROM ORV USE; RECENT ACTIVITIY OBSERVED.

General: 16 PLANTS OBSERVED IN 1995.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 42 **Map Index:** 38969 **EO Index:** 33976

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-03-28
Site: 1995-03-28
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.48382º / -118.02698º
UTM: Zone-11 N3816281 E405700
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 05N
Range: 11W
Section: 34 **Qtr:** NW
Meridian: S
Elevation: 3,400 ft

Location: WEST SIDE OF LITTLE ROCK RESERVOIR, ABOUT 0.3 MILE NNW OF LAKESIDE CAMPGROUND, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED WITHIN THE NW 1/4 NW 1/4 SECTION 34.

Ecological: ON DRY N-FACING SLOPE IN FULL SUN ON COARSE GRANITIC SUBSTRATE WITH ARCTOSTAPHYLOS GLANDULOSA, MELICA IMPERFECTA, ARTEMISIA TRIDENTATA, ERIODICTYON CRASSIFOLIUM, AND ERICAMERIA COOPERI.

Threat:

General: 8 PLANTS OBSERVED IN 1995.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 43 **Map Index:** 38970 **EO Index:** 33977

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-04-05
Site: 1995-04-05
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.47418º / -118.02727º
UTM: Zone-11 N3815212 E405662
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 05N
Range: 11W
Section: 34 **Qtr:** SW
Meridian: S
Elevation: 3,400 ft

Location: WEST SIDE OF LITTLE ROCK RESERVOIR, ABOUT 0.25 MILE SW OF JUNIPER GROVE CAMPGROUND, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ALONG NORTH SIDE OF DRAW WITHIN THE NW 1/4 SW 1/4 SECTION 34.

Ecological: ON DRY E-FACING SLOPE IN FULL SUN ON GABBRO CLAY WITH PINUS MONOPHYLLA, BRICKELLIA MICROPHYLLA, POA SECUNDA, BROMUS TECTORUM, AND CRYPTANTHA.

Threat: POTENTIAL THREAT FROM ORV USE. RECENT ACTIVITY OBSERVED.

General: 4 PLANTS OBSERVED IN 1995.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 44 **Map Index:** 38971 **EO Index:** 33978

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-04-25
Site: 1995-04-25
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.42806º / -118.01960º
UTM: Zone-11 N3810091 E406315
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 15 **Qtr:** S
Meridian: S
Elevation: 4,000 ft

Location: SOUTH BRANCH OF KITTER CANYON, ABOUT 1.2 MI SSW OF CONFLUENCE OF KITTER CANYON AND LITTLE ROCK CREEK, SAN GABRIEL MTNS.

Location Detail: MAPPED ABOUT 0.4 MILE UPSTREAM (SOUTH) OF KITTER CANYON.

Ecological: ON DRY W-FACING SLOPE IN FULL SUN ON GRANITIC LOAM WITH CLAYTONIA PARVIFLORA, QUERCUS WISLIZENII, SYNTRICHOPAPPUS LEMMONII, CHAENACTIS SANTALINOIDES, AND POA SECUNDA.

Threat: POTENTIAL THREAT FROM ORV USE. RECENT ACTIVITY OBSERVED.

General: 6 PLANTS OBSERVED IN 1995. BOTH VARIETIES (BRACHYCLADA AND BASILARIS) PRESENT AS WELL AS SEVERAL INDIVIDUALS THAT APPEARED INTERMEDIATE.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 45 **Map Index:** 38972 **EO Index:** 33979

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-04-28
Site: 1995-04-28
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.43244º / -118.03102º
UTM: Zone-11 N3810588 E405270
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 16 **Qtr:** SE
Meridian: S
Elevation: 4,200 ft

Location: ABOVE KITTER CANYON, ABOUT 1.4 MI SW OF CONFLUENCE OF KITTER CANYON AND LITTLE ROCK CREEK, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ABOUT 0.2 MILE UPSLOPE (NORTH) OF KITTER CANYON.

Ecological: ON DRY E-FACING SLOPE IN FULL SUN ON GRAVELLY GRANITIC LOAM WITH CLAYTONIA PARVIFLORA, CRYPTANTHA, ERIOGONUM FASCICULATUM, ERIODICTYON TRICHOCALYX, AND BROMUS TECTORUM.

Threat:

General: 20 PLANTS OBSERVED IN 1995.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 46 **Map Index:** 38973 **EO Index:** 33980

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-05-10
Site: 1995-05-10
Record Last Updated: 1998-06-30

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.42201º / -118.01296º
UTM: Zone-11 N3809414 E406918
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 22 **Qtr:** NE
Meridian: S
Elevation: 4,400 ft

Location: NORTH SLOPE OF WEST FORK BARE MTN CANYON, ABOUT 0.25 MI WEST OF CONFLUENCE WITH BARE MTN CANYON, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ABOUT 0.15 MILE UPSLOPE (NORTH) OF WEST FORK CANYON.

Ecological: ON DRY LOW RELIEF BENCH IN FULL SUN ON COARSE GRANITIC LOAM WITH VULPIA MICROSTACHYS, MIMULUS FREMONTII, CAMISSONIA STRIGULOSA, FREMONTODENDRON CALIFORNICA, AND LOTUS SCOPARIUS.

Threat:

General: 3 PLANTS OBSERVED IN 1995. SEVERAL INDIVIDUALS MORE CLOSELY RESEMBLING VAR. BASILARIS. NO THREATS APPARENT.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 47 **Map Index:** 38974 **EO Index:** 33981

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-06-20
Site: 1995-06-20
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.38738º / -118.00809º
UTM: Zone-11 N3805569 E407328
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 35 **Qtr:** SW
Meridian: S
Elevation: 5,100 ft

Location: UPPER BARE MOUNTAIN CANYON, ABOUT 2.5 MI SOUTH OF CONFLUENCE WITH WEST FORK BARE MOUNTAIN CANYON, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED ALONG LOWER SLOPE OF CANYON.

Ecological: ON DRY S-FACING SLOPE IN PARTIAL SHADE ON GRANITIC LOAM WITH AGOSERIS RETRORSA, RHUS TRILOBATA, QUERCUS CHRYSOLEPIS, ELYMUS GLAUCUS, EPILOBIUM CANUM, AND SOLIDAGO CALIFORNICA.

Threat:

General: 1 PLANT OBSERVED IN 1995.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 48 **Map Index:** 38975 **EO Index:** 33982

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-03-03
Site: 1990-03-03
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.49881º / -118.04341º
UTM: Zone-11 N3817959 E404208
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 11W
Section: 28 **Qtr:** NW
Meridian: S
Elevation: 3,400 ft

Location: POWERLINE ROAD SOUTH OF MT EMMA ROAD, ABOUT 1 MILE WNW OF LITTLE ROCK STATION ALONG LITTLE ROCK WASH, SAN GABRIEL MTNS.

Location Detail: ALONG ROAD PARALLEL TO HIGH TENSION LINES 1 MILE SOUTHWEST OF JUNCTION OF MT EMMA ROAD AND LITTLE ROCK CREEK ROAD. WITHIN THE NW 1/4 NW 1/4 SECTION 28.

Ecological: OPEN SAGEBRUSH SCRUB WITH QUERCUS TURBINELLA, ARTEMISIA TRIDENTATA, CERCOCARPUS BETULOIDES, YUCCA WHIPPLEI, ARCTOSTAPHYLOS GLAUCA, AND ERIOGONUM FASCICULATUM. WELL DEVELOPED UNDERSTORY OF GRASSES AND HERBS.

Threat: POTENTIAL THREAT FROM ORV USE, TRASH DUMPING, AND VANDALISM.

General: 7 PLANTS OBSERVED IN 1990.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 49 **Map Index:** 38976 **EO Index:** 33983

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1989-05-15
Site: 1989-05-15
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.47875º / -118.06851º
UTM: Zone-11 N3815758 E401880
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 77.7 acres

Township: 05N
Range: 11W
Section: 31 **Qtr:** NE
Meridian: S
Elevation: 4,000 ft

Location: HUNT CANYON ALONG SOUTH SIDE OF MT EMMA ROAD, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED MOSTLY WITHIN THE SW 1/4 NE 1/4 SECTION 31.

Ecological: OPEN SAGEBRUSH SCRUB WITH SCATTERED PINUS MONOPHYLLA AND JUNIPERUS CALIFORNICA. GROWING WITH SAMBUCUS, QUERCUS TURBINELLA, ARTEMISIA TRIDENTATA, CERCOCARPUS BETULOIDES, YUCCA WHIPPLEI, ARCTOSTAPHYLOS GLAUCA, AND ERIOGONUM FASCICULATUM.

Threat: MOST OF VEGETATION DAMAGED BY FIREARM USE. HABIATAT HEAVILY DEGRADED.

General: FEW WIDELY SCATTERED PLANTS OBSERVED IN 1989.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 50 **Map Index:** 38977 **EO Index:** 33984

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-03-03
Site: 1990-03-03

Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.46639º / -118.08121º
UTM: Zone-11 N3814400 E400699
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 05N
Range: 12W
Section: 36 **Qtr:** NE
Meridian: S
Elevation: 4,200 ft

Location: NORTH SIDE OF MT EMMA ROAD ABOUT 1.9 MILES NE OF JUNCTION WITH ANGELES FOREST HIGHWAY, SAN GABRIEL MOUNTAINS.

Location Detail: ALSO WITHIN THE NE 1/4 NE 1/4 SECTION 1.

Ecological: PINYON/SOUTHERN CHAPARRAL/SAGEBRUSH ECOTONE WITH PINUS MONOPHYLLA, JUNIPERUS CALIFORNICA, QUERCUS TURBINELLA, ADENOSTOMA, ARTEMISIA TRIDENATA, CERCOCARPUS BETULOIDES, YUCCA WHIPPLEI, ARCTOSTAPHYLOS GLAUCA, AND ERIOGONUM FASCICULATUM.

Threat:

General: 40 PLANTS OBSERVED BETWEEN OCCURRENCE #50 AND 51 IN 1990.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 51 **Map Index:** 38978 **EO Index:** 33985

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-03-03
Site: 1990-03-03

Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.44872º / -118.09777º
UTM: Zone-11 N3812457 E399157
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 7.8 acres

Township: 04N
Range: 12W
Section: 11 **Qtr:** NE
Meridian: S
Elevation: 3,800 ft

Location: SOUTH SIDE OF MT EMMA ROAD ABOUT 0.3 MILE NE OF JUNCTION WITH ANGELES FOREST HIGHWAY, SAN GABRIEL MOUNTAINS.

Location Detail: MAPPED WITHIN THE NE 1/4 NE 1/4 SECTION 11.

Ecological: PINYON/SOUTHERN CHAPARRAL/SAGEBRUSH ECOTONE WITH PINUS MONOPHYLLA, JUNIPERUS CALIFORNICA, QUERCUS TURBINELLA, ADENOSTOMA, ARTEMISIA TRIDENATA, CERCOCARPUS BETULOIDES, YUCCA WHIPPLEI, ARCTOSTAPHYLOS GLAUCA, AND ERIOGONUM FASCICULATUM.

Threat:

General: 40 PLANTS OBSERVED BETWEEN OCCURRENCE #50 AND 51 IN 1990. PLANTS AT THIS SITE APPEAR TO BE INTROGRESSED WITH VAR. BASILARIS.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 52 **Map Index:** 38979 **EO Index:** 33986

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-07-01
Site: 1990-07-01
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.40195º / -118.06901º
UTM: Zone-11 N3807242 E401744
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 14.1 acres

Township: 04N
Range: 11W
Section: 30 **Qtr:** SE
Meridian: S
Elevation: 5,100 ft

Location: EAST OF MILL CREEK ABOUT 0.4 MILE ENE OF CONFLUENCE OF MILL CREEK AND TIE CANYON, SAN GABRIEL MOUNTAINS.

Location Detail: RIDGE NORTH OF TIE CANYON DRAINAGE. MAPPED WITHIN THE NW 1/4 SE 1/4 SECTION 30.

Ecological: OPEN CHAPARRAL WITH ERIOGONUM FASCICULATUM, YUCCA WHIPPLEI, ERIODICTYON TRICHOCALYX, GARRYA VEATCHII, AND ARCTOSTAPHYLOS GLAUCA.

Threat: RIDGELINE APPEARS TO BE FORMER FIREBREAK. FIREBREAK MAINTENANCE MAY DAMAGE/DESROY POPULATION.

General: 12 PLANTS OBSERVED IN 1990. PLANTS NOTED WHILE DRIVING; MORE PLANTS PROBABLY OCCUR IN THIS AREA.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 53 **Map Index:** 38980 **EO Index:** 33987

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-07-01
Site: 1990-07-01
Record Last Updated: 1998-06-16

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.38225º / -118.09443º
UTM: Zone-11 N3805083 E399384
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 57.4 acres

Township: 04N
Range: 12W
Section: 36 **Qtr:** SW
Meridian: S
Elevation: 4,300 ft

Location: BETWEEN MILL CREEK AND ANGELES FOREST HIGHWAY, ABOUT 1 MILE SOUTHWEST OF TIE SUMMIT STATION, SAN GABRIEL MOUNTAINS.

Location Detail: TWO COLONIES; LARGE COLONY MAPPED MOSTLY WITHIN THE SW 1/4 SW 1/4 SECTION 36, SMALLER COLONY MAPPED WITHIN THE NE 1/4 SW 1/4 SECTION 36.

Ecological: OPEN CHAPARRAL DOMINATED BY ADENOSTOMA FASCICULATUM AND CEANOTHUS CRASSIFOLIUS IN ASSOCIATION WITH YUCCA WHIPPLEI, PLATANUS RACEMOSA, CEANOTHUS LEUCODERMIS, ARTEMISIA DRACUNCULUS, SOLIDAGO CALIFORNICA, ARCTOSTAPHYLOS GLAUCA, ET AL.

Threat:

General: 40 PLANTS OBSERVED IN 1990. PLANTS RESEMBLING VAR. BASILARIS AND VAR. BRACHYCLADA BOTH ENCOUNTERED.

Owner/Manager: USFS-ANGELES NF

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 54 **Map Index:** 38988 **EO Index:** 33995

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1989-06-01
Site: 1989-06-01
Record Last Updated: 1998-06-16

Quad Summary: Palmdale (3411851/161D)
County Summary: Los Angeles

Lat/Long: 34.52661º / -118.07788º
UTM: Zone-11 N3821075 E401076
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 20.8 acres

Township: 05N
Range: 11W
Section: 18 **Qtr:** NW
Meridian: S
Elevation: 3,000 ft

Location: SOUTHEAST OF PEARBLOSSOM HIGHWAY ABOUT 0.5 MILE SOUTH OF THE CALIFORNIA AQUEDUCT AT BARREL SPRINGS ROAD, PALMDALE.

Location Detail: MAPPED MOSTLY WITHIN THE NW 1/4 NW 1/4 SECTION 18.

Ecological: CALIFORNIA JUNIPER WOODLAND/JOSHUA TREE WOODLAND WITH JUNIPERUS CALIFORNICA, YUCCA BREVIFOLIA, ARTEMISIA TRIDENTATA, CHRYSOTHAMNUS NAUSEOSUS, HAPLOPAPPUS COOPERI, AND H. LINEARIFOLIUS.

Threat: SUBDIVISION PROPOSED ON SITE.

General: 23 PLANTS OBSERVED IN 1989, ADDITIONAL PLANTS MAY BE PRESENT.

Owner/Manager: PVT

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 55 **Map Index:** 38989 **EO Index:** 33996

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1989-03-20
Site: 1989-03-20
Record Last Updated: 1998-06-16

Quad Summary: Ritter Ridge (3411852/161C)
County Summary: Los Angeles

Lat/Long: 34.58272º / -118.18511º
UTM: Zone-11 N3827408 E391307
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 11.8 acres

Township: 06N
Range: 12W
Section: 30 **Qtr:** NE
Meridian: S
Elevation: 2,900 ft

Location: SAN ANDREAS RIFT ZONE, JUST SOUTH OF ELIZIBETH LAKE-PINE CANYON ROAD AND WEST OF CALIFORNIA AQUEDUCT, WEST OF PALMDALE.

Location Detail: MAPPED WITHIN THE SE 1/4 NE 1/4 SECTION 30.

Ecological: CALIFORNIA JUNIPER WOODLAND WITH YUCCA BREVIFOLIA, JUNIPERUS CALIFORNICA, CHRYSOTHAMNUS NAUSEOSUS, HAPLOPAPPUS LINEARIFOLIUS, H. COOPERI, EPHEDRA NEVADENSIS, AND ARCTOSTAPHYLOS GLAUCA.

Threat: MUCH OF AREA MAY BE IMPACTED BY PROPOSED DEVELOPMENT.

General: 8 PLANTS OBSERVED IN 1989. INTERGRADATION WITH VAR. BASILARIS MAY BE OCCURING IN THIS AREA.

Owner/Manager: PVT

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 56 **Map Index:** 38993 **EO Index:** 34000

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1989-03-20
Site: 1989-03-20
Record Last Updated: 1998-06-16

Quad Summary: Ritter Ridge (3411852/161C)
County Summary: Los Angeles

Lat/Long: 34.57756º / -118.17124º
UTM: Zone-11 N3826821 E392573
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 96.0 acres

Township: 06N
Range: 12W
Section: 29 **Qtr:** SE
Meridian: S
Elevation: 2,900 ft

Location: SAN ANDREAS RIFT ZONE, NORTH OF CITY RANCH ROAD AND EAST OF CALIFORNIA AQUEDUCT, WEST OF PALMDALE.

Location Detail: MAPPED ALONG SE-NW TRENDING DRAINAGE MOSTLY WITHIN THE SE 1/4 OF SECTION 29.

Ecological: CALIFORNIA JUNIPER WOODLAND WITH YUCCA BREVIFOLIA, JUNIPERUS CALIFORNICA, CHRYSOTHAMNUS NAUSEOSUS, HAPLOPAPPUS LINEARIFOLIUS, H. COOPERI, EPHEDRA NEVADENSIS, AND ARCTOSTAPHYLOS GLAUCA.

Threat: MUCH OF AREA MAY BE IMPACTED BY PROPOSED DEVELOPMENT.

General: 305 PLANTS OBSERVED IN 1989. INTERGRADATION WITH VAR. BASILARIS MAY BE OCCURING IN THIS AREA.

Owner/Manager: PVT

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 57 **Map Index:** 38994 **EO Index:** 34001

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1989-03-20
Site: 1989-03-20
Record Last Updated: 1998-06-17

Quad Summary: Ritter Ridge (3411852/161C)
County Summary: Los Angeles

Lat/Long: 34.56970º / -118.16815º
UTM: Zone-11 N3825945 E392846
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 11.2 acres

Township: 06N
Range: 12W
Section: 32 **Qtr:** NE
Meridian: S
Elevation: 2,950 ft

Location: ANAVERDE VALLEY BETWEEN ANAVERDE CREEK AND THE CALIFORNIA AQUEDUCT, WEST OF PALMDALE.

Location Detail: MAPPED ABOUT 1.7 MILES SW OF 10TH AVENUE AT AVENUE Q. WITHIN THE NE 1/4 NE 1/4 OF SECTION 32.

Ecological: CALIFORNIA JUNIPER WOODLAND WITH YUCCA BREVIFOLIA, JUNIPERUS CALIFORNICA, CHRYSOTHAMNUS NAUSEOSUS, HAPLOPAPPUS LINEARIFOLIUS, H. COOPERI, EPHEDRA NEVADENSIS, AND ARCTOSTAPHYLOS GLAUCA.

Threat: MUCH OF AREA MAY BE IMPACTED BY PROPOSED DEVELOPMENT.

General: 5 PLANTS OBSERVED IN 1989. INTERGRADATION WITH VAR. BASILARIS MAY BE OCCURING IN THIS AREA.

Owner/Manager: PVT

Opuntia basilaris var. brachyclada

short-joint beavertail

Element Code: PDCAC0D053

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, RIPARIAN WOODLAND.

Micro: SANDY SOIL OR COARSE, GRANITIC LOAM. 425-1800M.

Occurrence No. 58 **Map Index:** 38995 **EO Index:** 34002

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1989-03-20
Site: 1989-03-20
Record Last Updated: 1998-06-17

Quad Summary: Ritter Ridge (3411852/161C)
County Summary: Los Angeles

Lat/Long: 34.56453º / -118.19133º
UTM: Zone-11 N3825397 E390713
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 90.9 acres

Township: 06N
Range: 12W
Section: 31 **Qtr:** S
Meridian: S
Elevation: 3,200 ft

Location: UNDER POWERLINES SOUTH OF ANAVERDE CREEK AND WEST OF THE CALIFORNIA AQUEDUCT, WEST OF PALMDALE.

Location Detail: MAPPED MOSTLY WITHIN THE N 1/2 OF THE S 1/2 SECTION 31.

Ecological: CALIFORNIA JUNIPER WOODLAND WITH YUCCA BREVIFOLIA, JUNIPERUS CALIFORNICA, CHRYSOTHAMNUS NAUSEOSUS, HAPLOPAPPUS LINEARIFOL., H. COOPERI, EPHEDRA NEVADENSIS, AND ARCTOSTAPHYLOS GLAUCA. LOCALLY ASSOC. WITH GRASSY HILLSIDE THAT RECENTLY BURNED.

Threat: MUCH OF AREA MAY BE IMPACTED BY PROPOSED DEVELOPMENT.

General: 12 PLANTS OBSERVED IN 1989. INTERGRADATION WITH VAR. BASILARIS MAY BE OCCURING IN THIS AREA.

Owner/Manager: PVT

Orobanche valida ssp. valida

Rock Creek broomrape

Element Code: PDORO040G2

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3T1	**CNPS List:** 1B.2
State: None	**State:** S1.2	

Habitat Associations

General: CHAPARRAL, PINYON-JUNIPER WOODLAND.

Micro: ON SLOPES OF LOOSE DECOMPOSED GRANITE; PARASITIC ON VARIOUS CHAPARRAL SHRUBS. 1705-1820M.

Occurrence No. 1 **Map Index:** 02624 **EO Index:** 29074

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1992-05-17
Site: 1992-05-17
Record Last Updated: 1996-05-28

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.37999º / -117.83728º
UTM: Zone-11 N3804607 E423023
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 03N
Range: 09W
Section: 05 **Qtr:** NE
Meridian: S
Elevation: 5,640 ft

Location: ALONG TRAIL BETWEEN SOUTH FORK CAMPGROUND AND ISLIP SADDLE. APPROX 1.4 AIRMI SW OF SOUTH FORK CAMPGROUND.

Location Detail: TRAIL FOLLOWS SOUTH FORK OF BIG ROCK CREEK. IN 2 SUBPOPULATIONS IN 1992: NEAR SWITCHBACKS AS YOU LEAVE THE RIVER (W SIDE OF TRAIL) AND BEFORE 2 MILE MARKER.

Ecological: IN PINYON WOODLAND, EAST-FACING SLOPE ON DECOMPOSED GRANITE NEAR CLUMPS OF STIPA SP. ALSO WITH ERIODICTYON TRICHOCALYX, CERCOCARPUS BETULOIDES, AND STEPHANOMERIA(?).

Threat: SOME PLANTS TRAMPLED BY HIKERS IN 1992.

General: APPROXIMATELY 50 PLANTS IN 1979, AT LEAST 100 IN 1982; 9 IN 1992 IN 2 SUBPOPULATIONS.

Owner/Manager: USFS-ANGELES NF

Perognathus inornatus inornatus

San Joaquin pocket mouse

Element Code: AMAFD01061

Status

Federal: None
State: None

NDDB Element Ranks

Global: G4T2T3
State: S2S3

Other Lists

CDFG Status:

Habitat Associations

General: TYPICALLY FOUND IN GRASSLANDS AND BLUE OAK SAVANNAS.
Micro: NEEDS FRIABLE SOILS.

Occurrence No. 1 **Map Index:** 21923 **EO Index:** 20947

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1931-04-12
Site: 1931-04-12

Record Last Updated: 1998-09-15

Quad Summary: Palmdale (3411851/161D), Ritter Ridge (3411852/161C)
County Summary: Los Angeles

Lat/Long: 34.57949º / -118.11653º
UTM: Zone-11 N3826978 E397593
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 06N
Range: 12W
Section: 26 **Qtr:** NE
Meridian: S
Elevation: 2,660 ft

Location: PALMDALE.
Location Detail:
Ecological:
Threat:
General: IDENTIFICATION OF SPECIMEN QUESTIONABLE. UCLA MUSEUM SPECIMEN #18670.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 42 **Map Index:** 02653 **EO Index:** 28132

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: XXXX-XX-XX
Site: XXXX-XX-XX

Record Last Updated: 1996-02-22

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.43119º / -117.82604º
UTM: Zone-11 N3810276 E424103
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 04N
Range: 09W
Section: 16 **Qtr:** S
Meridian: S
Elevation: 4,080 ft

Location: APPROX 2 MILES SOUTHEAST OF VALYERMO RANGER STATION.
Location Detail:
Ecological:
Threat:
General: MVZ SPECIMEN. NO DATE OR MUSEUM # GIVEN. FROM MCGURTY 1980 REPT TO DFG.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 43 **Map Index:** 02736 **EO Index:** 28119

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: XXXX-XX-XX
Site: XXXX-XX-XX

Record Last Updated: 1989-08-10

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.39054º / -117.76423º
UTM: Zone-11 N3805724 E429748
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 04N
Range: 08W
Section: 31 **Qtr:** NW
Meridian: S
Elevation: 5,720 ft

Location: FENNER CANYON NEAR BIG ROCK CAMP.
Location Detail:
Ecological:
Threat:
General: AAS SPECIMEN, NO DATE OR MUS # GIVEN. FROM MCGURTY 1980 REPT TO DFG.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 44 **Map Index:** 02408 **EO Index:** 28121

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1922-05-30
Site: 1922-05-30
Record Last Updated: 1989-08-10

Quad Summary: Juniper Hills (3411748/135B)
County Summary: Los Angeles

Lat/Long: 34.42033º / -117.97554º
UTM: Zone-11 N3809194 E410355
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 10W
Section: 19 **Qtr:** NW
Meridian: S
Elevation: 4,000 ft

Location: LITTLE ROCK CREEK, PALMDALE.
Location Detail:
Ecological:
Threat:
General: LACM #4282-83 FROM MCGURTY 1980 REPT TO DFG.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 76 **Map Index:** 02660 **EO Index:** 28107

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: XXXX-XX-XX
Site: XXXX-XX-XX

Record Last Updated: 1996-02-22

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.40665º / -117.82451º
UTM: Zone-11 N3807554 E424222
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 09W
Section: 28 **Qtr:** NE
Meridian: S
Elevation: 4,333 ft

Location: SOUTH FORK BIG ROCK CREEK JUST ABOVE CAMPGROUND.

Location Detail:

Ecological:

Threat:

General: AAS SPECIMEN AND LACM SPECIMENS. COLLECTION NUMBER & DATE UNKNOWN. INFO FROM SCHOENHERR ARTICLE TAKEN FROM MCGURTY REPT TO CDFG.

Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 79 **Map Index:** 02343 **EO Index:** 28103

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1951-XX-XX
Site: 1951-XX-XX

Record Last Updated: 2006-01-23

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.47804º / -118.02284º
UTM: Zone-11 N3815636 E406073
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 05N
Range: 11W
Section: 34 **Qtr:** NE
Meridian: S
Elevation: 3,258 ft

Location: LITTLE ROCK RESERVOIR.
Location Detail:
Ecological:
Threat:
General: LACM SPECIMEN #19861, COLLECTED IN 1951.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 112 **Map Index:** 02586 **EO Index:** 28092

Dates Last Seen

Element: 193X-XX-XX
Site: 193X-XX-XX

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Record Last Updated: 1989-08-10

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.42110º / -117.85202º
UTM: Zone-11 N3809177 E421707
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 09W
Section: 20 **Qtr:** NW
Meridian: S
Elevation: 4,400 ft

Location: DEVILS PUNCHBOWL.
Location Detail:
Ecological:
Threat:
General: FROM MCGURTY 1980 REPT TO DFG. ORIGINAL OBS FROM BOGERT, 1980.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 113 **Map Index:** 02747 **EO Index:** 28095

Dates Last Seen
Element: XXXX-XX-XX
Site: XXXX-XX-XX

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Record Last Updated: 1996-02-22

Quad Summary: Valyermo (3411747/135A), Mescal Creek (3411746/134B)

County Summary: Los Angeles

Lat/Long: 34.43832º / -117.75728º
UTM: Zone-11 N3811017 E430427
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 08W
Section: 18 **Qtr:** NW
Meridian: S
Elevation: 4,651 ft

Location: DIRT ROAD TO BOULDER CANYON, 2.5 MILES NORTH OF MILE HIGH.
Location Detail:
Ecological:
Threat:
General: RGM SPECIMEN. NO DATE OR MUS # GIVEN. FROM MCGURTY 1980 REPORT TO DFG.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 127 **Map Index:** 02257 **EO Index:** 28081

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1967-06-03
Site: 1967-06-03

Record Last Updated: 2006-01-23

Quad Summary: Palmdale (3411851/161D)

County Summary: Los Angeles

Lat/Long: 34.54276º / -118.05395º
UTM: Zone-11 N3822843 E403291
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 05N
Range: 11W
Section: 05 **Qtr:** SW
Meridian: S
Elevation: 2,800 ft

Location: JUNCTION OF 42ND ST & PEAR BLOSSOM HWY (JOSHUA ACRES), 3 MILES SOUTHEAST OF PALMDALE.

Location Detail:

Ecological:

Threat:

General: LACM SPECIMEN #52793 COLLECTED 3 JUN 1967 BY HOSKELL.

Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 133 **Map Index:** 02669 **EO Index:** 28074

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1951-05-12
Site: 1951-05-12

Record Last Updated: 2006-01-23

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.39582º / -117.81922º
UTM: Zone-11 N3806349 E424698
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 04N
Range: 09W
Section: 28 **Qtr:** SE
Meridian: S
Elevation: 4,600 ft

Location: SOUTH FORK CAMPGROUND, SOUTHWEST OF PINYON RIDGE, ANGELES NATIONAL FOREST.

Location Detail:

Ecological:

Threat:

General: LACM SPECIMEN #101338 COLLECTED 12 MAY 1951.

Owner/Manager: USFS-ANGELES NF

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 144 **Map Index:** 02088 **EO Index:** 28064

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1953-04-01
Site: 1953-04-01

Record Last Updated: 2006-01-23

Quad Summary: Acton (3411842/136B)

County Summary: Los Angeles

Lat/Long: 34.47010º / -118.19618º
UTM: Zone-11 N3814930 E390144
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 05N
Range: 13W
Section: 36 **Qtr:** SW
Meridian: S
Elevation: 2,800 ft

Location: ACTON, SOLEDAD CANYON.
Location Detail:
Ecological:
Threat:
General: LACM SPECIMEN #19877 COLLECTED 1 APR 1953.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 146 **Map Index:** 02195 **EO Index:** 28067

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1964-05-10
Site: 1964-05-10

Record Last Updated: 2006-01-23

Quad Summary: Palmdale (3411851/161D), Ritter Ridge (3411852/161C)

County Summary: Los Angeles

Lat/Long: 34.60856º / -118.12305º
UTM: Zone-11 N3830208 E397032
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 06N
Range: 12W
Section: 14 **Qtr:** SW
Meridian: S
Elevation: 2,620 ft

Location: 5 MILES SOUTH OF LANCASTER ON HWY 6.
Location Detail:
Ecological:
Threat:
General: LACM SPECIMEN #101335 COLLECTED 10 MAY 1964 BY D.J. SUTHERLIN.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 147 **Map Index:** 02186 **EO Index:** 28068

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1964-05-10
Site: 1964-05-10

Record Last Updated: 2006-01-23

Quad Summary: Lancaster East (3411861/161A), Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.65831º / -118.13118º
UTM: Zone-11 N3835734 E396348
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 07N
Range: 12W
Section: 34 **Qtr:** NE
Meridian: S
Elevation: 2,480 ft

Location: 2 MILES SOUTH OF LANCASTER ON HWY 6.
Location Detail:
Ecological:
Threat:
General: LACM SPECIMEN # 101336 COLLECTED 10 MAY 1964 BY D.J. SUTHERLIN.
Owner/Manager: UNKNOWN

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 155 **Map Index:** 02232 **EO Index:** 28047

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1972-04-09
Site: 1972-04-09

Record Last Updated: 2006-01-23

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.42059º / -118.09605º
UTM: Zone-11 N3809336 E399281
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 04N
Range: 12W
Section: 24 **Qtr:** NW
Meridian: S
Elevation: 3,800 ft

Location: 0.8 MI NORTH ON ALISO CYN RD, OFF ANGELES FOREST HWY, 7 MI SE OF ACTON.
Location Detail:
Ecological:
Threat:
General: LACM SPECIMEN #101333 COLLECTED 9 APR 1972 BR R.E. LEE.
Owner/Manager: USFS-ANGELES NF

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 204 **Map Index:** 02582 **EO Index:** 28023

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1946-09-29
Site: 1946-09-29

Record Last Updated: 2006-01-23

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.40040º / -117.85336º
UTM: Zone-11 N3806882 E421564
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 04N
Range: 09W
Section: 30 **Qtr:** SE
Meridian: S
Elevation: 5,400 ft

Location: 3.2 MILES SOUTH OF VALYERMO.
Location Detail:
Ecological:
Threat:
General: LACM SPECIMEN #19860 COLLECTED 29 SEP 1946
Owner/Manager: USFS-ANGELES NF

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 325 **Map Index:** 20081 **EO Index:** 9901

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-04-12
Site: 1990-04-12
Record Last Updated: 1991-12-03

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.47512º / -118.11754º
UTM: Zone-11 N3815405 E397373
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 05N
Range: 12W
Section: 34 **Qtr:** NE
Meridian: S
Elevation: 3,200 ft

Location: APPROXIMATELY ONE MI SSE OF HWY 14, ALONG THE ANGELES FOREST HWY.
Location Detail:
Ecological: HABITAT IS A WASH WITHIN DESERT TRANSITIONAL CHAPARRAL.
Threat: SITE HAS RECEIVED ORV USE ADJACENT TO OR IN THE WASH. CURRENTLY THREATENED BY RESIDENTIAL DEVELOPMENT.
General:

Owner/Manager: PVT

Phrynosoma coronatum (blainvillii population)

coast (San Diego) horned lizard

Element Code: ARACF12021

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND SEMI-ARID CLIMATE CONDIT

Micro: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.

Occurrence No. 522 **Map Index:** 56325 **EO Index:** 56341

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 2004-04-XX
Site: 2004-04-XX

Record Last Updated: 2004-08-05

Quad Summary: Sleepy Valley (3411853/162D), Ritter Ridge (3411852/161C)

County Summary: Los Angeles

Lat/Long: 34.50909º / -118.25067º
UTM: Zone-11 N3819315 E385193
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 05N
Range: 13W
Section: 21 **Qtr:** NW
Meridian: S
Elevation: 3,400 ft

Location: JUST NORTH OF VALLEY SAGE ROAD, 0.25 MILE NORTH OF HWY 14 AND APPROXIMATELY 0.25 MILE WEST OF HISTORIC PURITAN MINE.

Location Detail:

Ecological: HABITAT CONSISTS OF JUNIPER WOODLAND WITH LOOSE, FRIABLE SOILS. SURROUNDING LAND IS RESIDENTIAL. DISTURBANCES INCLUDE TRASH, HISTORIC MINING AND RECREATION.

Threat:

General: 1 OBSERVED DURING APRIL 2004.

Owner/Manager: PVT

Phrynosoma coronatum (frontale population)

coast (California) horned lizard

Element Code: ARACF12022

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4G5	**CDFG Status:** SC
State: None	**State:** S3S4	

Habitat Associations

General: FREQUENTS A WIDE VARIETY OF HABITATS, MOST COMMON IN LOWLANDS ALONG SANDY WASHES WITH SCATTERED LOW BUSHES.

Micro: OPEN AREAS FOR SUNNING, BUSHES FOR COVER, PATCHES OF LOOSE SOIL FOR BURIAL, & ABUNDANT SUPPLY OF ANTS & OTHER INSECTS.

Occurrence No. 8 **Map Index:** 39837 **EO Index:** 34839

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1991-05-15
Site: 1991-05-15
Record Last Updated: 1998-09-28

Quad Summary: Lancaster West (3411862/161B)
County Summary: Los Angeles

Lat/Long: 34.63468º / -118.21594º
UTM: Zone-11 N3833204 E388549
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 06N
Range: 13W
Section: 01 **Qtr:** SW
Meridian: S
Elevation: 2,585 ft

Location: 4733 WEST AVE., M-12, 0.15 MILE EAST OF JUNCTION WITH 50TH STREET WEST, QUARTZ HILL.

Location Detail: IN FRONT YARD NEAR HIGH DENSITY POPULATION OF ANTS.

Ecological: LAWNS, GARDENS, SINGLE FAMILY RESIDENCES ON 3/4 ACRE LOTS IN OLD ALMOND ORCHARD. SEVERAL VACANT OR OVERGROWN LOTS ON M-12, COULD SUPPORT A VIABLE POPULATION OF P.CORONATUM HERE.

Threat: DEVELOPMENT.

General: 1 OBSERVED, 1991. IT WAS STATED THAT MORE SURVEYS NEEDED IN THE QUARTZ HILL AREA; PREVIOUS RECORDS OF P.C. BLAINVILLEI COULD BE ERRONEOUS.

Owner/Manager: PVT

Plagiobothrys parishii

Parish's popcorn-flower

Element Code: PDBOR0V0U0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	**CNPS List:** 1B.1
State: None	**State:** S1.1	

Habitat Associations

General: GREAT BASIN SCRUB, JOSHUA TREE WOODLAND.

Micro: ALKALINE SOILS; MESIC SITES. 750-1400M.

Occurrence No. 3 **Map Index:** 55449 **EO Index:** 55449

Occ Rank: None
Origin: Natural/Native occurrence
Presence: Extirpated
Trend: Unknown

Dates Last Seen
Element: 1917-04-08
Site: 1917-04-08

Record Last Updated: 2004-05-12

Quad Summary: Lovejoy Buttes (3411757/160D)

County Summary: Los Angeles

Lat/Long: 34.60522º / -117.82677º
UTM: Zone-11 N3829576 E424193
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 06N
Range: 09W
Section: 15 **Qtr:** XX
Meridian: S
Elevation: 2,700 ft

Location: LOVEJOY SPRINGS, ABOUT 16 MILES NORTHEAST OF PALMDALE.

Location Detail: EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDB, IN THE VICINITY OF LOVEJOY SPRINGS, ON THE EAST SIDE OF LOVEJOY BUTTES, APPROX. 1.7 MILES N OF PALMDALE AVENUE.

Ecological: IN SWAMPY SOIL.

Threat:

General: UNKNOWN NUMBER OF PLANTS SEEN IN 1917. PER TIM THOMAS, 1999, PLANTS ARE EXTIRPATED FROM THIS SITE.

Owner/Manager: UNKNOWN

Rana muscosa

Sierra Madre yellow-legged frog

Element Code: AAABH01330

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:** SC
State: None	**State:** S1	

Habitat Associations

General: FEDERAL LISTING REFERS TO POPULATIONS IN THE SAN GABRIEL, SAN JACINTO & SAN BERNARDINO MOUNTAINS ONLY.

Micro: ALWAYS ENCOUNTERED WITHIN A FEW FEET OF WATER. TADPOLES MAY REQUIRE 2 - 4 YRS TO COMPLETE THEIR AQUATIC DEVELOPMENT.

Occurrence No. 92 **Map Index:** 42586 **EO Index:** 42586

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1953-05-01
Site: 1953-05-01

Record Last Updated: 2000-03-20

Quad Summary: Juniper Hills (3411748/135B)

County Summary: Los Angeles

Lat/Long: 34.40572º / -117.96121º
UTM: Zone-11 N3807561 E411656
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 04N
Range: 10W
Section: 30 **Qtr:** NE
Meridian: S
Elevation: 4,080 ft

Location: 0.5 MILE ESE OF CONFLUENCE OF SOUTH FORK AND LITTLE ROCK CREEKS, 3 MILES SSW OF JUNIPER HILLS.

Location Detail: SITE DESCRIPTION GIVE: LITTLE ROCK CREEK; LAT/LONG (IN DECIMAL DEGREES): 34.40, -117.96.

Ecological: STREAM FLOWS THROUGH SOUTHERN SYCAMORE ALDER RIPARIAN WOODLAND.

Threat:

General: 2 SPECIMENS COLLECTED, MVZ #'S 60001, 60002.

Owner/Manager: USFS-ANGELES NF

Rana muscosa

Sierra Madre yellow-legged frog

Element Code: AAABH01330

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:** SC
State: None	**State:** S1	

Habitat Associations

General: FEDERAL LISTING REFERS TO POPULATIONS IN THE SAN GABRIEL, SAN JACINTO & SAN BERNARDINO MOUNTAINS ONLY.

Micro: ALWAYS ENCOUNTERED WITHIN A FEW FEET OF WATER. TADPOLES MAY REQUIRE 2 - 4 YRS TO COMPLETE THEIR AQUATIC DEVELOPMENT.

Occurrence No. 93 **Map Index:** 42587 **EO Index:** 42587

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1911-04-11
Site: 1911-04-11

Record Last Updated: 2000-03-20

Quad Summary: Juniper Hills (3411748/135B)

County Summary: Los Angeles

Lat/Long: 34.38988º / -117.94161º
UTM: Zone-11 N3805788 E413442
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 04N
Range: 10W
Section: 32 **Qtr:** NE
Meridian: S
Elevation: 4,700 ft

Location: 2 MILES SE OF CONFLUENCE OF SOUTH FORK AND LITTLE ROCK CREEKS, 3.5 MILES S OF JUNIPER HILLS.

Location Detail: SITE DESCRIPTION GIVEN: "LITTLE ROCK CANYON; ELEVATION 4700 FT". LAT/LONG (DECIMAL DEGREES): 34.40, -117.96.

Ecological: STREAM FLOWS THROUGH SOUTHERN SYCAMORE ALDER RIPARIAN WOODLAND.

Threat:

General: 2 SPECIMENS COLLECTED 11 APR 1911, MVZ #'S 4390 & 4391.

Owner/Manager: USFS-ANGELES NF

Rana muscosa

Sierra Madre yellow-legged frog

Element Code: AAABH01330

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:** SC
State: None	**State:** S1	

Habitat Associations

General: FEDERAL LISTING REFERS TO POPULATIONS IN THE SAN GABRIEL, SAN JACINTO & SAN BERNARDINO MOUNTAINS ONLY.

Micro: ALWAYS ENCOUNTERED WITHIN A FEW FEET OF WATER. TADPOLES MAY REQUIRE 2 - 4 YRS TO COMPLETE THEIR AQUATIC DEVELOPMENT.

Occurrence No. 95 **Map Index:** 42602 **EO Index:** 42602

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1970-07-23
Site: 1970-07-23
Record Last Updated: 2000-03-22

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.40879º / -117.86288º
UTM: Zone-11 N3807820 E420697
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 09W
Section: 30 **Qtr:** NW
Meridian: S
Elevation: 4,800 ft

Location: PUNCHBOWL CANYON, SAN GABRIEL MOUNTAINS, ABOUT 2 MILES SOUTH OF VALYERMO.
Location Detail:
Ecological:
Threat:
General: CAS #199442-4, 3 ADULTS COLLECTED BY H. ADAMS & M.B. RUGGLES ON 23 JUL 1970.
Owner/Manager: USFS-ANGELES NF, LAX COUNTY

Rana muscosa

Sierra Madre yellow-legged frog

Element Code: AAABH01330

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:** SC
State: None	**State:** S1	

Habitat Associations

General: FEDERAL LISTING REFERS TO POPULATIONS IN THE SAN GABRIEL, SAN JACINTO & SAN BERNARDINO MOUNTAINS ONLY.

Micro: ALWAYS ENCOUNTERED WITHIN A FEW FEET OF WATER. TADPOLES MAY REQUIRE 2 - 4 YRS TO COMPLETE THEIR AQUATIC DEVELOPMENT.

Occurrence No. 97 **Map Index:** 42607 **EO Index:** 42607

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1969-05-24
Site: 1969-05-24
Record Last Updated: 2000-03-22

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.45468º / -118.01703º
UTM: Zone-11 N3813041 E406581
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 11W
Section: 03 **Qtr:** XX
Meridian: S
Elevation: 3,360 ft

Location: LITTLE ROCK CREEK ABOUT 1 MILE SOUTH OF LITTLE ROCK RESERVOIR. SAN GABRIEL MOUNTAINS, ANGELES NF.

Location Detail:

Ecological: ACCORDING TO MAPPED CNDDB COMMUNITY OCCURRENCE, STREAM FLOWS THROUGH SOUTHERN SYCAMORE ALDER RIPARIAN WOODLAND.

Threat:

General: CAS #19940 & 19941, 1 ADULT & 1 UNKNOWN LIFE STAGE COLLECTED 24 MAY 1969 BY M.C. LONG & L. ISAKSEN.

Owner/Manager: USFS-ANGELES NF

Rana muscosa

Sierra Madre yellow-legged frog

Element Code: AAABH01330

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:** SC
State: None	**State:** S1	

Habitat Associations

General: FEDERAL LISTING REFERS TO POPULATIONS IN THE SAN GABRIEL, SAN JACINTO & SAN BERNARDINO MOUNTAINS ONLY.

Micro: ALWAYS ENCOUNTERED WITHIN A FEW FEET OF WATER. TADPOLES MAY REQUIRE 2 - 4 YRS TO COMPLETE THEIR AQUATIC DEVELOPMENT.

Occurrence No. 134 **Map Index:** 42967 **EO Index:** 42967

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1947-02-03
Site: 1947-02-03
Record Last Updated: 2000-05-16

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.44795º / -117.85375º
UTM: Zone-11 N3812156 E421573
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 09W
Section: 07 **Qtr:** XX
Meridian: S
Elevation: 3,720 ft

Location: BIG ROCK CREEK, VALYERMO

Location Detail: LACM #'S 13750-52 FROM ISLA HERMOSA ON BIG ROCK CREEK. NO LOCATION REFERENCES FOUND FOR ISLA HERMOSA SO DATA INCLUDED HERE. MAPPED ~1 MILE ON EITHER SIDE OF VALYERMO SINCE SITE LOCATION WAS VAGUE.

Ecological: THIS AREA IS MOSTLY WITHIN THE CCCNDDB COMMUNITY OF, MOJAVE RIPARIAN FOREST.

Threat:

General: 6 SPECIMENS COLLECTED IN 1943, LACM #'S 13753-13758; 2 IN 1946, #'S 13751, 13752; 1 IN 1947, # 13750; ALL COLLECTED BY COWLES.

Owner/Manager: USFS-ANGELES NF

Rana muscosa

Sierra Madre yellow-legged frog

Element Code: AAABH01330

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:** SC
State: None	**State:** S1	

Habitat Associations

General: FEDERAL LISTING REFERS TO POPULATIONS IN THE SAN GABRIEL, SAN JACINTO & SAN BERNARDINO MOUNTAINS ONLY.

Micro: ALWAYS ENCOUNTERED WITHIN A FEW FEET OF WATER. TADPOLES MAY REQUIRE 2 - 4 YRS TO COMPLETE THEIR AQUATIC DEVELOPMENT.

Occurrence No. 135 **Map Index:** 42968 **EO Index:** 42968

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1959-08-10
Site: 1959-08-10
Record Last Updated: 2000-05-16

Quad Summary: Valyermo (3411747/135A)
County Summary: Los Angeles

Lat/Long: 34.41260º / -117.82420º
UTM: Zone-11 N3808213 E424255
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 04N
Range: 09W
Section: 21 **Qtr:** SE
Meridian: S
Elevation: 4,270 ft

Location: SYCAMORE FLAT CAMPGROUND, BIG ROCK CREEK, ANGELES NATIONAL FOREST.
Location Detail: SITE DESCRIBED AS: SAN GABRIEL MOUNTAINS, BIG ROCK CANYON, NO. SYCAMORE FLATS CAMP GROUNDS.
Ecological: THIS AREA IS PARTLY WITHIN THE CCCNDDB COMMUNITY OF, MOJAVE RIPARIAN FOREST.
Threat:
General: 2 SPECIMENS COLLECTED IN 1959 BY A. SCHOENHERN, LACM #'S 26650 & 26651
Owner/Manager: USFS-ANGELES NF

Rana muscosa

Sierra Madre yellow-legged frog

Element Code: AAABH01330

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G1	**CDFG Status:** SC
State: None	**State:** S1	

Habitat Associations

General: FEDERAL LISTING REFERS TO POPULATIONS IN THE SAN GABRIEL, SAN JACINTO & SAN BERNARDINO MOUNTAINS ONLY.

Micro: ALWAYS ENCOUNTERED WITHIN A FEW FEET OF WATER. TADPOLES MAY REQUIRE 2 - 4 YRS TO COMPLETE THEIR AQUATIC DEVELOPMENT.

Occurrence No. 136 **Map Index:** 42969 **EO Index:** 42969

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1959-08-07
Site: 1959-08-07

Record Last Updated: 2000-05-16

Quad Summary: Pacifico Mountain (3411841/136A), Juniper Hills (3411748/135B)

County Summary: Los Angeles

Lat/Long: 34.43724º / -117.99736º
UTM: Zone-11 N3811089 E408368
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 11W
Section: 14 **Qtr:** XX
Meridian: S
Elevation: 3,600 ft

Location: 2.5 MILES NORTHWEST OF SYCAMORE CAMPGROUND, LITTLE ROCK CANYON, SAN GABRIEL MOUNTAINS, ANGELES NATIONAL FOREST.

Location Detail: SITE DESCRIPTION AS: SAN GABRIEL MOUNTAINS, LITTLE ROCK CANYON, 2.5 MILES NORTH SYCAMORE CAMP GROUND.

Ecological: THIS AREA IS WITHIN THE CCCNDDB COMMUNITY OF, SOUTHERN SYCAMORE ALDER RIPARIAN WOODLAND.

Threat:

General: 3 SPECIMENS COLLECTED IN 1959 BY A. SCHOENHERR, LACM #'S 26647-26649

Owner/Manager: USFS-ANGELES NF

Southern California Threespine Stickleback Stream

Element Code: CARE2320CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G?	
State: None	**State:** SNR	

Habitat Associations

General:

Micro:

Occurrence No. 5 **Map Index:** 02048 **EO Index:** 5408

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Fluctuating

Dates Last Seen
Element: 1993-08-04
Site: 1993-08-04
Record Last Updated: 1995-10-24

Quad Summary: Acton (3411842/136B), Agua Dulce (3411843/137A)
County Summary: Los Angeles

Lat/Long: 34.43811º / -118.33058º
UTM: Zone-11 N3811537 E377754
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 13W
Section: 08 **Qtr:** XX
Meridian: S
Elevation: 2,440 ft

Location: SANTA CLARA RIVER, SOLEDAD CANYON, LOS ANGELES COUNTY.

Location Detail: FROM 1.25 MILE EAST OF THE TOWN OF LANG UPSTREAM TO 1 MILE UP CREEK IN ARRASTRE CANYON.

Ecological: CONTAINS PURE POPULATION OF UNARMORED THREESPINE STICKLEBACK. INTRODUCED SANTA ANA SUCKER AND ARROYO CHUB ARE ALSO FOUND HERE. WILLOW-BACCHARIS RIPARIAN WITH COTTONWOOD & LIVE OAK OVERSTORY.

Threat: WATER DIVERSIONS AND IMPOUNDMENTS FROM PVT CAMPGROUNDS. HAZARDOUS WASTE FROM SP RAILROAD. URBANIZATION AND RECREATION.

General: STICKLEBACK POPULATION STUDIES DONE DURING 1981-85 & 1989-1993. PEAK FLOOD YEARS SIGNIFICANTLY REDUCE STICKLEBACK POPULATION.

Owner/Manager: PVT, USFS-ANGELES NF

Southern Cottonwood Willow Riparian Forest

Element Code: CTT61330CA

Status
Federal: None
State: None

NDDB Element Ranks
Global: G3
State: S3.2

Other Lists

Habitat Associations
General:
Micro:

Occurrence No. 31 **Map Index:** 02251 **EO Index:** 15819

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-20

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.40872º / -118.08265º
UTM: Zone-11 N3808006 E400498
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 280.7 acres

Township: 04N
Range: 12W
Section: 14 **Qtr:** W
Meridian: S
Elevation: 3,600 ft

Location: ALISO CANYON, FROM NEAR CONFL OF TIE CYN D/S TO ABOUT 0.5 MINW OF WAGONWHEEL RANCH.
Location Detail: INTERPRETED FROM 1978 AERIAL PHOTOGRAPHS.
Ecological:
Threat:
General: NEEDS FIELD CHECK. THIS WAS OCC #031 OF CTT61330CA.
Owner/Manager: USFS-ANGELES NF

Southern Cottonwood Willow Riparian Forest

Element Code: CTT61330CA

Status
Federal: None
State: None

NDDB Element Ranks
Global: G3
State: S3.2

Other Lists

Habitat Associations
General:
Micro:

Occurrence No. 32 **Map Index:** 02181 **EO Index:** 15817

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-29
Site: 1978-09-19
Record Last Updated: 1998-07-20

Quad Summary: Pacifico Mountain (3411841/136A), Acton (3411842/136B)
County Summary: Los Angeles

Lat/Long: 34.43226º / -118.12807º
UTM: Zone-11 N3810662 E396353
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 378.1 acres

Township: 04N
Range: 12W
Section: 16 **Qtr:** N
Meridian: S
Elevation: 3,160 ft

Location: ALISO CANYON, FROM 1 MI U/S OF BLUM RANCH BUILDING S U/S ABOUT 3 MI.
Location Detail: INTERPRETED FROM 1978 AERIAL PHOTOGRAPHS. FORMERLY EXTENDED FARTHER D/S.
Ecological: CLOSED CANOPY POPULUS FREMONTII ACCORDING TO WIESLANDER SURVEY.
Threat:
General: THIS WAS OCC #032 OF CTT61330CA.
Owner/Manager: USFS-ANGELES NF

Southern Cottonwood Willow Riparian Forest

Element Code: CTT61330CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	
State: None	**State:** S3.2	

Habitat Associations

General:

Micro:

Occurrence No. 33 **Map Index:** 02095 **EO Index:** 15818

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19

Record Last Updated: 1998-07-20

Quad Summary: Acton (3411842/136B)
County Summary: Los Angeles

Lat/Long: 34.43155º / -118.19213º
UTM: Zone-11 N3810651 E390466
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 139.4 acres

Township: 04N
Range: 13W
Section: 13 **Qtr:** XX
Meridian: S
Elevation: 2,760 ft

Location: ARRASTRE CANYON FROM ABOUT 0.5 MI U/S OF CONFL W/ SOLEDAD CANYON U/S FOR >1 MI.
Location Detail: INTERPRETED FROM 1978 AERIAL PHOTOGRAPHS.
Ecological: CLOSED CANOPY POPULUS FREMONTII ACCORDING TO WIESLANDER SURVEY.
Threat:
General: THIS WAS OCC #033 OF CTT61330CA.
Owner/Manager: UNKNOWN

Southern Cottonwood Willow Riparian Forest

Element Code: CTT61330CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	
State: None	**State:** S3.2	

Habitat Associations

General:

Micro:

Occurrence No. 34 **Map Index:** 02007 **EO Index:** 15816

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-20

Quad Summary: Acton (3411842/136B), Agua Dulce (3411843/137A)
County Summary: Los Angeles

Lat/Long: 34.44253º / -118.21091º
UTM: Zone-11 N3811889 E388755
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 192.1 acres

Township: 04N
Range: 13W
Section: 16 **Qtr:** N
Meridian: S
Elevation: 2,320 ft

Location: SOLEDAD CANYON, FROM ACTON CAMP D/S FOR OVER 3 MI.
Location Detail: INTERPRETED FROM 1978 AERIAL PHOTOGRAPHS.
Ecological: CLOSED CANOPY POPULUS FREMONTII, PLATANUS RACEMOSA & SALIX SPP ACCORDING TO WIESLANDER SURVEY.
Threat:
General: THIS WAS OCC #034 OF CTT61330CA.
Owner/Manager: UNKNOWN

Southern Riparian Scrub

Element Code: CTT63300CA

Status
Federal: None
State: None

NDDB Element Ranks
Global: G3
State: S3.2

Other Lists

Habitat Associations
General:
Micro:

Occurrence No. 27 **Map Index:** 02405 **EO Index:** 15315

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-23

Quad Summary: Juniper Hills (3411748/135B)
County Summary: Los Angeles

Lat/Long: 34.45949º / -117.97564º
UTM: Zone-11 N3813537 E410388
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 33.3 acres

Township: 04N
Range: 10W
Section: 06 **Qtr:** W
Meridian: S
Elevation: 4,120 ft

Location: INTERMITTENT STREAM WEST OF BRAINARD CANYON, ABOUT 1 MI WSW OF CIMA MESA CO PARK.
Location Detail:
Ecological: 1978 EXTENT MAPPED FROM INTERPRETATION OF AERIAL PHOTOGRAPHS. UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO
Threat:
General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION.
Owner/Manager: UNKNOWN

Southern Riparian Scrub

Element Code: CTT63300CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	
State: None	**State:** S3.2	

Habitat Associations

General:

Micro:

Occurrence No. 37 **Map Index:** 01944 **EO Index:** 15306

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 2006-09-06

Quad Summary: Agua Dulce (3411843/137A), Acton (3411842/136B)
County Summary: Los Angeles

Lat/Long: 34.43990º / -118.29916º
UTM: Zone-11 N3811699 E380642
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 701.0 acres

Township: 04N
Range: 14W
Section: 12 **Qtr:** SW
Meridian: S
Elevation: 2,000 ft

Location: SANTA CLARA RIVER, SOLEDAD GUARD STATION AND APPROX 2.2 MI D/S, SOLEDAD CANYON.

Location Detail: 1978 EXTENT MAPPED FROM INTERPRETATION OF AERIAL PHOTOGRAPHS.

Ecological: MAPPED BY WIESLANDER SURVEY AS SCRUB OF ARTEMISIA TRIDENTATA, ERIOGONUM FASCICULATUM AND LEPIDOSPARTUM SQUAMATUM.

Threat:

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. THIS WAS OCC #037 OF CTT63300CA.

Owner/Manager: PVT

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 66 **Map Index:** 02262 **EO Index:** 15488

Dates Last Seen

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Element: 1988-03-30
Site: 1988-03-30
Record Last Updated: 1998-07-22

Quad Summary: Chilao Flat (3411831/136D), Condor Peak (3411832/136C), Waterman Mtn. (3411738/135C), Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.32903º / -118.11913º
UTM: Zone-11 N3799206 E397048
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 4,241.8 acres

Township: 03N
Range: 11W
Section: 31 **Qtr:** XX
Meridian: S
Elevation: 3,600 ft

Location: BIG TUJUNGA CANYON & MANY TRIBUTARIES, U/S OF RESERVOIR BEHIND BIG TUJUNGA DAM.

Location Detail:

Ecological: CLOSED CANOPY PLATANUS RACEMOSA, Q. CHRYSOLEPIS, SALIX SPP. & ALNUS RHOMBIFOLIA W/SCATTERED POPULUS FREMONTII & MORE WILLOWS THAN W FORK SAN GABRIEL ACCORDING TO WIESLANDER SURVEY. MIDDLE FORK MILL CK BURNED 1977, RECOVERING PER HOLLAND.

Threat:

General: THIS WAS OCC #066 OF CTT62400CA.

Owner/Manager: USFS-ANGELES NF

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 76 **Map Index:** 02622 **EO Index:** 15480

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-22

Quad Summary: Valyermo (3411747/135A), Crystal Lake (3411737/135D)
County Summary: Los Angeles

Lat/Long: 34.37193º / -117.83604º
UTM: Zone-11 N3803712 E423130
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 428.9 acres

Township: 03N
Range: 09W
Section: 05 **Qtr:** XX
Meridian: S
Elevation: 5,250 ft

Location: SOUTH FORK BIG ROCK CREEK, BETWEEN MT WILLIAMSON & MT LEWIS.
Location Detail: EXTANT, 1978, PER AERIAL PHOTO INTERPRETATION.
Ecological: CLOSED CANOPY ALNUS RHOMBIFOLIA ACCORDING TO WIESLANDER SURVEY.
Threat:
General: RECENT GROUND TRUTH NEEDED. THIS WAS OCC #076 OF CTT62400CA.
Owner/Manager: USFS-ANGELES NF

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 78 **Map Index:** 02416 **EO Index:** 15477

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1988-03-31
Site: 1988-03-31
Record Last Updated: 1998-07-22

Quad Summary: Waterman Mtn. (3411738/135C), Juniper Hills (3411748/135B), Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.40264º / -117.94278º
UTM: Zone-11 N3807204 E413347
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 1,775.5 acres

Township: 04N
Range: 10W
Section: 30 **Qtr:** XX
Meridian: S
Elevation: 4,000 ft

Location: LITTLE ROCK CREEK, FROM ABOUT 0.7 MI U/S OF LITTLE ROCK RESERVOIR U/S FOR SEVERAL MI.

Location Detail: PORTIONS FIELD CHECKED 1988, COPPER CYN MAPPED FROM INTERPRETATION OF 1978 AIR PHOTOS, WIESLANDER DID NOT MAP; MAY NOT BE SYCAMORES AT HIGHER ELEVATIONS.

Ecological: CLOSED CANOPY QUERCUS CHRYSOLEPIS, PLATANUS RACEMOSA, SALIX SPP. & ALNUS RHOMBIFOLIA IN VARIOUS COMBINATIONS ACCORDING TO WIESLANDER SURVEY.

Threat:

General: THIS WAS OCC #078 OF CTT62400CA.

Owner/Manager: USFS-ANGELES NF

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 79 **Map Index:** 02294 **EO Index:** 15476

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-22

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.43629º / -118.05412º
UTM: Zone-11 N3811036 E403152
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 222.7 acres

Township: 04N
Range: 11W
Section: XX **Qtr:** XX
Meridian: S
Elevation: 4,000 ft

Location: SANTIAGO CANYON FROM ABOUT 1.5 MI U/S (SW) OF LITTLE ROCK RESERVOIR IS SEVERAL MILES.
Location Detail: EXTANT, 1978, PER AERIAL PHOTO INTERPRETATION.
Ecological: CLOSED CANOPY ALNUS RHOMBIFOLIA ACCORDING TO WIESLANDER SURVEY.
Threat:
General: THIS WAS OCC #079 OF CTT62400CA.
Owner/Manager: USFS-ANGELES NF

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 80 **Map Index:** 02369 **EO Index:** 15474

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-22

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.40679º / -118.01010º
UTM: Zone-11 N3807724 E407164
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 133.0 acres

Township: 04N
Range: 11W
Section: XX **Qtr:** XX
Meridian: S
Elevation: 4,200 ft

Location: BARE MOUNTAIN CANYON, ABOUT 1 MI WSW OF TOP OF BARE MTN D/S FOR ABOUT 2 MI.
Location Detail: EXTANT, 1978, PER AERIAL PHOTO INTERPRETATION.
Ecological: CLOSED CANOPY QUERCUS CHRYSOLEPIS & ALNUS RHOMBIFOLIA ACCORDING TO WIESLANDER SURVEY.
Threat:
General: THIS WAS OCC #080 OF CTT62400CA.
Owner/Manager: USFS-ANGELES NF

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 81 **Map Index:** 02125 **EO Index:** 15475

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-22

Quad Summary: Acton (3411842/136B)
County Summary: Los Angeles

Lat/Long: 34.40972º / -118.17592º
UTM: Zone-11 N3808213 E391927
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 145.7 acres

Township: 04N
Range: 12W
Section: 19 **Qtr:** W
Meridian: S
Elevation: 3,240 ft

Location: ARRASTRE CANYON, U/S OF WERNER CAMP FOR ABOUT 2 MI.
Location Detail: EXTANT, 1978, PER AERIAL PHOTO INTERPRETATION.
Ecological: CLOSED CANOPY QUERCUS CHRYSOLEPIS & ALNUS RHOMBIFOLIA ACCORDING TO WIESLANDER SURVEY.
Threat:
General: THIS WAS OCC #081 OF CTT62400CA.
Owner/Manager: USFS-ANGELES NF

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 82 **Map Index:** 02039 **EO Index:** 15473

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-22

Quad Summary: Acton (3411842/136B)
County Summary: Los Angeles

Lat/Long: 34.40223º / -118.22579º
UTM: Zone-11 N3807436 E387333
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 195.5 acres

Township: 04N
Range: 13W
Section: 22 **Qtr:** SW
Meridian: S
Elevation: 2,800 ft

Location: MILL CANYON & TRIBUTARY FROM EAST, FROM 1.75 MI U/S OF CONFLW/ SOLEDAD CYN U/S >1 MI.
Location Detail: EXTANT, 1978, PER AERIAL PHOTO INTERPRETATION.
Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.
Threat:
General: RECENT GROUND TRUTH NEEDED.
Owner/Manager: USFS-ANGELES NF

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 83 **Map Index:** 02017 **EO Index:** 15472

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-22

Quad Summary: Acton (3411842/136B)
County Summary: Los Angeles

Lat/Long: 34.45638º / -118.24160º
UTM: Zone-11 N3813459 E385954
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 42.0 acres

Township: 04N
Range: 13W
Section: 04 **Qtr:** SE
Meridian: S
Elevation: 2,680 ft

Location: HUGHES CANYON ABOUT 1 MI N OF SOLEDAD CANYON.
Location Detail: EXTANT, 1978, PER AERIAL PHOTO INTERPRETATION.
Ecological: VEG COMPOSITION UNKNOWN. UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO
Threat:
General: RECENT GROUND TRUTH NEEDED.
Owner/Manager: UNKNOWN

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 151 **Map Index:** 01996 **EO Index:** 15411

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-22

Quad Summary: Acton (3411842/136B), Agua Dulce (3411843/137A)
County Summary: Los Angeles

Lat/Long: 34.41561º / -118.25540º
UTM: Zone-11 N3808954 E384630
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 117.0 acres

Township: 04N
Range: 13W
Section: 20 **Qtr:** XX
Meridian: S
Elevation: 2,840 ft

Location: MATTOX CANYON, FROM 0.9 TO 2.4 MI U/S FROM JCT WITH SANTA CLARA RIVER,
Location Detail: 1978 EXTENT MAPPED FROM INTERPRETATION OF AERIAL PHOTOS.
Ecological: CLOSED CANOPY PLATANUS RACEMOSA ACCORDING TO WIESLANDER SURVEY.
Threat:
General: NEEDS FIELD VERIFICATION. THIS WAS OCC #151 OF CTT62400CA.
Owner/Manager: USFS-ANGELES NF

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G4	
State: None	**State:** S4	

Habitat Associations

General:

Micro:

Occurrence No. 153 **Map Index:** 01973 **EO Index:** 15410

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-09-19
Site: 1978-09-19
Record Last Updated: 1998-07-22

Quad Summary: Sunland (3411833/137D), Acton (3411842/136B), Agua Dulce (3411843/137A)

County Summary: Los Angeles

Lat/Long: 34.38193º / -118.26179º
UTM: Zone-11 N3805226 E383997
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 167.4 acres

Township: 03N
Range: 13W
Section: XX **Qtr:** XX
Meridian: S
Elevation: 3,560 ft

Location: NORTH FORK PACOIMA CANYON AND TRIBUTARY.

Location Detail: 1978 EXTENT MAPPED FROM INTERPRETATION OF AERIAL PHOTOS; EXTENT INCREASED RELATIVE TO WIESLANDER SURVEY.

Ecological: CLOSED CANOPY QUERCUS AGRIFOLIA & PLATANUS RACEMOSA ACCORDING TO WIESLANDER SURVEY.

Threat:

General: NEEDS FIELD VERIFICATION. THIS WAS OCC #153 OF CTT62400CA.

Owner/Manager: USFS-ANGELES NF

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status

Federal: None
State: Threatened

NDDB Element Ranks

Global: G2G3
State: S2S3

Other Lists

CDFG Status:

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 23 **Map Index:** 21922 **EO Index:** 8137

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1954-03-15
Site: 1954-03-15

Record Last Updated: 1993-02-17

Quad Summary: Lovejoy Buttes (3411757/160D)
County Summary: Los Angeles

Lat/Long: 34.59430º / -117.85407º
UTM: Zone-11 N3828385 E421680
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 06N
Range: 09W
Section: 20 **Qtr:** XX
Meridian: S
Elevation: 3,100 ft

Location: LOVEJOY BUTTES, 18 MILES EAST OF PALMDALE.
Location Detail:
Ecological:
Threat:
General: ONE MALE COLLECTED ON 15 MAR 1954; MVZ #125679. D. CLARK #S: DC59.
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 24 **Map Index:** 02204 **EO Index:** 7331

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1932-04-05
Site: 1932-04-05
Record Last Updated: 1993-09-24

Quad Summary: Palmdale (3411851/161D), Ritter Ridge (3411852/161C)

County Summary: Los Angeles

Lat/Long: 34.59436º / -118.12067º
UTM: Zone-11 N3828631 E397232
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 06N
Range: 12W
Section: 23 **Qtr:** XX
Meridian: S
Elevation: 2,600 ft

Location: PALMDALE AND VICINITY.

Location Detail: 4/28/20 COLLECTION: SEC 14; 7/15/20 COLLECTION: SEC 23; 6/15/31 AND 4/05/32 COLLECTIONS: SEC 26.

Ecological:

Threat: ("OTHER" CONTINUED) (LACM #S 003009-10 AND 003129-003135); 4 TRAPPED ON UNKNOWN DATE (UCLA #18645-6, 18661 AND 18669)

General: 3 FEMALES & 1 MALE TRAPPED 4/28/20 BY L.S. NEVILLE (MVZ #31158-31160, & U. MICH. #77651); 1 TRAPPED 7/15/20 (MVZ #31966)-DC #56; 1 FEMALE TRAPPED 6/15/31 (LACM #030714); 6 FEMALES & 1 MALE TRAPPED 3/13-31 & 4/4-5/32 (CONTINUED IN "THREAT")

Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 25 **Map Index:** 02598 **EO Index:** 8139

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1930-04-04
Site: 1930-04-04
Record Last Updated: 1993-02-17

Quad Summary: Lovejoy Buttes (3411757/160D), Hi Vista (3411767/160A)
County Summary: Los Angeles

Lat/Long: 34.61704º / -117.84039º
UTM: Zone-11 N3830896 E422956
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 06N
Range: 09W
Section: 09 **Qtr:** SW
Meridian: S
Elevation: 2,650 ft

Location: 1 MILE NW OF LOVEJOY SPRINGS, 18 MILE ENE OF PALMDALE.
Location Detail:
Ecological:
Threat:
General: ONE FEMALE TRAPPED 0N 4 APR 1930; MVZ #44285. D. CLARK #S: DC57.
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status

Federal: None
State: Threatened

NDDB Element Ranks

Global: G2G3
State: S2S3

Other Lists

CDFG Status:

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 26 **Map Index:** 02196 **EO Index:** 7360

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1984-06-14
Site: 1984-06-14

Record Last Updated: 1993-09-24

Quad Summary: Lancaster East (3411861/161A), Lancaster West (3411862/161B)

County Summary: Los Angeles

Lat/Long: 34.67380º / -118.12153º
UTM: Zone-11 N3837442 E397251
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 07N
Range: 12W
Section: 26 **Qtr:** XX
Meridian: S
Elevation: 2,440 ft

Location: VICINITY OF LANCASTER.

Location Detail: 1920 COLLECTION WAS IN SEC 26; 1984 DETECTION WAS IN SEC 23.

Ecological:

Threat:

General: ONE MALE COLLECTED ON 16 JUL 1920 (MVZ #31967); 1 SQUIRREL DETECTED 14 JUN 1984 BY MCKERNAN (DC #271).

Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 45 **Map Index:** 02258 **EO Index:** 7332

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1934-08-27
Site: 1934-08-27
Record Last Updated: 1993-09-24

Quad Summary: Palmdale (3411851/161D)
County Summary: Los Angeles

Lat/Long: 34.57990º / -118.07606º
UTM: Zone-11 N3826983 E401306
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 06N
Range: 11W
Section: 30 **Qtr:** XX
Meridian: S
Elevation: 2,600 ft

Location: 2.5 MILES EAST OF PALMDALE.
Location Detail: 1931 COLLECTIONS: SECTIONS 29 AND 30; 1934 COLLECTION: SEC 30.
Ecological:
Threat:
General: 6 TRAPPED IN 1931 IN SEC 30: 1 FEMALE ON 8/6 (SDNHM #9629), 3 FEMALES & 1 MALE ON 8/26 (SDNHM #9623-24 & 9708-09), & 1 MALE ON 8/27 (SDNHM #9726); 3 TAKEN 6/14/31 (LACM #002639-41. 2 FEM & 1 UNK GENDER); 1 MALE TAKEN 8/27/34 (SDMNH #9710)
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status

Federal: None
State: Threatened

NDDB Element Ranks

Global: G2G3
State: S2S3

Other Lists

CDFG Status:

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 54 **Map Index:** 02626 **EO Index:** 24255

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1960-XX-XX
Site: 1972-XX-XX

Record Last Updated: 1996-02-22

Quad Summary: Valyermo (3411747/135A)

County Summary: Los Angeles

Lat/Long: 34.47690º / -117.83500º
UTM: Zone-11 N3815351 E423322
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 05N
Range: 09W
Section: 33 **Qtr:** W
Meridian: S
Elevation: 3,520 ft

Location: INTERSECTION OF BOBS GAP AND 165TH STREET.

Location Detail:

Ecological:

Threat:

General: SIGNIFICANT POPULATION IN EARLY 1960'S, BUT NONE FOUND IN 1972.

Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2G3	**CDFG Status:**
State: Threatened	**State:** S2S3	

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 134 **Map Index:** 21920 **EO Index:** 28617

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1977-XX-XX
Site: 1977-XX-XX

Record Last Updated: 1993-02-04

Quad Summary: Palmdale (3411851/161D)
County Summary: Los Angeles

Lat/Long: 34.60553º / -118.04512º
UTM: Zone-11 N3829795 E404173
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 11W
Section: 16 **Qtr:** SE
Meridian: S
Elevation: 2,540 ft

Location: AT CORNER OF 47TH STREET E AND AVENUE P STREET, 4 MILES ENE OF PALMDALE
Location Detail:
Ecological:
Threat:
General: UNKNOWN NUMBER OF SQUIRRELS TRAPPED BY M.A. RECHT FROM 1973-1977.
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status

Federal: None
State: Threatened

NDDB Element Ranks

Global: G2G3
State: S2S3

Other Lists

CDFG Status:

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 135 **Map Index:** 21921 **EO Index:** 20950

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1931-06-13
Site: 1931-06-13

Record Last Updated: 1993-02-04

Quad Summary: Palmdale (3411851/161D)
County Summary: Los Angeles

Lat/Long: 34.57997º / -118.01360º
UTM: Zone-11 N3826931 E407035
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 06N
Range: 11W
Section: 26 **Qtr:** XX
Meridian: S
Elevation: 2,640 ft

Location: 5 MILES EAST OF PALMDALE.
Location Detail:
Ecological:
Threat:
General: ONE FEMALE COLLECTED ON 13 JUN 1931 (LACM #2638).
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2G3	**CDFG Status:**
State: Threatened	**State:** S2S3	

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 190 **Map Index:** 22805 **EO Index:** 7926

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1976-09-XX
Site: 1976-09-XX

Record Last Updated: 1993-03-22

Quad Summary: Hi Vista (3411767/160A)
County Summary: Los Angeles

Lat/Long: 34.70444º / -117.81822º
UTM: Zone-11 N3840572 E425067
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 07N
Range: 09W
Section: 15 **Qtr:** XX
Meridian: S
Elevation: 3,000 ft

Location: JUST EAST OF BLUE ROCK, 2 MILES NORTHWEST OF SADDLEBACK BUTTE.
Location Detail:
Ecological: NO INFORMATION GIVEN.
Threat: UNKNOWN.
General: TWENTY SQUIRRELS SIGHTED BY RECHT FROM APR 1974-SEP 1976.
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 226 **Map Index:** 22800 **EO Index:** 7925

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1991-05-25
Site: 1991-05-25
Record Last Updated: 1993-03-22

Quad Summary: Hi Vista (3411767/160A)
County Summary: Los Angeles

Lat/Long: 34.65050º / -117.86965º
UTM: Zone-11 N3834630 E420305
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 09W
Section: 31 **Qtr:** SE
Meridian: S
Elevation: 2,500 ft

Location: JUST NORTH OF ROCKY BUTTES. ALONG DIRT ROAD (SHOULD BE AVENUE L-8 EAST, ABOUT 1/2 MILE WEST OF 150TH STREET.)

Location Detail:

Ecological: JOSHUA TREE WOODLAND HABITAT. SANDY SOIL.

Threat: AREA UNDER CONSIDERATION FOR HOUSING DEVELOPMENT.

General: TWO ADULTS OBSERVED ALONG ROAD AT SEPARATE TIMES. BOTH INDIVIDUALS ENTERED AND EXITED SITE UNDER OBSERVATION FOR DESERT TORTOISE. AREA OBSERVED FOR WEEKS DURING SPRING OF 1990 BUT NO SQUIRRELS SIGHTED.

Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 227 **Map Index:** 22803 **EO Index:** 7881

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1992-XX-XX
Site: 1992-XX-XX

Record Last Updated: 1993-02-12

Quad Summary: Hi Vista (3411767/160A)

County Summary: Los Angeles

Lat/Long: 34.67792º / -117.81583º
UTM: Zone-11 N3837629 E425263
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 07N
Range: 09W
Section: XX **Qtr:** XX
Meridian: S
Elevation: 2,700 ft

Location: SADDLEBACK BUTTE STATE PARK.

Location Detail: SQUIRRELS SEEN ALL OVER PARK EXCEPT ROCKY AREAS. NON-SPECIFIC POLYGON ALSO NE 1/4 SEC 24 AND SE 1/4 OF SEC 13.

Ecological: NO INFORMATION GIVEN.

Threat: UNKNOWN.

General: UNKNOWN NUMBER OF SQUIRRELS OBSERVED BY RECHT FROM 1973-1992. DATA REPORTED BY D. CLARK (DC231 AND 233).

Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 228 **Map Index:** 22804 **EO Index:** 7927

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1977-XX-XX
Site: 1977-XX-XX
Record Last Updated: 1993-02-12

Quad Summary: Hi Vista (3411767/160A)
County Summary: Los Angeles

Lat/Long: 34.70388º / -117.77677º
UTM: Zone-11 N3840479 E428863
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 09W
Section: 13 **Qtr:** NE
Meridian: S
Elevation: 2,970 ft

Location: 0.25 MILE SOUTHWEST OF INTERSECTION OF NORTH 200 STREET EAST AND AVENUE I.
Location Detail:
Ecological: NO INFORMATION GIVEN.
Threat: UNKNOWN.
General: UNKNOWN NUMBER OF SQUIRRELS DETECTED BY RECHT FROM 1973-1977. DATA REPORTED BY D. CLARK (DC232).
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 229 **Map Index:** 22802 **EO Index:** 7887

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1977-XX-XX
Site: 1977-XX-XX

Record Last Updated: 1993-02-12

Quad Summary: Hi Vista (3411767/160A)

County Summary: Los Angeles

Lat/Long: 34.64815º / -117.82447º
UTM: Zone-11 N3834334 E424444
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 09W
Section: 34 **Qtr:** SW
Meridian: S
Elevation: 2,600 ft

Location: JUST NORTHWEST OF INTERSECTION OF NORTH 170TH STREET EAST AND EAST AVENUE M.

Location Detail:

Ecological: NO INFORMATION GIVEN.

Threat: UNKNOWN.

General: UNKNOWN NUMBER OF SQUIRRELS DETECTED BY RECHT BETWEEN 1973-1977. DATA REPORTED BY D. CLARK (DC237).

Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 230 **Map Index:** 22801 **EO Index:** 7888

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1977-XX-XX
Site: 1977-XX-XX

Record Last Updated: 1993-02-12

Quad Summary: Hi Vista (3411767/160A)

County Summary: Los Angeles

Lat/Long: 34.63612º / -117.86598º
UTM: Zone-11 N3833032 E420628
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 09W
Section: 06 **Qtr:** E
Meridian: S
Elevation: 2,600 ft

Location: JUST WEST OF NORTH 150TH STREET EAST, 0.5 MILE NORTH OF AVENUE N.

Location Detail:

Ecological: NO INFORMATION GIVEN.

Threat: UNKNOWN.

General: UNKNOWN NUMBER OF SQUIRRELS DETECTED BY RECHT FROM 1973-1977. DATA REPORTED BY D. CLARK (DC238).

Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 255 **Map Index:** 22817 **EO Index:** 21239

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1977-XX-XX
Site: 1977-XX-XX

Record Last Updated: 1993-02-18

Quad Summary: Alpine Butte (3411768/160B)
County Summary: Los Angeles

Lat/Long: 34.64949º / -117.96578º
UTM: Zone-11 N3834598 E411495
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 10W
Section: 32 **Qtr:** SW
Meridian: S
Elevation: 2,525 ft

Location: WEST OF ALPINE BUTTE, JUST NORTHEAST OF INTERSECTION OF EAST AVE M & 90TH STREET EAST.
Location Detail:
Ecological:
Threat:
General: UNKNOWN NUMBER OF SQUIRRELS DETECTED BY RECHT FROM 1973-77 (DC229).
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 256 **Map Index:** 22818 **EO Index:** 17042

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1987-XX-XX
Site: 1987-XX-XX
Record Last Updated: 1993-02-18

Quad Summary: Hi Vista (3411767/160A), Alpine Butte (3411768/160B)
County Summary: Los Angeles

Lat/Long: 34.68664º / -117.87685º
UTM: Zone-11 N3838643 E419681
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 09W
Section: 19 **Qtr:** NW
Meridian: S
Elevation: 2,510 ft

Location: NORTH OF ALPINE BUTTE, 1.25 MI EAST OF EAST AVE J-130TH STREET EAST JUNCTION.
Location Detail:
Ecological:
Threat:
General: UNKNOWN NUMBER OF SQUIRRELS DETCTED BY RECHT FROM 1973-77 AND IN 1987 (DC230).
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 268 **Map Index:** 22828 **EO Index:** 21422

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1931-07-02
Site: 1931-07-02
Record Last Updated: 1993-02-18

Quad Summary: Valyermo (3411747/135A), Lovejoy Buttes (3411757/160D)
County Summary: Los Angeles

Lat/Long: 34.50646º / -117.82764º
UTM: Zone-11 N3818624 E424025
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 05N
Range: 09W
Section: 21 **Qtr:** XX
Meridian: S
Elevation: 3,200 ft

Location: LLAN0-HWY 138.
Location Detail:
Ecological:
Threat:
General: TWO FEMALES COLLECTED ON 14 JUN AND 2 JUL 1931 BY SANTA BARBARA MUS OF NATURAL HISTORY (#S 1224 AND 1240). DC195.
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 271 **Map Index:** 22831 **EO Index:** 7876

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1973-04-28
Site: 1973-04-28
Record Last Updated: 1993-02-18

Quad Summary: Lancaster East (3411861/161A)
County Summary: Los Angeles

Lat/Long: 34.63831º / -118.03195º
UTM: Zone-11 N3833418 E405418
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 06N
Range: 11W
Section: 03 **Qtr:** XX
Meridian: S
Elevation: 2,500 ft

Location: EAST OF AIR FORCE PLANT 42.
Location Detail:
Ecological:
Threat:
General: TWO SQUIRRELS DETECTED BY MCKERNAN ON 28 APR 1973 (DC272).
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 279 **Map Index:** 22838 **EO Index:** 7875

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1989-XX-XX
Site: 1989-XX-XX

Record Last Updated: 1993-04-02

Quad Summary: Littlerock (3411758/160C)
County Summary: Los Angeles

Lat/Long: 34.53843º / -117.93166º
UTM: Zone-11 N3822252 E414508
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 05N
Range: 10W
Section: 09 **Qtr:** N
Meridian: S
Elevation: 2,800 ft

Location: LITTLEROCK, SOUTH OF AVE T FROM 106TH STREET TO 116TH STREET.
Location Detail:
Ecological:
Threat:
General: UNKNOWN NUMBER OF SQUIRRELS DETECTED BY RECHT 1973-77 AND 1986-89 (DC236).
Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status

Federal: None
State: Threatened

NDDB Element Ranks

Global: G2G3
State: S2S3

Other Lists

CDFG Status:

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 280 **Map Index:** 22837 **EO Index:** 7873

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1989-XX-XX
Site: 1989-XX-XX

Record Last Updated: 1993-04-02

Quad Summary: Littlerock (3411758/160C)

County Summary: Los Angeles

Lat/Long: 34.56476º / -117.88980º
UTM: Zone-11 N3825137 E418375
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 06N
Range: 10W
Section: 36 **Qtr:** XX
Meridian: S
Elevation: 2,800 ft

Location: FOUR MILES NNW OF PEARBLOSSOM, AND NORTH OF AVE S-136TH STREET EAST JUNCTION.

Location Detail:

Ecological:

Threat:

General: THREE SQUIRRELS DETECTED ON 4 SEP 1974 BY MCKERNAN (DC267). ONE SQUIRREL DETECTED BY LSA IN 1989 IN THE SE QUARTER OF SEC 36. DATA REPORTED BY D. CLARK (DC152)

Owner/Manager: UNKNOWN

Spermophilus mohavensis

Mohave ground squirrel

Element Code: AMAFB05150

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G2G3	**CDFG Status:**	
State:	Threatened	**State:**	S2S3		

Habitat Associations

General: OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.

Micro: PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.

Occurrence No. 309 **Map Index:** 57305 **EO Index:** 57321

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1961-06-04
Site: 1961-06-04

Record Last Updated: 2004-10-07

Quad Summary: Hi Vista (3411767/160A), Rogers Lake South (3411777/185D)

County Summary: Los Angeles

Lat/Long: 34.73816º / -117.82758º
UTM: Zone-11 N3844319 E424241
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 08N
Range: 09W
Section: 34 **Qtr:** XX
Meridian: S
Elevation: 3,000 ft

Location: LOCATED 3 MILES WEST OF HI VISTA ALONG AVENUE G.

Location Detail:

Ecological:

Threat:

General: 1 SPECIMEN COLLECTED (MALE) 4 JUN 1961 AT "3 MILES WEST OF HI VISTA." LACM CATALOG NUMBER 47348.

Owner/Manager: UNKNOWN

Stylocline masonii

Mason's neststraw

Element Code: PDAST8Y080

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G1	**CNPS List:** 1B.1
State: None	**State:** S1.1	

Habitat Associations

General: CHENOPOD SCRUB, PINYON-JUNIPER WOODLAND.

Micro: SANDY WASHES. 100-1200M.

Occurrence No. 1 **Map Index:** 23828 **EO Index:** 19443

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1991-04-30
Site: 1991-04-30

Record Last Updated: 1993-08-20

Quad Summary: Acton (3411842/136B)

County Summary: Los Angeles

Lat/Long: 34.46836º / -118.18708º
UTM: Zone-11 N3814728 E390978
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 05N
Range: 13W
Section: 36 **Qtr:** SE
Meridian: S
Elevation: 2,720 ft

Location: SOLEDAD CANYON, 0.8 KM (0.5 MI) EAST OF ACTON.

Location Detail: BROAD, SANDY WASH 2600 FT ESE OF ACTON. SE 1/4 OF THE SE 1/4 OF SECTION 36.

Ecological: GROWING IN ASSOCIATION WITH ARTEMISIA TRIDENTATA SSP. PARISHII, EPHEDRA SP., RUMEX HYMENOSEPALUS, PENSTEMON SPECTABILIS, STYLOCLINE PSILOCARPHOIDES, NEMOPHILA MENZIESII, CRYPTANTHA MICRANTHA, PHACELIA FREMOTII, AND CLAYTONIA EXIGUA.

Threat:

General: FIRST REPORT FOR LOS ANGELES COUNTY.

Owner/Manager: UNKNOWN

Symphyotrichum greatae

Greata's aster

Element Code: PDASTE80U0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.3
State: None	**State:** S2.3	

Habitat Associations

General: CHAPARRAL, CISMONTANE WOODLAND.

Micro: MESIC CANYONS. 800-1500M.

Occurrence No. 10 **Map Index:** 58442 **EO Index:** 58478

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-07-12
Site: 1995-07-12

Record Last Updated: 2004-12-09

Quad Summary: Juniper Hills (3411748/135B)

County Summary: Los Angeles

Lat/Long: 34.40731º / -117.96431º
UTM: Zone-11 N3807741 E411373
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 10W
Section: 30 **Qtr:** NW
Meridian: S
Elevation: 4,000 ft

Location: SAN GABRIEL MOUNTAINS, LITTLE ROCK CREEK JUST SOUTH OF CONFLUENCE WITH SOUTH FORK LITTLE ROCK CREEK.

Location Detail:

Ecological: NEAR STREAM IN MOIST GRANITIC SAND IN PARTIAL SUN. ASSOCIATED WITH PLATANUS RACEMOSA, JUNCUS MACROPHYLLUS, ALNUS RHOMBIFOLIA, BOYKINIA ROTUNDIFOLIA, SALIX LASIOLEPIS, MELIOLOTUS ALBUS, AND ARTEMISIA LUDOVICIANA.

Threat: HIGH RECREATIONAL USE, LEADING TO SOME HABITAT DEGRADATION.

General: 4 PLANTS SEEN IN 1995.

Owner/Manager: USFS-ANGELES NF

Symphyotrichum greatae

Greata's aster

Element Code: PDASTE80U0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.3
State: None	**State:** S2.3	

Habitat Associations

General: CHAPARRAL, CISMONTANE WOODLAND.

Micro: MESIC CANYONS. 800-1500M.

Occurrence No. 11 **Map Index:** 58443 **EO Index:** 58479

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-09-27
Site: 1994-09-27

Record Last Updated: 2004-12-09

Quad Summary: Pacifico Mountain (3411841/136A), Juniper Hills (3411748/135B)

County Summary: Los Angeles

Lat/Long: 34.43806º / -117.99899º
UTM: Zone-11 N3811182 E408220
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 11W
Section: 14 **Qtr:** NE
Meridian: S
Elevation: 3,700 ft

Location: SAN GABRIEL MOUNTAINS, LITTLE ROCK CREEK, JUST ABOVE AND BELOW CONFLUENCE WITH BARE MOUNTAIN CANYON.

Location Detail: MAPPED ALONG LITTLE ROCK CREEK NEAR THE CONFLUENCE WITH BARE MOUNTAIN CANYON.

Ecological: NEAR STREAM IN MOIST, COARSE SAND IN PARTIAL SUN. ASSOCIATED WITH BACCHARIS SALICIFOLIA, SALIX LASIOLEPIS, TYPHA DOMINGUENSIS, EQUISETUM SP., AND ARTEMISIA DRACUNCULUS.

Threat:

General: SMALL POPULATION OF SEVERAL INDIVIDUALS IN 1995.

Owner/Manager: USFS-ANGELES NF

Symphyotrichum greatae

Greata's aster

Element Code: PDASTE80U0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.3
State: None	**State:** S2.3	

Habitat Associations

General: CHAPARRAL, CISMONTANE WOODLAND.

Micro: MESIC CANYONS. 800-1500M.

Occurrence No. 34 **Map Index:** 58685 **EO Index:** 58721

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1994-06-21
Site: 1994-06-21

Record Last Updated: 2004-12-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.40184º / -118.03442º
UTM: Zone-11 N3807198 E404923
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 28 **Qtr:** SE
Meridian: S
Elevation: 5,200 ft

Location: SAN GABRIEL MOUNTAINS, SANTIAGO CANYON.

Location Detail: MAPPED IN THE NW 1/4 OF SE 1/4 OF SEC. 28.

Ecological: IN STREAM BOTTOM IN FULL SHADE ON MOIST, COARSE GRANITIC LOAM. ASSOCIATED WITH AQUILEGIA FORMOSA, CAREX CF. ALMA, PSEUDOTSUGA MACROCARPA, CALOCEDRUS DECURRENS, AND ALNUS RHOMBIFOLIA.

Threat:

General: "SMALL GROUP" OF PLANTS SEEN IN 1994.

Owner/Manager: USFS-ANGELES NF

Symphyotrichum greatae

Greata's aster

Element Code: PDASTE80U0

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G2	**CNPS List:** 1B.3
State: None	**State:** S2.3	

Habitat Associations

General: CHAPARRAL, CISMONTANE WOODLAND.

Micro: MESIC CANYONS. 800-1500M.

Occurrence No. 35 **Map Index:** 58686 **EO Index:** 58722

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-05-23
Site: 1995-05-23

Record Last Updated: 2004-12-16

Quad Summary: Pacifico Mountain (3411841/136A)

County Summary: Los Angeles

Lat/Long: 34.40751º / -118.00974º
UTM: Zone-11 N3807803 E407197
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/10 mile

Township: 04N
Range: 11W
Section: 26 **Qtr:** NW
Meridian: S
Elevation: 4,450 ft

Location: SAN GABRIEL MOUNTAINS, BARE MOUNTAIN CANYON.

Location Detail: MAPPED IN THE NW 1/4 OF NW 1/4 OF SEC. 26.

Ecological: ADJACENT TO STREAM ON MOIST GRANITIC LOAM IN PARTIAL SUN. ASSOCIATED WITH ALNUS RHOMBIFOLIA, BROMUS DIANDRUS, CLEMATIS LIGUISTICIFOLIA, AND ARTEMISIA DOUGLASIANA.

Threat:

General: FEWER THAN 20 PLANTS IN 1995.

Owner/Manager: USFS-ANGELES NF

Symphyotrichum greatae

Greata's aster

Element Code: PDASTE80U0

Status

Federal: None
State: None

NDDB Element Ranks

Global: G2
State: S2.3

Other Lists

CNPS List: 1B.3

Habitat Associations

General: CHAPARRAL, CISMONTANE WOODLAND.
Micro: MESIC CANYONS. 800-1500M.

Occurrence No. 36 **Map Index:** 02088 **EO Index:** 58723

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1893-08-XX
Site: 1893-08-XX

Record Last Updated: 2004-12-16

Quad Summary: Acton (3411842/136B)
County Summary: Los Angeles

Lat/Long: 34.47010º / -118.19618º
UTM: Zone-11 N3814930 E390144
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 05N
Range: 13W
Section: 36 **Qtr:** SW
Meridian: S
Elevation: 2,800 ft

Location: ACTON.
Location Detail: MAPPED AS BEST GUESS IN THE VICINITY OF ACTION.
Ecological:
Threat:
General: ONLY SOURCE IS 1893 COLLECTION. NEEDS FIELDWORK.
Owner/Manager: UNKNOWN

Taxidea taxus

American badger

Element Code: AMAJF04010

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G5	**CDFG Status:** SC
State: None	**State:** S4	

Habitat Associations

General: MOST ABUNDANT IN DRIER OPEN STAGES OF MOST SHRUB, FOREST, AND HERBACEOUS HABITATS, WITH FRIABLE SOILS.

Micro: NEED SUFFICIENT FOOD, FRIABLE SOILS & OPEN, UNCULTIVATED GROUND. PREY ON BURROWING RODENTS. DIG BURROWS.

Occurrence No. 150 **Map Index:** 56841 **EO Index:** 56857

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1930-04-03
Site: 1930-04-03

Record Last Updated: 2004-09-20

Quad Summary: Lovejoy Buttes (3411757/160D)
County Summary: Los Angeles

Lat/Long: 34.60227º / -117.84994º
UTM: Zone-11 N3829266 E422066
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 06N
Range: 09W
Section: 17 **Qtr:** XX
Meridian: S
Elevation: 2,950 ft

Location: NEAR LOVEJOY BUTTES.
Location Detail: MAPPED ACCORDING TO LAT/LONG GIVEN BY MVZ; MAX ERROR DISTANCE: 3 MI.
Ecological:
Threat:
General: COLLECTION (MVZ #44282) BY SETH B. BENSON ON 3 APR 1930.
Owner/Manager: UNKNOWN

Thamnophis hammondii

two-striped garter snake

Element Code: ARADB36160

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: COASTAL CALIFORNIA FROM VICINITY OF SALINAS TO NORTHWEST BAJA CALIFORNIA. FROM SEA TO ABOUT 7,000 FT ELEVATION.

Micro: HIGHLY AQUATIC, FOUND IN OR NEAR PERMANENT FRESH WATER. OFTEN ALONG STREAMS WITH ROCKY BEDS AND RIPARIAN GROWTH.

Occurrence No. 42 **Map Index:** 33384 **EO Index:** 29231

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1997-07-01
Site: 1997-07-01

Record Last Updated: 2005-06-28

Quad Summary: Pacifico Mountain (3411841/136A), Juniper Hills (3411748/135B)

County Summary: Los Angeles

Lat/Long: 34.44630º / -118.01208º
UTM: Zone-11 N3812107 E407026
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 04N
Range: 11W
Section: 10 **Qtr:** XX
Meridian: S
Elevation: 3,300 ft

Location: LITTLE ROCK CREEK, BETWEEN BASIN CAMPGROUND AND THE BARE MOUNTAIN CANYON CONFLUENCE, ANGELES NATIONAL FOREST

Location Detail:

Ecological: HABITAT CONSISTS OF RIPARIAN AREA ALONG LITTLE ROCK CREEK, DOMINATED BY SALIX EXIGUA, POPULUS SP, BACCHARIS SALICIFOLIA, & PLATANUS.

Threat:

General: 1 ADULT (3' LONG) OBSERVED ON 30 APR 1991. 2 ADULTS/2 JUVENILES OBSERVED FORAGING IN CREEKBED IN 1995; 1 ADULT HAD APPARENTLY JUST EATEN A 3-5 INCH FISH (SMALL TROUT). 5 SUB-ADULTS OBSERVED HUNTING IN JUN & JUL 1997.

Owner/Manager: USFS-ANGELES NF

Thamnophis hammondii

two-striped garter snake

Element Code: ARADB36160

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: COASTAL CALIFORNIA FROM VICINITY OF SALINAS TO NORTHWEST BAJA CALIFORNIA. FROM SEA TO ABOUT 7,000 FT ELEVATION.

Micro: HIGHLY AQUATIC, FOUND IN OR NEAR PERMANENT FRESH WATER. OFTEN ALONG STREAMS WITH ROCKY BEDS AND RIPARIAN GROWTH.

Occurrence No. 44 **Map Index:** 33420 **EO Index:** 14530

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1996-06-03
Site: 1996-06-03
Record Last Updated: 1996-06-17

Quad Summary: Pacifico Mountain (3411841/136A)
County Summary: Los Angeles

Lat/Long: 34.44575º / -118.04995º
UTM: Zone-11 N3812081 E403546
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 29.7 acres

Township: 04N
Range: 11W
Section: 08 **Qtr:** SE
Meridian: S
Elevation: 3,800 ft

Location: SANTIAGO CANYON, 0.25-0.50 MILE DOWNSTREAM FROM WHERE ROAD 4N20 CROSSES SANTIAGO CREEK, 2 MI SW OF LITTLE ROCK RESERVOIR

Location Detail:

Ecological: HABITAT CONSISTS OF SOUTHERN SYCAMORE ALDER RIPARIAN WOODLAND. COAST HORNED LIZARDS ALSO OBSERVED IN VICINITY.

Threat: THREATENED BY ORV USE IN THE AREA.

General: WILDFIRE IN 1994 IMPACTED THE DOWNSTREAM HABITAT AT THIS SITE. 1 ADULT OBSERVED ON 3 JUNE 1996.

Owner/Manager: USFS-ANGELES NF

Thamnophis hammondii

two-striped garter snake

Element Code: ARADB36160

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: COASTAL CALIFORNIA FROM VICINITY OF SALINAS TO NORTHWEST BAJA CALIFORNIA. FROM SEA TO ABOUT 7,000 FT ELEVATION.

Micro: HIGHLY AQUATIC, FOUND IN OR NEAR PERMANENT FRESH WATER. OFTEN ALONG STREAMS WITH ROCKY BEDS AND RIPARIAN GROWTH.

Occurrence No. 45 **Map Index:** 33483 **EO Index:** 19316

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1995-06-XX
Site: 1995-06-XX

Record Last Updated: 1996-09-09

Quad Summary: Ritter Ridge (3411852/161C)
County Summary: Los Angeles

Lat/Long: 34.59663º / -118.23072º
UTM: Zone-11 N3829000 E387143
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 06N
Range: 13W
Section: 23 **Qtr:** NW
Meridian: M
Elevation: 2,020 ft

Location: AMARGOSA CREEK, SOUTH OF RITTER RIDGE, WEST OF PALMDALE.
Location Detail:
Ecological: HABITAT CONSISTS OF AN INTERMITTENT CREEK WITH AREAS OF DENSE RIPARIAN, PRIMARILY WILLOW AND COTTONWOOD. WESTERN POND TURTLE ALSO FOUND AT THIS SITE.
Threat: THREATENED BY FLOOD CONTROL MEASURES.
General: 1 ADULT OBSERVED FORAGING IN JUNE 1995.
Owner/Manager: PVT

Thamnophis hammondii

two-striped garter snake

Element Code: ARADB36160

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S2	

Habitat Associations

General: COASTAL CALIFORNIA FROM VICINITY OF SALINAS TO NORTHWEST BAJA CALIFORNIA. FROM SEA TO ABOUT 7,000 FT ELEVATION.

Micro: HIGHLY AQUATIC, FOUND IN OR NEAR PERMANENT FRESH WATER. OFTEN ALONG STREAMS WITH ROCKY BEDS AND RIPARIAN GROWTH.

Occurrence No. 54 **Map Index:** 17287 **EO Index:** 42186

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1999-09-15
Site: 1999-09-15
Record Last Updated: 2000-01-18

Quad Summary: Ritter Ridge (3411852/161C), Sleepy Valley (3411853/162D)

County Summary: Los Angeles

Lat/Long:		**Township:**	
UTM:		**Range:**	
Mapping Precision:		**Section:**	**Qtr:**
Symbol Type:		**Meridian:**	
Radius:		**Elevation:**	

Location: AMARGOSA CREEK, ALONG THE NORTH SIDE OF ELIZABETH LAKE PINE CANYON ROAD, APPROXIMATELY 7 MILES WNW OF PALMDALE.

Location Detail:

Ecological: HABITAT CONSISTS OF RIPARIAN; CREEK CONTAINS SMALL PONDED AREAS OF WATER. THE MAIN POOL IS LOCATED NEXT TO THE ROADWAY WHERE IT CROSSES BENEATH THE ROAD. THIS AREA CONTAINS SMALL REEDS BUT NO TREES.

Threat: POSSIBLE THREATS INCLUDE AFRICAN CLAWED FROGS AND CATFISH.

General: 1 VERY LARGE ADULT FEMALE AND 1 JUVENILE OBSERVED ON 6 MAY 1997. 1 ADULT MALE (MARKED) OBSERVED ON 5 JUN 1997. 1 JUVENILE OBSERVED CRAWLING ACROSS THE DRIED CREEK BOTTOM ON 15 SEP 1999.

Owner/Manager: UNKNOWN

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 1 **Map Index:** 21923 **EO Index:** 20945

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1920-05-11
Site: 1920-05-11
Record Last Updated: 1998-09-15

Quad Summary: Palmdale (3411851/161D), Ritter Ridge (3411852/161C)
County Summary: Los Angeles

Lat/Long: 34.57949º / -118.11653º
UTM: Zone-11 N3826978 E397593
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 06N
Range: 12W
Section: 26 **Qtr:** NE
Meridian: S
Elevation: 2,660 ft

Location: PALMDALE.
Location Detail:
Ecological:
Threat:
General: COLLECTED BY VAN ROSSEN IN 1920 (UCLA SPECIMEN #H 672).
Owner/Manager: UNKNOWN

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 2 **Map Index:** 02234 **EO Index:** 24553

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1926-05-16
Site: 1926-05-16
Record Last Updated: 1989-08-10

Quad Summary: Palmdale (3411851/161D)
County Summary: Los Angeles

Lat/Long: 34.52776º / -118.09397º
UTM: Zone-11 N3821218 E399601
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 05N
Range: 12W
Section: 07 **Qtr:** SW
Meridian: S
Elevation: 4,125 ft

Location: 5 MI SW PALMDALE.
Location Detail:
Ecological:
Threat:
General: LACM SPECIMEN #14253.
Owner/Manager: UNKNOWN

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 58 **Map Index:** 02450 **EO Index:** 24515

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1978-04-29
Site: 1978-04-29
Record Last Updated: 1989-08-10

Quad Summary: Juniper Hills (3411748/135B), Littlerock (3411758/160C)

County Summary: Los Angeles

Lat/Long: 34.50804º / -117.93923º
UTM: Zone-11 N3818889 E413782
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1 mile

Township: 05N
Range: 10W
Section: 21 **Qtr:** W
Meridian: S
Elevation:

Location: PEARBLOSSOM, NEAR INTERSECTION OF 106TH ST & HWY 138.

Location Detail:

Ecological:

Threat:

General: EGG SET FROM NEST IN DENSE SHRUB (OLIVE?) GROWING IN CREOSOTE BUSH. THIS SHRUB WAS PLANTED IN A ROW ALONG A SIDE RD. MANY OLD THRASHER NESTS WERE IN THESE SHRUBS.

Owner/Manager: UNKNOWN

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 89 **Map Index:** 02553 **EO Index:** 24494

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1987-05-12
Site: 1987-05-12
Record Last Updated: 1989-08-10

Quad Summary: Hi Vista (3411767/160A)
County Summary: Los Angeles

Lat/Long: 34.65276º / -117.86340º
UTM: Zone-11 N3834875 E420880
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 09W
Section: 32 **Qtr:** NW
Meridian: S
Elevation: 2,560 ft

Location: W OF PIUTE BUTTE, W SIDE OF NORTH 150TH ST, 0.2 MI S JCT W/ RD TO ANTELOPE VALLEY MUSEUM.
Location Detail: 4 OBS DURING 1987 BREEDING SEASON IN SUITABLE HABITAT.
Ecological: VEG WITHIN A 50 M RADIUS INCLUDES ATRIPLEX, HYMENOCLEA SALSOLA & YUCCA BREVIFOLIA.
Threat: ADJACENT TO PAVED ROAD.
General:
Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 90 **Map Index:** 02555 **EO Index:** 24492

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03
Record Last Updated: 1989-08-10

Quad Summary: Hi Vista (3411767/160A)
County Summary: Los Angeles

Lat/Long: 34.64664º / -117.86312º
UTM: Zone-11 N3834196 E420900
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 09W
Section: 32 **Qtr:** SW
Meridian: S
Elevation: 2,570 ft

Location: SW OF PIUTE BUTTE, JCT OF NORTH 150TH ST & EAST AVE.
Location Detail: 1 INDIVIDUAL HEARD DURING 1986 BREEDING SEASON IN SUITABLE HABITAT. NONE OBS IN 1987.
Ecological: YUCCA BREVIFOLIA, LARREA TRIDENTATA, AMBROSIA DUMOSA & SALSOLA KALI TENUIFOLIA.
Threat: PAVED ROAD TO EAST.
General:
Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3
State: S3

Other Lists

CDFG Status: SC

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 91 **Map Index:** 02556 **EO Index:** 24491

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1987-05-12
Site: 1987-05-12

Record Last Updated: 1994-08-01

Quad Summary: Lovejoy Buttes (3411757/160D), Hi Vista (3411767/160A)

County Summary: Los Angeles

Lat/Long: 34.62497º / -117.86257º
UTM: Zone-11 N3831793 E420930
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 09W
Section: 08 **Qtr:** NW
Meridian: S
Elevation: 2,620 ft

Location: NORTH OF LOVEJOY BUTTES, N 150TH ST EAST, 0.5 MI N OF JCT WITH AVENUE O.

Location Detail: THREE OBS DURING 1987 BREEDING SEASON IN SUITABLE HABITAT.

Ecological: VEG WITHIN 50 M IS MOSTLY SALSOLA KALI TENUIFOLIA BUT ALSO ATRIPLEX & YUCCA BREVIFOLIA. CLEARED UNDERSTORY.

Threat: PAVED ROAD & HOUSES ARE ADJACENT TO THE SITE.

General:

Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status

Federal: None
State: None

NDDB Element Ranks

Global: G3
State: S3

Other Lists

CDFG Status: SC

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 92 **Map Index:** 02554 **EO Index:** 24490

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1986-06-03
Site: 1986-06-03

Record Last Updated: 1989-08-10

Quad Summary: Lovejoy Buttes (3411757/160D)

County Summary: Los Angeles

Lat/Long: 34.61776º / -117.86368º
UTM: Zone-11 N3830994 E420822
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 09W
Section: 07 **Qtr:** SE
Meridian: S
Elevation: 2,650 ft

Location: NORTH OF LOVEJOY BUTTES, JCT OF AVENUE O & 150TH ST EAST.

Location Detail: ONE HEARD DURING 1986 BREEDING SEASON IN SUITABLE NESTING HABITAT. NONE HEARD IN 1987.

Ecological: VEG WITHIN 50 M INCLUDES YUCCA BREVIFOLIA, LARREA TRIDENTATA, ATRIPLEX AND SALSOLA KALI TENUIFOLIA.

Threat: POWERLINE OCCURS TO WEST. HOUSES OCCUR TO EAST & SOUTHEAST.

General:

Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 93 **Map Index:** 02544 **EO Index:** 24489

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03
Record Last Updated: 1989-08-10

Quad Summary: Lovejoy Buttes (3411757/160D)
County Summary: Los Angeles

Lat/Long: 34.61304º / -117.87145º
UTM: Zone-11 N3830477 E420104
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 09W
Section: 18 **Qtr:** NW
Meridian: S
Elevation: 2,650 ft

Location: NORTHWEST OF LOVEJOY BUTTES, N 145TH ST EAST, 2.5 MI S OF JCT WITH AVENUE O.
Location Detail: ONE HEARD & ONE OBS DURING 1986 BREEDING SEASON IN SUITABLE BREEDING HABITAT. NONE HEARD IN 1987.
Ecological: VEG WITHIN 50 M RADIUS INCLUDES LARREA TRIDENTATA, YUCCA BREVIFOLIA, ATRIPLEX &
Threat: ADJACENT TO PAVED RD.
General:
Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 94 **Map Index:** 02541 **EO Index:** 24488

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1987-05-12
Site: 1987-05-12
Record Last Updated: 1989-08-10

Quad Summary: Lovejoy Buttes (3411757/160D)
County Summary: Los Angeles

Lat/Long: 34.60414º / -117.87256º
UTM: Zone-11 N3829491 E419994
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 10W
Section: 18 **Qtr:** SW
Meridian: S
Elevation: 2,780 ft

Location: WEST LOVEJOY BUTTES, N 145TH ST EAST, 0.9 MI S OF JCT WITH AVENUE O.
Location Detail: ONE OBS DURING 1987 BREEDING SURVEY IN SUITABLE HABITAT.
Ecological: VEG WITHIN 50 M RADIUS INCLUDES YUCCA BREVIFOLIA, LARREA TRIDENTATA, AMBROSIA DUMOSA AND BUNCHGRASS.
Threat: ADJACENT TO PAVED ROAD. MOBILE HOME PARK TO NORTHEAST.
General:
Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 95 **Map Index:** 02484 **EO Index:** 24487

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03
Record Last Updated: 1989-08-10

Quad Summary: Littlerock (3411758/160C), Alpine Butte (3411768/160B)

County Summary: Los Angeles

Lat/Long: 34.62414º / -117.91535º
UTM: Zone-11 N3831744 E416091
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 10W
Section: 11 **Qtr:** SW
Meridian: S
Elevation: 2,800 ft

Location: ANTELOPE VALLEY, W OF ALPINE, 5.5 MI N JCT 121 STREET EAST & AVENUE T.

Location Detail: ONE HEARD & ONE OBS DURING 1986 SURVEY IN SUITABLE HABITAT.

Ecological: VEG WITHIN 50 M INCLUDES SALSOLA KALI TENUIFOLIA, HYMENOCLEA SALSOLA AND LARREA TRIDENTATA.

Threat: HIGHLY DISTURBED AREA. POSSIBLY BURNED IN PAST. ADJACENT TO ROAD.

General:

Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 96 **Map Index:** 02480 **EO Index:** 24486

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03
Record Last Updated: 1989-08-10

Quad Summary: Littlerock (3411758/160C)
County Summary: Los Angeles

Lat/Long: 34.61637º / -117.91757º
UTM: Zone-11 N3830884 E415879
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 10W
Section: 15 **Qtr:** NE
Meridian: S
Elevation: 2,660 ft

Location: ANTELOPE VALLEY, SW ALPINE BUTTE 4 MI N JCT 121 STREET EAST AND AVENUE T.
Location Detail: ONE OBS DURING 1986 BREEDING SURVEY IN SUITABLE HABITAT. NONE OBS IN 1987.
Ecological: VEG WITHIN A 50 M RADIUS INCLUDES LARREA TRIDENTATA, YUCCA BREVIFOLIA, ACAMPTOPAPPUS SPHAEROCEPHALUS, AMBOSIA DUMOSA & BUNCHGRASS.
Threat: ADJACENT TO PAVED ROAD.
General:
Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 97 **Map Index:** 02525 **EO Index:** 24485

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03
Record Last Updated: 1989-08-10

Quad Summary: Littlerock (3411758/160C)
County Summary: Los Angeles

Lat/Long: 34.61637º / -117.88201º
UTM: Zone-11 N3830855 E419140
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 10W
Section: 13 **Qtr:** NE
Meridian: S
Elevation: 2,680 ft

Location: ANTELOPE VALLEY, SE ALPINE BUTTE, 2.5 MI N JCT PALMDALE BLVD AND 140TH STREET EAST.

Location Detail: ONE HEARD DURING 1986 BREEDING SEASON IN SUITABLE HABITAT. NONE OBS IN 1987.

Ecological: VEG WITHIN 50 M RADIUS INCLUDES LARREA TRIDENTATA, CROTON CALIFORNICUS, AMBROSIA DUMOSA & BUNCHGRASS.

Threat: ADJACENT TO PAVED ROAD.

General:

Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 98 **Map Index:** 02545 **EO Index:** 24484

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03

Record Last Updated: 1989-08-10

Quad Summary: Lovejoy Buttes (3411757/160D)
County Summary: Los Angeles

Lat/Long: 34.59748º / -117.87062º
UTM: Zone-11 N3828751 E420166
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 09W
Section: 19 **Qtr:** NE
Meridian: S
Elevation: 2,790 ft

Location: ANTELOPE VALLEY, W OF LOVEJOY BUTTES, E OF N 145TH ST EAST, 1.2 MI S OF JCT WITH AVENUE O.
Location Detail: TWO INDIVIDUALS HEARD DURING 1986 BREEDING SEASON IN SUITABLE HABITAT. NONE OBS IN 1987.
Ecological: VEG WITHIN 50 M RADIUS INCLUDES LARREA TRIDENTATA, YUCCA BREVIFOLIA & BUNCHGRASS.
Threat: ADJACENT TO PAVED ROAD.
General:
Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 99 **Map Index:** 02543 **EO Index:** 24483

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03
Record Last Updated: 1989-08-10

Quad Summary: Lovejoy Buttes (3411757/160D)
County Summary: Los Angeles

Lat/Long: 34.58804º / -117.87229º
UTM: Zone-11 N3827705 E420003
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 10W
Section: 19 **Qtr:** SW
Meridian: S
Elevation: 2,743 ft

Location: ANTELOPE VALLEY, W OF LOVEJOY BUTTES, NW OF JCT OF AVENUE Q & NORTH 145TH STREET EAST.
Location Detail: ONE INDIVIDUAL HEARD DURING 1986 BREEDING SEASON IN SUITABLE HABITAT. NONE LOCATED IN 1987.
Ecological: VEG WITHIN 50 M RADIUS INCLUDES YUCCA BREVIFOLIA, ATRIPLEX, LARREA TRIDENTATA & CHRYSOTHAMNUS NAUSEOSUS.
Threat:
General:
Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 131 **Map Index:** 02642 **EO Index:** 24451

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03
Record Last Updated: 1989-08-10

Quad Summary: Hi Vista (3411767/160A)
County Summary: Los Angeles

Lat/Long: 34.67859º / -117.82730º
UTM: Zone-11 N3837712 E424212
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 09W
Section: 22 **Qtr:** SW
Meridian: S
Elevation: 2,610 ft

Location: W OF SADDLEBACK BUTTE, 0.75 MI N OF JCT E AVE K-8 & 170TH STREET EAST.
Location Detail: ONE HEARD DURING 1986 BREEDING SEASON IN SUITABLE HABITAT. NOT SEEN IN 1987.
Ecological: VEGETATION WITHIN A 50 M RADIUS INCLUDES LARREA TRIDENTATA, YUCCA BREVIFOLIA AND ATRIPLEX. PAVED ROAD AND CAMP GROUND OCCUR WITHIN HABITAT.
Threat:
General:
Owner/Manager: DPR-SADDLEBACK BUTTE SP

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 132 **Map Index:** 02631 **EO Index:** 24450

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03

Record Last Updated: 1989-08-10

Quad Summary: Hi Vista (3411767/160A)

County Summary: Los Angeles

Lat/Long: 34.69026º / -117.83034º
UTM: Zone-11 N3839008 E423944
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 09W
Section: 21 **Qtr:** NE
Meridian: S
Elevation: 2,640 ft

Location: NW OF SADDLEBACK BUTTE, 1.8 MI E OF JCT EAST AVENUE J & NORTH 150TH STREET EAST.

Location Detail: ONE HEARD DURING 1986 BREEDING SEASON IN SUITABLE HABITAT. NOT HEARD IN 1987.

Ecological: VEGETATION WITHIN A 50 M RADIUS INCLUDES LARREA TRIDENTATA, AMBROSIA DUMOSA AND YUCCA BREVIFOLIA. PAVED ROAD, POWER LINE AND HOUSES OCCUR IN AREA.

Threat:

General:

Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 133 **Map Index:** 02673 **EO Index:** 24449

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1986-06-03
Site: 1986-06-03
Record Last Updated: 1989-08-10

Quad Summary: Hi Vista (3411767/160A)
County Summary: Los Angeles

Lat/Long: 34.69081º / -117.81007º
UTM: Zone-11 N3839054 E425802
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 09W
Section: 15 **Qtr:** SE
Meridian: S
Elevation: 2,775 ft

Location: N OF SADDLEBACK BUTTE, 3.1 MI E OF JCT OF NORTH 150TH STREETEAST & EAST AVENUS J.

Location Detail: ONE HEARD AND ONE OBSERVED DURING 1986 BREEDING SEASON IN SUITABLE HABITAT. NOT SEEN IN 1987.

Ecological: VEGETATION WITHIN A 50 M RADIUS INCLUDES LARREA TRIDENTATA, YUCCA BREVIFOLIA, AMBROSIA DUMOSA AND BUNCHGRASS. PAVED ROAD OCCURS WITHIN HABITAT.

Threat:

General:

Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 134 **Map Index:** 02721 **EO Index:** 24448

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1987-05-12
Site: 1987-05-12
Record Last Updated: 1989-08-10

Quad Summary: Hi Vista (3411767/160A)
County Summary: Los Angeles

Lat/Long: 34.71192º / -117.77367º
UTM: Zone-11 N3841369 E429154
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 08W
Section: 07 **Qtr:** SW
Meridian: S
Elevation: 2,970 ft

Location: NE OF SADDLEBACK BUTTE, 0.4 MI N OF JCT OF EAST AVENUE I & NORTH 200TH STREET EAST.

Location Detail: TWO OBSERVED DURING 1987 BREEDING SEASON IN SUITABLE HABITAT. ALSO ONE HEARD IN 1986.

Ecological: VEGETATION IS SPARSE AND WITHIN A 50 M RADIUS INCLUDES LARREA TRIDENTATA, AMBROSIA DUMOSA, YUCCA BREVIFOLIA, ATRIPLEX, AND TYMENOCLEA SALSOLA. PAVED ROAD OCCURS WITHIN HABITAT.

Threat:

General:

Owner/Manager: PVT

Toxostoma lecontei

Le Conte's thrasher

Element Code: ABPBK06100

Status	NDDB Element Ranks	Other Lists
Federal: None	**Global:** G3	**CDFG Status:** SC
State: None	**State:** S3	

Habitat Associations

General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.

Micro: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.

Occurrence No. 156 **Map Index:** 24361 **EO Index:** 6608

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1990-04-28
Site: 1990-04-28
Record Last Updated: 1993-09-27

Quad Summary: Lovejoy Buttes (3411757/160D)
County Summary: Los Angeles

Lat/Long: 34.61339º / -117.84835º
UTM: Zone-11 N3830498 E422223
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 06N
Range: 09W
Section: 17 **Qtr:** NE
Meridian: S
Elevation: 2,760 ft

Location: NORTH SLOPE OF LOVEJOY BUTTES, SOUTH OF AVENUE "O," BETWEEN 155TH STREET EAST & 158TH STREET EAST, LAKE LOS ANGELES.

Location Detail: BIRDS FOUND ON THE NORTH-FACING SLOPE, AMONG LARGE ROCK OUTCROPS.

Ecological: HABITAT CONSISTS OF JOSHUA TREE WOODLAND, WITH ABUNDANT ANNUALS PRESENT.

Threat: THREATENED BY A PROPOSED SUBDIVISION, ORV'S, & RECREATIONAL USE OF SITE (HERP COLLECTING & HIKING).

General: IN 1990, ONE PAIR OF THRASHERS OBSERVED, STAYING CLOSE AND CALLING, ALTHOUGH NO NEST WAS FOUND.

Owner/Manager: UNKNOWN

APPENDIX 7

GPS COORDINATES FOR SPECIAL-STATUS SPECIES AND SIGN OBSERVED DURING 2008 SURVEYS

Appendix 7. GPS Coordinates for Special-Status Species and Sign Observed During 2008 Surveys

ID	UTM NAD 83		Description	Nest site*	Height (ft)
	Easting	Northing			
POWER PLANT SITE					
1	398849	3833942	Corvid/Raptor nest	JT	20
2	398847	3833950	Passerine nest x2	JT	8
3	398824	3833861	Passerine nest x2	JT	8
4	398794	3833787	Corvid/Raptor nest	JT	20
5	398770	3833644	Passerine nest	JT	7
6	398622	3833625	Passerine nest	JT	6.5
7	398548	3833861	Mourning Dove nest	Ground	0
8	398551	3833619	Passerine nest x2	JT	13
9	398521	3833593	Corvid/Raptor nest	JT	12
10	398523	3833792	Passerine nest	JT	9
11	398418	3833130	Passerine nest	JT	8
12	398271	3833440	Passerine nest	JT	8
13	398282	3833462	Passerine nest	JT	8
14	398176	3834139	Corvid/Raptor nest	JT	25
15	398184	3834180	Corvid/Raptor nest	JT	30
16	398173	3833758	Common Raven nest	JT	30
17	398094	3833224	Passerine nest	JT	8
18	398079	3833562	Passerine nest	JT	13
19	398029	3833410	Common Raven nest	JT	20
20	398025	3834116	Loggerhead Shrike x2		
21	398012	3833787	Passerine nest	JT	7
22	397992	3833858	Passerine nest	JT	9
23	397939	3834000	Passerine nest	JT	8
24	397910	3833503	Passerine nest	JT	12
25	397874	3833936	Passerine nest	JT	8
27	397788	3833916	Passerine nest	JT	15
28	397802	3833886	Passerine nest	JT	9
29	397795	3833218	Passerine nest	JT	10
30	397758	3833163	Horned Lark nest	Ground	0
31	397720	3833302	Passerine nest	JT	8
32	397687	3833498	Corvid/Raptor nest	JT	20
33	397673	3833858	Passerine nest	JT	10
34	397651	3833446	Passerine nest	JT	8
35	397568	3833674	Corvid/Raptor nest	JT	18

Appendix 7. GPS Coordinates for Special-Status Species and Sign Observed During 2008 Surveys

ID	UTM NAD 83		Description	Nest site*	Height (ft)
	Easting	Northing			
36	397529	3833284	Common Raven nest	JT	22
37	397542	3833734	Passerine nest	JT	8
38	397528	3833900	Passerine nest	JT	7
39	397471	3833599	Passerine nest	JT	9
40	397427	3833247	Corvid/Raptor nest	JT	25
41	397427	3833247	Passerine nest	JT	10
42	397400	3833844	Passerine nest	JT	15
43	397403	3833674	Corvid/Raptor nest	JT	10
44	397388	3833177	Passerine nest	JT	7
45	397293	3833254	Passerine nest x2	JT	9
46	398718	3834234	Passerine nest	JT	5
47	398708	3834215	Passerine nest	JT	10
48	398722	3833730	Passerine nest	JT	15
49	398690	3833753	Passerine nest	JT	9
50	398666	3833122	Passerine nest	JT	12
51	398666	3833196	Passerine nest	JT	6
52	398656	3834036	Passerine nest	JT	15
53	398661	3834181	Passerine nest	JT	8
54	398661	3834164	Passerine nest	JT	7
55	398648	3834065	Passerine nest	JT	5
56	398566	3833870	Le Conte's Thrasher		
57	398660	3833770	Passerine nest	JT	6
58	398646	3833189	Passerine nest	JT	12
59	398657	3833131	Passerine nest	JT	8
60	398631	3833700	Passerine nest	JT	14
61	398629	3834206	Passerine nest	JT	15
62	397537	3834483	Corvid/Raptor nest	JT	15
63	398087	3834496	Common Raven nest	JT	25
64	397215	3833489	Corvid/Raptor nest	JT	10
65	398641	3834427	Le Conte's Thrasher		
66	396313	3831937	Desert Tortoise Class 5 burrow		
TRANSMISSION LINE					
67	398915	3834532	Common Raven nest	JT	20
68	399120	3834346	Corvid/Raptor nest	JT	20

Appendix 7. GPS Coordinates for Special-Status Species and Sign Observed During 2008 Surveys

ID	UTM NAD 83		Description	Nest site*	Height (ft)
	Easting	Northing			
69	399514	3834344	Corvid/Raptor nest	T-Line Pole	50
70	401361	3835157	Corvid/Raptor nest	JT	25
71	401465	3835843	Common Raven nest	JT	25
72	402441	3836056	Corvid/Raptor nest	JT	20
73	408276	3835867	Passerine nest	JT	20
74	408526	3835809	Corvid/Raptor nest	JT	30
75	400049	3835097	Loggerhead Shrike		
76	399291	3834791	Common Raven nest	JT	30
77	402106	3835561	Loggerhead Shrike		
78	402094	3835382	Corvid/Raptor nest	JT	15
79	401356	3835159	Corvid/Raptor nest	JT	28
80	401543	3835168	Loggerhead Shrike		
81	403381	3836253	Ferruginous Hawk		
82	408565	3835155	Common Raven nest	JT	
83	408449	3835478	Corvid/Raptor nest	JT	
84	401372	3835360	Passerine nest	JT	7
85	409942	3835782	Corvid/Raptor nest	JT	20
86	408714	3835958	Common Raven nest	Tower	75
87	410439	3835724	Corvid/Raptor nest	JT	20
88	412797	3835766	Passerine nest	JT	22
89	412848	3834379	Corvid/Raptor nest	JT	30
90	410625	3835474	Corvid/Raptor nest	JT	15
91	411582	3835024	Corvid/Raptor nest	JT	25
92	412304	3834259	Common Raven nest	JT	12
93	412781	3834752	Passerine nest	JT	7
94	414038	3830164	Common Raven nest	JT	10
95	407667	3836011	Corvid/Raptor nest	JT	25
96	414262	3830789	Common Raven nest	JT	20
97	414589	3831091	Corvid/Raptor nest	JT	30
98	415828	3827957	Common Raven nest	JT	15
100	415969	3830357	Passerine nest	JT	20
101	416021	3830088	Passerine nest	JT	12
102	416113	3830812	Common Raven nest	JT	25
104	416038	3829027	Corvid/Raptor nest	JT	25
105	414843	3830978	Corvid/Raptor nest	JT	

Appendix 7. GPS Coordinates for Special-Status Species and Sign Observed During 2008 Surveys

ID	UTM NAD 83		Description	Nest site*	Height (ft)
	Easting	Northing			
106	414570	3831896	Loggerhead Shrike		
107	414570	3831746	Common Raven nest	JT	30
108	415928	3830174	Loggerhead Shrike		
109	415011	3830541	Common Raven nest	JT	22
110	414932	3830226	Common Raven nest	JT	22
111	415351	3831315	Corvid/Raptor nest	JT	
112	415190	3829461	Common Raven nest	JT	25
113	416453	3829276	Loggerhead Shrike		
114	413026	3827630	Corvid/Raptor nest	JT	
115	413329	3827659	Common Raven nest	JT	
116	414200	3827662	Corvid/Raptor nest	JT	
117	414569	3827583	Common Raven nest	JT	
118	416734	3827038	Loggerhead Shrike		
119	416732	3824780	Common Raven nest	JT	
120	416108	3825164	Common Raven nest	JT	
121	412857	3829002	Corvid/Raptor nest	JT	20
122	414303	3827813	Corvid/Raptor nest	JT	20
123	415676	3827817	Corvid/Raptor nest	JT	15
124	414376	3827682	Mourning Dove nest	Velvet Ash	9
125	416952	3824396	Loggerhead Shrike		
126	416502	3824365	Passerine nest	JT	9
127	417319	3822099	Common Raven nest	JT	12
128	417385	3822700	Burrowing Owl with burrows		
129	416784	3819442	Common Raven nest	T-Line Tower	120
130	416490	3819528	Common Raven nest	T-Line Tower	120
131	413492	3828287	Corvid/Raptor nest	JT	12
132	413501	3828690	Common Raven nest	JT	15
133	413174	3828450	Corvid/Raptor nest	JT	20
134	413778	3827535	Corvid/Raptor nest	JT	15
135	414393	3827249	Common Raven nest	JT	15
136	416197	3824007	Common Raven nest	JT	15
137	410773	3819361	Cactus Wren nest	Silver Cholla	
138	411357	3819390	Passerine nest	JT	
140	409163	3819200	Passerine nest	Silver Cholla	

Appendix 7. GPS Coordinates for Special-Status Species and Sign Observed During 2008 Surveys

ID	UTM NAD 83		Description	Nest site*	Height (ft)
	Easting	Northing			
141	410029	3819293	Passerine nest	JT	7
142	410755	3819356	Cactus Wren nest	Silver Cholla	
146	409257	3819220	Cactus Wren nest	Silver Cholla	
148	409103	3819212	Loggerhead Shrike x2		
150	415035	3819534	Common Raven nest	T-Line Tower	120
151	414630	3819496	Common Raven nest	T-Line Tower	120
152	408931	3819261	Common Raven nest		
153	409231	3819163	Common Raven nest	T-Line Tower	120
154	409406	3819306	Common Raven nest	T-Line Tower	120
155	410749	3820006	Corvid/Raptor nest	JT	15
156	409215	3818842	Corvid/Raptor nest	JT	15
157	412152	3820238	Corvid/Raptor nest	JT	10
158	409561	3819014	Common Raven nest	T-Line Tower	120
159	410423	3819140	Common Raven nest	T-Line Tower	120
160	413325	3819369	Common Raven nest	T-Line Tower	120
161	413785	3819410	Common Raven nest	T-Line Tower	120
162	412771	3819360	Common Raven nest	T-Line Tower	120
163	410774	3819130	Common Raven nest	T-Line Tower	120
164	411357	3819221	Common Raven nest	T-Line Tower	120
165	411594	3819202	Common Raven nest	T-Line Tower	120
166	411833	3819267	Common Raven nest	T-Line Tower	120
167	412024	3819247	Common Raven nest	T-Line Tower	120
168	411139	3819160	Common Raven nest	T-Line Tower	120
169	406741	3819017	Common Raven nest	T-Line Tower	120
170	408150	3819185	Common Raven nest	T-Line Tower	120
171	407634	3819113	Corvid/Raptor nest	T-Line Tower	120
172	408531	3819189	Common Raven nest	T-Line Tower	120
173	408164	3819097	Hummingbird nest	Encelia	2.5
174	405626	3818920	Corvid/Raptor nest	T-Line Tower	120
175	406139	3819023	Corvid/Raptor nest	T-Line Tower	120
176	405619	3818985	Cactus Wren nest	Silver Cholla	
177	401274	3818221	Corvid/Raptor nest	T-Line Tower	120
178	400949	3818214	Common Raven nest	T-Line Tower	120
179	403515	3818128	Passerine nest	Sambucus	
180	402679	3818199	Common Raven nest	T-Line Tower	120

Appendix 7. GPS Coordinates for Special-Status Species and Sign Observed During 2008 Surveys

ID	UTM NAD 83		Description	Nest site*	Height (ft)
	Easting	Northing			
181	401278	3818223	Common Raven nest	T-Line Tower	120
182	400039	3818225	Red-tailed Hawk nest	T-Line Tower	120
183	398709	3818085	Corvid/Raptor nest	T-Line Tower	120
184	399043	3818189	Common Raven nest	T-Line Tower	120
198	416700	3820860	Corvid/Raptor nest	JT	15
199	414538	3827440	Corvid/Raptor nest	JT	15
201	415986	3825384	Passerine nest	JT	20
202	416714	3821628	Corvid/Raptor nest	JT	15
204	412839	3827914	Vaux's Swift		
RECLAIMED WATER PIPELINE					
186	396881	3830598	Corvid/Raptor nest	JT	20
187	396777	3831564	Loggerhead Shrike x2		
188	396709	3832060	Common Raven nest	JT	20
190	397263	3829851	Corvid/Raptor nest	JT	15
191	397275	3830161	Corvid/Raptor nest	JT	12
192	397274	3830160	Corvid/Raptor nest	JT	10
193	397973	3830081	Corvid/Raptor nest	JT	15
194	398043	3830059	Passerine nest	JT	12
195	398162	3829776	Corvid/Raptor nest	JT	20

***LEGEND**

JT Joshua tree
T-Line Transmission Line
Pole Transmission Line Wooden Mono-pole
Tower Transmission Line Steel Lattice Tower

APPENDIX 8

DESERT TORTOISE SURVEY FORMS

January 1992

(place a 4 X 6 photograph showing the area where the transect was conducted)

If no tortoise sign occurs on the project site or Zone of Influence, the summary form should be completed. Please fill in all sections on the top 2/3 of the page of the summary form.

M/D/Y
Date Apr 8, 2008
Transect No. _____
State CA
County Los Angeles
City Palmdale
Recorder Analong
Address _____
Project Name PHPP
Type of Project Power Plant site
Quad Name _____
Scale _____
Site Name Power Plant
T_____ R_____ Sec_____
¼ Sec_____ ¼¼ Sec_____
UTM Zone _____
Northing _____
Easting _____
Parcel No. _____

SUMMARY FORM
FOR PRESENCE-OR-ABSENCE AND CLEARANCE SURVEYS
FOR DESERT TORTOISE SIGN

% Slope: high_____ low_____ Aspect_____ Elevation 2500 ft.
Land Form (e.g., mesa, bajada, wash) Flat desert
Soils _____
Vegetation: dominant perennials Yucca brevifolia, Larrea tridentata, Atriplex spp., Ephedra, Chrysothamnus nauseosus
other species Lycium, Grayia, Krascheninnikovia
dominant annuals Erodium, Schismus
other species Lasthenia, Malacothrix, Amsinckia, Bromus
Adjacent Land Use: immediate Air Force Plant 42, urban, open desert
Within 1 mi. Same
Soils _____
Vegetation _____

Weather: Temperature - Air at 5 cm_____°C Surface_____°C Cloud cover_____%
Wind speed_____ Rainfall_____in. Rainfall in last 30 days_____in.

Corrected Sign	Live Tortoises Adult/Juv.	TOTAL NUMBER OF Shelter Sites Pallet/Burrow/Den Active/Inactive [1]	Scats [2]	Shell Remains [3]
	A= 0 J= 0	One Class 5 burrow on 3,960-ft. 201	M= 0 F= 0 Unk= 0	A= 0 J= 0 Unk= 0

Tracks	Eggshell Fragments	Drinking Sites	Courtship Rings	Other	Neotoma Middens w/sign	:w/o sign
None	None	None	None	None	:None	91

SIGNS OF HUMAN DISTURBANCE - NUMBER AND TYPES SEEN

Tire Tracks	Human Footprints	Dog Sign	Trash	Dump Sites	Shotgun/ Rifle Shells	Blading	Ravens	Other

January 1992

M/D/Y
Date 4.8.08
Transect No. 3/4 mi South
State CA
County LA
City Palmdale
Recorder Jim Boone
Project Name PPP

Parcel No.

INFORMATION ON SHELTER SITES
(Please indicate why you believe a shelter site is active or inactive[1])

66

Sign No.	Type	Location	Width	Estimated Length	Other Sign
1	Burrow	396313, 3831937	12"	2'	none

Condition of Shelter Site[1]/Comments
under winter fat shrub, orientated North; domed roof, flat bottom. no tracks or other sign

* class 5 *

CONDITION OF SCATS[2] - COMMENTS (See below)

CONDITION OF SHELL REMAINS[3] - COMMENTS (See below)

SIGNS OF HUMAN DISTURBANCE-COMMENTS

January 1992

(place a 4 X 6 photograph showing the area where the transect was conducted)

If no tortoise sign occurs on the project site or Zone of Influence, the summary form should be completed. Please fill in all sections on the top 2/3 of the page of the summary form.

M/D/Y
Date Apr 26, 2008
Transect No. _____
State CA
County Los Angeles
City Palmdale/Lancaster
Recorder Amalong
Address _____
Project Name PHPP
Type of Project Transmission Line
Quad Name _____
Scale _____
Site Name transmission line Seg. 1
T_____ R_____ Sec_____
¼ Sec_____ ¼¼ Sec_____
UTM Zone _____
Northing _____
Easting _____
Parcel No. _____

SUMMARY FORM
FOR PRESENCE-OR-ABSENCE AND CLEARANCE SURVEYS
FOR DESERT TORTOISE SIGN

% Slope: high_____ low_____ Aspect_____ Elevation_____ft.
Land Form (e.g., mesa, bajada, wash) _____
Soils _____
Vegetation: dominant perennials Yucca brevifolia, Larrea tridentata, Chrysothamnus nauseosus
other species Ephedra, Hymenoclea,
dominant annuals Erodium, Schismus
other species Malacothrix, Amsinckia, Bromus
Adjacent Land Use: immediate _____
Within 1 mi. Air Force Plant 42, Agriculture, Open desert, Residential, Urban
Soils _____
Vegetation _____

Weather: Temperature - Air at 5 cm_____°C Surface_____°C Cloud cover_____%
Wind speed_____ Rainfall_____in. Rainfall in last 30 days_____in.

Corrected Sign	Live Tortoises Adult/Juv.	TOTAL NUMBER OF Shelter Sites Pallet/Burrow/Den Active/Inactive [1]	Scats [2]	Shell Remains [3]
	A= 0 J= 0	0	M= 0 F= 0 Unk= 0	A= 0 J= 0 Unk= 0

Tracks	Eggshell Fragments	Drinking Sites	Courtship Rings	Other	Neotoma Middens w/sign	:w/o sign
None	None	None	None	None	None	8

SIGNS OF HUMAN DISTURBANCE - NUMBER AND TYPES SEEN

Tire Tracks	Human Footprints	Dog Sign	Trash	Dump Sites	Shotgun/ Rifle Shells	Blading	Ravens	Other

January 1992

(place a 4 X 6 photograph showing the area where the transect was conducted)

If no tortoise sign occurs on the project site or Zone of Influence, the summary form should be completed. Please fill in all sections on the top 2/3 of the page of the summary form.

M/D/Y
Date Apr 23, 2008
Transect No. _____
State CA
County Los Angeles
City Palmdale
Recorder Amalong
Address _____
Project Name PHPP
Type of Project Transmission Line
Quad Name _____
Scale _____
Site Name transmission line Seg 2
T_____ R_____ Sec_____
¼ Sec_____ ¼¼ Sec_____
UTM Zone _____
Northing _____
Easting _____
Parcel No. _____

SUMMARY FORM
FOR PRESENCE-OR-ABSENCE AND CLEARANCE SURVEYS
FOR DESERT TORTOISE SIGN

% Slope: high_____ low_____ Aspect_____ Elevation_____ft.
Land Form (e.g., mesa, bajada, wash) _____
Soils _____
Vegetation: dominant perennials Larrea tridentata, Yucca brevifolia
other species Juniperus californica
dominant annuals Erodium, Schismus
other species Bromus, Plagiobothrys
Adjacent Land Use: immediate _____
Within 1 mi. Urban, San Gabriel Mtns, Residential
Soils _____
Vegetation _____

Weather: Temperature - Air at 5 cm_____°C Surface_____°C Cloud cover_____%
Wind speed_____ Rainfall_____in. Rainfall in last 30 days_____in.

Corrected Sign	Live Tortoises Adult/Juv.	TOTAL NUMBER OF: Shelter Sites Pallet/Burrow/Den Active/Inactive [1]	Scats [2]	Shell Remains [3]
	A= 0 J= 0	0	M= 0 F= 0 Unk= 0	A= 0 J= 0 Unk= 0

Tracks	Eggshell Fragments	Drinking Sites	Courtship Rings	Other	Neotoma Middens w/sign	:w/o sign
None	None	None	None	None	0	17

SIGNS OF HUMAN DISTURBANCE - NUMBER AND TYPES SEEN

Tire Tracks	Human Footprints	Dog Sign	Trash	Dump Sites	Shotgun/ Rifle Shells	Blading	Ravens	Other

January 1992

(place a 4 X 6 photograph showing the area where the transect was conducted)

If no tortoise sign occurs on the project site or Zone of Influence, the summary form should be completed. Please fill in all sections on the top 2/3 of the page of the summary form.

M/D/Y
Date Apr 10, 2008
Transect No. _____
State CA
County Los Angeles
City Palmdale
Recorder Amalong
Address _____
Project Name PHPP
Type of Project Water Line
Quad Name _____
Scale _____
Site Name reclaimed water pipeline
T_____ R_____ Sec_____
¼ Sec_____ ¼¼ Sec_____
UTM Zone _____
Northing _____
Easting _____
Parcel No. _____

SUMMARY FORM
FOR PRESENCE-OR-ABSENCE AND CLEARANCE SURVEYS
FOR DESERT TORTOISE SIGN

% Slope: high_____ low_____ Aspect_____ Elevation_____ft.
Land Form (e.g., mesa, bajada, wash) _____
Soils _____
Vegetation: dominant perennials Larrea tridentata, Chrysothamnus nauseosus, Yucca brevifolia
other species ~~Lasthen~~ Lycium
dominant annuals Erodium, Bromus, Schismus, Amsinckia
other species Lasthenia, Mustard
Adjacent Land Use: immediate _____
Within 1 mi. Urban, Residential, open desert, Air Force Plant 42
Soils _____
Vegetation _____

Weather: Temperature - Air at 5 cm_____°C Surface_____°C Cloud cover_____%
Wind speed_____ Rainfall_____in. Rainfall in last 30 days_____in.

Corrected Sign	Live Tortoises Adult/Juv.	TOTAL NUMBER OF Shelter Sites Pallet/Burrow/Den Active/Inactive [1]	Scats [2]	Shell Remains [3]
	A= 0 J= 0	0	M= 0 F= 0 Unk= 0	A= 0 J= 0 Unk= 0

Tracks	Eggshell Fragments	Drinking Sites	Courtship Rings	Other	Neotoma Middens w/sign	:w/o sign
None	None	None	None	None	0	9

SIGNS OF HUMAN DISTURBANCE - NUMBER AND TYPES SEEN

Tire Tracks	Human Footprints	Dog Sign	Trash	Dump Sites	Shotgun/ Rifle Shells	Blading	Ravens	Other

January 1992

(place a 4 X 6 photograph showing the area where the transect was conducted)

If no tortoise sign occurs on the project site or Zone of Influence, the summary form should be completed. Please fill in all sections on the top 2/3 of the page of the summary form.

M/D/Y
Date Apr 11, 2008
Transect No. _____
State CA
County Los Angeles
City Palmdale
Recorder Amalong
Address _____
Project Name PHPP
Type of Project Gas Pipeline
Quad Name _____
Scale _____
Site Name Natural Gas Supply Pipeline
T_____ R_____ Sec_____
¼ Sec_____ ¼¼ Sec_____
UTM Zone _____
Northing _____
Easting _____
Parcel No. _____

SUMMARY FORM
FOR PRESENCE-OR-ABSENCE AND CLEARANCE SURVEYS
FOR DESERT TORTOISE SIGN

% Slope: high_____ low_____ Aspect_____ Elevation_____ft.
Land Form (e.g., mesa, bajada, wash) _____
Soils _____
Vegetation: dominant perennials Larrea tridentata, Chrysothamnus nauseosus, Yucca brevifolia
other species Ericameria, Artemisia tridentata
dominant annuals Bromus, Erodium, Amsinckia
other species Mustard, Salsola
Adjacent Land Use: immediate _____
Within 1 mi. Urban, Residential, Air Force Plant 42, Open desert
Soils _____
Vegetation _____

Weather: Temperature - Air at 5 cm_____°C Surface_____°C Cloud cover_____%
Wind speed_____ Rainfall_____in. Rainfall in last 30 days_____in.

Corrected Sign	Live Tortoises Adult/Juv.	TOTAL NUMBER OF: Shelter Sites Pallet/Burrow/Den Active/Inactive [1]	Scats [2]	Shell Remains [3]
	A= 0 J= 0	0	M= 0 F= 0 Unk= 0	A= 0 J= 0 Unk= 0

Tracks	Eggshell Fragments	Drinking Sites	Courtship Rings	Other	Neotoma Middens w/sign	:w/o sign
None	None	None	None	None	0	0

SIGNS OF HUMAN DISTURBANCE - NUMBER AND TYPES SEEN

Tire Tracks	Human Footprints	Dog Sign	Trash	Dump Sites	Shotgun/ Rifle Shells	Blading	Ravens	Other