ORANGE GROVE ENERGY, L.P.
1900 East Golf Road, Suite 1030, Schaumburg, IL 60173 (847) 908-2800

October 1, 2008

Ms. Felicia Miller
Project Manager
c/o Dockets Unit, 4th Floor
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Ref: Responses to Data Requests from the September 11, 2008 Workshop for the Orange Grove Project (08-AFC-4)

Dear Ms. Miller:

Please find enclosed two electronic copies, one paper copy, and one original of the Orange Grove Energy, L.P. responses to California Energy Commission staff's data requests made during the September 11, 2008 workshop and subsequent to the workshop. The enclosed copy is for your use. The enclosed original is for filing with the docket office. An electronic copy of the responses, along with a proof of service declaration, have been sent to each of the individuals on the attached proof of service list.

If you have questions regarding the enclosed responses, please call Joe Stenger at (805) 528-6868, or Steve Thome at the phone number in the letterhead.

Sincerely,

Michael J. DuBois
Vice President of Asset Management
Orange Grove Energy, L.P.

Enclosure:
Responses to Data Requests from the September 11, 2008 Workshop and Other Data Requests

Attachment:
Proof of Service

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
ORANGE GROVE POWER PLANT PROJECT

DOCKET No. 08-AFC -4
PROOF OF SERVICE
Revised 8/25/08

INSTRUCTIONS: All parties shall either (1) send an original signed document plus 12 copies or (2) mail one original signed copy AND e-mail the document to the address for the Docket as shown below, AND (3) all parties shall also send a printed or electronic copy of the document, which includes a proof of service declaration to each of the individuals on the proof of service list shown below:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-4
1516 Ninth Street, MS-15
Sacramento, CA 95814-5512
docket@energy.state.ca.us

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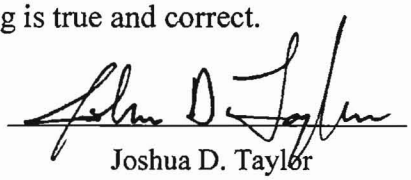
DECLARATION OF SERVICE

I, Joshua D. Taylor, Declare that on October 1, 2008, I deposited copies of the attached Responses to California Energy Commission Data Requests for the Orange Grove Project (08-AFC-4), pursuant to CEC staff request, at the Federal Express Hub on Barranca Parkway in Irvine, California, with waybills fully prepaid and addressed to those individuals identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.



Joshua D. Taylor

Orange Grove Energy AFC (08-AFC-4)
Responses to Data Requests from the September 11, 2008 Workshop And Other Data Requests

PART A - RESPONSES TO SEPTEMBER 11, 2008 WORKSHOP DATA REQUESTS

Technical Area: Air Quality

DATA REQUEST

Staff requested examples of the calculations used to quantify the water trucking tailpipe and PM10 emissions presented in the responses to Data Requests 2, 3 and 4, and a copy of the California Air Resources Board (CARB) methodology for estimating dust emissions from paved road travel.

RESPONSE

Attachment 1 to this letter provides details and examples of the calculations for fugitive dust emissions from offsite roadway traffic and particulate emissions from heavy-heavy duty truck engine exhaust, brake and tire wear referenced in Data Responses 2, 3 and 4. Fugitive road dust emission factors are based on CARB's Emission Inventory Procedure Manual, Volume III (the relevant section is 7.9, Entrained Paved Road Dust Paved Road Travel, included in Attachment 1), which in turn is based on EPA's 1995 AP-42 section on roadway fugitive dust emissions. Particulate emissions from trucks are based on the results of CARB's Emfac07 emission model for San Diego County. The fugitive road dust calculation included fleet average exhaust emissions and tire and brake wear emissions, while Emfac07 calculates these emissions specifically for heavy-heavy diesels. Thus the exhaust, tire and brake wear emissions are conservatively being "double counted."

DATA REQUEST

Staff requested that the Applicant locate the Rosemary Mountain Quarry Environmental Impact Report and provide additional emission information for that project relevant to Data Request No. 10, if available.

RESPONSE

Attachment 2 provides the *Air Quality Portion of the Final Environmental Impact Report* (FEIR) for the Rosemary's Mountain Quarry referenced in the Data Response 10. This is a "mark-up" version of the air quality portion of the FEIR, which was revised in November 2000, and which summarizes previous emission estimates and presents the final emissions estimates as the "Mitigated Emission Inventory" as described on pages 7 and 11 (particulate emission) of the document and in Table 13 (gaseous emissions). Attachment 3 provides a revised Exhibit 10-2 for the response to Data Request No. 10 previously submitted to the California Energy Commission (CEC). The revised exhibit in Attachment 3 reflects the updated Rosemary's Mountain Quarry emissions estimates from Attachment 2.

DATA REQUEST

Staff requested the following changes to the cumulative modeling protocol provided in the Response to Data Request No. 12:

- Eliminate fine grid receptors and leave only coarse grid receptor array;
- Eliminate on-property receptors and receptors within 1 grid space of the cumulative sources;
- Use start-up emissions for short-term modeling (already the basis for short-term modeling); and
- Document source contributions to high impact predictions for each source.

RESPONSE

The requested changes to the cumulative modeling protocol are accepted by the Applicant. Cumulative impact modeling is currently being conducted and will be provided to CEC when completed.

Technical Area: Biology

DATA REQUEST

Staff requested that the Parry's tetracoccus mitigation plan previously submitted to CEC as Exhibit 39-1 pursuant to Data Request No. 39 be revised as follows:

- 10 percent overplanting;
- Collection of seeds and cuttings from the site area during Fall 2008; and
- Commitment to preservation of the mitigation area for the life of the project.

RESPONSE

A revised Exhibit 39-1, Parry's tetracoccus Conceptual Mitigation Plan, is provided in Attachment 4 incorporating the requested changes. For convenience, revisions are provided in track-changes format.

DATA REQUEST

Staff requested additional details on the mitigation bank(s) to be used for the project as these details become available.

RESPONSE

The following provides updated information regarding mitigation opportunities for the project.

1. Crestridge Conservation Bank [Contact is Tammy Lawhead of J. Whalen Associates at (619) 683-5544]:
   - Approximately 80 acres of coast live oak woodland credits are available.
2. Confidential Property [Contact is Tammy Lawhead of J.Whalen Associates at (619) 683-5544]:
   - This property is currently going through the approval process and located in the Pala area.
   - Approximately 19 acres of occupied coastal sage scrub (CSS) and 1.7 acres of non-native grassland (NNG) available.
   - Contact is checking to see if oak woodland credits are available.

3. Red Mountain Mitigation Bank [Contact is Westley Peltzer at (760) 744-7125]:

   - Likely to be approved by end of this year.
   - If no approval obtained, they can process an individual easement for this project.
   - Approximately 20 acres of occupied CSS credit; 0.4 acre of NNG; 10 acres of southern mixed chaparral, which can be substituted for NNG with San Diego County approval; 6.2 acres of coast live oak woodland; and 32 acres of southern coast live oak riparian forest.

4. Daley Ranch Conservation Bank [Contact is Darren Parker with City of Escondido Planning Division (760) 839-4553]:

   - Oak woodland credits available (amount not yet confirmed).

5. Carlsbad Oaks Habitat Bank [Contact is Michael McCollum with McCollum Associates (916) 688-2040]:

   - Likely to be approved sometime this year.
   - NNG credits available that can cover any project in the county according to website.
   - Approximately 6 acres of CSS credit available according to website.

Technical Area: Cultural Resources

DATA REQUEST

Staff requested a 1 inch = 400 foot scale map of the Holocene alluvium geologic/ geomorphic unit in the vicinity of the gas pipeline.

RESPONSE

Attachment 5 provides the requested map in two figures enumerated as Figures 1A and 1B.

DATA REQUEST

Staff requested that the Applicant reevaluate whether there are locations available in the field where the Applicant can further characterize the upper portion of the Holocene alluvium with regard to geoarchaeology without suffering the project delays expressed as a concern by the Applicant's project team during the workshop.

RESPONSE

The Applicant commissioned a study of the area to determine if there are locations where the upper portion of the Holocene alluvium can be further characterized with regard to geoarchaeology. A California Professional Geologist conducted field reconnaissance of accessible areas of the Holocene alluvium near the project to determine if there are any existing river banks, drainages, excavations or other locations where the upper portion of the Holocene alluvium is exposed. As a result of this work, one location was found where the upper portion of the Holocene alluvium was exposed in an erosion feature. Hand-tools were used to maximize the vertical exposure of the Holocene alluvium to the extent practical. With this work, the geologist was able to obtain good exposure for the uppermost approximately six feet of the Holocene alluvium. The anticipated depth of trenching for the majority of the gas pipeline installation in the alluvium is approximately 4.5 feet. (The exception is where the gas pipeline will be in the Caltrans right-of-way where trenching may be up to approximately 10 feet.) The location of the identified exposure of Holocene alluvium is provided in Attachment 5 (see Figure 1B in Attachment 5). Photographs of the exposure are provided in Attachment 6. The materials encountered in the exposure are alluvial sands and minor gravel, collectively interpreted as channel deposits of the San Luis Rey River. The exposure did not contain significant fine grain beds indicative of overbank deposits, paleosoil horizons, substantial organic matter conducive to radio carbon dating, nor evidence of cultural resources or cultural influence. These results are consistent with the geoarchaeologic characterization of the Holocene alluvium materials provided in the response to Data Request No. 46 and support the assessment in that response that the character of the Holocene alluvium is well understood based on existing information.

Furthermore, the Applicant had their cultural resource consultant re-examine records of cultural resources that have been found in the area and this effort reaffirmed that no cultural resources are recorded to have ever been found in the Holocene alluvium in the project vicinity, as previously described in the response to Data Request No. 46.

Finally, the Applicant's consultants contacted the former owner and operator of the Fenton Sand Mine that occurs just south of State Route (SR) 76 near the project site. A record of conversation is provided in Attachment 7. TRC's consultant spoke with Mr. Marvin Howell, Director of Land Use, Planning and Permitting for Hanson Aggregates. Mr. Howell was involved with the Fenton Sand Mine for two decades and until the mine closed in 2006. The mine excavated materials from the Holocene alluvium to depths of approximately 40 feet. Mr. Howell indicated that the materials encountered were exclusively river channel deposits consisting primarily of sand with minor gravel and that no buried cultural resources were found. He further volunteered that, if cultural resources would have been found, he would have been notified. The characteristics of the Holocene alluvium in the Fenton Sand Mine as described by Mr. Howell and the absence of buried cultural resources at that facility are consistent with the geoarchaeologic characterization of the Holocene alluvium materials provided in the response to Data Request No. 46.

Collectively, the above provides strong additional validation of the geoarchaeologic characterization of the Holocene alluvium previously provided to CEC in the response to Data Request No. 46.

Technical Area: Hazardous Materials Management

DATA REQUEST

Staff requested information on the size of trucks that may be used to deliver aqueous ammonia to the project site.

RESPONSE

We contacted Airgas Specialty Products (ASP), a major supplier of aqueous ammonia for San Diego region power plants, to determine the size of trucks in their fleet typically used to deliver 19% aqueous ammonia. ASP currently uses two types of trucks for delivery of aqueous ammonia. Based on discussions with an ASP representative, most aqueous ammonia deliveries in the region occur using a semi-trailer mounted tank with a kingpin to rear axle (KPRA) dimension of approximately 40 feet, but deliveries can also be made with a much smaller single unit (i.e., tank-on chassis) truck. The dimensions of the single unit trucks currently in ASP's fleet are shown in Attachment 8. While the project does not intend to commit to any particular supplier at this time, our contact with ASP and the information in Attachment 8 demonstrates that there are trucks commonly available in existing reagent delivery fleets that would not exceed Caltrans KPRA advisory dimension for SR 76. If determined necessary by CEC, the Applicant is willing to accept a condition of approval requiring that the project specify in contracts for aqueous ammonia supply that delivery to the site shall not occur using any truck that exceeds the Caltrans KPRA advisory dimension in effect at the time, and that if any such delivery truck arrives at the site the load shall be rejected.

Use of smaller trucks than originally anticipated will increase the frequency of aqueous ammonia deliveries. If single unit trucks are used, the load capacity is expected to be approximately 2,500 to 3,000 gallons. Whereas, the Application for Certification (AFC) estimated that aqueous ammonia would be delivered to the site approximately once every other month, if single unit trucks are used the frequency of aqueous ammonia delivery could increase to approximately once per month.

DATA REQUEST

Staff suggested that the Applicant pursue fire protection via contract with North County Fire Protection District (NCFPD) for emergency response until such time that the project site is within a fire protection district service area, and that staff be kept appraised of progress in obtaining fire protection.

RESPONSE

NCFPD has agreed in principal with the concept of contracted emergency fire response, and Orange Grove Energy has responded to queries from NCFPD requesting contact information for other, similar facilities within the San Diego Gas &

Electric Company (SDG&E) service territory as well as estimated property tax information.

NCFPD reportedly has delivered a draft services agreement to its legal counsel for review before sending it to Orange Grove.

Orange Grove Energy will continue to keep the CEC informed as work towards a contract continues.

Technical Area: Soil and Water Resources

DATA REQUEST

Staff requested that the Applicant contact the Regional Water Quality Control Board (RWQCB) to confirm that they will not need to issue a 401 Water Quality Certification or Waste Discharge Requirements for the planned horizontal drilling activities.

RESPONSE

The Applicant's consultants attempted contact with the regional board, but to date, contact has not been made. Staff has since informed the Applicant's consultants that they will attempt contact with the RWQCB directly.

DATA REQUEST

Staff requested information on the fate of material that may be excavated from the gas pipeline trench that may be rocks or boulders too large for use as backfill.

RESPONSE

The gas pipeline will be installed on a bed of sand and covered with a layer of sand prior backfilling with common backfill material, so small rocks (e.g., on the order of 4 inches or less) will be suitable for use in backfill without risk of damage to the pipeline. If rock is present in the excavated material that is too large to use in the common backfill material, such rock will be used at the power plant site to construct vehicle barriers (e.g., where roadways occur near buildings or equipment) or as a component of landscaping. Alternatively, some of the rock could be crushed and used to offset the projects crushed rock import needs.

Technical Area: Waste Management

DATA REQUEST

Staff requested information on the existing septic system for the SDG&E storage area, to assure that it will not present a hazard to project construction staging and laydown.

RESPONSE

In response to this request, SDG&E has committed that, upon final certification from the CEC to construct the Orange Grove Project and prior to construction, SDG&E plans to abandon any existing septic system in place and will block off surface areas overlying this system that may present safety issues during construction.

PART B: OTHER DATA REQUESTS

Technical Area: Biology

DATA REQUEST

Staff requested confirmation that the fuel modification zones proposed for fire protection will be accepted without modification by the fire district.

RESPONSE

The Applicant's fire protection consultant, Hunt Research Corporation, contacted Mr. Sid Morel, Fire Marshal for NCFPD, to obtain concurrence for the proposed fuel modification zones. Attachment 9 provides an e-mail chain of this correspondence and documents the Fire Marshal's approval in concept of the proposed fuel modification zone size and location.

Technical Area: Water Resources

DATA REQUEST

Staff requested that the Applicant pursue written confirmation from Rainbow Municipal Water District (RMWD) regarding the availability of water from RMWD and their policies relevant to trucking of water for short term construction use vs. long term operations use.

RESPONSE

Attachment 10 provides an e-mail from Mr. Brian Lee, District Engineer for RMWD, confirming that RMWD will provide a construction meter for a construction project within the District, so long as conditions listed in their policies are met and that, per their policies, construction water may be trucked to the construction site. RMWD's position on long-term water use by the project is provided in a letter from RMWD to CEC's Project Manager, Ms. Felicia Miller, dated August 27, 2008.

Technical Area: Transmission System Engineering

DATA REQUEST

CEC's Data Request No. 66 requested that the Applicant submit a short analysis describing the environmental impacts for the reconductoring of the SDG&E 698E, Pala-Monserate Tap 69 kV line with 636 kcmil ACSS conductor and proposed mitigation measures.

RESPONSE

A project description and impact assessment for the reconductoring work is included as Attachment 11.

DATA REQUEST

CEC's Data Request 67 requested that the Applicant submit a short analysis describing the environmental impacts for the reconductoring of the SDG&E TL 698B, Monserate-Monserate Tap 69 kV line with 636 kcmil ACSS conductor and proposed mitigation measures.

RESPONSE

Please see response above.

Additional Information

In a recent meeting with Caltrans, their staff indicated that the portion of the Orange Grove Energy gas pipeline construction work that occurs in the Caltrans right-of-way will likely be conditioned by Caltrans pursuant to the encroachment permit process to limit allowable working hours, likely requiring construction at night. The Applicant notes that this would be an exception to the typical daytime work hours identified in the AFC.

ATTACHMENT 1
Example Calculations and CARB Methodology

TRC
21 Griffin Road North
Windsor, CT 06095

Main 860-298-9692
Fax 860-298-6399

Memorandum

Date: September 22, 2008

To: Doug Murray

From: Steven Eitelman

Re: Orange Grove Power
Background and Sample Calculations

Per your request, this memorandum provides clarification of the emission calculations performed for the tables "Data Request 3, Offsite On-Road Fugitive Dust Emission Summary, Delivery of Water for Operations" and "Data Request 4, Off site On-Road Emission Summary, Delivery of Water for Operations, Table 62C-16 Offsite On-Road Emission Summary, Delivery of Water for Operations (Revised8/21/08)." A summary of the items presented with this memorandum are provided below:

Data Request 3, Offsite On-Road Fugitive Dust Emission Summary, Delivery of Water for Operations

- A copy of the Data Request 3 table with added text boxes describing key parameters used to estimate fugitive particulate emissions of 10 microns or less (PM10)
- Sample Calculations – Operations Emissions presents the calculations used to estimate hourly, daily, annual expected, and annual maximum emissions
- A copy of the "California Air Resources Board, Emission Inventory Procedure Manual Volume III: Methods of Assessing Area Source Emissions, Section 7.9 Entrained Paved Road Dust Paved Road Travel (Updated July 1997)," which includes Table 3 Silt Loadings and Emission Factors for California Entrained Paved Road Dust Estimates.

Data Request 4, Offsite On-Road Emission Summary, Delivery of Water for Operations, Table 6.2C-16 Offsite On-Road Emission Summary, Delivery of Water for Operations (Revised8/21/08)

- A copy of Data Request 4 table with added text boxes describing key parameters used to estimate tail-pipe emissions
- Sample Calculations – Operations Emissions presents the calculations used to estimate hourly, daily, annual expected, and annual maximum PM10 emissions
- Report results from the California Air Resources Board (CARB) emission model Emfac07 V2.3 Nov 1 2006 (Version 2.30.3.501 build 2007.5.1.1) to estimate tailpipe emissions from the proposed heavy duty diesel-fired water truck. Only the results for PM10 are presented.

If you have any questions regarding this memorandum please call me at (860) 298-6369.

Data Request 3, Offsite On-Road Fugitive Dust Emission Summary, Delivery of Water for Operations

Motor Vehicles / Offsite	Fuel	Avg Vehicle Weight (ton)	Silt Loading [1]	Miles/ Round Trip	Trips				Emission Factors [1]		PM Emissions							
					Hourly	Daily	Annual Expected	Annual Maximum			Hourly		Daily		Annual, Expected		Annual, Maximum	
									PM10 (lb/mi)	PM2.5 (lb/mi)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM10 (lb/day)	PM2.5 (lb/day)	PM10 (lb/year)	PM2.5 (lb/year)	PM10 (lb/year)	PM2.5 (lb/year)
On-Site Water Truck Reclaim Water	D	30	0.037	31.2	1	24	1,000	3,200	1.00E-03	2.00E-04	0.0312	0.00624	0.749	0.150	31.2	6.24	99.8	20.0
On-Site Water Truck FPUD Fresh Water	D	30	0.037	18	1	24	1,000	3,200	1.00E-03	2.00E-04	0.0180	0.00360	0.432	0.0864	18.0	3.60	57.6	11.52
										Total Truck PM:	**0.049**	**0.010**	**1.18**	**0.24**	**49.2**	**9.84**	**157**	**31.5**

(1) From ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997)

The average water truck weight is presented in this table for reference only. The average vehicle weight used by CARB is 2.4 tons for developing the San Diego County on-road fugitive dust emission factor. Per EPA's AP-42, "only one emission factor should be calculated to represent the "fleet" average of all vehicles travelling the road."

The silt loading is presented in this table for reference only. The silt loading is the basis for the on-road fugitive dust emission factor developed by CARB that this table uses to estimate emissions. Similar calculations are preformed for the FPUD Fresh Water truck and the two sets of emissions are totaled to calculate the fugitive on-road dust attributable to the water trucks.

1 Reclaim water truck per hour will be required when 2 turbines are operating at full load. The annual estimates assume that the 2 turbines operate at the same time and at full load.

This is the emission factored developed by CARB for San Diego County and is used to calculate on-road fugitive emissions presented in this table. The emission factor is published in Table 3 "Silt Loadings and Emission Factors for California Entrained Paved Road Dust Emissions." The emission factor is rounded up from Table 3's value of 825.5 pounds per 1,000,000 VMT (0.0008255 lb/mile). The CARB report is attached.

The sample calculations for hourly, daily, and annual PM10 emissions from the water truck that makes a round trip of 31.2 miles to the Reclaim Water Pickup Station are attached.

Sample Calculations – Operation Emissions

Data Request 3, Offsite On-Road Fugitive Dust Emission Summary, Delivery of Water for Operations

Hourly, Reclaim Water Pickup Station

Truck Trips	1	per hour
		(2 turbines @ 1 hour each)
Distance	31.2	miles per round trip
Emission Factor	825.5	pounds/1,000,000 miles of PM10
		(Source - Table 3 CARB Section 7.9 Entrained Paved Road Dust Paved Road Travel, updated July 1997, factor in table Data Request 3 was rounded up from 825.5 lbs/1,000,000 miles to 0.001lbs/1 mile)

$$\left(\frac{31.2\,miles}{1hour}\right)*\left(\frac{825.5lbsPM\ \ 10}{1{,}000{,}000\ miles}\right)\approx 0.0312\ \ \frac{lbsPM\ \ 10}{hr}$$

Daily, Reclaim Water Pickup Station

Truck Trips	1	per hour
	24	per day, maximum
		(2 turbines @ 24 hours each)
Distance	31.2	miles per round trip
Emission Factor	825.5	pounds/1,000,000 miles of PM10

$$\left(\frac{31.2\,miles}{1hour}\right)*\left(\frac{24\,hours}{1day}\right)*\left(\frac{825.5lbsPM\ \ 10}{1{,}000{,}000\ miles}\right)\approx 0.749\ \ \frac{lbsPM\ \ 10}{day}$$

Annual Expected, Reclaim Water Pickup Station

Truck Trips	1	per hour
	1,000	per year, expected operations
		(2 turbines @ 1,000 hours each)
Distance	31.2	miles per round trip
Emission Factor	825.5	pounds/1,000,000 miles of PM10

$$\left(\frac{31.2\,miles}{1hour}\right)*\left(\frac{1{,}000\ hours}{1year}\right)*\left(\frac{825.5lbsPM\ \ 10}{1{,}000{,}000\ miles}\right)\approx 31.2\,\frac{lbsPM\ \ 10}{year}$$

Annual Maximum, Reclaim Water Pickup Station

Truck Trips	1	per hour
	3,200	per year, maximum operations
		(2 turbines @ 3,200 hours each)
Distance	31.2	miles per round trip
Emission Factor	825.5	pounds/1,000,000 miles of PM10 emission

$$\left(\frac{31.2\,miles}{1hour}\right)*\left(\frac{3{,}200\ hours}{1year}\right)*\left(\frac{825.5lbsPM\ \ 10}{1{,}000{,}000\ miles}\right)\approx 99.8\,\frac{lbsPM\ \ 10}{year}$$

SECTION 7.9

ENTRAINED PAVED ROAD DUST
PAVED ROAD TRAVEL

(Updated July 1997)

EMISSION INVENTORY SOURCE CATEGORY
Miscellaneous Processes / Road Dust

EMISSION INVENTORY CODES (CES CODES) AND DESCRIPTION

640-635-5400-0000 (83618) Paved Entrained Road Dust - Freeways

640-637-5400-0000 (83626) Paved Entrained Road Dust - Major Streets

640-639-5400-0000 (83634) Paved Entrained Road Dust - Collector Streets

640-641-5400-0000 (83642) Paved Entrained Road Dust - Local Streets

640-636-5400-0000 (47456) Paved Entrained Road Dust - Paved Roads (obsolete)

METHODS AND SOURCES

The paved road dust category includes emissions of fugitive dust particulate matter entrained by vehicular travel on paved roads. Road dust emissions are estimated for four classes of roads. The four classifications are: 1) freeways/expressways, 2) major streets/highways, 3) collector streets, and 4) local streets. The estimated particulate matter emissions for paved road dust for each California county are listed in Table 1. Table 2 shows the portion of travel on each of the four major road types in each county.

OVERVIEW OF ESTIMATION METHODOLOGY

Dust emissions from vehicle travel on paved roads are computed using the emission factor equation provided in the Fifth Edition of U.S. EPA's AP-42 document.[1] Inputs to the paved road dust equation were developed from California specific roadway silt loading and average vehicle weight data measured by Midwest Research Institute (MRI) in 1995.[2] Data from the Air Resources Board and air districts were used to estimate county specific VMT (vehicle miles traveled) data.[3,4] Caltrans HPMS (Highway Performance Monitoring System)[5] data were used to estimate the fraction of travel on each of the four road types in each county. The paved road dust category does not include directly emitted brake and tire wear, nor TOG, CO, NO_x, SO_x, or PM exhaust emissions. These directly emitted motor vehicle emissions are included in the motor vehicle emission inventory.

EMISSIONS ESTIMATION METHODOLOGY

The emission factor provided by the EPA for estimating entrained dust emissions from vehicles traveling on paved roads is:

$$E = k \left(\frac{sL}{2} \right)^{0.65} \left(\frac{W}{3} \right)^{1.5}$$

where E is the particulate emission factor in units of pounds of particulate matter per VMT, k is the particle size multiplier (used to compute PM_{10}, $PM_{2.5}$, etc.), sL is the roadway silt loading in grams/square meter, and W is the average weight (in tons) of vehicles traveling the road.

The statewide average vehicle weight is assumed to be 2.4 tons. This estimate is based on an informal traffic count estimated by MRI while they were performing California silt loading measurements. Table 3 shows the roadway silt loadings and emission factors used in each California county. The silt loading values are the averages of silt loadings measured by MRI in the South Coast AQMD and the San Joaquin Valley Unified AQMD.[2] (Note: The South Coast Air Quality Management District (SCAQMD) computed county specific average vehicle weight estimates by using average fleet weights with estimates of the amount of VMT traveled by each vehicle class. The weights used are shown in Table 3.)

The county roadway emission factors, combined with ARB and air district VMT data[3,4] for each roadway type, are linked with the Caltrans HPMS data[5] to estimate emissions for each road type in each county. Further detail on the derivation of the paved road dust emission factors, silt loadings, and roadway travel fractions are available in the ARB background document for entrained paved road dust.[6]

TEMPORAL ACTIVITY AND GROWTH

Temporal activity is assumed to be the same as on-road vehicle travel: uniform in spring and fall, increasing slightly in summer, and decreasing slightly in winter. The monthly temporal profile below shows this trend. The weekly and daily activities are estimated to have higher activities on weekdays and during daylight hours.

CES	Hours	Days	Weeks
ALL	24	7	52

CES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
ALL	7.7	7.7	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	7.7

ASSUMPTIONS AND LIMITATIONS

1. The current AP-42 emission factor assumes that road dust emissions are proportional to VMT, roadway silt loading, and average vehicle weight.

2. Virtually the same silt loading values are used throughout the state. These silt loadings are based on a total of eight silt loading measurements each in the South Coast Area, Coachella Valley, and Bakersfield. This does not fully represent the variability in California silt loading.

3. The methodology assumes that roadway silt loading, and therefore the emission factor, varies by the type of road.

4. It is assumed that the EPA particle size multiplier (i.e., the 'k' factor in the AP-42 equation) reasonably represents the size distribution of California paved road dust.

5. The average vehicle fleet weight is assumed to be 2.4 tons, statewide (except for the SCAQMD).

6. For freeway and major roads, emissions growth is assumed to be proportional to changes in roadway centerline mileage. For collector and local roads, emissions growth is assumed proportional to changes in VMT.

CHANGES IN THE METHODOLOGY

There were substantial changes in the paved road dust emission estimates for this update. These include:

- Incorporation of the new EPA paved road emission factor from the Fifth Edition of EPA's AP-42 document (January 1995, Section 13.2.1).
- Update of the Vehicle Miles Traveled (VMT) data to 1993 levels based on ARB and Air District supplied values.
- Update of the fractions of vehicle miles traveled on each of the four major roadway categories (i.e., freeways, major roads, collectors, and local roads) to reflect 1993 data.
- Incorporation of California specific roadway silt loading values.
- Emissions growth was changed so that freeways and major roads are grown based on increases in roadway centerline mileage, and local and collector roads are grown based on increases in VMT. Previously, all roads were grown based on VMT.

The changes reduced the paved road dust emission estimates by about 70% from the previous 1993 published emission inventory estimates.

COMMENTS AND RECOMMENDATIONS

Studies are ongoing by the University of California, Riverside, and the University of California, Davis, to better understand and quantify paved road dust emissions. These studies are not showing clear correlations between roadway silt loading and dust production, or VMT and dust production in urban areas. The results of these studies will be incorporated into this methodology when they are available. Also, effort is needed to better account for the variability in dust emissions based on population density, adjacent land uses, and geographic location.

SAMPLE CALCULATIONS

The table below summarizes the data computations necessary to estimate the paved road dust emissions in Santa Cruz county. The following steps are performed:

Step 1: Silt Loadings. Use the ARB default silt loadings, or local silt loadings if better data are available. Detailed information on the derivation of the ARB default values is included in reference 6.

Step 2: Emission Factor. Using the silt loadings shown and the AP-42 emission factor equation shown previously, compute the emission factor for each road type. In this case, a default average vehicle weight of 2.4 tons is used. Also, because PM_{10}, emissions are being computed, a 'k' factor of 0.016 is used from AP-42. For reference, the 'k' factor for $PM_{2.5}$ is 0.0073 (for units of lb/VMT).

Step 3: Using the data in Table 2, fill in the county specific travel fraction data. These data are derived from Caltrans HPMS data.[5] See reference 6 for additional information on how the traffic splits were derived.

Step 4: Using the county total VMT values provided in Table 1, and the travel fraction values from Step 3, compute the VMT traveled on each roadway type.
Total VMT x Travel Fraction = Road VMT.

Step 5: Multiply the emission factors in Step 2 by the VMT data in Step 4 to compute the PM_{10} emissions for each road type. *Road EF x Road VMT = Road Emissions*. Divide the computed values by 2000 lbs/ton to get the annual tons of PM_{10}/year from paved road dust.

Step 6: The ARB's database system maintains particulate emissions as Total Suspended Particulates (TSP). Therefore, the PM_{10} emissions must be converted to TSP emissions. For California paved road dust, it is estimated that 46% of TSP is PM_{10}, therefore, dividing the PM_{10} value by 0.46 produces the correct TSP emissions.[7]

Estimating Paved Road Dust Emissions In Santa Cruz County

		Road Type				
		Freeway	Major	Collector	Local	
Step 1	Silt Loading *(g/m^2)*	0.02	0.035	0.32	0.32	
Step 2	Emission Factor *(lbs PM_{10}/1e6 VMT)*	574	825	825	3479	Totals
Step 3	Travel Fraction	0.285	0.465	0.181	0.069	1
Step 4	VMT *(1993, million/yr)*	519	847	330	125	1821
Step 5	PM_{10} Emissions *(tons /yr)*	149	349	136	219	853
Step 6	TSP Emissions *(tons/yr)*	324	759	296	476	1855

ADDITIONAL CODES

SOURCE CATEGORY GROWTH AND CONTROL CODES

Various

SOURCE CATEGORY CODE POLLUTANT SPECIATION PROFILES

For All: PM = 393, VOC = not applicable

SOURCE CATEGORY CODE REACTIVITY FACTORS

Not Applicable

REFERENCES

1. U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, AP-42, Section 13.2.1, Fifth Edition. January 1995.

2. Muleski, Greg. Improvement of Specific Emission Factors (BACM Project No. 1), Final Report. Midwest Research Institute, March 29, 1996.

3. California Air Resources Board, Technical Support Division. 1993 Vehicle Miles Traveled by County from 1993 Ozone SIP EMFAC/BURDEN7F runs. Contact: Ed Yotter.

4. County VMT data for 1993 for the San Joaquin Valley Unified Air Pollution Control District and South Coast Air Quality Management District were obtained from district staff (who collected the information from local transportation agencies).

5. California Department of Transportation. California 1993 Daily Vehicle Miles of Travel for Public Maintained Paved Roads based on Highway Performance Monitoring System (HPMS) Data from 'TRAV93'. Barry Chrissinger; May 1995.

6. Gaffney, Patrick. Entrained Dust from Paved Road Travel, Emission Estimation Methodology, Background Document. California Air Resources Board. July 1997.

7. Houck, J.E., Chow, J.C., Watson, J.G., et al. Determination of Particle Size Distribution and Chemical Composition of Particulate Matter from Selected Sources in California, Final Report. Desert Research Institute & OMNI Environmental. Prepared for California Air Resources Board. Agreement No. A6-175-32. June 30, 1989.

UPDATED BY

Patrick Gaffney
August 1997

TABLE 1

1993 Reentrained Paved Road Dust Emissions for PM_{10} and TSP

EIC: Various; Activity: On Road Travel; Process: Paved Road

AIR BASIN	COUNTY	1993 VMT (million VMT per year)	Paved Road Dust PM10 Emissions (tons/yr)				1993 PM_{10} Emissions (tons/year)	1993 TSP Emissions (tons/year)
			Freeway	Major	Collector	Local		
GBV	ALPINE	52	0.0	16.4	2.6	9.9	29	63
	INYO	460	0.0	140.8	25.1	100.8	267	580
	MONO	311	0.0	99.7	10.2	78.4	188	409
LC	LAKE	420	0.0	110.9	28.5	144.0	283	616
LT	EL DORADO	343	0.0	111.8	7.1	95.3	214	466
	PLACER	158	19.4	21.9	6.3	38.6	86	187
MC	AMADOR	304	0.0	90.1	20.7	62.0	173	376
	CALAVERAS	320	0.0	90.2	26.5	64.3	181	393
	EL DORADO	1479	0.0	482.4	30.4	411.2	924	2009
	MARIPOSA	226	0.0	67.0	10.9	65.2	143	311
	NEVADA	948	88.4	143.9	53.8	279.4	565	1229
	PLACER	262	32.1	36.3	10.5	64.0	143	311
	PLUMAS	278	0.0	66.5	24.2	101.2	192	417
	SIERRA	92	3.4	17.8	4.9	43.3	69	151
	TUOLUMNE	511	0.0	130.5	47.4	138.5	316	688
NC	DEL NORTE	223	0.0	62.3	19.3	44.5	126	274
	HUMBOLDT	1114	0.0	329.6	55.1	315.8	701	1523
	MENDOCINO	997	0.0	258.2	87.3	278.3	624	1356
	TRINITY	142	0.0	40.2	4.9	57.5	103	223
	SONOMA	514	29.9	109.2	37.3	95.9	272	592
NCC	MONTEREY	3223	119.9	784.5	219.5	647.1	1771	3850
	SAN BENITO	375	0.0	123.5	10.1	89.7	223	485
	SANTA CRUZ	1821	149.1	349.3	136.1	218.6	853	1855
NEP	LASSEN	492	0.0	118.0	44.4	171.9	334	727
	MODOC	149	0.0	28.4	11.7	89.6	130	282
	SISKIYOU	812	101.1	73.2	30.0	365.3	570	1238
SC	LOS ANGELES	65793	9858.7	15402.2	1802.2	5814.7	32878	71474
	ORANGE	22026	3386.3	5105.9	420.7	2153.7	11067	24058
	RIVERSIDE	11278	2291.0	2564.7	828.0	2450.7	8134	17683
	SAN BERNARDINO	10853	2356.7	3042.6	645.5	2324.3	8369	18194
SCC	SAN LUIS OBISPO	2351	28.9	740.9	64.0	521.8	1356	2947
	SANTA BARBARA	3105	269.8	653.6	158.5	343.5	1425	3098
	VENTURA	5858	576.8	1215.3	160.4	895.0	2848	6191
SD	SAN DIEGO	23094	3478.3	3105.1	757.4	2804.8	10146	22056
SED	IMPERIAL	1341	94.0	223.3	417.3	404.3	1139	2476
	KERN	817	54.9	197.8	33.8	111.1	398	864
	LOS ANGELES	1409	203.4	306.5	35.9	144.6	690	1501
	RIVERSIDE	4780	877.0	947.0	305.7	1131.1	3261	7089
	SAN BERNARDINO	5173	661.0	823.1	174.6	786.0	2445	5315
SF	ALAMEDA	9867	1556.1	1306.5	293.6	986.5	4143	9006
	CONTRA COSTA	6259	884.5	913.0	164.3	984.1	2946	6404
	MARIN	1947	271.0	241.0	115.1	242.8	870	1891
	NAPA	717	36.6	163.0	42.6	159.2	401	873
	SAN FRANCISCO	3167	348.6	662.7	80.7	262.4	1354	2944
	SAN MATEO	4923	813.1	627.0	114.7	508.0	2063	4484
	SANTA CLARA	10674	1443.8	1792.2	240.5	1246.9	4723	10268
	SOLANO	2314	422.2	228.9	55.9	265.8	973	2115
	SONOMA	1922	111.7	408.2	139.3	358.5	1018	2212
SJV	FRESNO	6112	343.4	1262.7	379.8	2829.8	4816	10469
	KERN	5011	337.2	1214.0	149.4	1386.3	3087	6711
	KINGS	967	62.1	209.3	48.2	319.6	639	1389
	MADERA	1010	0.0	312.1	35.3	571.0	918	1997
	MERCED	2377	127.0	563.3	138.5	830.3	1659	3607
	SAN JOAQUIN	4776	480.3	830.3	232.4	1353.6	2897	6297
	STANISLAUS	3455	211.7	628.1	305.6	1051.4	2197	4776
	TULARE	2984	47.7	744.3	202.1	1775.1	2769	6020
SV	BUTTE	1532	25.7	362.8	123.6	458.4	971	2110
	COLUSA	495	81.2	34.9	17.9	146.8	281	610
	GLENN	404	61.0	36.3	17.8	105.9	221	480
	PLACER	2373	290.8	328.3	95.1	579.3	1294	2812
	SACRAMENTO	9056	1046.5	1598.0	328.5	1288.3	4261	9264
	SHASTA	1722	208.3	272.4	69.9	290.4	841	1828
	SOLANO	1030	187.9	101.9	24.9	118.3	433	941
	SUTTER	634	14.2	165.7	36.1	166.2	382	831
	TEHAMA	773	104.5	88.7	35.7	186.3	415	903
	YOLO	1456	227.4	157.7	42.1	312.8	740	1609
	YUBA	502	20.5	106.1	39.6	135.6	302	656
	Totals	262363	34445	53590	10329	42874	141238	307062

Fraction of PM10 = 0.46 (PM10 Emissions = TSP x 0.46)

TABLE 2

1993 Roadway Travel Fractions and VMT Estimates for California Entrained Paved Road Dust Estimates

AIR BASIN	COUNTY	1993 VMT 1993 O_3 SIP* (million VMT)	1993 HPMS Travel Fractions			
			Freeway	Major	Collector	Local
GBV	ALPINE	52	0.000	0.767	0.123	0.110
	INYO	460	0.000	0.742	0.132	0.126
	MONO	311	0.000	0.776	0.079	0.145
LC	LAKE	420	0.000	0.639	0.164	0.197
LT	EL DORADO	343	0.000	0.790	0.050	0.160
	PLACER	158	0.427	0.335	0.097	0.140
MC	AMADOR	304	0.000	0.718	0.165	0.117
	CALAVERAS	320	0.000	0.684	0.201	0.116
	EL DORADO	1479	0.000	0.790	0.050	0.160
	MARIPOSA	226	0.000	0.718	0.117	0.166
	NEVADA	948	0.325	0.368	0.138	0.170
	PLACER	262	0.427	0.335	0.097	0.140
	PLUMAS	278	0.000	0.580	0.211	0.209
	SIERRA	92	0.129	0.470	0.129	0.272
	TUOLUMNE	511	0.000	0.619	0.225	0.156
NC	DEL NORTE	223	0.000	0.676	0.210	0.114
	HUMBOLDT	1114	0.000	0.717	0.120	0.163
	MENDOCINO	997	0.000	0.627	0.212	0.160
	TRINITY	142	0.000	0.685	0.083	0.232
	SONOMA	514	0.203	0.515	0.176	0.107
NCC	MONTEREY	3223	0.130	0.590	0.165	0.115
	SAN BENITO	375	0.000	0.798	0.065	0.137
	SANTA CRUZ	1821	0.285	0.465	0.181	0.069
NEP	LASSEN	492	0.000	0.581	0.219	0.201
	MODOC	149	0.000	0.463	0.190	0.347
	SISKIYOU	812	0.434	0.218	0.089	0.258
SC	LOS ANGELES	65793	0.437	0.458	0.054	0.051
	ORANGE	22026	0.450	0.455	0.038	0.057
	RIVERSIDE	11278	0.453	0.340	0.110	0.096
	SAN BERNARDINO	10853	0.445	0.385	0.082	0.087
SCC	SAN LUIS OBISPO	2351	0.043	0.764	0.066	0.128
	SANTA BARBARA	3105	0.303	0.510	0.124	0.064
	VENTURA	5858	0.343	0.503	0.066	0.088
SD	SAN DIEGO	23094	0.525	0.326	0.079	0.070
SED	IMPERIAL	1341	0.244	0.403	0.179	0.173
	KERN	817	0.235	0.587	0.100	0.078
	LOS ANGELES	1409	0.437	0.458	0.054	0.051
	RIVERSIDE	4780	0.453	0.340	0.110	0.096
	SAN BERNARDINO	5173	0.445	0.385	0.082	0.087
SF	ALAMEDA	9867	0.550	0.321	0.072	0.057
	CONTRA COSTA	6259	0.493	0.353	0.064	0.090
	MARIN	1947	0.485	0.300	0.143	0.072
	NAPA	717	0.178	0.551	0.144	0.128
	SAN FRANCISCO	3167	0.384	0.507	0.062	0.048
	SAN MATEO	4923	0.576	0.309	0.056	0.059
	SANTA CLARA	10674	0.471	0.407	0.055	0.067
	SOLANO	2314	0.636	0.240	0.059	0.066
	SONOMA	1922	0.203	0.515	0.176	0.107
SJV	FRESNO	6112	0.196	0.501	0.151	0.153
	KERN	5011	0.235	0.587	0.072	0.106
	KINGS	967	0.224	0.525	0.121	0.131
	MADERA	1010	0.000	0.749	0.085	0.167
	MERCED	2377	0.186	0.574	0.141	0.099
	SAN JOAQUIN	4776	0.351	0.421	0.118	0.110
	STANISLAUS	3455	0.214	0.440	0.214	0.132
	TULARE	2984	0.056	0.604	0.164	0.176
SV	BUTTE	1532	0.058	0.574	0.196	0.172
	COLUSA	495	0.572	0.170	0.088	0.170
	GLENN	404	0.526	0.217	0.106	0.151
	PLACER	2373	0.427	0.335	0.097	0.140
	SACRAMENTO	9056	0.403	0.428	0.088	0.082
	SHASTA	1722	0.422	0.383	0.098	0.097
	SOLANO	1030	0.636	0.240	0.059	0.066
	SUTTER	634	0.078	0.633	0.138	0.151
	TEHAMA	773	0.471	0.278	0.112	0.139
	YOLO	1456	0.544	0.262	0.070	0.123
	YUBA	502	0.142	0.512	0.191	0.155
			State Averages			
All	Statewide Total	262363	0.252	0.500	0.119	0.123

* The VMT for most counties is from the ARB's EMFAC/BURDEN 7F runs performed for the 1993 ozone SIPs. The VMT for the SCAQMD and SJVUAPCD was provided by each district from their local transportation agencies.

TABLE 3
Silt Loadings and Emission Factors for
California Entrained Paved Road Dust Estimates

		Silt Loadings and PM_{10} Emission Factors										
		Freeway		Major		Collector		Local		Local Rural (1)		
AIR BASIN	COUNTY	Silt Load (g/m^2)	EF (lbs PM_{10} per 10^6 VMT)	Silt Load (g/m^2)	EF (lbs PM_{10} per 10^6 VMT)	Silt Load (g/m^2)	EF (lbs PM_{10} per 10^6 VMT)	Silt Load (g/m^2)	EF (lbs PM_{10} per 10^6 VMT)	Silt Load (g/m^2)	EF (lbs PM_{10} per 10^6 VMT)	Average Vehicle Weight (tons)
GBV	ALPINE	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	INYO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	MONO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
LC	LAKE	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
LT	EL DORADO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	PLACER	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
MC	AMADOR	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	CALAVERAS	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	EL DORADO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	MARIPOSA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	NEVADA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	PLACER	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	PLUMAS	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SIERRA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	TUOLUMNE	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
NC	DEL NORTE	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	HUMBOLDT	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	MENDOCINO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	TRINITY	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SONOMA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
NCC	MONTEREY	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SAN BENITO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SANTA CRUZ	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
NEP	LASSEN	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	MODOC	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SISKIYOU	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
SC (2,3)	LOS ANGELES	0.020	685.5	0.037	1022.4	0.037	1022.4	0.240	3447			2.7
	ORANGE	0.020	682.8	0.037	1018.5	0.037	1018.5	0.240	3434			2.7
	RIVERSIDE	0.020	896.0	0.037	1336.6	0.037	1336.6	0.240	4506			3.2
	SAN BERNARDINO	0.020	975.1	0.037	1454.5	0.037	1454.5	0.240	4904			3.4
SCC	SAN LUIS OBISPO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SANTA BARBARA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	VENTURA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
SD	SAN DIEGO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
SED	IMPERIAL (4)	0.020	573.8	0.035	825.5	0.320	3478.8	0.320	3479			2.4
	KERN	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	LOS ANGELES (2,3)	0.020	660.5	0.035	950.3	0.035	950.3	0.320	4004			2.6
	RIVERSIDE (2,3)	0.020	809.3	0.035	1164.3	0.035	1164.3	0.320	4907			3.0
	SAN BERNARDINO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
SF	ALAMEDA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	CONTRA COSTA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	MARIN	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	NAPA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SAN FRANCISCO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SAN MATEO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SANTA CLARA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SOLANO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SONOMA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
SJV (5)	FRESNO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479	1.6	9903	2.4
	KERN	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479	1.6	9903	2.4
	KINGS	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479	1.6	9903	2.4
	MADERA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479	1.6	9903	2.4
	MERCED	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479	1.6	9903	2.4
	SAN JOAQUIN	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479	1.6	9903	2.4
	STANISLAUS	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479	1.6	9903	2.4
	TULARE	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479	1.6	9903	2.4
SV	BUTTE	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	COLUSA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	GLENN	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	PLACER	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SACRAMENTO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SHASTA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SOLANO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	SUTTER	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	TEHAMA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	YOLO	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4
	YUBA	0.020	573.8	0.035	825.5	0.035	825.5	0.320	3479			2.4

Notes for Table 3.

(1) The SJVUAPCD splits local roads into urban and rural classes, and uses separate silt loading values.
(2) The SCAQMD uses the median, rather than the average value of the BACM silt loading values.
(3) The SCAQMD computed county specific vehicle weight averages. Los Angeles and Orange Counties have an average vehicle weight value of 2.7 tons. Riverside has a value of 3.2 tons, and San Bernardino is set to 3.4 tons.
(4) In Imperial county, a silt loading value of 0.32 is used for collector roads to account for the large portion of developed areas.
(5) The SJV district splits their local roads into urban and rural roads. A higher silt loading value derived from AP-42 data is used in computing emissions for rural local roads due to anticipated higher loading levels.

Data Request 4, Offsite On-Road Emission Summary, Delivery of Water for Operations
Table 6.2C-16 Offsite On-Road Emission Summary, Delivery of Water for Operations (Revised 8/21/08)

Motor Vehicle	Fuel	Miles Round Trip	Truck Trips				Emission Factors (HHDT-DSL from SCAQMD)								Operation Emissions - Hourly								Operation Emissions - 24 Hour Maximum Day							
			Hourly	Full Load Operating Hours 24 Hour Day	3,200 Hour Year	1,000 Hour Year	ROG* (lb/vmt)	CO* (lb/vmt)	NOx* (lb/vmt)	SOx (lb/vmt)	PM10* (lb/vmt)	PM2.5* (lb/vmt)	CH4 (lb/vmt)	CO2 (lb/vmt)	ROG (lb/hr)	CO (lb/hr)	NOx (lb/hr)	SOx (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	CH4 (lb/hr)	CO2 (lb/hr)	ROG (lb)	CO (lb)	NOx (lb)	SOx (lb)	PM10 (lb)	PM2.5 (lb)	CH4 (lb)	CO2 (lb)
Reclaim Water Pickup Station	D	31.2	1	24	3,200	1,000	6.40E-04	2.80E-03	1.30E-02	4.01E-05	4.80E-04	4.00E-04	1.5E-04	4.2	2.00E-02	8.74E-02	4.04E-01	1.25E-03	1.50E-02	1.25E-02	4.76E-03	131	0.5	2.1	9.7	0.030	0.36	0.3	0.11	3,153
FPUD Fresh Water Pickup	D	18	1	24	3,200	1,000	6.40E-04	2.80E-03	1.30E-02	4.01E-05	4.80E-04	4.00E-04	1.5E-04	4.2	1.15E-02	5.04E-02	2.33E-01	7.22E-04	8.64E-03	7.20E-03	2.74E-03	76	0.3	1.2	5.6	0.017	0.2	0.2	0.07	1,819
		Total =	2	48	6,400	2,000									Total (lbs) =	3.15E-02	1.38E-01	6.38E-01	1.97E-03	2.36E-02	1.97E-02	7.50E-03	207	0.76	3.3	15.3	0.05	0.57	0.47	0.18	4,972
															Total (tons) =	1.6E-05	6.9E-05	3.2E-04	9.9E-07	1.2E-05	9.8E-06	3.8E-06	0.104	3.8E-04	1.7E-03	7.7E-03	2.4E-05	2.8E-04	2.4E-04	9.0E-05	2.49

* Factor from CARB's Emfac2007, V2.3

Motor Vehicle	Fuel	Miles Round Trip	Truck Trips				Emission Factors (HHDT-DSL from SCAQMD)								Operation Emissions - 6,400 Turbine Hour Year (3,200 hours/year of operation, each turbine)								Operation Emissions - 2,000 Turbine Hour Year (1,000 hours/year of operation, each turbine)							
			Hourly	24 Hour Day	3,200 Hour Year	1,000 Hour Year	ROG* (lb/vmt)	CO* (lb/vmt)	NOx* (lb/vmt)	SOx (lb/vmt)	PM10* (lb/vmt)	PM2.5* (lb/vmt)	CH4 (lb/vmt)	CO2 (lb/vmt)	ROG (lb)	CO (lb)	NOx (lb)	SOx (lb)	PM10 (lb)	PM2.5 (lb)	CH4 (lb)	CO2 (lb)	ROG (lb)	CO (lb	NOx (lb)	SOx (lb)	PM10 (lb)	PM2.5 (lb)	CH4 (lb)	CO2 (lb)
Reclaim Water Pickup Station	D	31.2	1	24	3,200	1,000	6.40E-04	2.80E-03	1.30E-02	4.01E-05	4.80E-04	4.00E-04	1.5E-04	4.2	64	280	1,294	4.0	48	40	15	420,407	20	87	404	1.3	15	12	4.8	131,377
FPUD Fresh Water Pickup	D	18	1	24	3,200	1,000	6.40E-04	2.80E-03	1.30E-02	4.01E-05	4.80E-04	4.00E-04	1.5E-04	4.2	37	161	746	2.3	28	23	9	242,543	12	50	233	0.7	9	7	3	75,795
		Total =	2	48	6,400	2,000									Total (lbs) =	101	441	2,040	6.32	76	63	24	662,950	31	138	638	2	24	20	8	207,172
															Total (tons) =	0.05	0.22	1.02	0.003	0.04	0.03	0.012	331	0.02	0.07	0.32	9.9E-04	0.01	0.01	0.004	104

* Factor from CARB's Emfac2007, V2.3

1 Reclaim Water truck per hour will be required when 2 turbines are operating at full load. The annual estimates assume that the 2 turbines operate at the same time and at full load.

The emission factors are from the CARB software Emfac2007, a sample of the report results are attached for PM10 emissions.

The sample calculations for hourly, daily, and annual PM10 emissions from the water truck that makes a round trip of 31.2 miles to the Reclaim Water Pickup Station are attached.

Sample Calculation – Operation Emissions

Data Request 4, Offsite On-Road Emission Summary, Delivery of Water for Operations
Table 6.2C-16 Offsite On-Road Emission Summary, Delivery of Water for Operations
(Revised 8/21/08)

Hourly, Reclaim Water Pickup Station

Truck Trips	1	per hour
		(2 turbines @ 1 hour each)
Distance	31.2	miles per round trip
Emission Factor	0.00048	pounds of PM10 emission per mile

$$\left(\frac{31.2\,miles}{1hour}\right)*\left(\frac{0.00048\ \ poundsPM\ \ 10}{1mile}\right)=0.015\ \frac{lbs}{hr}$$

24 Hour Maximum Day, Reclaim Water Pickup Station

Truck Trips	1	per hour
	24	per day, maximum
		(2 turbines @ 24 hours each)
Distance	31.2	miles per round trip
Emission Factor	0.00048	pounds of PM10 emission per mile

$$\left(\frac{31.2\,miles}{1hour}\right)*\left(\frac{24\,hours}{1day}\right)*\left(\frac{0.01296\ \ poundsPM\ \ 10}{1mile}\right)=0.36\ \frac{lbs}{day}$$

2,000 Turbine Hour Year, Reclaim Water Pickup Station

Truck Trips	1	per hour
	1,000	per year, expected operations
		(2 turbines @ 1,000 hours each)
Distance	31.2	miles per round trip
Emission Factor	0.00048	pounds of PM10 emission per mile

$$\left(\frac{31.2\,miles}{1hour}\right)*\left(\frac{1{,}000\ hours}{1year}\right)*\left(\frac{0.01296\ \ poundsPM\ \ 10}{1mile}\right)=15\ \frac{lbs}{year}$$

6,400 Turbine Hour Year, Reclaim Water Pickup Station

Truck Trips	1	per hour
	3,200	per year, maximum operations
		(2 turbines @ 3,200 hours each)
Distance	31.2	miles per round trip
Emission Factor	0.00048	pounds of PM10 emission per mile

$$\left(\frac{31.2\,miles}{1hour}\right)*\left(\frac{3{,}200\ hours}{1year}\right)*\left(\frac{0.01296\ \ poundsPM\ \ 10}{1mile}\right)=48\ \frac{lbs}{year}$$

Emfac2007 Estimates
On-Road Emissions

This table is the report results from Emfac2007. Some data added are calculated based on the report results, they are presented in italicized and blue font.

Title : Total for 2010
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2008/08/21 16:13:33
Scen Year: 2010 -- Model years 2009 and 2010 selected
Season : Annual
Area : San Diego County
I/M Stat : Enhanced Interim (2005)
Emissions: Tons Per Day

****

	HHDT-CAT	HHDT-DSL	HHDT-TOT	ALL-TOT
Vehicles	14	864	878	878
VMT/1000	4	250	254	254
Trips	656	4372	5028	5028
PM10 Emissions				
Run Exh	0	0.05	0.05	0.05
Idle Exh	0	0	0	0
Start Ex	0	0	0	0
	-------	-------	-------	-------
Total Ex	0	0.05	0.05	0.05
TireWear	0	0.01	0.01	0.01
BrakeWr	0	0.01	0.01	0.01
	-------	-------	-------	-------
Total	0	0.06	0.06	0.06
Total (tons/250,000 VMT)		*0.06*		
Pounds per ton		*2000*	*2000*	*2000*
Total (pounds)		*120*	*120*	*120*
VMT (Vehicle Miles Traveled)		*250000*	*254000*	*254000*
Total Emissions (pounds/VMT)	*0.0000*	*0.000480*	*0.000472441*	*0.000472441*
Fuel Consumption (000 gallons)				
Gasoline	0.26	0	0.26	0.26
Diesel	0	46.39	46.39	46.39

ATTACHMENT 2
Air Quality Portion of the Rosemary's Mountain Quarry FEIR

AIR QUALITY PORTION OF
FINAL ENVIRONMENTAL IMPACT REPORT

Revisions shown in ~~strike-out~~/<u>underline</u> format

November 30, 2000

E. Air Quality

An air quality analysis of the proposed Palomar Aggregates Quarry was performed by AWR Engineering Group in January of 1988 (Appendix K). This original report was updated in 1991 and 1996 to reflect current regulations. ~~The following section is a summary of the 1996 report.~~ Environmental Management Associates (EMA) reviewed the air quality effects of the project and prepared an air quality assessment (Appendix L) evaluating the significance of the impact of particulate matter smaller than ten microns in aerodynamic diameter (PM_{10}) from the combined emissions from the processing activities, haul roads, and fugitive sources associated with the project.

1. Existing Conditions

Air Quality Strategies

In an effort to improve the nation's air quality, Congress passed the Clean Air Act in 1970. This Act, and subsequent amendments, required federal air quality standards to be set and enforced by the Environmental Protection Agency (EPA). State and local agencies were also established to develop air qualities strategies, monitor compliance with federal standards, and regulate emission sources.

The California Air Resources Board (CARB) regulates mobile sources of emissions, primarily motor vehicle pollution. Regulation of stationary emissions, such as the proposed aggregate plant and asphalt and concrete batch plants, is the responsibility of the San Diego County Air Pollution Control District (SDAPCD). This agency also prepares the State Implementation Plan (SIP) and a Reasonable Further Progress Report for the San Diego area.

State Implementation Plans became mandatory after an amendment to the Federal Clean Air Act in 1977. The SIP must address control strategies for the five major pollutants (ozone, carbon monoxide, particulate matter, nitrogen dioxide, and sulfur dioxide). Attainment levels were to be met by 1982; however, for those areas which could not meet this deadline, an extension was given until 1987 to attain the standards. Attainment levels for carbon monoxide, nitrogen oxide and sulfur dioxide have been met for the San Diego region. Compliance with ozone standards continue to be a problem for the San Diego region, related in large part to meteorological conditions which transport ozone from the Orange/Los Angeles County areas to San Diego.

An extension for ozone compliance was received with a requirement to submit a revision to the existing SIP. The SDAPCD revised the SIP in 1994, and is forecasting attainment of the Federal ozone standard by the required date of 1999.

Hydrocarbons and nitrogen oxides emitted from mobile and stationary sources react with sunlight to produce ozone, commonly referred to as smog. The control strategy for ozone is to reduce reactive hydrocarbon emissions, more than half of which are produced by motor vehicles.

Prior to 1987, particulate matter was measured as Total Suspended Particulate. In 1987, the standard was changed to measure only that portion of particulates which are less than ten microns in diameter, known as PM_{10}. These are the particles which present the greatest threat to human health. For PM_{10}, the San Diego Air Basin is unclassified.

EMA's recent review (see Appendix L) of existing conditions and applicable plans revealed that there has been no change in air quality strategies or local air quality conditions that would substantially alter the environmental impacts of the project's emissions of PM_{10}. As of 1999, the San Diego Air Basin remains "unclassified (attainment)" for PM_{10} by the federal Environmental Protection Agency under the Clean Air Act, and "non-attainment" for PM_{10} by the California Air Resources Board under the California Clean Air Act. The rules and regulations of the SDAPCD pertinent to the project's emissions of PM_{10} have not been substantially revised since the publication of the Final EIR. Monitoring of PM_{10} at the closest monitoring station to the project, the Escondido monitoring station, continues to demonstrate no violations of the federal 24-hour or annual PM_{10} standards. Although the PM_{10} concentrations monitored in Escondido since 1994 appear to indicate a trend of improving air quality, the station continues to record concentrations which exceed the California 24-hour PM_{10} standard.

In addition to the SIP, the APCD is also required to prepare annually Reasonable Further Progress (RFP) Reports to assess progress in attaining healthful air quality in the San Diego region. The Federal Clean Air Act defines

Reasonable Further Progress as "annual incremental reductions of emissions of the applicable air pollutant which are sufficient in the judgement of the Administrator of the Environmental Protection Agency to provide for attainment of the applicable national ambient air quality standard by the date required". The report's primary objective is to reaffirm the validity of claims made in the SIP reports, and to prevent future emission trends from interfering with attainment of air quality standards. The next RFP is expected to continue to focus on control strategies for ozone, which remains the major pollution problem in San Diego.

The major emphasis of the SDAPCD's efforts is on "new source review" which requires regulated activities, such as the Proposed Project, to obtain "Authority to Construct" and "Permit to Operate". Four sets of SDAPCD regulations are applicable to the proposed aggregate plant, hot-mix asphalt plant and concrete batch plant:

- Prohibitive Standards that limit the amount of emissions from each process;
- New Source Performance Standards (NSPS) that require stricter controls for the proposed hot-mix asphalt and aggregate plants; and,
- New Source Review Standards that require Best Available Control Technology (BACT) be applied to all portions of the proposed facility, and that the air quality impacts of all proposed quarry operations be fully evaluated if emissions exceed certain threshold values. BACT is defined as the "maximum degree of air contaminant reduction which the Air Pollution Control District determines is achievable".
- Federal EPA Title V Standards that would require a Federal operating permit if certain annual emissions threshold are exceeded.

The APCD's regulations forbid construction until the entire proposed facility can demonstrate that it would comply with all four sets of standards.

Local Conditions

The general climate at the proposed project site is largely governed by the semi-permanent high pressure system over the Pacific Ocean and the atomospheric interaction between the cool ocean and the warm desert interior. The San Luis Rey Valley's sub-climate is somewhat warmer than the county's coastal corridor in the summer, and experiences less cloud cover and fog than along the ocean. A morning breeze, resulting from local heating of the east and south facing slopes, travels northwards at the proposed quarry. By the mid-to late morning the regional sea breeze penetrates the area and these winds from the southwest and west are generally light until mid-afternoon. A stronger breeze then prevails until late evening, especially in the summer and on the higher hills on either side of I-15. At night the winds are primarily offshore, especially in the winter, when they drain down off hills surrounding the area and flow south before heading southwest down the river channel. The annual average temperature is 62° Fahrenheit. Winter mornings drop down into the upper 30s and summer afternoons reach the low 90s. Temperature extremes over 100° or much below freezing rarely occur because of the moderating influence of the ocean to the west. Annual rainfall averages approximately 14 inches, most of which occurs from late November until early April.

There are no recent air quality monitoring data available from the Pala Mesa area by which existing compliance with clean air standards can be determined. The nearest San Diego Air Pollution Control District monitoring station is in Escondido, approximately 15 miles to the south of the project site. Of the gaseous pollutants measured at the Escondido monitoring station, only the level of ozone exceeded the Federal clean air standard during the period 1990-1994. The Pala Mesa area is expected to have lower levels of carbon monoxide and nitrogen oxides than Escondido, with little probability of any violations, due to its lower level of urban development.

The nearest PM_{10} measurement sites to Pala Mesa are Oceanside (19 miles to the west) and Escondido (13 miles to the south); PM10 monitoring at these sites show compliance with Federal standards. No violations of the federal annual or 24 hour standard for PM_{10} have been recently recorded in San Diego County; however, the state annual standard and 24 hour standards were not met at several county monitoring stations during the period between 1990-1994.

Applicable Plans

There are two air quality plans that are currently applicable to the San Diego air basin in which the project is located: the *1991 San Diego Regional Air Quality Strategy*, as updated through the *1998 Triennial Regional Air Quality Strategy Revision for the San Diego Air Basin*, and the *State Implementation Plan (SIP) for the San Diego Air Basin*. Neither plan addresses PM_{10} emissions or PM_{10} air quality, and neither plan proposes strategies to reduce or limit PM_{10} emissions. Thus, PM_{10} emissions from the project would neither conflict with nor obstruct implementation of either plan.

2. Environmental Impacts

The major source of air pollutants in aggregate mining and processing activities occurs from the release of dust particles during excavation, processing and hauling. This release of dust is commonly referred to as "fugitive emissions". With respect to a rock quarry, the initial blasting, crushing, and transfer of aggregate are the major sources of fugitive emissions. ~~The emissions generated by blasting are not calculated into the total particulate emission estimate, however, since information on blasting at stone quarries is, according to EPA document AP-42 (Rev 9/88) Section 8.19.2, sparse and unreliable.~~

If not properly controlled, fugitive dust could be dispersed throughout the area and settle on nearby parked vehicles, structures, outdoor furniture, and foliage. The distance dust would be carried depends on the wind velocity, the particle size, the altitude to which it would rise, and topographical features which would influence air flow. The early morning breezes would carry the dust northward, toward the existing nearby Pankey residence and groveland. By mid to late morning the dust would be carried more to the northeast and east, towards a hill which remains covered with natural vegetation. The western slope of the project site would shield the quarrying activities from the westerly winds, so only the finer particulate which have risen to higher altitudes would be carried by these winds. Beyond the hill to the east are existing farmlands which may receive some of the dust, especially later in the afternoon when the winds velocities have increased. Existing grovelands immediately to the southwest would not receive much dust unless there is no wind or Santa Ana conditions exists.

A second source of air quality impacts is gaseous pollutants which are generated in the preparation of hot-mix asphalt and by combustion emissions from vehicles involved in the mining and transporting of aggregate materials. Only those generated by the production of asphalt are addressed in this report, since the vehicular emissions are a regional issue and would result primarily from the transport of the products for the use throughout the area.

~~Fugitive~~ Particulate Emissions

~~Fugitive p~~Particulate emissions have been calculated for each source~~, other than blasting~~ for dust particles less than 10 microns in diameter (PM_{10}). AWR Engineering Group's ~~E~~ estimates of fugitive particulate emissions based upon project material throughput values, are summarized in Table 11. These estimates are based on application of BACT and other control measures described in this report and on project plot plans.

Table 11. Estimate of Particulate Emissions (PM_{10}) (AWR EMISSION INVENTORY)

Source		Pounds/Hour	Pounds/Day	Tons/Year
Processing		12.98	95.1	10.13
Crushing & Screening		8.23		
Asphalt Production		4.36		
Concrete Production		0.39		
Handling, Transfer & Storage		12.27	82.7	9.54
Drilling		0.07		
Material Handling		2.30		
Aggregate Transfer		5.96		
Wind Erosion		3.94		
Haul Roads		14.28	111.0	11.11
Quarry	10.67			
Aggregate		1.99		
Raw Material		0.37		
Asphalt		0.64		
Concrete		0.61		

~~Processing particulate emissions generated by the crushing and screening to produce 625 tons/hour of aggregate are estimated to be 8.23 pounds/hour PM_{10}, and are based upon the assumption that BACT is utilized.~~ Control measures include the use of fabric filters and the use of water/surfactant sprays to create a higher dust control efficiency. The use and/or effectiveness of fabric filters would be:

Jaw Crusher: 90 percent with fabric filter on discharge.
Cone Crushers: 95 percent with fabric filter on discharge.
Screening: 99 percent with covered screen and surfactant.
Recrushing 99 percent with insertable fabric filter on discharge.

The production of hot-mix asphalt would involve combing various sized aggregate, sand and asphaltic cement and would require a fabric filter (baghouse) system for control of the particulate emissions. Due to the New Source Performance Standards currently in effect, such a baghouse system would provide 60 percent cleaner exhaust than is achieved at existing asphalt plants in San Diego County. ~~Assuming an asphalt production rate of 350 tons/hour maximum, the PM_{10} emissions would be 4.4 pound/hour.~~

Particulate emissions associated with the concrete batch plant would consist of cement dust and aggregate dust, from the conveyance and unloading of these materials. Control measures would include the enclosure of dumping and

loading areas, pneumatic conveyance for transfer of cement, filters on storage bin vents and the use of water sprays. These techniques would provide overall dust control efficiencies of at least 90 percent ~~and limit the PM_{10} emissions to 0.39 pounds/hour~~.

Fugitive emissions associated with operation of the rock plant have been identified in four areas: drilling in the quarry area, rock handling in the quarry area, stockpiling and loadout operations in the plant, and wind erosion of stockpiles. ~~Average emissions associated with drilling are calculated to be 0.07 pounds/hour PM_{10}, based on 250 days of drilling.~~ Material handling within the quarry would involve transferring the quarried material onto the grizzly feeding the jaw crusher. ~~Assuming a handling rate of 625 tons/hour, an estimated 2.30 pounds/hr PM_{10} fugitive emissions would be generated. The transference of material to stockpiles, load out bins, and into haul trucks would produce an estimated 5.96 pounds/hour PM_{10} emissions. The figure is based on the assumption that the material would be moist from water sprays located on each stockpiling conveyor. Wind erosion across the storage piles would generate a maximum 3.94 pounds/hour PM_{10} fugitive emissions.~~

In addition to fugitive dust generation from production, traffic within the project site could generate dust from the access road, and thereby increase the level of particulate in the air. It is anticipated that there would be approximately 1,500 round trips per month (68 round trips per working day) associated with off-site delivery of ready-mix concrete, and 3,100 round trips per month (141 round trips per working day) for aggregate or asphalt delivery. Employees and miscellaneous trips would add approximately 31 round trips per day, generating a total " worst case" estimate of 240 round trips per day. Due to SDAPCD's Regulations that require paved haul roads at the facility rather than the chemical stabilization of unpaved haul roads, fugitive emissions would be significantly reduced. Additionally, recent field investigations at similar mineral products industry facilities have shown an 80 percent efficiency in controlling particulate emissions when the road surface is wet swept routinely, coupled with watering the paved surface to further suppress airborne dust emissions.

~~Assuming that the haul roads are paved, aggregate haul trucks are expected to generate 1.99 pounds/hour PM_{10} emissions. The importation of asphaltic cement, portland cement, and sand, all of which would be brought on site in 25 ton loads on paved haul surfaces, would generate 0.37 pounds/hour PM_{10} emissions, assuming a maximum of two trucks of each type of raw material arriving in any one hour. The hauling of hot mix asphalt would generate 0.64 pounds/hour PM_{10} emissions and hauling of ready mix concrete would generate 0.61 pounds/hour PM_{10} emissions.~~ Equipment within the quarry is expected to generate 10.67 pounds/hour PM_{10} emissions while transporting quarried material, assuming the pit-area and adjacent traveled surfaces are watered two times a day (before commencing work in the morning and at lunch time).

~~SDAPCD's New Source Review Rules utilize three thresholds to determine the District's level of project review. If estimates of particulate emissions exceed 10 pounds/day utilizing standard dust control measures, then BACT is required to be implemented. In addition, a threshold of 100 pounds per day is established to evaluate whether process PM_{10} emissions once BACT is employed, could potentially cause significant off site air quality impacts. If this threshold is exceeded, detailed air quality modeling is required by APCD. As shown in Table 11, PM_{10} daily emissions would exceed the 10 pounds/day threshold of Rule 20.2 and BACT would be required for the entire facility.~~

~~The Maximum of 95.0 pounds/day of process PM_{10} emissions, with BACT, would not exceed the 100 pounds/day threshold established by the SDAPCD Standards. These sources are not expected to cause a significant off site quality impact and detailed air quality modeling would not be required by APCD. As shown in Table 11, PM_{10} daily emissions would exceed the 10 pounds/day threshold of Rule 20.2, and BACT would be required for the entire facility.~~

~~The maximum of 95.0 pounds/day of process PM_{10} emissions, would not exceed the 100 pounds/day threshold established by the SDAPCD Standards. These sources are not expected to cause a significant off site air quality impact and detailed air quality modeling would not be required by the District. The maximum 10.1 ton/year of PM10 emissions calculated for the facility would not exceed the SDAPCD's threshold of 15 tons/year, so that no emissions offsets would be required. The Proposed Project would be in compliance with the SDAPCD Prohibitive Standards, New Source Performance Standards, New Source Review Rules, and Federal EPA Title V Permit Rules.~~

~~Fugitive PM_{10} emissions would be generated by blasting. As noted above, the U.S. EPA has revised the list of~~

~~emissions factors for crushed stone operations to eliminate the factor for blasting emissions. The EPA cited the sparsity and unreliability of available test data, and specified that the use of previous estimation techniques was to be discontinued. Blasting would be an infrequent source of fugitive emissions at the facility, and emissions which occur on an irregular basis are not usually included in the SDAPCD's summation of hourly and daily emissions. To ensure that dust from blasting does not add to dust from routine operations, all blasting would be conducted on Saturdays.~~

Updated Project PM_{10} Emission Inventory

In preparing its January 1996 inventory of PM_{10} emissions, AWR Engineering Group principally used air pollution emission factors published by the U.S. Environmental Protection Agency (USEPA) in the fourth edition of the *Compilation of Air Pollutant Emission Factors, AP-42, Volume I: Stationary Point and Area Sources*, most often simply known as AP-42, and control efficiencies from various sources. In January 1995, the USEPA released an updated revision of AP-42 (the fifth edition), which modified the emission factors for a number of the processes involved in the Project and renumbered most of the sections presenting the emission factors for these processes. On April 9, 1996, the SDAPCD issued a memorandum that detailed the methods to be used by the SDAPCD staff to calculate PM_{10} emissions from mineral operations *(Mineral Industry Emission Calculations Policy Re: Conveyor Transfer Points, Crushing Operations, Screening Operations, and Paved and Unpaved Haul Roads)*, which guidance implemented many of these updated AP-42 emission factors. Further, in December 1999 SDAPCD issued its *New Source Review Requirements for Best Available Control Technology (BACT), Guidance Document*, which updated BACT for several processes and revised the control factors to be used for several control technologies. Thus, although the project itself has not changed, the recognized techniques for estimating the project emissions and control of emissions of PM_{10} have been substantially revised by the federal and local agencies responsible for providing guidance on these issues.

Because of these updates in the techniques for estimating PM_{10} emissions from operations such as the project, EMA undertook a review of the AWR PM_{10} emission inventory to produce an updated PM_{10} emission inventory. Table 2.2 provides a summary of the updates made by EMA to update the AWR PM_{10} emission inventory (the project emission inventory presented in Appendix A to the EMA report (Appendix L hereto) provides additional information regarding each of these updates). In addition, EMA corrected some errors in the AWR inventory, and added in estimated emissions for blasting which were omitted from the AWR inventory. As a result of these updates and corrections to the AWR emission inventory, prior to the application of any mitigation measures, the calculated total Project on-site emissions of PM_{10} were reduced by about one-third, from 39.53 to 26.12 lbs per hour; from 288.8 to 199.87 lbs/day, and from 30.78 to 21.50 tons per year. Table 2.3 presents a system-by-system comparison of the PM_{10} emission inventory calculated by AWR with the updated emission inventory calculations.

Mitigated Project PM_{10} Emission Inventory

Mitigation Measures E-2 (requiring crushing operations to vent to fabric filters), E-8 (enclosing screens and secondary crushers), E-10 (pneumatic conveying of cement) and E-11 (asphalt plant baghouse) were already considered as part of the project in the AWR inventory. However, other listed mitigation measures identified in the Final EIR to further reduce the PM_{10} emissions of the project were not considered as part of AWR's PM_{10} emission inventory. To calculate and account for the effects of these mitigation measures, EMA prepared an additional "mitigated" PM_{10} emission inventory which considers the effects of these mitigation measures.

As required by Final EIR Mitigation Measures E-3, E-14 and E-15, as well as BACT (Final EIR Mitigation Measure E-18), PM_{10} emission reductions associated with the use of wet suppression control technology (water with added surfactant or enclosures with fogging sprays) were calculated for all crushed stone conveyor transfer points (both in the aggregate plant and to the aggregate transfer and load out fugitive emissions). Also, as required by Final EIR Mitigation Measures E-5 and E-7, PM_{10} emission reductions associated with watering of the unpaved roads and quarry equipment operation areas were also calculated. As a result of the implementation of these mitigation measures, the total project on-site emissions of PM_{10} were further reduced by approximately one-half from the updated values as follows: from 26.12 to 12.76 lbs per hour; from 199.87 to 92.99 lbs/day, and from 21.50 to 9.74 tons per year.

Table 2.4 presents a system-by-system comparison of the PM_{10} emission inventory calculated by AWR, the updated emission inventory calculations, and the mitigated emission inventory calculations. Nearly 72 percent of the PM_{10} reductions from the updated emission inventory result from the simple watering of the unpaved roads and quarry

equipment operation areas (Final EIR Mitigation Measures E-5 and E-7); 20 percent result from the application of wet suppression control to the aggregate plant process emissions (BACT [Final EIR Mitigation Measure E-18]); and slightly more than 8 percent result from the application of wet suppression control to the aggregate transfer and load out fugitive emissions (Final EIR Mitigation Measures E-3, E-14 and E-15).

Project Construction PM_{10} Emission Inventory

The AWR PM_{10} emission inventory was prepared strictly to estimate PM_{10} emissions from ongoing project operations, and did not attempt to estimate potential PM_{10} emissions which may occur during Project construction activities. Table 2.5 provides a summary of the estimated uncontrolled and controlled PM_{10} emissions which may result from surface disturbing activities during construction of the quarry, process area and on-site haul roads. Appendix C to the EMA report (Appendix L hereto) provides additional detail regarding this construction PM_{10} emission inventory. The maximum uncontrolled PM_{10} emissions from surface disturbing activities during construction were estimated at 188.98 lbs per hour, 1,457.43 lbs per day, and 27.07 tons per quarter, with nearly 80 percent of these PM_{10} emissions coming from fugitive dust generated by the haul trucks traveling on unpaved haul roads. However, with the implementation of a fugitive dust control plan, consisting principally of watering, PM_{10} emissions from construction can be reduced to an estimated maximum 30.63 lbs per hour, 217.88 lbs per day, and 3.58 tons per quarter.

Source		Pounds/Hour	Pounds/Day	Tons/Year
Process Emissions				
	Aggregate Plant	8.23		
	Asphalt Plant	4.36		
	Concrete Plant	0.39		
	Total:	12.98	95.1	10.13
Handling, Transfer & Storage Fugitive Emissions				
	Drilling	0.07		
	Quarry Handling	2.30		
	Aggregate Transfer	5.96		
	Wind Erosion	3.94		
	Total:	12.27	82.7	9.54
Haul Road Fugitive Emissions				
	Quarry	10.67		
	Aggregate Product	1.99		
	Raw Materials	0.37		
	Asphalt Product	0.64		
	Concrete Product	0.61		
	Total:	14.28	111.0	11.11
TOTAL PROJECT EMISSIONS:		39.53	288.8	30.78

NOTE: Aggregate Plant process operations, including quarry operations, assume 5,000 tons per day (equivalent to 8 hours per day of 625 tons per hour throughput) and 1,100,000 tons per year (equivalent to 220 days per year at 5,000 tons per day). Asphalt Plant operations assume 2,100 tons per day aggregate throughput (equivalent to 6 hours per day at 350 tons per hour aggregate throughput) and 420,000 tons per year aggregate throughput (equivalent to 200 days per year at 2,100 tons per day aggregate throughput). Concrete Plant operations assume 1,600 tons per day of mixed concrete output (equivalent to 8 hours per day of 200 tons per hour of mixed concrete output) and 270,000 tons per year of mixed concrete output (equivalent to, 1,350 hours per year (168.75 days per year) at 200 tons per hour (1,600 tons per day) of mixed concrete output). Aggregate Product Haul Road operations assume 5,000 tons per day (equivalent to 8 hours per day at 625 tons per hour throughput and 510,000 tons per year throughput (equivalent to approximately 2,320 tons per day for 220 days per year). The higher hourly and daily Aggregate Product Haul Road rate is conservatively set as equal to the crushed stone plant throughput. The lower annual Aggregate Product Haul Road rate is that which the facility can sustain on an annual basis, since over half of the aggregate produced by the crushed stone plant will be consumed by the concrete and asphalt plants.

SOURCE	SUMMARY OF UPDATES/CORRECTIONS
Process Emissions	
Aggregate Plant	Updated emission factors [consistent with SDAPCD Minerals Policy] for conveyor 4 and conveyor 8 transfer points, all crushing operations, and all screening operations.
	Updated control factors [consistent with SDAPCD Minerals Policy/SDAPCD NSR BACT] for crushing operations and screening operations.
	Correction to throughput of conveyor 4 (increase from 625 to 750 tons/hr)
Asphalt Plant	Correction of math error in emission calculation
Concrete Plant	Updated emission factors [consistent with EPA AP-42] for sand and aggregate transfer to elevated bins and cement unloading to elevated storage bins
	Updated PM_{10} partioning factors [consistent with SDAPCD Air Toxics Emission Guidance] for cement
	Updated control factors [consistent with SDAPCD Minerals Policy/SDAPCD NSR BACT]
Handling, Transfer & Storage Fugitive Emissions	
Drilling	Updated AP-42 emission factor
	Correction of math error
Blasting	Added factor from EPA AP-42 generally consistent with SDAPCD Minerals Policy
Quarry Handling	Decreased average wind speed in quarry
Aggregate Transfer	Eliminated duplicate emissions (stockpile transfer points already counted)
	Updated emission factors [consistent with SDAPCD Minerals Policy]
	Eliminated control factors [consistent with SDAPCD Minerals Policy and updated emission factors]
Wind Erosion	Applied correct emission factor (calculated only "inactive" wind erosion from the stockpiles, each for 365 days, since all other emissions associated with "active" days [loading of aggregate onto storage piles and equipment traffic in storage areas] were already calculated separately)
	Reduced emissive acres to actual areas of stockpiles
Haul Road Fugitive Emissions	
Quarry	No change
Aggregate Product	Updated control factor [consistent with SDAPCD Minerals Policy/SDAPCD NSR BACT]
Raw Materials	Updated control factor [consistent with SDAPCD Minerals Policy/SDAPCD NSR BACT]
Asphalt Product	Updated control factor [consistent with SDAPCD Minerals Policy/SDAPCD NSR BACT]
Concrete Product	Updated control factor [consistent with SDAPCD Minerals Policy/SDAPCD NSR BACT]

Source		AWR Emission Inventory			Updated Emission Inventory		
		lbs/hr	lbs/day	tons/yr	lbs/hr	lbs/day	tons/yr
Process Emissions							
	Aggregate Plant	8.23	65.80	7.25	6.3963	51.1700	5.6287
	Asphalt Plant	4.36	26.20	2.62	4.3200	25.9200	2.5920
	Concrete Plant	0.39	3.10	0.26	0.1937	1.5493	0.1307
	Total:	12.98	95.10	10.13	10.9099	78.6393	8.3514
Handling, Transfer & Storage Fugitive Emissions							
	Drilling	0.07	0.80	0.06	0.0500	0.4000	0.0440
	Blasting	0.00	0.00	0.00	#0.0000	#0.0000	0.2488
	Quarry Handling	2.30	18.40	2.02	0.9509	7.6072	0.8368
	Aggregate Transfer	5.96	47.70	5.25	1.7500	14.0000	1.5400
	Wind Erosion	3.94	15.80	2.21	0.0570	1.3688	0.2498
	Total:	12.27	82.70	9.54	2.8079	23.3760	2.6706
Haul Road Fugitive Emissions							
	Quarry	10.67	85.40	9.39	10.6638	85.3103	9.3841
	Aggregate Product	1.99	15.30	0.78	0.9386	7.5090	0.3830
	Raw Materials	0.37	1.50	0.14	0.1802	0.7434	0.0676
	Asphalt Product	0.64	3.90	0.39	0.3154	1.8923	0.1892
	Concrete Product	0.61	4.90	0.41	0.3004	2.4029	0.2027
	Total:	14.28	111.00	11.11	12.3984	97.8579	10.2266
TOTAL PROJECT EMISSIONS:		39.53	288.80	30.78	26.1162	199.8732	21.2487

Source		AWR Emission Inventory			Updated Emission Inventory			Mitigated Emission Inventory		
		lbs/hr	lbs/day	tons/yr	lbs/hr	lbs/day	tons/yr	lbs/hr	lbs/day	tons/yr
Process Emissions										
	Aggregate Plant	8.23	65.80	7.25	6.3963	51.1700	5.6287	3.7275	29.8200	3.2802
	Asphalt Plant	4.36	26.20	2.62	4.3200	25.9200	2.5920	4.3200	25.9200	2.5920
	Concrete Plant	0.39	3.10	0.26	0.1937	1.5493	0.1307	0.1937	1.5493	0.1307
	Total:	12.98	95.10	10.13	10.9099	78.6393	8.3514	8.2412	57.2893	6.0029
Handling, Transfer & Storage Fugitive Emissions										
	Drilling	0.07	0.80	0.06	0.0500	0.4000	0.0440	0.0500	0.4000	0.0440
	Blasting	0.00	0.00	0.00	#0.0000	#0.0000	0.2488	#0.0000	#0.0000	0.2488
	Quarry Handling	2.30	18.40	2.02	0.9509	7.6072	0.8368	0.9509	7.6072	0.8368
	Aggregate Transfer	5.96	47.70	5.25	1.7500	14.0000	1.5400	0.6563	5.2500	0.5775
	Wind Erosion	3.94	15.80	2.21	0.0570	1.3688	0.2498	0.0570	1.3688	0.2498
	Total:	12.27	82.70	9.54	2.8079	23.3760	2.9194	1.7142	14.6260	1.9569
Haul Road Fugitive Emissions										
	Quarry	10.67	85.40	9.39	10.6638	85.3103	9.3841	1.0664	8.5310	0.9384
	Aggregate Product	1.99	15.30	0.78	0.9386	7.5090	0.3830	0.9386	7.5090	0.3830
	Raw Materials	0.37	1.50	0.14	0.1802	0.7434	0.0676	0.1802	0.7434	0.0676
	Asphalt Product	0.64	3.90	0.39	0.3154	1.8923	0.1892	0.3154	1.8923	0.1892
	Concrete Product	0.61	4.90	0.41	0.3004	2.4029	0.2027	0.3004	2.4029	0.2027
	Total:	14.28	111.00	11.11	12.3984	97.8579	10.2266	2.8010	21.0786	1.7809
TOTAL PROJECT EMISSIONS:		39.53	288.80	30.78	26.1162	199.8732	21.4975	12.7563	92.9939	9.7408

NOTE: Aggregate Plant process operations, including quarry operations, assume 5,000 tons per day (equivalent to

8 hours per day of 625 tons per hour throughput) and 1,100,000 tons per year (equivalent to 220 days per year at 5,000 tons per day). Asphalt Plant operations assume 2,100 tons per day aggregate throughput (equivalent to 6 hours per day at 350 tons per hour aggregate throughput) and 420,000 tons per year aggregate throughput (equivalent to 200 days per year at 2,100 tons per day aggregate throughput). Concrete Plant operations assume 1,600 tons per day of mixed concrete output (equivalent to 8 hours per day of 200 tons per hour of mixed concrete output) and 270,000 tons per year of mixed concrete output (equivalent to 1,350 hours per year (168.75 days per year) at 200 tons per hour (1,600 tons per day) of mixed concrete output). Aggregate Product Haul Road operations assume 5,000 tons per day (equivalent to 8 hours per day at 625 tons per hour throughput and 510,000 tons per year throughput (equivalent to approximately 2,320 tons per day for 220 days per year). The higher hourly and daily Aggregate Product Haul Road rate is conservatively set as equal to the crushed stone plant throughput. The lower annual Aggregate Product Haul Road rate is that which the facility can sustain on an annual basis, since over half of the aggregate produced by the crushed stone plant will be consumed by the concrete and asphalt plants. (See Appendix B to Appendix L hereto.) Fugitive dust from material handling within the quarry has been estimated using only one-half of the average annual wind speed since the quarry is below grade and thus sheltered from the wind. "#" As blasting occurs only on weekend days when other operations are not emitting, blasting emissions are applicable and added only to the annual emission estimate.

Description	Maximum Emission Rates					
	Uncontrolled			Controlled		
	(lbs/hr)	(lbs/day)	(tons/qtr)	(lbs/hr)	(lbs/day)	(tons/qtr)
Haul Road Construction Emissions						
Haul Road Dozing/Ripping	16.5103	132.0828	0.6604	8.2552	66.0414	0.3302
Haul Road Construction Grading	0.7650	6.1200	0.0306	0.3825	3.0600	0.0153
Subtotal:	17.2753	138.2028	0.6910	8.6377	69.1014	0.3455
Quarry Construction Emissions						
Quarry Area Dozing/Ripping	16.5103	66.0414	1.3208	8.2552	33.0207	0.6604
Loader/Excavator Transfer to Haul Truck (Material Handling)	1.9164	15.3312	0.3066	1.9164	15.3312	0.3066
Truck Haul (Round Trip)	132.9352	1063.4816	21.2696	6.6468	53.1741	1.0635
Truck Dump	1.9164	15.3312	0.3066	0.9582	7.6656	0.1533
Dumped Material Dozing	16.5103	132.0828	2.6417	3.3021	26.4166	0.5283
Haul Road Maintenance Grading	0.7650	0.7650	0.0153	0.3825	0.3825	0.0077
Wind Erosion	1.0625	25.5000	0.5100	0.5313	12.7500	0.2550
Subtotal:	171.6162	1318.5332	26.3707	21.9924	148.7407	2.9748
Facility Construction Unpaved Road Emissions						
On-Site Light Vehicle Trips	0.0694	0.5553	0.0042	0.0035	0.0278	0.0002
Delivery Traffic	0.0174	0.1388	0.0010	0.0009	0.0069	0.0001
Subtotal:	0.0868	0.6941	0.0052	0.0043	0.0347	0.0003
TOTAL PROJECT EMISSIONS:	188.9783	1457.4300	27.0669	30.6344	217.8768	3.3206

Gaseous Emissions

The utilization of BACT methods were also assumed for predicting the gaseous emissions generated by the production of hot-mix asphalt (Table 12). These emissions are not expected to significantly increase the existing levels of these pollutants in the region. Although hot-mix asphalt production would result in the generation of nitrogen oxides which, when mixed with other pollutants in the presence of sunlight, result in ozone (the gaseous pollutant that already has levels exceeding the clean air standard), the project's off-site impact is very insignificant (Table 13).

Table 12. Gaseous Emission From Asphalt Plant

Pollutant	Stack Gas Conc. (PPM)	Maximum Pounds/Hour	Maximum Pounds/Day
Carbon Monoxide	200	24.5	147.8
Nitrogen Oxides	65	13.2	78.9
Sulfur Oxides	40	11.3	67.6

Emissions of gaseous pollutants from haul trucks can be estimated by using the current California Air Resources Board (ARB) emissions factors for heavy diesel trucks.

These emissions are:

Carbon Monoxide = 10.14 grams per mile
Nitrogen Oxides = 14.12 grams per mile
Sulfur Oxides = 0.55 grams per mile.

Table 13. Gaseous Emissions from Project Operations

Pollutant	Haul Trucks	Asphalt Plant	On-site Equipment	Total Project	All Sources County Wide
Daily Emissions (Pounds)					
CO	158.7	147.8	33.1	340.0	2,800,000
NO_X	221.0	78.9	176.0	476.0	440,000
SO_2	8.6	67.6	11.1	87.0	38,000
Yearly Emissions (Tons)					
CO	15.87	14.78	4.14	35.00	511,000
NO_X	22.10	7.89	22.00	52.00	80,300
SO_2	0.86	6.76	1.39	9.00	6,935

Total daily miles can be estimated from the daily haul truck trips (452) and mileage to the various destinations (17 miles to Escondido, 11 miles to Temecula, and 18 miles to Oceanside/Carlsbad) noted in Traffic/Circulation Section of this FEIR. The maximum miles traveled are estimated to be 7,100 miles per day.

These assumptions would yield a total of 158.7 pounds per day of carbon monoxides, 221.0 pounds per day of nitrogen oxides, and 8.6 pounds per day of sulfur oxides.

The daily and annual emissions of gaseous pollutants associated with plant operation, including those from quarry equipment and the asphalt plant, are presented in the Table 13, in comparison to county-wide pounds per day and tons per year emissions from all sources.

Under the Federal Clean Air Act of 1970, a comprehensive, basin-wide plan for attaining and maintaining air quality standards is required. The State Implementation Plan Revisions forecast the level of emissions anticipated in the future, including the planned growth of new sources. The San Diego Association of Government population projections were used for such forecast.

Since the Proposed Project does not, itself, create growth, but rather provides construction materials to support planned growth, it would not conflict with state and local air quality programs.

The impact of all project-related emissions is both local and regional in nature. The very fine particulate generated on the property, as well as the emissions generated by heavy-duty trucks traveling within the County, would be distributed throughout the San Diego Air Basin and add to the cumulative effects of pollution-generating activities within the region.

3. Summary of Impact Significance

Air quality impacts are significant but mitigable. All significant impacts would be mitigated to a level below significance with implementation of the mitigation measures identified herein, including Best Available Control Technologies and specific project design and features including enclosures, screens and filters.

With regard to this project's operational emissions of PM_{10}, the County of San Diego Board of Supervisors adopted a threshold of significance for air quality impacts of 100 pounds per day or 15 tons per year. This means that the project's combined operational emissions of PM_{10} (process, haul roads, and fugitive emissions) should be considered

significant if the total level of emissions from all sources exceeds 100 pounds per day.[1]

Based upon the updated PM_{10} emissions inventory discussed above and presented in Table 2.3, the project's combined operational PM_{10} emissions from all sources, prior to the application of all mitigation measures, exceed 100 pounds per day and 15 tons per year. Therefore, the operational impacts of the project are considered potentially significant, but mitigable.

Construction impacts to air quality are temporary, and are frequently measured against longer term thresholds of significance than operational impacts. Consistent with the guidance provided by the South Coast Air Quality Management District, combined construction emissions of PM_{10} from surface disturbing activities will be considered significant if the total emissions exceed 4.5 tons per quarter (calculated by multiplying the operational threshold of 100 pounds per day times 90 days per quarter, and converting to tons). Based upon this threshold, the unmitigated impacts of construction are also considered potentially significant, but mitigable.

4. Mitigation Measures

The following operational requirements, which appear as notes on project plans and/or assumptions in the technical report as Best Available Control Technology, represent current SDAPCD standards and shall be followed in project operations. Monitoring and compliance with these operational techniques are included in the Mitigation Monitoring program for the project. Implementation of the following air pollution control measures, together with SDAPCD permitting requirements would adequately mitigate potential air quality impacts.

E-1. As a condition of operation, no blasting shall take place when wind velocity equals or exceeds 15 miles per hour. A licensed blasting contractor shall determine wind speed through the use of an anometer located a minimum of 10 feet above ground level near the on-site project office.

E-2. As a condition of operation, dust emissions from all crushing operations shall be controlled by venting to a fabric filter system.

E-3. As a condition of operation, stockpiles of sand shall be kept moist or shall be watered before reaching transfer points.

E-4. As a condition of operation, visible emissions from transfer points shall not exceed 20 percent opacity at any time.

E-5. As a condition of operation, unpaved haul roads will be chemically stabilized to minimize dust emissions to below the requirements of APCD Rule 50 (20 percent opacity). In lieu of chemical stabilization, watering of haul roads at least every two hours will be required.

E-6. Initial clearing of areas to be minded, including removal an stockpiling of topsoil, shall be accompanied by surface watering to control dust generation.

E-7. As a condition of operation, the area traversed by the quarry equipment shall be watered two times a day (once prior to commencing work in the morning and once at mid-day).

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[1]/ The threshold of significance for PM_{10} (100 pounds per day or 15 tons per year) adopted by the County for this project is conservative in that it is sometimes used as a prohibitive regulatory standard for *process PM_{10} emissions only*. Here, in order for the project's *combined* PM_{10} emissions to be considered less than significant, they must be less than 100 pounds per day or 15 tons per year. Moreover, this threshold is comparable with the thresholds of significance for CEQA purposes established by other counties and air districts. For example, the Sacramento Metropolitan Air Quality Management District has adopted a CEQA threshold of significance for total project emissions of PM_{10} of 275 pounds per day. (Air Quality Thresholds of Significance, Sacramento Metropolitan Air Quality Management District, (1st ed. 1994).) Likewise, the South Coast Air Quality Management District's CEQA threshold of significance for total project operational emissions of PM_{10} is 150 pounds per day. (South Coast AQMD Air Quality Analysis Guidance Handbook.)

E-8. As a condition of operation, screens and secondary crushers would be fully enclosed except for the openings necessary to accommodate the conveyor belts.

E-9. As a condition of operation, other dust control methods, as necessary, must be applied to any dust-producing condition which may develop at the borrow pit, which would result in a nuisance from this operation (APCD Rule 51).

E-10. As a condition of operation, the transfer of cement shall be only by pneumatic conveying. There shall be no leaks of cement dust to the atmosphere anywhere within the transfer system.

E-11. As a condition of operation, the hot-mix asphalt plant shall have a fabric filter (baghouse) system.

E-12. As a condition of operation, covers for hot-oil storage tanks must be kept in place unless the tanks are being filled. The condenser system for fugitive blue-smoke emissions shall be fully operational.

E-13. As a condition of operation, the temperature of batched hot-mix asphalt shall not exceed 330° F.

E-14. As a condition of operation, loading bins shall be closed.

E-15. As a condition of operation, water sprays shall be used during the loading/unloading operations for aggregate and stockpile materials, if visible emissions are present.

E-16. As a condition of operation, quarry operations shall shut down when wind speed exceeds 20 miles per hour as determined by an on-site anemometer.

E-17. As a condition of operation, only unleaded gasoline and diesel fuel containing less than 0.05 % sulfur shall be used in the on-site equipment.

E-18. As a condition of operation, the project shall comply with all APCD rules and regulations applicable to new quarry operations, including APCD Rule 20.2.

All of these measures are still recommended. The applicant has agreed to implement these measures. Some, including Mitigation Measures E-2 (requiring crushing operations to vent to fabric filters), E-8 (enclosing screens and secondary crushers), E-10 (pneumatic conveying of cement) and E-11 (asphalt plant baghouse), were already considered as part of the project in the AWR inventory. As discussed above, however, other listed mitigation measures to further reduce the PM_{10} emissions of the project were not considered by AWR as part of the PM_{10} emission inventory. The mitigated project PM_{10} emission inventory presented in Table 2.4 considered the effects of these mitigation measures as follows:

- Mitigation Measures E-3, E-14, E-15 and E-18 - wet suppression control technology (water with added surfactant or enclosures with fogging sprays) for all crushed stone conveyor transfer points (both in the aggregate plant and to the aggregate transfer and load out fugitive emissions); and

- Mitigation Measures E-5 and E-7 - water of the unpaved roads and quarry equipment operation areas.

Accounting for the implementation of these mitigation measures, the total project on-site process and fugitive emissions of PM_{10} are reduced to 92.99 lbs/day and 9.74 tons per year.

Mitigation Measure E-6 requires surface watering during initial clearing or areas to be mined, including removal and stockpiling of topsoil. Implementation of this mitigation measure, as well as those listed above, as applicable during construction activities, result in PM_{10} emissions of 3.58 tons per quarter.

5. Summary of Impacts After Mitigation

~~Based on the use of these air pollution control techniques which would control emission below threshold levels~~

~~considered significant by APCD (i.e., 100 pounds/day of process PM_{10} emissions), no significant air quality impacts would result from the project as proposed.~~

Based upon the calculations of the updated project combined operational PM_{10} emissions inventory (as discussed above and presented in Table 2.3), the project's operational PM_{10} emissions, without mitigation, exceed both the 100 pounds per day and 15 tons per year significance thresholds. However, following the implementation of the recommended mitigation measures (see Table 2.4), the total project operational on-site process, fugitive and haul road emissions of PM_{10} are reduced to 92.99 lbs/day and 9.74 tons per year, which both now fall below the 100 pounds per day and 15 tons per year significance thresholds. Further, construction PM_{10} emissions are reduced to 3.58 tons per quarter through the implementation of the recommended mitigation measures (see Table 2.5), which is also below the 4.5 tons per quarter significance threshold. Thus, with the application of the recommended mitigation measures, all air quality impacts of the project are below the level of significance, and there are no residual significant effects.

0090557.001

ATTACHMENT 3
Revised Exhibit 10-2

Exhibit 10-2 (Revised 9/30/08)

Rosemary's Mountain Quarry
Palomar Aggregates Inc.
Valley Center, San Diego County

Mitigated/Controlled Emission Estimates

Emissions per "Air Quality Portion of Final Environmental Impact Report" dated November 30, 2000 from San Diego County, Mitigated Emission Inventory (pg. 11), Table 12 (pg .13), and Table 13 (pg.14)

Asphalt Plant

Pollutants	Emission Estimates				
	(lb/hour)	(lb/day)	(lb/day) 8 am - 4 pm	(lb/year)	(ton/year)
NOx	13.2	78.9	78.9	15,780	8
CO	24.5	147.8	147.8	29,560	15
VOC					
SO2	11.3	67.6	67.6	13,520	7
PM10	4.32	25.92	25.92	5,184	2.592

Process Emissions (not including Asphalt Plant)

Pollutants	Emission Estimates				
	(lb/hour)	(lb/day)	(lb/day) 8 am - 4 pm	(lb/year)	(ton/year)
NOx	22.00*	176.0	176.0	44,000	22.00
CO	4.14*	33.1	33.1	8,280	4.14
VOC					
SO2	1.39*	11.1	11.1	2,780	1.39
PM10	3.9212	31.3693	31.3693	6,822	3.4109

*Assumes an 8 hour work day

Handling, Transfer, & Storage Emissions (fugitive)

Pollutants	Emission Estimates				
	(lb/hour)	(lb/day)	(lb/day) 8 am - 4 pm	(lb/year)	(ton/year)
PM10 (no wind erosion inc.)	1.6572	13.257	13.257	3,414	1.7071
PM10 (wind erosion only)	0.0570	1.3688	0.456	500	0.2498

Haul Road "Gaseous Emissions" and Fugitive PM

Pollutants	Emission Estimates				
	(lb/hour)	(lb/day)	(lb/day) 8 am - 4 pm	(lb/year)	(ton/year)
NOx	27.63*	221.0	221.0	44,200	22.10
CO	19.84*	158.7	158.7	31,740	15.87
VOC					
SO2	1.08*	8.6	8.6	1,720	0.86
PM10	2.801	21.0786	21.0786	3,562	1.7809

*Assumes an 8 hour work day

ATTACHMENT 4

Revised Exhibit 39-1 (Parry's tetracoccus Conceptual Mitigation Plan)

Parry's Tetracoccus
Conceptual Mitigation Plan

Orange Grove Project,
San Diego County, California

August 2008
(revised September 2008)

Prepared for:
Orange Grove Energy, L.P.
1900 East Golf Road, Suite 1030
Schaumburg, Illinois 60173
(847)908-2800

Prepared by:

TRC
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EXECUTIVE SUMMARY

This Conceptual Mitigation and Monitoring Plan (Conceptual Plan) outlines appropriate revegetation measures to mitigate for impacts to Parry's tetracoccus (*Tetracoccus dioicus*) that will result from implementation of the proposed Orange Grove Energy Project (Project). The approximately 8.5-acre project site (Site) is located within a larger, approximately 202-acre property (Property), owned by San Diego Gas and Electric (SDG&E) west of the unincorporated community of Pala in rural northern San Diego County, California.

Approximately 8.3-acres of the 8.5 acre Site will be graded for Project development. The majority of the proposed Site occupies a former citrus grove. However, a small, approximately 0.2-acre area of disturbed habitat is located within in the northwestern portion of the Site where 23 Parry's tetracoccus individuals have been mapped and recorded. It is anticipated that all 23 individuals will be directly impacted by the proposed Project. To mitigate for these impacts to Parry's tetracoccus, the Project applicant is proposing to establish approximately 23 Parry's tetracoccus individuals in an approximately 0.09-acre mitigation area in the northern corner of the Site.

This Conceptual Plan includes the restoration implementation strategy for compensatory mitigation of 23 Parry's tetracoccus individuals on a 0.09 acre portion of the Site. The primary goal of this Conceptual Plan is to ensure appropriate mitigation for impacts to Parry's tetracoccus. Achievement of the performance criteria described herein would create suitable habitat for Parry's tetracoccus and occupation of the site by this species is a requirement for successful mitigation of project related impacts to this species.

This Conceptual Plan presents information on project location and work descriptions, project impacts, proposed mitigation, planting recommendations, maintenance recommendations, monitoring methodology and revegetation success criteria.

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1.0 INTRODUCTION

The primary purpose of this document is to provide site-specific recommendations for meeting the success criteria for mitigating impacts to Parry's tetracoccus that are associated with the construction of the proposed Project. Mitigation for construction impacts to Parry's tetracoccus shall be provided through successful transplanting or revegetation, preservation and management of an equal number of individuals in a native habitat suitable for Parry's tetracoccus within an onsite area. This plan solely addresses revegetation and enhancement of upland habitat suitable for Parry's tetracoccus within the onsite preserve area and should be implemented under the project biologist's discretion in order to meet the applicable success criteria established in Section 6.1 of this plan below.

The habitat restoration and enhancement program for the mitigation area is designed to provide for long-term suitable habitat for use by a the impacted species, which are found in coastal sage scrub habitats in San Diego County. This plan was prepared by TRC to facilitate review of the proposed Project by the California Energy Commission (CEC).

1.1 PROJECT DESCRIPTION

The proposed Project consists of the construction of a 96 megawatt (MW) electric generating plant within the approximately 8.5 acre Site, an approximately 0.3 mile underground electric transmission line interconnection between the Site and the existing Pala substation, an approximately 2.4-mile natural gas pipeline lateral which will connect the Site to an existing SDG&E regional gas transmission main, fresh water pickup station where water trucks will be filled from an existing Fallbrook Public Utility District (FPUD) water main for hauling to the Site, a reclaimed water pickup station where water trucks will be filled at an existing FPUD water reclamation plant for hauling to the Site and Pala substation upgrades as required for interconnection and transmission to the Pala substation agreed upon by the California Independent System Operator (CAISO) and SDG&E.

The Project will supply SDG&E with new generating capacity to support reliability within the service territory. Orange Grove Energy will operate the plant which will employ up to 9 full-time onsite staff. Natural gas fuel will be supplied by SDG&E and electric power generated by the plant will be supplied to SDG&E under a tolling agreement.

1.2 Project Location (Impact Site)

The Site is located off of State Route (SR) 76 approximately 3.5 air miles northeast of Interstate 15 (I-15) (Figure 1). The Site occurs on portions of the southwest ¼ of the southeast ¼ of Section 29 and the northwest ¼ of the northeast ¼ of Section 32, in Township 9 South, Range 2 West. The Site occurs on Assessor's Parcel Number (APN) 110-072-26 which is owned by SDG&E (Figure 2).

The Site is located in rural north San Diego County about 5.0 miles east of the City of Fallbrook and approximately 2.0 miles west of the unincorporated community of Pala (Figure 3). The Site

occurs at a mean elevation of approximately 400 feet above mean sea level (AMSL) on a gently sloping alluvial fan. The Site does not have any undisturbed natural habitat within the proposed Project impact areas. The majority of the Site has been used for agriculture and is occupied by a former citrus grove. A fenced SDG&E storage area occurs just south of the Site on the adjacent parcel and is an area that is anticipated to be used as a temporary construction laydown area.

North of the Site, the ground slopes uphill to a ridgeline that surrounds the Site to the northeast, north and west at elevations of up to 1,700 feet AMSL. The ridgeline and other local terrain prevent views of the Site from any substantial distance. The area is not visible from any regional population center or major transportation corridor such as I-15 which is approximately 3 miles to the west.

1.3 Location of Mitigation Area

The centroid of the mitigation site is located at approximately 33°21'37.26"N and 117° 6'39.29"W within the northern corner of the 8.5-acre Project Site (Figure 4). Regional access to the mitigation site is the same as to the proposed Project Site.

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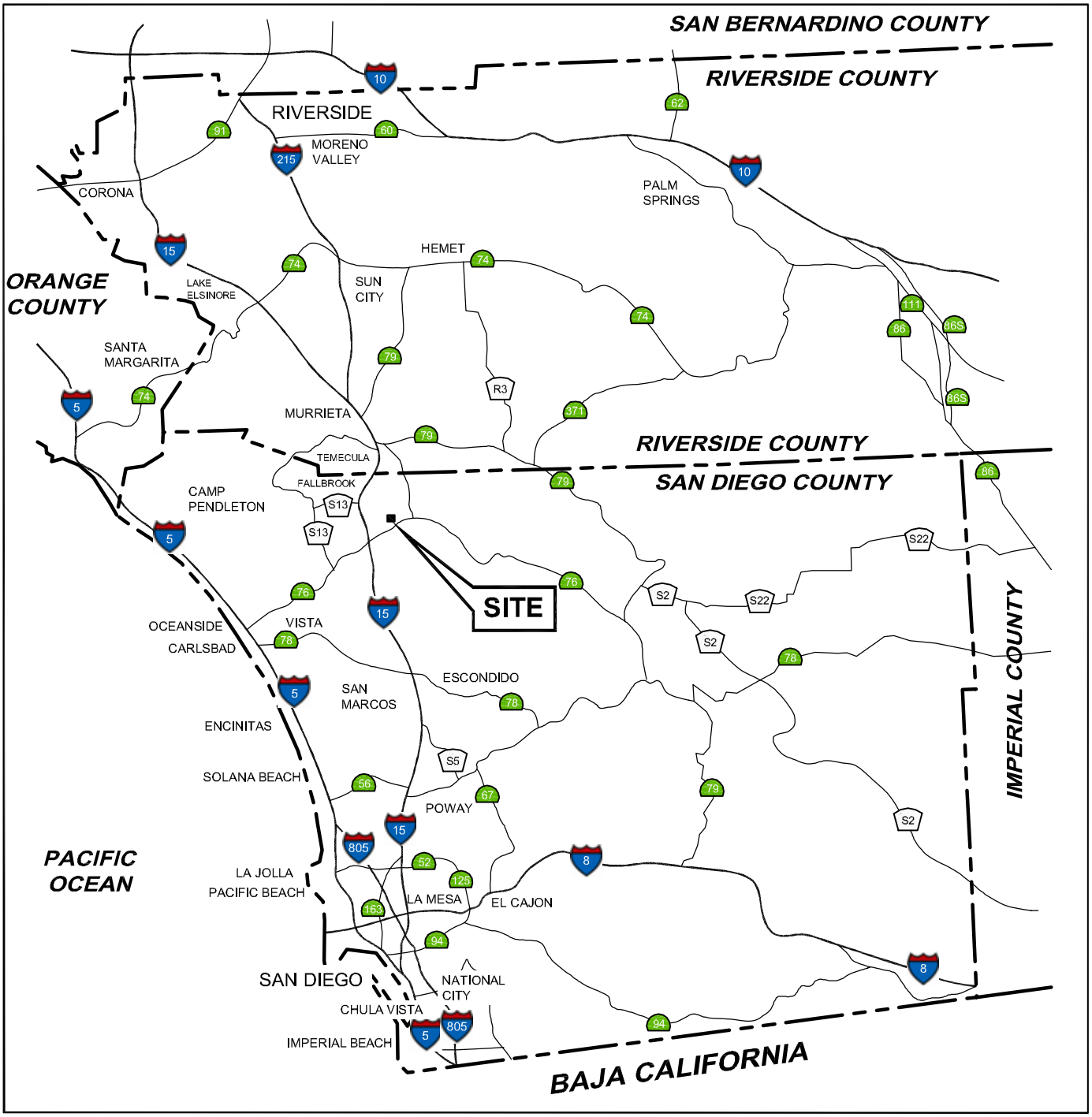

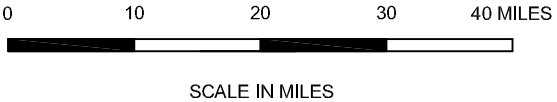

TRC	PROJECT: 125158	PROJECT OVERVIEW MAP
	FACILITY: ORANGE GROVE PROJECT SAN DIEGO COUNTY, CALIFORNIA	FIGURE 1

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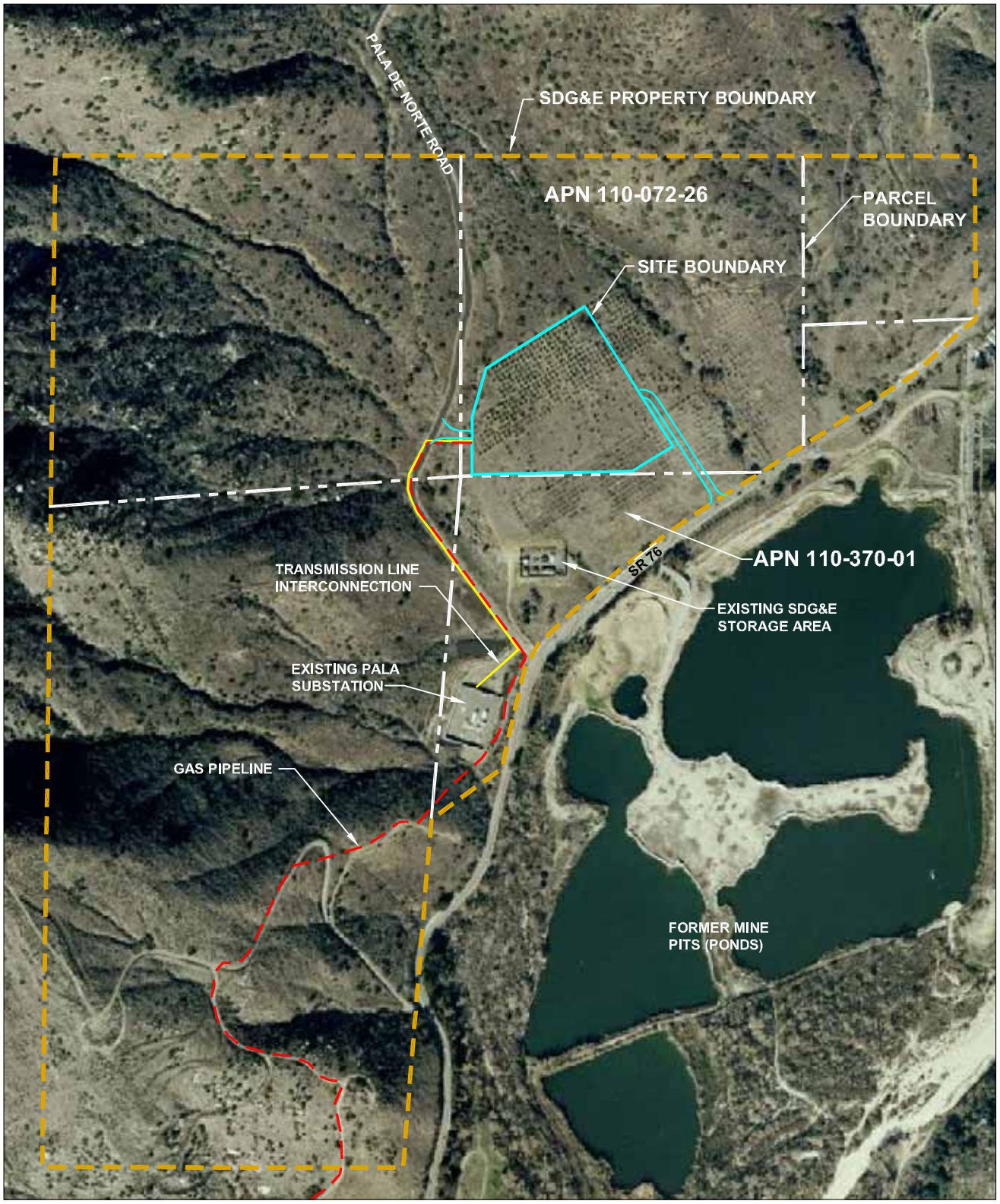

SOURCE:

Virtual Earth, 2006.

APPROXIMATE SCALE (FEET)

0 600 1200

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TRC

PROJECT: 125158

FACILITY:

ORANGE GROVE PROJECT
SAN DIEGO COUNTY, CALIFORNIA

PROJECT VICINITY MAP

FIGURE 2

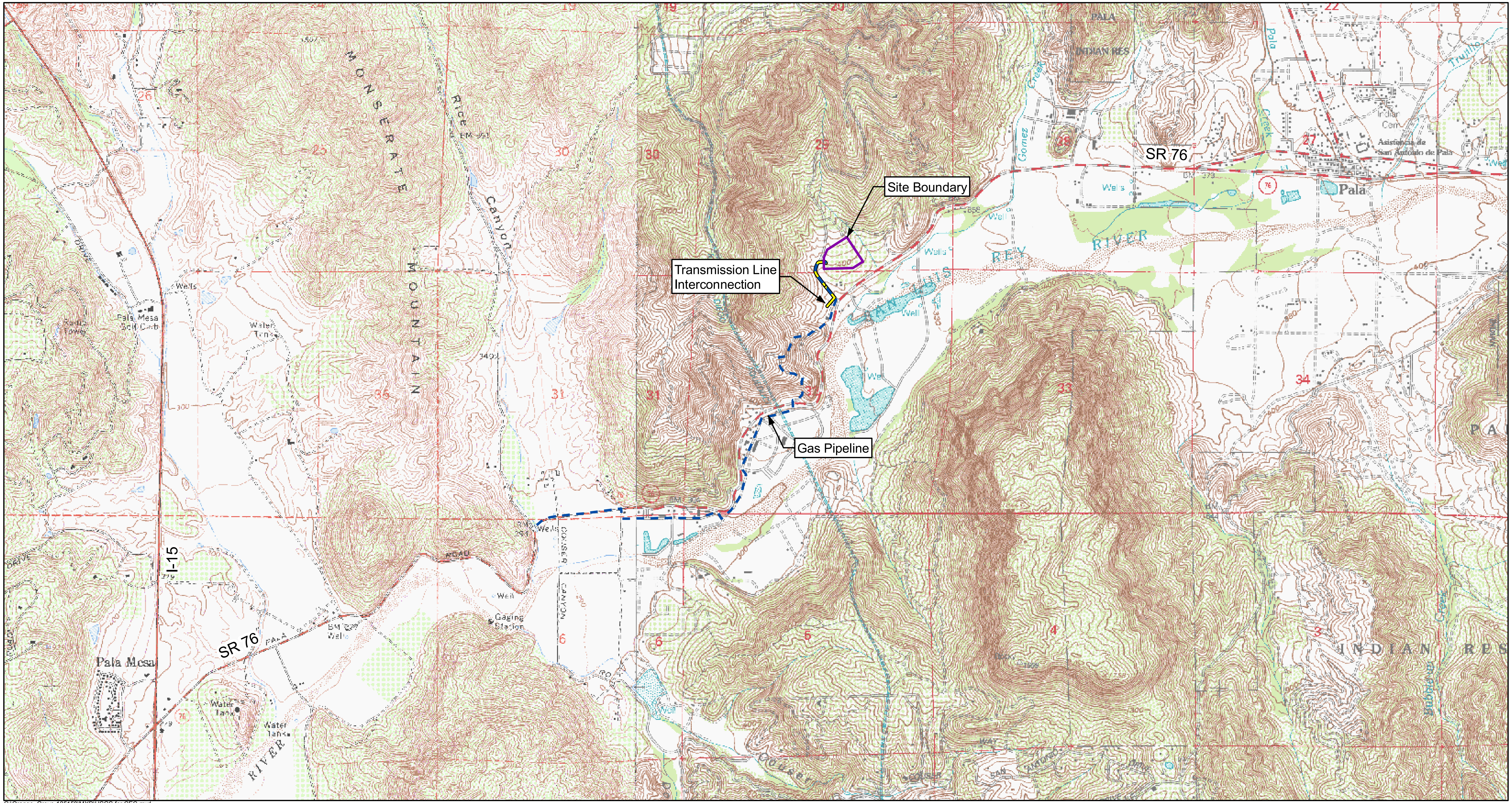

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Figure 3

Project Location
Orange Grove Project
San Diego County, CA

1" = 2,000'

2,000 1,000 0 2,000 4,000 6,000 Feet

Source:
USGS Topographical Quardrangles:
Pala, Bonsall

TRC

N
W
E
S

Pala del Norte Rd.

Mitigation replanting area for
23 Parry's Tetraccocus in stand #2

Site Location

SR 76

Existing Storage Area

Existing Pala Substation

Parry's Tetracoccus Stands (from 2007 & 2008 survey data)

Site Boundary

Underground Electrical Transmission Line

Parry's Tetracoccus Mitigation Area

Fuel Modification Zones

Limit of Disturbance

Proposed Natural Gas Pipeline

Source:
Aerial Photography from ESRI_Imagery_World_2D

1" = 200'

0 100 200 400 600
Feet

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Figure 4

Proposed Parry's tetracoccus Mitigation Site

Orange Grove Project

TRC

2.0 MITIGATION SITE EXISTING CONDITIONS

2.1 SITE DESCRIPTION/GENERAL CONDITIONS

The mitigation area is located within the northern corner of the Site at the edge of an area that is a former citrus grove. The site is adjacent to existing live oak woodland to the immediate north, nonnative grassland to the east, coastal sage scrub habitat to the west and an existing SDG&E storage yard and Pala substation to the south. A gravel mining facility within the San Luis Rey River is located on the south side of SR 76.

The site is characterized by being on a gently sloping alluvial fan of Las Posas series soil with some gabbro soil inclusions. Elevations on site range from approximately 440 feet AMSL in the northern portion of the site to approximately 360 feet AMSL near SR 76.

2.2 GENERAL BIOLOGICAL RESOURCES

Surveys of the Site were conducted on March 14 and June 20, 2007 and February 7 and 12, 2008. In addition, a general botanical survey was conducted May 19 to 22, 2008. The mitigation site is located within an area that was a former orchard. The orchard has not been irrigated for at least 5 years and is no longer viable as an orchard. Most of the orchard's trees have not yet been cut or removed from the Site. Vegetation found in the orchard understory and between trees consists of non-native grasses and herbaceous broadleaf species, similar those found in the non-native grassland. Since the Site has not been maintained, a few individuals of coastal sage shrub species have established within the Site.

2.3 SOILS

Las Posas Stony Fine Sandy Loam 9-30% Slope (LrE) is the dominant soil type within the Site and mitigation area. Las Posas series consists of well drained, moderately deep stony fine sandy loams with a clay subsoil (Bowman, 1973). They occur on moderately sloping to steep uplands under chaparral or grass-oak vegetation. Las Posas soils have massive, hard, reddish brown, slightly acid, fine sandy loam or loam A horizons low in organic matter (<1%). They have dark reddish brown to dark red, neutral, heavy clay loam or clay Bt horizons (National Cooperative Soil Survey, 1964).

Steep Gullied Land (StG) is present in the western portion of the Site but not within the mitigation area. This series consists of strongly sloping to steep areas that are actively eroding into old alluvium or decomposed rock (Bowman, 1973).

2.4 SENSITIVE BIOLOGICAL RESOURCES

Focused surveys were conducted for the Project for potentially occurring sensitive species. One sensitive plant species was detected within the proposed impact area for the Project. Sources used for determination of sensitive biological resources are as follows: for wildlife, US Fish and Wildlife Service (USFWS 2000), California Department and Fish and Game (CDFG 2005a,c), Murphy (1990); for plants, USFWS (2000), CDFG (2005b,c), and California Native Plant Society (CNPS, 2001) including any revisions provided on http://www.cnps.org/inventory (Accessed August 2008); and for habitats, Holland (1986).

2.5.1 Sensitive Plant Species

One regionally sensitive plant species, Parry's tetracoccus (Picrodendraceae, formerly Euphorbiaceae), was detected within and adjacent to the proposed Project area. This species does not have any federal or state sensitivity status but is listed by CNPS as a List 1B.2 species. This designation by CNPS means that the organization considers this species to be rare, threatened or endangered in California and elsewhere.

2.5.2 Sensitive Wildlife Species

No sensitive wildlife were found near the proposed mitigation site.

2.5.3 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the immigration and emigration of animals. Habitat linkages may function as wildlife corridors for some species and permanent habitat for others. Wildlife corridors and habitat linkages assure the continual exchange of genes between populations, provide access to adjacent habitat areas for foraging and mating; allow for a greater carrying capacity, and provide colonization routes following local population extinctions or habitat recovery from ecological catastrophes (*e.g.*, fires).

The Site does not function as a viable wildlife corridor or habitat linkage as it is a non-viable citrus grove previously used for agricultural purposes. The San Luis Rey River functions as the major wildlife corridor and habitat linkage in the vicinity of the proposed Project area, located south of all project disturbances. The Site has minimal potential to contribute as a "stepping-stone" for dispersal of wildlife to the San Luis Rey River from naturally occurring habitats to the north of the Site.

2.5 EXISTING BIOLOGICAL FUNCTIONS AND VALUES

The area proposed for Paerry's tetracoccus mitigation currently provides relatively low wildlife function and value as it is an open area at the northern corner of the proposed Site within a former citrus grove. It totals approximately 0.09 acre and is sparsely vegetated, and located adjacent to coastal sage scrub habitat where the dominant plant species are native plant species found throughout San Diego County.

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3.0 MITIGATION PROGRAM

As previously stated, construction of the proposed Project will result in permanent impacts to a total of 23 Parry's tetracoccus individuals. Mitigation for the loss of these 23 individuals will be provided by the establishment of approximately 23 Parry's tetracoccus individuals (100 percent of the impacted amount) within the 0.09 acre onsite mitigation area (Figure 4). A total of at least 26 individuals will initially be planted (10 percent overplanting) to help facilitate the goal of establishing at least 23 successful individuals.

This Conceptual Plan includes the restoration implementation strategy for compensatory mitigation for impacts to 23 Parry's tetracoccus individuals and this plans use, in whole or in part, is within the project biologist's discretion so that the success criteria can be obtained in the most feasible and cost-effective manner.

3.1 MITIGATION AREA GOALS AND OBJECTIVES

The goal of the Conceptual Plan is to ensure mitigation for impacts to Parry's tetracoccus caused by the implementation of the proposed Project. Occupation of the site by species other than Parry's tetracoccus is not a requirement for successful completion of the mitigation as outlined in the Conceptual Plan.

3.2 HABITAT TO BE ESTABLISHED

The mitigation program for the proposed Project does not require the establishment of any habitats to be considered successful. However, proposed habitat creation and enhancement will provide habitat functions.

Mitigation implementation for the 0.9 acre area will begin with exotic vegetation and weed removal, installation of a temporary irrigation system, and planting of Parry's tetracoccus container stock. To help to ensure success with the mitigation program, the removal of exotic invasive species will occur within the mitigation site boundaries.

3.3 REVEGETATION MATERIALS

Plant materials for the mitigation planting should include container stock of Parry's tetracoccus derived either from cuttings or grown from seed. The cuttings and seeds should be collected in

the fall 2008 considering the anticipated construction startup in Spring 2009. Implementation of this Conceptual Plan should be coordinated among a qualified habitat restoration contractor, the project biologist, and the nursery providing the plant materials from appropriate nursery stock. Plant material may be propagated from Tree of Life Nursery in San Juan Capistrano, Las Pilitas Nursery in Escondido, El Nativo Nursery in Azusa, Matilija Nursery in Moorpark, or an alternative source approved by the project biologist.

Standard planting procedures should be employed for installing container stock. Planting holes should be approximately twice the width of the rootball and as deep. If dry soil conditions exist at the time of plant installation the planting holes should be filled with water and allowed to drain immediately prior to planting. Backfill soil should contain no amendments or fertilizers unless recommend by the results soil tests and project biologist recommendations.

Appropriate timing of planting will limit the need for supplemental watering and will increase the survival of the plants. The best survival rates are generally achieved when container plants and seed are installed between November 15 and 15 April. Planting and seeding at the site should be timed to take advantage of seasonal rainfall patterns and should be accomplished no later than early spring. In order to obtain the goal of establishment of 23 plants (the impact amount), an overplanting of 10% will be conducted so that 26 individual plants will be installed.

3.4 PROTECTION OF SITE

The mitigation area will be located on a portion of the 8.5 acre project Site that will be leased by Orange Grove Energy for a period of 25 years and Orange Grove Energy will preserve the mitigation area throughout this period in conjunction with the project. Signs will be placed around the mitigation area indicating it is an "Environmentally Sensitive Area" further protecting the area. The signs will also indicate that unauthorized persons should stay out of the area.

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4.0 IMPLEMENTATION PLAN

The following program describes recommended implementation measures for the creation and enhancement of the desired upland habitat and establishment of Parry's tetracoccus. The project biologist shall be free to implement any of these, or additional implementation measures as appropriate in order to meet applicable success criteria.

4.1 RATIONALE FOR EXPECTING SUCCESS

The following factors were considered in the development of this plan and are expected to contribute to the anticipated success of the proposed mitigation program. Locations for restoration on the mitigation site are adjacent to viable and self-sustaining stands of the impacted species indicating correct environmental conditions to support the species. This plan recommends the use of temporary irrigation to promote establishment and survival of Parry's tetracoccus. Invasive non-native weeds that could displace desirable native plant species within the mitigation site should be removed and controlled. If possible, Parry's tetracoccus should be propagated by cuttings or from seed collected from the individuals that will be impacted by implementation of the proposed Project in order to maintain genetic integrity and increase the potential for long-term success. Otherwise, plant materials should be acquired as indicated in Section 3.3 of this plan. Testing of the soil within the mitigation site is recommended prior to any planting or seeding activities occurring within the mitigation area to ensure that the citrus grove and agricultural practices utilized during its time as a production crop has not adversely affected the soil which could hamper the establishment of Parry's tetracoccus within the mitigation site. If the soil is found to have nutrient deficiencies or chemical residues from the prior agricultural activities a certified soil scientist should be contracted to rectify the problem(s) prior to commencement of any planting or seeding activities.

4.2 PRELIMINARY SCHEDULE

Upon appropriate approvals, implementation of the revegetation program is anticipated to begin in the Fall 2009, when cuttings and/or seedling container stock is deemed mature enough to survive transplanting to the mitigation site, or suitable container stock is available from other sources. Considering the project schedule to begin construction in Spring 2009, cuttings and seeds should be collected in Fall 2008. Updates to this schedule will be provided to all parties involved in the mitigation plan, as necessary (Table 1).

TABLE 1
Preliminary Mitigation Schedule

Task	Date
Collect cuttings/seeds from site	Fall 2008
Site Clearing & Soil Preparation/ Perimeter Exotic Removal	Fall 2009 or at the completion of the avian breeding season in 2009
Installation of temporary irrigation system	Fall 2009 following site clearing and soil preparation
Weed/exotic removal and grow-kill cycles	Fall 2009 following site preparation if applicable
Planting container stock	Early Winter 2009 when site preparation is complete
Hydroseed Application	Winter 2009-10 following planting of Parry's tetracoccus container stock
Completion of installation/assessment of site installation and perimeter invasive control	Following completion of construction and 120-Day PEP
5-year biological monitoring and maintenance	To begin upon successful completion of the 120-Day PEP
Final sign-off	2015 at the end of year five monitoring and maintenance period

4.3 SITE PREPARATION

The landscape contractor should be responsible for site preparation which includes invasive weed species removal and soil preparation. Before restoration work begins, the limit of work boundary should be delineated and staked to ensure that the contractor stays within the limit of work and the proper acreage is revegetated. Clearing of trees and shrubs and mitigation site preparation should be performed outside the migratory bird nesting season (generally March 15 to August 30), where feasible. However, if vegetation removal does occur during this time period, appropriate bird surveys should be performed in accordance with applicable State and Federal law.

During site preparation, all invasive weed species, (*i.e.* artichoke thistle, fennel, pampas grass, black mustard, tocalote, castor bean, brome grasses etc.) should be removed or treated within the mitigation area. The initial weed control effort could involve chemical and/or mechanical treatment of non-native broadleaved species, such as tocalote, fennel, and black mustard in the mitigation area. Prior to the installation of native seed and container plants "grow and kill" weed removal treatments could be conducted by the landscape contractor by activating an irrigation system over an approximately two-week period to encourage non-native seedling emergence. When weeds have begun to grow a foliar application of an appropriate systemic herbicide could be applied to kill target weeds. Additional cycles could be required as recommended by the project biologist. Any herbicide application should be conducted in accordance with label instructions under the direction of a state-certified and qualified pesticide applicator.

Application of herbicides in this manner can be very effective in the removal of invasive exotic plant species; however, sloppy or imprecise application of herbicides can negatively impact desired native plant species within and immediately adjacent to the mitigation area.

Soil testing should be conducted to determine the exact chemical properties of the soil to determine if the site possesses the appropriate components to support Parry's tetracoccus. If the existing soil chemistry is not suitable for Parry's tetracoccus proposed to be applied to the mitigation site the soil, the project biologist should determine if the site needs to be amended with soil conditioners or if the site needs to be compacted or decompacted to reflect naturally occurring soil conditions within the general vicinity of the mitigation area. Soil samples could be collected by the project biologist and/or maintenance contractor and laboratory analysis could be conducted to evaluate existing soil conditions in the mitigation area. Data collected from soil samples would dictate appropriate amendments which could be added to the mitigation area, the possibility of soil leaching, or whether mechanical soil preparation is needed.

Excessive soil compaction or limited soil fertility may require areas to be mechanically treated. Treatment may require portions of the mitigation area to be mechanically ripped to a depth of approximately 18 inches. Soil fertility may require the ripped soil to be treated with appropriate soil amendments to make the soil suitable for installation of native plant species. Following soil manipulation and/or addition of amendments the surface of the soil should be fine graded to best accept container plant installation and application of seed by hydroseeding or imprinting. BMPs shall be incorporated as an erosion control measure where applicable. Soil amendments may also be added to the hydroseed slurry if recommended by the project biologist.

4.4 MITIGATION AREA EXOTIC REMOVAL

To ensure the long-term success of the mitigation area the landscape contractor should be responsible for the removal and follow up treatment of target invasive exotic weed species within the mitigation area. Invasive weed removal would include the one time removal and follow-treatments of exotic weeds through the Project's 120-Day plant establishment period (PEP). Invasive weed species which would require treatment includes pampas grass, castor bean, artichoke thistle and fennel. Success of the perimeter invasive exotic treatments is predicated on eliminating the reoccurrence of target weed seedlings. The project biologist may recommend additional treatments to control persistent invasive plant species within the mitigation site. Timing restrictions due to the avian nesting season, treatment and removal procedures are discussed in Section 4.3, above.

4.5 TEMPORARY IRRIGATION SYSTEM

It is recommended that a temporary above-grade irrigation system provide supplemental irrigation to the mitigation area to ensure Parry's tetracoccus container stock and seed installed within the mitigation area become established. The irrigation system should only be used until the plants are established such that they can survive on their own from seasonal rainfall. It is expected that an irrigation system would be shut-off and removed from the mitigation site at the end of year three of the five-year monitoring and maintenance period which is dependent upon the level of plant establishment achieved by the end of year three. Watering onsite would gradually be decreased prior to the irrigation system being abandoned to allow the plants to become acclimated to the site's natural hydrology. If the container plants and seed mix respond well and establish before the end of the third year of the five year monitoring and maintenance period an irrigation system could be removed early.

The irrigation system should be installed as an above-ground system so that irrigation equipment could be easily removed once the system has been decommissioned and the site has been approved and signed-off by the CEC. The irrigation system could utilize water from the Project Site landscaping irrigation system. Drip irrigation is recommended to reduce the total volume of water necessary to be applied to the site for successful establishment of Parry's tetracoccus, and to limit irrigation to weedy species. Irrigation should be installed by the landscape contractor and approved by the project biologist to ensure adequate coverage within the mitigation area. Any irrigation system is expected to be abandoned by the end of the third year and all above-ground components of the system should be removed from the site at the end of the five-year period.

4.6 EROSION CONTROL

It is unlikely that the mitigation area will suffer from erosion problems; however, erosion control measures such as silt fencing or fiber rolls should be maintained onsite following constructin and planting of the mitigation area until the ground surface is stabilized and vegetation becomes established. The need for and location of erosion control in the mitigation area shall be determined in the field by the project biologist and maintenance contractor.

4.7 120-DAY PLANT ESTABLISHMENT PERIOD

During the 120-Day PEP, following the container plant installation and seeding, the project biologist should monitor site conditions including irrigation timing and efficiency, seedling germination, container plant survival and soil erosion to determine if the plants are becoming

adequately established and to verify that the seed application has been successful. If the seed application has been successful and adequate germination occurs then rapid seedling emergence should limit the need for erosion control devices. Potential remedial actions if germination of the seed mix is not sufficient include reseeding, installation of additional erosion control devices and follow-up weed control.

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5.0 FIVE-YEAR MONITORING AND MAINTENANCE

The purpose of the five-year monitoring and maintenance period is to provide guidelines for maintenance and biological monitoring of the mitigation area. All maintenance activities will occur in consultation with the project biologist. The maintenance period will begin upon acceptance of the mitigation site installation by the project biologist at the end of the 120-Day PEP and is scheduled for five years. The maintenance period will conclude after five years if the success criteria established in Section 6.1 of this plan is met.

Because the goal of this project is to establish a natural system that can support itself with little or no maintenance, the primary focus of the monitoring and maintenance plan is concentrated in the first few seasons of plant growth following the initial revegetation effort when annual and perennial weed species can easily out-compete Parry's tetracoccus. The intensity of the maintenance activities is expected to subside each year as the native plant materials become more established and local competition from non-native plants for resources on the mitigation site is minimized through direct removal and treatment of non-native plant species. The early spring through early summer will be the time period where the most effort will be required to control and eradicate non-native plant species within the mitigation area. However, long-term maintenance concerns for the site should include removal of non-native exotic and invasive plant species adjacent to the site and potential establishment and introduction of non-native plant species from wind-borne seed.

The risk of large scale reinvasion of non-native plants onto the mitigation area can be adequately minimized during the first few years after installation at the mitigation site by following these specific maintenance and management guidelines.

5.1 MAINTENANCE ACTIVITIES

- Areas where container stock are installed and applied should be irrigated when natural rainfall is not adequate to sustain container plants and seed for a maximum of three years after the completion of the 120-Day PEP. The project biologist in conjunction with the maintenance contractor will be responsible for determining the time and duration of all artificial watering. The Contractor should be responsible for implementation of the irrigation schedule to promote plant and seed growth and establishment. The contractor should maintain the irrigation system in proper working order and a log of when and how long the irrigation system is in operation during all watering events.
- Native understory species should not be cleared in the mitigation area unless competition from these species inhibits the growth and establishment of Parry's tetracoccus.
- The mitigation site should not be fertilized during the monitoring and maintenance period unless deemed necessary by the project biologist as a remedial measure to correct soil nutrient deficiencies or increase germination and establishment of Parry's tetracoccus.

- Non-native species may invade the mitigation area and become a problem before or during the establishment of the desired native plant species. Weedy, invasive, non-native species such as fennel, castor bean, pampas grass, tree tobacco tocalote and others as indicated by the project biologist should be removed by hand or other appropriate method as determined by the project biologist, or treated with the appropriate systemic herbicide before they become firmly established within the mitigation site.
- Deadwood and leaf litter of native shrubs should not be removed. Deadwood and leaf litter of non-native species should be removed from the mitigation site only at the direction of the project biologist. Deadwood and leaf litter provide valuable microhabitats for invertebrates, reptiles, small mammals and birds. Non organic trash and debris such as windblown litter, if any, should be removed from the mitigation area on a regular basis at no less than once-per calendar quarter intervals during the five-year monitoring and maintenance period.
- Areas showing excessive erosion within the mitigation area should be promptly remedied with BMPs until they are deemed no longer necessary by the project biologist or the successful completion of the five-year monitoring and maintenance period.

5.2 GENERAL HABITAT MAINTENANCE GUIDELINES

5.2.1 Pest Management/Weed Control

Weeds are expected to be the primary pest problem in the mitigation area during the first several years of the maintenance period; however, native and non-native animal species can be classified as pest species within revegetation sites and removal and exclusion of these species would need to conform to any applicable laws and ordinances. Weeds should be controlled so they do not prevent the establishment of the native species or invade adjacent native habitats. Weeds should be controlled prior to setting seed and removed from the site. If weed species do produce mature fruits prior to removal, care should be taken to remove the fruits whole from the mitigation site without shedding unnecessary seed within the mitigation area. The maintenance contractor should control weeds and invasive exotic species within the mitigation site and where the contractor is unsure of a plants native or non-native status, the maintenance contractor should confer with the project biologist. A combination of physical removal, mechanical treatments (*i.e.* weed whipping) and appropriate herbicide treatments as determined by the project biologist should be used to control non-native and invasive plant species.

Removal of weeds with hand held tools is the most desirable method of control for annual and perennial exotic plant species and should be used around individual plantings and native seedlings as much as is feasible. All chemical control should be pre-approved by the project biologist and the herbicide used should be compliant with any applicable regulations concerning the application of herbicides within the State of California and County of San Diego. If feasible as determined by the project biologist, any native plants killed by herbicide applications should be identified to species and should be replaced by the contractor. Where replacement is not

feasible the contractor, at the direction of the project biologist, should collect and apply native seed collected within or immediately adjacent to the mitigation area to the incidental impact area.

5.2.2 Irrigation System

The irrigation system should be checked regularly to ensure proper operation, adequate coverage of the revegetated area and that there are no significant leaks in any PVC pipe, joints or irrigation heads. Problems with the irrigation system should be repaired immediately upon detection to reduce potential native plant mortality and establishment of non-native plant species. The frequency and duration of irrigation applications should be adjusted seasonally by the maintenance contractor in coordination with the project biologist to meet habitat needs. It is assumed that the majority of the supplemental irrigation, if any, will be from late spring to the first rains in the fall; however, if drought conditions occur it is recommend that the irrigation system be utilized as needed to ensure establishment of Parry's tetracoccus. The irrigation system should be used as necessary during the first three years of the five-year monitoring and maintenance period and should be terminated at the end of year three to ensure that the site is self-sustaining for at least two years (*i.e.*, two summers) prior to completing the five year monitoring period. The irrigation system is expected to be completely removed from the mitigation area at the successful completion of the revegetation and enhancement. The timing of cessation and removal of any irrigation system shall be determined by the project biologist but it is anticipated that the irrigation system would be removed only after successful completion of the mitigation.

5.2.3 Clearing and Trash Removal

Trash consists of all man-made materials, equipment, or debris dumped, thrown, blown, washed into or left within the mitigation area. It is recommended that trash be removed by the maintenance contractor at the completion of each maintenance visit and deposited at an appropriate facility (*e.g.* county dump). Pruning or clearing of native vegetation should not be allowed within the mitigation area unless extensive growth is causing a maintenance problem outside of or within the mitigation area. Any pruning or clearing of native vegetation should be approved by the project biologist prior to the commencement of any pruning activities. Deadwood and leaf litter should be left in place within the mitigation area to replenish soil nutrients and organic matter.

5.3 SCHEDULE OF MAINTENANCE INSPECTIONS

It is recommended that the project biologist perform quarterly monitoring inspections during the 5-year monitoring and maintenance period. Recommendations for maintenance efforts will be based upon these site observation visits. Weed control by the maintenance contractor should be conducted monthly during the first year of the monitoring and maintenance period, and then quarterly during years two through five of the monitoring and maintenance period, or as directed by the project biologist.

6.0 MONITORING PLAN

Monitoring of the mitigation site has a two-fold purpose: 1) To monitor the progress of the mitigation area by assessing Parry's tetracoccus success; and 2) To direct and monitor the maintenance activities and determine remedial actions in a manner that ensures that appropriate maintenance occurs in a timely manner. The monitoring should be performed by the project biologist or a qualified biologist or habitat restoration specialist.

It is recommended that the project biologist be responsible for monitoring activities of the installation contractor in preparation of the mitigation area including perimeter invasive removal, site clearing and preparation, irrigation installation, Parry's tetracoccus planting, monthly monitoring during the 120-Day PEP and quarterly monitoring during the five-year monitoring and maintenance period. The project biologist should communicate and coordinate with the landscape contractor to assure the timely performance of project activities. The project biologist should prepare an "As-Built" letter report within 60 days of completion of the installation period (end of 120-Day PEP), and Annual Reports each year on the anniversary date during the five-year monitoring and maintenance period, to document implementation and success.

6.1 PERFORMANCE STANDARDS

Performance standards have been established for the mitigation area based on optimal vegetative development within a properly functioning habitat of the same type. Specific performance criteria is targeted for each installation anniversary date through the completion of the five-year monitoring and maintenance program. Standard success criteria are listed in Table 2.

TABLE 2
Mitigation Site Performance Standards

Time Period	Maximum Percent Weed Cover	# of Parry's Tettrococcus[1]
120-Day PEP	5%	3
Year 1	5%	5
Year 2	10%	7
Year 3	15%	12
Year 4	10%	17
Year 5	5%	23

[1]Percent container plant survival can be augmented by recruitment of Parry's tetracoccus seedlings from container stock fruit and seed production.

Performance standards are discussed in reference to 'target vegetative species' which are Parry's tetracoccus. Non-native annual grass species that are not considered highly invasive (e.g., *Avena* spp., *Lolium* spp., *Bromus hordeaceus, B. diandrus*) are non-target species which should be removed from the site unless they are performing a beneficial function that the target native species are not, such as soil or bank stabilization, and can be left in place until native species are

able to perform the same function. Natural recruitment by non-invasive non-native grass species, native coastal sage scrub or other native species in the mitigation area is also considered a sign of success.

These performance criteria shall be utilized to assess the annual progress of the mitigation area, and are regarded as interim project objectives designed to reach the final goals. Fulfillment of these criteria will indicate that the mitigation area is progressing toward the long-term goals of the plan. If the restoration efforts fail to meet the performance standards in any one year, the project biologist will recommend remedial actions to be implemented the following year which are intended to enhance the vegetation within the site to a level of conformance with the original standard. These remedial actions may include re-seeding, applying soil amendments, additional weed control measures, erosion control, or adjustments to irrigation and maintenance practices.

6.2 MONITORING METHODS AND SCHEDULE

It is recommended that the project biologist conduct quarterly qualitative monitoring visits throughout the 5-year monitoring and maintenance period. Permanent vegetation transect points should be established within the mitigation area at appropriate representative locations to achieve representative samples of the site. Transects could be used to determine compliance and achievement of the restoration success standards. A minimum of twenty-five (25) sampling points is recommended. Qualitative assessment of the mitigation area should be used during the first two years to assess percent survival of container plants and percent cover of target vegetation and weed cover. Starting in the spring of year three, a point intercept method could be used to determine percent target vegetation cover and weed cover.

Qualitative monitoring should include reviewing the health and vigor of container plants, checking for the presence of pests and disease, soil moisture content and the effectiveness of the irrigation system, erosion problems, invasion of weeds/exotics, and the occurrence of trash and/or vandalism. Contractor maintenance activities and performance should be reviewed as well by the project biologist. Each monitoring visit should be followed by a summary of observations, recommendations, and conclusions.

Quantitative evaluation of container plant survival could be determined through counts of dead container plants. The fall site visit should assess plant mortality and recommend container plant replacement, if needed, at the conclusion of the first year of the monitoring and maintenance period. Cover of invasive exotics could be determined by visual inspections of the mitigation site during all site visits to assure that invasive species are not present. Removal of invasive species should be recommended immediately if such species are detected.

6.3 ANNUAL MONITORING REPORTS

It is recommended that an annual yearend report be prepared by the project biologist, through the end of the five-year monitoring and maintenance period. The monitoring reports should describe the existing conditions of the site, compare existing conditions with the performance guidelines,

identify any shortcomings of the revegetation program, and recommend remedial measures necessary to help guide the project to a successful completion of the revegetation program.

The reports should also include:

- A list of names, titles and companies of all persons who prepared the content of the annual report and participated in maintenance and monitoring activities;
- Prints of representative monitoring photographs; and
- Maps identifying the monitoring area, planting zones, etc. as appropriate.

The remainder of this page is intentionally blank.

7.0 COMPLETION OF COMPENSATORY MITIGATION

At the end of the five-year monitoring period and if the success criteria in Section 6.1 is met, the applicant shall notify the CEC, or appropriate resource agency, upon submitting the annual report for the fifth and/or final year and request acceptance of the site and release from any further responsibility at the site. Early release may be possible if success criteria/performance standards are met early and the CEC agree with the level of establishment and agree to release the project from the mitigation requirements.

Following the receipt of notification of completion the CEC may visit the site to confirm completion of the mitigation efforts and issue letters of formal acceptance.

The remainder of this page is intentionally blank.

8.0 REFERENCES

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Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California.* Nongame-Heritage Program, California Department of Fish and Game.

United States Fish and Wildlife Service (USFWS). 2000. Federally listed and candidate species that may occur within the jurisdiction of the Carlsbad Fish and Wildlife Office. Provided by the USFWS Carlsbad Fish and Wildlife Office on November 1, 2000.

ATTACHMENT 5

Map Showing Geologic Contact of the Holocene Alluvium Geologic/Geomorphic Unit in the Vicinity of the Gas Pipeline

el Norte Rd.

N
W
E
S

Site Location

SR 76

Existing Storage Area

Existing Pala Substation

Former Mine Pits
(Ponds)

SR 76

K

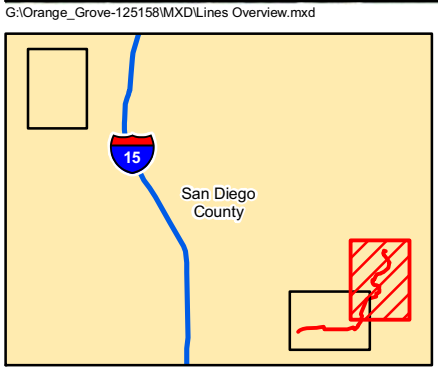
Qa

Jaimie's Lane

Former Dairy Farm

San Luis Rey River

G:\Orange_Grove-125158\MXD\Lines Overview.mxd



Proposed Gas Line

Site Boundary

Artificial Fill

K/Qa Geologic Contact Between Cretaceous Basement Rock (K) and Holocene Aluvium (Qa)

*Surveyed by observation from public roads

Source:
Aerial Photography from ESRI_Imagery_World_2D

Figure 1 A

Orange Grove Project

Location of Holocene Alluvium and Holocene Alluvium Outcrop

1" = 400'

400 200 0 400 800

Feet

TRC

K
Qa
K
Qa
K
Qa
K
SR 76
K
Qa
K
Qa
Qa
K
Rice Canyon Rd
K
6' Outcrop
Photographed
& Described
San Luis Rey River
Couser Canyon Rd
N
E
S
W

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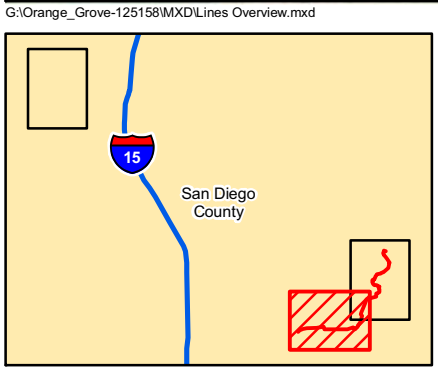


Proposed Gas Line
Site Boundary
Artificial Fill
K/Qa Geologic Contact Between Cretaceous Basement Rock (K) and Holocene Aluvium (Qa)

*Surveyed by observation from public roads

Source:
Aerial Photography from ESRI_Imagery_World_2D

1" = 400'
400 200 0 400 800
Feet

TRC

Figure 1 B

Orange Grove Project

Location of Holocene Alluvium and Holocene Alluvium Outcrop

ATTACHMENT 6

Photographs of the Holocene Alluvium Outcrop (Location Shown in Attachment 5)

Photo No. 1: Holocene Alluvium Outcrop

Photo No. 2: Holocene Alluvium Outcrop after digging out base to maximize exposure. A 6-foot vertical exposure was achieved.

Photo No. 3: Upper portion of outcrop before digging out base or cleaning.

Photo No. 4: Outcrop from 0.5 to 1 foot below ground surface

Photo No. 5: Outcrop from 1 to 1.5 feet below ground surface

Photo No. 6: Outcrop from 1.5 to 2 feet below ground surface

Photo No. 7: Outcrop from 2 to 2.5 feet below ground surface

Photo No. 8: Outcrop from 2.5 to 3 feet below ground surface

Photo No. 9: Outcrop from 3 to 3.5 feet below ground surface

Photo No. 10: Outcrop from 3.5 to 4 feet below ground surface

Photo No. 11: Outcrop from 4 to 4.5 feet below ground surface (top)

Photo No. 12: Outcrop from 4 to 4.5 feet below ground surface (bottom)

Photo No. 13: Outcrop from 4.5 to 5 feet below ground surface

Photo No. 14: Outcrop from 5 to 5.5 feet below ground surface

Photo No. 15: Outcrop from 5.5 to 6 feet below ground surface

ATTACHMENT 7
Record of Conversation Regarding the Fenton Sand Mine Operations

Record of Conversation

Date: September 29, 2008 **Time:** 11:30 am

Call From: Marvin Howell, Director of Land Use Planning and Permitting, Hanson Aggregates (858-577-2770)

Call To: Joe Stenger, TRC (805-528-6868)

Subject: Fenton Sand Mine

Details:

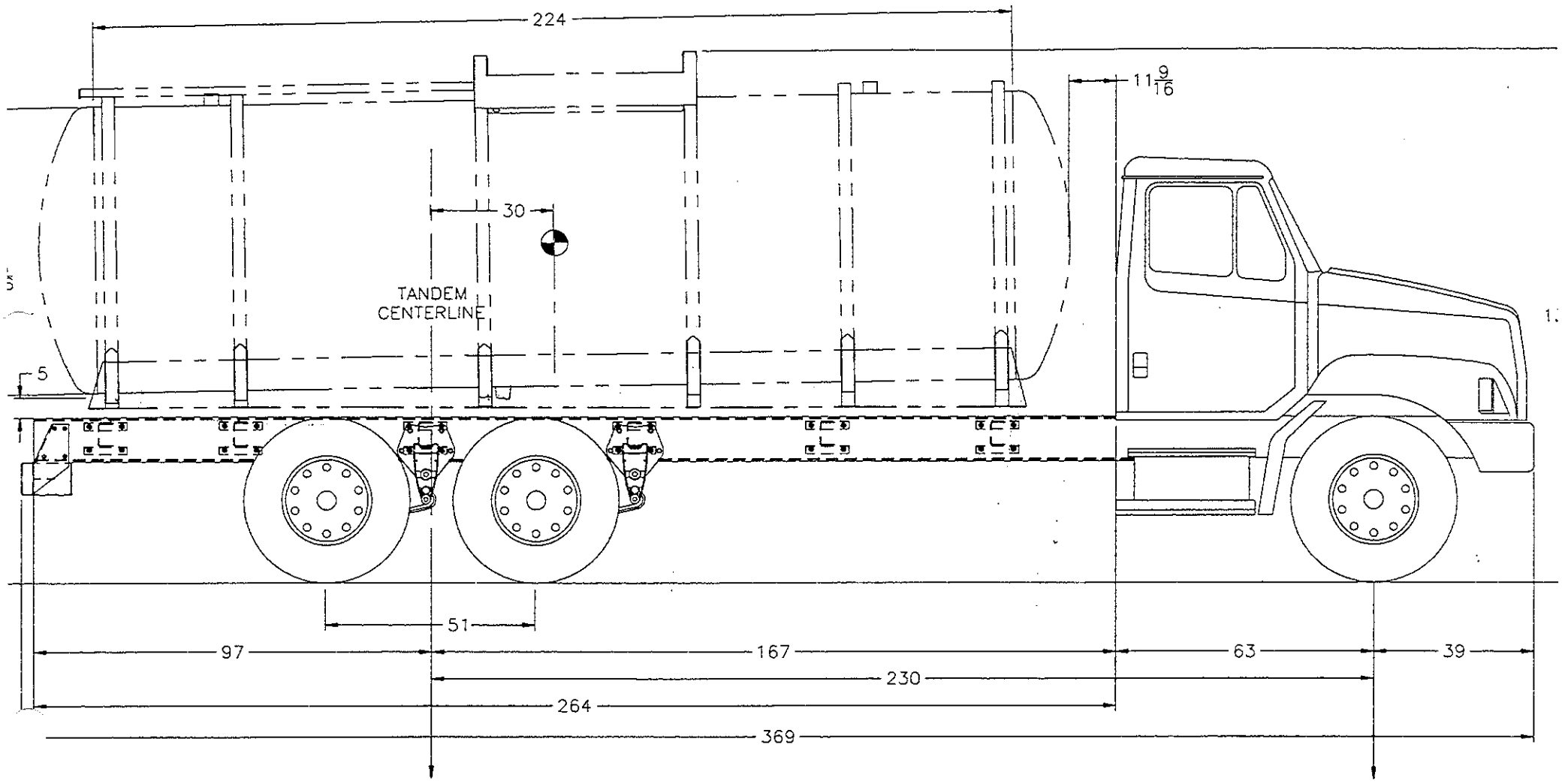
Mr. Howell returned my call this morning pursuant to a voice mail that I left him last week. I had called Mr. Howell to find out whether he was knowledgeable regarding operations at the former Fenton Sand Mine south of SR 76 near the Orange Grove Project and, if so, whether he knew if any buried cultural resources were ever found during excavations conducted at the mine. The mine pits were excavated in Holocene alluvium that is representative of the Holocene alluvium just downstream of the mine where the Orange Grove Project will be digging a trench for construction of the proposed gas pipeline.

Mr. Howell indicated that he was involved with the former Fenton Sand Mine from 1986 until the mine closed in 2006, and that he was very familiar with the operations that occurred there. He indicated that the mine pits extended to a depth of approximately 40 feet below grade, and that materials encountered in the mine pits were sand channel deposits with minor gravel (10 percent or less). He indicated that no substantial fine-grain layers were encountered.

I asked Mr. Howell if any cultural resources were ever encountered during the mining operation. He indicated that to his knowledge no cultural resources were encountered. Mr. Howell volunteered that, if cultural resources would have been found as the mine excavations occurred, he would know of it.

ATTACHMENT 8

Dimensions of Airgas Specialty Products Single Unit Trucks for Aqueous Ammonia Deliveries



7,280	TRUCK W/ FUEL	
32,720	TANK/PAYLOAD	
40,000	Total	

TRUCK W/ FUEL	8,760
TANK/PAYLOAD	3,240
Total	12,000

31,460	PAYLOAD
4,500	TANK

ATTACHMENT 9

Record of Conversation Regarding Fire Marshal Review of the Proposed Fuel Modification Zones

From: Jim Hunt [jhunt2@gte.net]
Sent: Friday, September 19, 2008 1:19 PM
To: Stenger, Joe (Irvine,CA-US)
Subject: Fw:

record of conversation; 9-19-08:

the below e mail from the North County Fire Protection District Fire Marshal was in response to my e mail to him this date. He is out of town in Minnesota at Fire Code hearings until next week. What I proposed to him was that the fuel modification zones will be a total of 125' from all equipment. There will be two zones within the 125'. The fuel modification on the roadsides will be 50' each side of the access roads, with the exception of a section on the existing public road next to the plant, which is 30' due to constraints of sensitive habitat regulations. My proposal acknowledged that his approval would, of course, be subject to his review of the final Fire Protection Plan.

Jim Hunt; Hunt Research Corporation
Consultant to applicant.

----- Original Message -----
From: Morel, Sidney
To: jhunt2@gte.net
Sent: Friday, September 19, 2008 11:22 AM

Jim, thanks for getting back to me in regards to the JPower facility. The North County Fire Protection District concurs in concept with the proposed size and location of the fuel modification zones subject to review of the final Fire Protection Plan, but at this time it appears adequate given the vegetation risk.

ATTACHMENT 10
E-mail from Rainbow Municipal Water District

From: Brian Lee <blee@rainbowmwd.com>
To: Jim Pomillo
CC: Dave Seymour <DSeymour@rainbowmwd.com>
Sent: Thu Sep 25 10:38:13 2008
Subject: Re: confirmation of statement in data responses for Orange Groveproject

Jim,

To date the District will provide a construction meter for a construction project within the District so long as the conditions listed in our policies are met. Per our policies, construction water may be utilized by truck or hose.

I hope this answers the question. If you need it more formalized (i.e. Letterhead) let me know.

- B

Brian Lee
District Engineer
Rainbow Municipal Water District
3707 Old Highway 395
Fallbrook, CA 92028
760.728.1178

ATTACHMENT 11

Environmental Impact Analysis for the Reconductoring of SDG&E Transmission Lines 698E and 698B

RESPONSE TO DATA REQUESTS 66 AND 67
ENVIRONMENTAL IMPACT ANALYSIS FOR THE RECONDUCTORING OF TRANSMISSION LINES 698E AND 698B
ORANGE GROVE PROJECT

1.0 INTRODUCTION

Operation of the Orange Grove Project 96 megawatt (MW) power plant will require reconductoring of San Diego Gas & Electric Company's (SDG&E's) TL 698E Pala-Monserate Tap 69 kilovolt (kV) transmission line and SDG&E's TL 698B Monserate-Monserate Tap 69 kV transmission line. The reconductoring will replace existing conductors with 636 kcml ACSS conductors. The need for this transmission line upgrade is identified in the project's System Impact Study (dated October 22, 2007) and Facilities Study (dated May 2, 2008) previously submitted to the California Energy Commission (CEC). CEC's Data Requests 66 and 67 requested an environmental analysis for the reconductoring work.

The environmental analysis provided herein responds to the CEC data requests and supplements the environmental and project description information provided in the Application for Certification (08-AFC-4) submitted to the CEC in June 2008 for the Orange Grove Project.

The location of the reconductoring work is shown in Figure 1-1.

2.0 WORK DESCRIPTION

2.1. Construction

The reconductoring scope of work (scope of work) will include:

- preparing existing transmission line poles and equipment to receive the new conductors;
- replacing 33 existing poles with new poles at approximately the same location;
- installing 9 new poles;
- removing 2 existing poles;
- use of helicopters as appropriate;
- erection and removal of temporary guard structures at road and overhead line crossings; and
- stringing of conductors.

All work will occur within SDG&E's existing right-of-way (ROW) and/or franchise position. A summary of work to occur at each pole is provided in Table 2-1. A map of

pole locations is provided in Figure 2-1. The pole line is shown on an aerial photograph base in Figure 2-2.

Reconductoring work will be performed by SDG&E or a construction contractor under their control. SDG&E has completed preliminary engineering evaluations of the work required in order to allow an assessment of environmental impacts. While specific details of work description provided herein are subject to refinement as SDG&E performs further engineering, the overall scope of work is representative of the work to occur and refinements that would affect the outcome of the environmental analysis are not expected.

As shown in Table 2-1, at most locations, pole work will be limited to overhead work that will not have surface disturbing impacts. Most poles will be accessed via existing public roads and existing SDG&E transmission line maintenance roads, which are regularly maintained. At locations that do not have available access, work will employ helicopter support as needed to minimize surface disturbance in sensitive habitats and private property.

"Top of pole work", as indicated in Table 2-1, will include tasks that will not affect the ground surface such as changing of insulators, line guards, top ties, jumper wires, cutouts, and pole-top supports. Pole-top transformers will be upgraded at 7 locations.

Where pole replacement is required, the existing poles are 50 to 100 foot high wood poles that will be replaced with 65 to 92 foot high poles, mostly of steel construction. The existing poles will typically be replaced within +/- 10 feet of the existing location.

Where existing poles will be removed, the poles will be pulled from the ground and hauled offsite to an appropriately licensed disposal site. If complete removal is not practical (e.g., if the pole cannot be pulled from the ground), then it will be cut off approximately two feet below grade and filled over, or if necessary to avoid impacts to sensitive resources or private property, poles may be cut off above ground.

Most of the nine new pole locations will be 65 to 75 foot in height wood poles. The maximum pole height for the new locations is a 110 foot high wood pole at Pole 112. A few of the new poles will be 65 to 75 foot high steel poles.

Where dictated by ground conditions, both new and replacement poles will be installed with concrete foundations. The foundations will measure up to approximately 6 feet in diameter and 25 feet deep. The foundation holes will be drilled, reinforcing steel cages will be lowered into the hole, and the foundation will be poured in place with pre-mixed concrete brought to the site in a cement truck. Each foundation will require up to approximately 25 yards of concrete. Pole erection and removal work will be facilitated with a truck-mounted crane or helicopter. Helicopter construction activities would be based at the project staging areas shown in Figure 2-2.

Poles and other equipment will be transported to the individual work sites by flatbed truck or by helicopter. Access will be via existing public roads and existing SDG&E

transmission system access roads. No new grading of access is required. Normal maintenance to existing access roads accomplished pursuant to SDG&E's existing access road grading program will provide adequate access.

Limited clearing will be required in non-natural and disturbed habitat areas for construction staging and materials/equipment storage activities, and for construction activities at some pole locations. Clearing at these areas would typically be accomplished using a bulldozer, grader or backhoe to prepare the required area. Clearing would be kept to the minimum amount needed for a safe working space for equipment, vehicles and materials. A summary of anticipated grading and clearing requirements is provided in Table 2-2.

Conductor stringing would begin with the installation of insulator and stringing sheaves. Sheaves are rollers, temporarily attached to the lower end of the isolators, which allow the conductor to be pulled along the pole line. Temporary clearance structures (i.e., guard structures), typically consisting of vertical wood poles with cross arms, will be installed where stringing work will cross existing facilities such as overhead electric, roadways and Interstate 15 (I-15) (areas where there is public access), as needed to assure minimum clearances are maintained while conductors are being installed. The initial stringing operation would consist of pulling a "sock line" through the sheaves using a vehicle traveling along the ROW to pull the line. The sock line will then be attached to the conductor and used to pull the conductor into place using conventional tractor-trailer mounted pulling equipment located at stringing sites spaced along the pole line. The locations of stringing sites are shown in Figure 2-2. The stringing sites are needed to set up the tractor trailers with the spool reels that hold the conductors, as well as trucks and tensioning equipment. Some incidental grading may be required at a limited number of stringing sites to provide level pads for equipment. Adjustments to stringing sites may be required as final engineering is completed, but stringing sites will be limited to existing roads and other disturbed areas. Undisturbed land and other natural habitat will be avoided to the greatest extent possible.

After installing the conductor wire, sagging and clipping activities will be performed. This process involves adjusting tension of the conductors, removing stringing sheaves, and permanently attaching the conductor to the insulators with specialized hardware.

Equipment laydown areas where materials and equipment will be stored and staged will be provided at two locations (refer to Figure 2-2). The primary location will be near the east end of the reconductoring work. This primary laydown location is located near Pole 101 in the eastern dairy farm area near the proposed staging area for the Project's gas pipeline construction. Laydown will also occur near the west end of the reconductoring work. The location of this laydown site is near Pole 20 as shown in Figure 2-2. Where a suitable all-season surface (e.g., asphalt, concrete, or gravel) does not already exist in the laydown area, the surface may need to be scraped, and a layer of crushed rock placed, to provide an all-weather surface. After construction, the rock would be removed and the area would be restored to a stable condition.

General equipment required for the reconductoring work may include bulldozers, graders, backhoes, drill rigs, truck-mounted augers, flatbed trucks, boom trucks, rigging and mechanics trucks, air compressors and generators, cranes, man-lifts, concrete trucks, and crew trucks. Helicopters will be used at some locations, in particular, where ground access is not practical.

Normal work hours will be Monday through Saturday, 7 am to 7 pm. All work will be done in compliance with local regulations, including noise requirements.

The reconductoring work will result in minimal surface disturbance as shown in Table 2-2. At the conclusion of work at each location, work equipment, excess materials, packing, hardware, and construction debris will be removed and disturbed areas will be stabilized. As required, appropriate best management practices (BMPs) will be implemented and maintained in disturbed and graded areas to prevent erosion.

2.2. Operations

The operation and maintenance of the reconductored line will include equipment access, routine maintenance and ROW inspections, facility repairs, access road maintenance and vegetation management activities that will be similar to existing conditions that are ongoing to operate the existing transmission lines.

3.0 ENVIRONMENTAL SETTING

The reconductoring will take place entirely within the existing SDG&E transmission line ROW or franchise position between the Monserate and Pala Substation located in northern San Diego County, California. However, temporary laydown and stringing sites may occur on disturbed and/or urban/developed areas adjacent to the ROW (refer to Figure 2-2). Temporary stringing and laydown sites were chosen specifically to avoid impacts to sensitive land uses and habitats. Please refer to Table 2-1 for a description of the specific environmental setting at each individual transmission pole, stringing, and laydown site.

The applicable portion of the existing SDG&E ROW (work zone) begins at the Monserate Substation, located near the corner of South Mission Road and Via Encinas Drive in the community of Fallbrook. The ROW is mostly surrounded by low density, single family residential land uses for approximately the first 2.5 miles of the work zone. There are also small patches of agriculture, undeveloped, and recreational land uses (golf course) also located along/adjacent to the ROW within the first 2.5 miles of the work zone. Once the ROW crosses Gird Road (Pole 34 – refer to Figures 2-1 and 2-2), land uses surrounding the work zone switch to agriculture for approximately 1.0 mile until the ROW begins to parallel Pala Mesa Drive at Pole 46. Beginning at Pole 46, the ROW is once again surrounded by low density, single family residential land uses for approximately the next 0.9 mile (until Pole 61), followed by approximately 0.3 mile of recreational land uses (golf course) before the ROW crosses I-15 following Pole 65. After crossing I-15, the ROW is surrounded by undeveloped and agricultural (cattle grazing)

land uses for approximately 0.3 mile (Poles 66 through 71). Following Pole 71, the ROW is surrounded by agricultural land uses (citrus and avocado orchards) for approximately 0.8 mile to Pole 81. Following Pole 81, the surrounding land use transitions to undeveloped land for approximately 0.4 mile until the ROW crosses Rice Canyon Road between Pole 86 and Pole 87. The next 0.5 mile of ROW (Poles 87 through 93) is located adjacent to State Route 76 surrounded by agricultural land uses. The ROW is then surrounded by undeveloped land for the next 0.5 mile (Poles 94 through 97). Between Poles 97 and 98, the ROW crosses over SR 76, into a former dairy farm that is now owned by Gregory Canyon Ltd and part of open space land that will surround the proposed Gregory Canyon Landfill. The ROW traverses the former dairy farm land for approximately 0.3 mile until crossing back over SR 76 just before Pole 102. The remaining 0.4 mile of ROW (Poles 103 through 105) is surrounded by undeveloped land until the work zone terminates at the existing Pala Substation. Poles 106 and 107 are located adjacent to the substation and are surrounded by developed land and SR 76. The Pala Substation is located near the intersection of Pala Del Norte Road and SR 76, just south of the proposed Orange Grove Energy power plant site. Table 2-1 provides additional information for the environmental setting at each pole location, including available access.

4.0 IMPACTS AND PROJECT DESIGN FEATURES TO LIMIT IMPACTS

4.1. Significance Criteria

The significance criteria identified in the AFC were used herein as the basis for evaluating significance of impacts expected to occur from the reconductoring scope of work. Impacts of the reconductoring work are primarily limited to those impacts that may occur during construction. Operation of the reconductored transmission lines will not be materially different than ongoing operations of the existing transmission lines, so there will be no significant operations impact attributable to the reconductoring. Impacts associated with the reconductoring construction work are addressed in the following sections.

4.2. Air Quality

Reconductoring work will result in temporary fugitive dust and vehicular emissions associated with the reconductoring activities. These potential impacts will be short-term, generally well away from residences or areas of routine public access and distributed over the 8 mile route of the power line being reconductored. Surface disturbance will be minimized to the extent practical for safe and efficient operations to minimize the generation of dust. Grading that will be required for preparing and restoring laydown areas and stringing sites will occur with water application to control dust emissions. A speed limit of 10 miles per hour will be implemented for vehicle travel on unpaved roads. Equipment will not be allowed to idle for more than 5 minutes. Fuel-burning equipment will be properly maintained to avoid unnecessary emissions. Considering these factors, impacts to air quality will be less than significant.

4.3. Geologic Hazards and Resources

The southern California region in which the project will occur is a seismically active area, but the potential for substantial ground shaking or any other geologic event to occur that could impact the reconductoring work during the short term of construction is not significant. Furthermore, the scope of work will not have any impact on mineral resources, since work will occur along an existing transmission line ROW. Considering these factors, the impact related to geologic hazards and resources will be less than significant.

4.4. Agriculture and Soils

Impacts to existing agricultural operations, including orchards and pasture lands, from construction activities will be minor and short term, primarily associated with access to work locations. The new poles that will be installed are not located in areas that would significantly affect agricultural operations (see Figure 2-2), and are within the existing SDG&E ROW and/or franchise position. There will be no loss of farmland resulting from the scope of work. The scope of work will not conflict with agricultural operations, and will not result in or induce the conversion of farmland to other land uses. Surface disturbance is expected to total on the order of 5.3 acre (Table 2-2) and will be kept to the minimum necessary for safe and efficient operations. The scope of work will be conducted using best management practices to avoid soil erosion in disturbed areas. Considering these factors, the impact on agriculture and soils will be less than significant.

4.5. Water Resources

The scope of work will not impact ground water supply or recharge, will not substantially alter existing drainage patterns, will not create or increase water runoff, and will not violate water quality standards or otherwise substantially degrade water quality. Work associated with Poles 66, 70 and 71 will occur adjacent to potential jurisdictional waterways; however, the scope of work at these sites will be completed without impacting the potential jurisdictional waterways. Work at Pole 66 will be completed within non-jurisdictional areas adjacent to the potentially jurisdictional waterway that the existing Pole 66 is located adjacent to. The replacement Pole 66 will be placed outside of the boundaries of the potential jurisdictional waterway. The existing Pole 66 will be cut off at or immediately above the top of the existing riparian vegetation. BMPs will be implemented at all sites where ground disturbance will take place to avoid erosion and sediment transport and other impacts to water quality. In addition, work will occur with BMPs to prevent water quality degradation. If fuel or other petroleum products are stored at the staging areas, secondary containment will be provided. No aspect of the work scope will require substantial grading that could materially alter existing drainage patterns or change in the potential for damage from flooding. Considering these factors, impacts to water resources will be less than significant.

4.6. Biological Resources

4.6.1. Direct Impacts

The scope or work will result in temporary and permanent impacts to vegetation habitat. Table 2.2 provides a summary of the clearing and grading activities for the poles where habitat will be affected. The following is a summary of total disturbance for each habitat type.

Habitat Type	***Square Footage***	***Acreage***
Disturbed Habitat	230,350	5.29
Golf Course (Turf)	100	0.002
Riparian	0	0
Orchard	50	0.001
Non-Native Grassland	4,375	0.10
Coastal Sage Scrub	5,225	0.12
Landscaped Area	500	0.01
Bare ground	400	0.009
Total	**241,000**	**5.53**

Coastal Sage Scrub and Non-Native Grassland

The scope of work will result in the direct disturbance of 0.12 acre of coastal sage scrub (CSS) and 0.10 acre of non-native grassland (see Table 2-2). New pole installations, pole removals, or pole replacements will take place within or immediately adjacent to CSS at Pole locations 82-86, 93-97, 102-106, 111, and 113. CSS habitat has the potential for occurrence of coastal California gnatcatcher (*Polioptila californica californica*).

Impacts to coastal California gnatcather will be avoided by not conducting construction activities within 500 feet of nesting gnatcatchers during the breeding season of February 15 until August 31. Therefore, work within CSS habitat will either be conducted between September 1 and February 14 (non-breeding season) or, if work in CSS habitat is planned to be conducted outside of this period, then a gnatcatcher survey would first be conducted and work would be directed to stay a minimum of 500 feet away from any identified active nest until the young have fledged.

Direct impacts to CSS and non-native grassland will be mitigated through the Habitat Loss Permit (HLP) process implemented by the County of San Diego as described within the AFC. The HLP process has already been initiated for impacts associated with the construction of the Orange Grove power generation facility and associated linear facilities. The 0.12 acre of CSS and 0.10 acres of non-native grassland that will be impacted by the scope of work will be added to the 9.3 acres of CSS and 3.4 acres of non-native grassland already being mitigated for by the Orange Grove project. Based on discussions with the County of San Diego,

the U.S. Fish and Wildlife and the California Department of Fish and Game, a 2:1 compensation ratio for the disturbance to CSS and 0.5:1 compensation ratio for the disturbance to non-native grassland will be required as part of the HLP process.

Implementation of these minimization measures will reduce potential impacts to less than significant.

Riparian Habitat

The scope of work will not result in direct impacts to riparian habitat. Locations within riparian habitat have the potential for occurrence of least Bell's vireo (*Vireo bellii pusillus*).

4.6.2. Indirect Impacts

Potential impacts to sensitive species may occur due to construction noise and activities. Limited construction periods will be utilized within sensitive habitats as applicable. If construction will occur within CSS during the breeding period, February 15 through August 31, a survey will be conducted to determine if nesting gnatcatchers are present in the work area. Construction will be directed to stay a minimum of 500 feet away from any identified active nest until the young have fledged. Construction within suitable habitat for the least Bell's vireo will be conducted outside of the least Bell's vireo breeding season, which is considered March 15 through September 15. Implementation of these measures will reduce potential impacts to less than significant.

4.6.3. Jurisdictional Waters

Poles 66, 70 and 71 are located adjacent to potentially jurisdictional waterways. However, work conducted at these locations will be outside of the boundaries of jurisdictional waters. The replacement Pole 66 will be placed outside the boundaries of the potentially jurisdictional waterways. Therefore, there will be no impacts to jurisdictional waters.

4.7. Cultural Resources

Pacific Legacy conducted a records/archival search at the South Coastal Information Center and completed an archaeological pedestrian survey between September 2 and September 4, 2008 to determine the potential for the scope of work to impact cultural resources. The area of pedestrian archaeological survey included a 100-foot radius around each accessible location for new transmission line poles and transmission line poles slated to be replaced, and each temporary laydown site and temporary stringing site, plus a 500-foot buffer around these areas. Only one archaeological resource, a single bedrock milling "slick", was found, located in the vicinity of one of the poles to be replaced. No other archaeological resources were found. A confidential report on the record search

and archaeological survey work has been prepared and will be provided to CEC under separate (confidential) cover.

Based on the inventory results, the scope of work will not affect any significant archaeological resources. The single milling slick is unlikely to qualify for listing in the California Register of Historical Resources. The resource can be avoided during construction and preserved in place. It is anticipated that the scope of work will not result in any significant impact on archaeological resources. In the event cultural resources are encountered during construction, workers will be instructed to cease work within 100 feet of any find until such time as the historical significance of the resource has been evaluated and appropriate mitigation measures implemented per the California Environmental Quality Act (CEQA) and CEQA Guidelines.

4.8. Paleontological Resources

The scope of work occurs on portions of the USGS 7.5 Minute series Pala and Bonsall quadrangle maps. These maps show that the transmission line ROW is located almost exclusively on Cretaceous Period igneous basement rocks and Holocene Epoch alluvium. Igneous rocks categorically do not contain paleontological resources due to the nature of their formation, and Holocene alluvium is too young to contain important paleontological resources. Therefore, there is no potential to impact important paleontological resources in the majority of the work area.

Very limited portions of the work area occur in sedimentary rocks that are mapped by the USGS as "older" alluvium (rock unit "Qoa") and "very old" alluvium (rock unit "Qvof"). These rock units are described in AFC section 6.3.1.2. These rock units are old enough and of a lithology such that they could potentially contain important paleontological remains, but their sensitivity is "unknown" (see AFC section 6.8.1.3 for definition of sensitivity ratings). Work locations where these units occur are limited to: Poles 56 to 63 and adjacent stringing sites 8, 9, 11, 12, 14 and 15; Poles 70 to 72 and stringing sits 16 and 17; and Poles 104 to 107 and stringing site 21. None of these locations will require any substantial grading to complete the scope of work. Therefore, completion of the scope of work is unlikely to affect paleontological resources. Work crews will be instructed to stop work in the area if any paleontological resources are observed. Considering these factors, the impact on paleontological resources is anticipated to be less than significant.

4.9. Land Use

All permanent alterations to the physical environment will occur within the existing SDG&E utility ROW and/or franchise position, including the installation of new transmission line poles (refer to Table 2-1). Activities occurring outside of the ROW and/or franchise position, such as access, project traffic and stringing/laydown areas, will be associated with construction activities only and will therefore be temporary. The scope of work will not conflict with land use regulations (general plans, specific plans, and zoning ordinances), will not physically divide an existing community, will not generate

or induce substantial growth, and will not conflict with established religious, scientific, or educational land uses in the vicinity. Temporary impacts to a golf course located adjacent to Poles 59 through 65 (refer to Figure 2-1) may occur during construction activities. This impact on recreational land use will be of limited duration. Considering these factors, impacts related to land use will be less than significant.

4.10. Socioeconomics

The scope of work will not result in displacement of homes, businesses, or any portion of the local population. The scope of work will also not result in increased demand for community resources or result in or induce substantial population growth. Due to the fact that the scope of work entails the enhancement of an existing transmission line, no new demands on fire protection or emergency services will be required and, therefore, no impacts will result relating to said services. Considering these factors, impacts relating to socioeconomics will be less than significant.

4.11. Traffic and Transportation

The scope of work will require the use of vehicles and equipment on and adjacent to roadways. The volume of traffic generated by the scope of work will be small and short-term, and will vary in location on a day-to-day basis during the construction period. Temporary impacts to traffic circulation will result from construction activities within and adjacent to roadways. Roadways may be used for stringing sites when better options are not available. Temporary impacts to traffic circulation will result from top of pole work carried out with the utilization of bucket trucks that will parked along roadway shoulders. These temporary impacts to traffic circulation will be minor and temporary in nature (only occurring during construction). Required permits for working within a roadway, along with appropriate traffic plans, including encroachment permits from the County of San Diego and CalTrans, will be obtained prior to work requiring such permits in any given area. Required traffic control measures will be implemented. Considering these factors, impacts to traffic and transportation will be less than significant.

4.12. Noise

Use of vehicles and equipment to complete the scope of work will generate noise, primarily in the vicinity of locations where pole replacements and/or new poles are located (refer to Table 2-1 and Figure 2-1). Impacts will be greatest where potential receptors are located in the immediate vicinity, for example, where homes are located in proximity to the ROW and/or franchise position (refer to Section 3.0). Noise impact will be temporary and will be very short term at any given location, except for the primary staging area, which is located away from residential areas. Use of heavy equipment and noisy activities will be limited to daylight hours. Equipment will be maintained in good working order so as to avoid unnecessary levels of noise generation. Considering these factors, impacts related to noise will be less than significant.

4.13. Visual Resources

During construction, work activities will be visible from surrounding areas. All permanent alterations to the physical environment will occur within the existing SDG&E utility ROW, where a transmission line already exists. Therefore, while there will be some changes in individual pole locations, overall, there will not be a substantial change in the existing visual character of the surroundings. The scope of work will not have a substantial affect on any scenic vista or affect any scenic highway. None of the proposed improvements will result in a new source of light or glare. Considering these factors, the impact to visual resources will be less than significant.

4.14. Waste Management

As stated within Section 6.14 of the AFC, many suitable waste hauling services and waste receiving facilities are capable of serving the Project vicinity. Waste generated during construction activities will be properly disposed of at an appropriate, licensed facility. Considering these factors, impacts relating to waste management will be less than significant.

4.15. Hazardous Materials Handling

Hazardous material associated with the construction activities will be handled and disposed of pursuant to applicable laws, ordinances, regulations, and standards (LORS) designed and implemented to mitigate significant hazards to the public and to minimize the potential for accidental release of hazardous materials to the environment. Due to the fact that the scope of work entails upgrading an existing transmission line, no physical interference of any adopted emergency response or evacuation plan will result. Considering these factors, impacts related to hazardous materials handling are anticipated to be less than significant.

4.16. Public Health

Work activities will result in the emission of certain hazardous air pollutants, primarily due to emissions from fuel burning equipment. These emissions will be minor, short term, and dispersed. Such emissions are expected to be well below thresholds that could represent a substantial health hazard. Considering these factors, impacts to public health will be less than significant.

4.17. Worker Safety

Potential impact to worker safety will be minimized through the utilization of SDG&E construction safety rules and a project specific Health and Safety Plan (HSP). Construction contractors utilized by SDG&E to complete the scope of work will also be required to conform with rules outlined within the HSP in addition to the contractor's self imposed safety procedures. Work will occur in accordance with applicable OSHA safety requirements. Work completed utilizing helicopters will also be completed in

conformance with FAA standards and specific permit conditions. Considering these factors, impacts related to worker safety are anticipated to be less than significant.

Table 2-1 - TL 698 Re-conductoring Scope of Work and Environmental Setting

Pole Number	Environmental Setting	Top of Pole Work[1]	Pole Replacement[2]	Pole Removal[3]	New Pole Installation[4]	New Foundation[5]	Air Support[6]	Grading/Clearing[7]	Access[8]
1	Paved substation	●	--	--	--	--	--	--	Access from Via Encinos Dr.
2	Bare ground surrounded by landscaping	●	--	--	--	--	--	--	Foot access from substation
3	Bare ground/landscaping surrounded by non-native grassland	●	--	--	--	--	--	--	Access from 1204 Via Encinos
4	Landscaping	●	--	--	--	--	--	--	Access from 1204 Via Encinos
5	Landscaping	●	--	--	--	--	--	--	Access from 1272 Via Encinos
6	Landscaping	--	●	--	--	--	○	○	Access from Sunset Dr.
7	Disturbed habitat	●	--	--	--	--	--	--	Access from 3501 Secluded Ln.
8	Bare ground surrounded by landscaping	●	--	--	--	--	--	--	Access from 3504 Secluded Ln.
9	Orchard/disturbed habitat surrounded by landscaping	●	--	--	--	--	--	--	Access from 1350 Sunset Grove
10	Disturbed habitat surrounded by landscaping	●	--	--	--	--	--	--	Access from 1378 Sunset Grove
11	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from terminus of Sunset Grove
12	Bare ground surrounded by landscaping/disturbed habitat	●	--	--	--	--	--	--	Access from Alta Vista
13	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from Vista Del Norte
14	Landscaping	●	--	--	--	--	--	--	Access from Vista Del Norte
15	Bare ground surrounded by landscaping	●	--	--	--	--	--	--	Access from Vista Del Norte
16	Disturbed habitat surrounded by oak woodland	●	--	--	--	--	--	--	Access from Vista Del Norte
17	Disturbed habitat surrounded by oak woodland	●	--	--	--	--	--	--	Access from Linda Vista Terrace at end of private road, around horse corral
18	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from Linda Vista Terrace
19	Bare ground surrounded by landscaping	●	--	--	--	--	--	--	Access from Linda Vista Terrace
20	Bare ground surrounded by landscaping	●	--	--	--	--	--	--	Access from Linda Vista Terrace

Table 2-1 - TL 698 Re-conductoring Scope of Work and Environmental Setting

Pole Number	Environmental Setting	Top of Pole Work[1]	Pole Replacement[2]	Pole Removal[3]	New Pole Installation[4]	New Foundation[5]	Air Support[6]	Grading/Clearing[7]	Access[8]
21	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from unpaved road connecting to Linda Vista Terrace
22	Disturbed habitat surrounded by landscaping	●	--	--	--	--	--	--	Access through private residence at the terminus of Vista Laguna Rd.
23	Disturbed habitat surrounded by Coastal sage scrub	●	--	--	--	--	--	--	Access from Via Chiquita
24	Bare ground surrounded by landscaping	--	●	--	--	--	○	--	Access from dirt at terminus of Dos Lomas, behind private residence
25	Disturbed habitat surrounded by landscaping/orchard	●	--	--	--	--	--	--	Access from dirt at terminus of Dos Lomas, behind private residence
26	Disturbed habitat surrounded by orchard	●	--	--	--	--	--	--	Access from existing SDG&E access road
27	Disturbed habitat surrounded by orchard/coastal sage scrub	●	--	--	--	--	--	--	Access from existing SDG&E access road
28	Bare ground surrounded by disturbed habitat/orchard	●	--	--	--	--	--	--	Access from existing SDG&E access road
29	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from Via Alicia
30	Disturbed habitat surrounded by landscaping	●	--	--	--	--	--	--	Access from Via Alicia
31	Non-native grassland surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from unpaved road off Via Alicia
32	Landscaping surrounded by disturbed habitat	●	--	--	--	--	--	--	Access through private residence on Caballo Ln.
33	Landscaping	●	--	--	--	--	--	--	Access from Caballo Ln.
34	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from Gird Rd.
35	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access through California Koi Farms Property on Gird Rd.
36	Bare ground surrounded by disturbed habitat	--	●	--	--	--	--	--	Access through California Koi Farms Property on Gird Rd.

Table 2-1 - TL 698 Re-conductoring Scope of Work and Environmental Setting

Pole Number	Environmental Setting	Top of Pole Work[1]	Pole Replacement[2]	Pole Removal[3]	New Pole Installation[4]	New Foundation[5]	Air Support[6]	Grading/Clearing[7]	Access[8]
37	Disturbed habitat	--	●	--	--	--	--	○	Access through California Koi Farms Property on Gird Rd.
38	Agricultural field/disturbed habitat surrounded by agricultural fields	●	--	--	--	--	--	--	Access from Gird Rd. and Lowell Ranch property
39	Agricultural field/disturbed habitat surrounded by agricultural fields	--	●	--	--	--	--	--	Access from Gird Rd. and Lowell Ranch property
40	Disturbed habitat surrounded by agricultural fields	--	●	--	--	--	--	○	Access from Gird Rd. and Lowell Ranch property
41	Disturbed habitat surrounded by agricultural fields	●	--	--	--	--	--	--	Access from unpaved SDG&E road
42	Agricultural field/disturbed habitat surrounded by agricultural fields	●	--	--	--	--	--	--	Access from private unpaved road connected to unpaved SDG&E road
43	Agricultural field/bare ground surrounded by agricultural fields	●	--	--	--	--	--	--	Access from private unpaved road connected to unpaved SDG&E road
44	Disturbed habitat surrounded by coastal sage scrub	●	--	--	--	--	--	--	Access from private unpaved road connected to unpaved SDG&E road
45	Bare ground surrounded by coastal sage scrub	●	--	--	--	--	--	--	Access from unpaved SDG&E road
46	Bare ground surrounded by oak woodland	●	--	--	--	--	--	--	Access from Pala Mesa Dr.
47	Bare ground surrounded by oak woodland	●	--	--	--	--	--	--	Access from Pala Mesa Dr.
48	Bare ground surrounded by oak woodland	●	--	--	--	--	--	--	Access from Pala Mesa Dr.
49	Non-native grassland surrounded by oak woodland	●	--	--	--	--	--	--	Access through private property on Pala Mesa Dr.
50	Orchard	●	--	--	--	--	--	--	Access through private property on Pala Mesa Dr.
51	Bare ground/landscaping surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from Foxglove Ln.

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Pole Number	Environmental Setting	Top of Pole Work[1]	Pole Replacement[2]	Pole Removal[3]	New Pole Installation[4]	New Foundation[5]	Air Support[6]	Grading/Clearing[7]	Access[8]
52	Orchard surrounded by orchard/landscaping	●	--	--	--	--	--	--	Access through private property on Pala Mesa Dr.
53	Disturbed habitat surrounded by orchard	●	--	--	--	--	--	--	Access through private property on Pala Mesa Dr.
54	Bare ground surrounded by disturbed habitat/oak woodland	--	●	--	--	--	--	--	Access paved driveway off of Daisy Ln.
55	Landscaping	●	--	--	--	--	--	--	Access through private property on Daisy Ln.
56	Bare ground surrounded by orchard	●	--	--	--	--	--	--	Access from Daisy Ln.
57	Oak woodland/landscaping	●	--	--	--	--	--	--	Access from Daisy Ln.
58	Landscaping	●	--	--	--	--	--	--	Access from sidewalk off of Los Padres Dr.
59	Landscaping	●	--	--	--	--	--	--	Access from Los Padres Ln.
60	Landscaping	●	--	--	--	--	--	--	Access from Golf Course driveway off of Los Padres Ln.
61	Landscaping surrounded by golf course	●	--	--	--	--	--	--	Access from Daisy Ln.
62	Disturbed habitat surrounded by golf course	●	--	--	--	--	--	--	Access from Daisy Ln.
63	Coastal sage scrub /non-native grassland	●	--	--	--	--	--	--	Access through Golf Course off of Los Padres Ln.
64	Landscaping surrounded by golf course	●	--	--	--	--	--	--	Access through Golf Course off of Los Padres Ln.
65	Golf course (turf)	--	●	--	--	●	--	●	Access through Golf Course off of Los Padres Ln.
66[9]	Riparian habitat adjacent to bare ground	--	●	--	--	●	--	●	Access from SDG&E unpaved road
67[10]	Riparian habitat surrounded by bare ground	--	--	●	--	--	--	--	Access from SDG&E unpaved road
68	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from SDG&E unpaved road
69	Bare ground surrounded by riparian habitat	●	--	--	--	--	--	--	Access from SDG&E unpaved road

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Pole Number	Environmental Setting	Top of Pole Work[1]	Pole Replacement[2]	Pole Removal[3]	New Pole Installation[4]	New Foundation[5]	Air Support[6]	Grading/Clearing[7]	Access[8]
70	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from SDG&E unpaved road
71	Disturbed habitat surrounded by riparian habitat	●	--	--	--	--	--	--	Access from SDG&E unpaved road
72	Orchard	--	●	--	--	--	--	○	Access through private orchard off of unpaved road.
73	Orchard	--	●	--	--	--	--	○	Access from unpaved SDG&E road
74	Orchard	--	●	--	--	--	--	○	Access from unpaved SDG&E road
75	Orchard	●	--	--	--	--	--	--	Access from unpaved SDG&E road
76	Disturbed habitat surrounded by orchard	--	●	--	--	--	--	--	Access from unpaved SDG&E road
77	Orchard	●	--	--	--	--	--	--	Access from unpaved SDG&E road
78	Orchard	●	--	--	--	--	--	--	Access from unpaved SDG&E road
79	Orchard	●	--	--	--	--	--	--	Access from unpaved SDG&E road
80	Orchard	●	--	--	--	--	--	--	Access from unpaved SDG&E road
81	Disturbed habitat surrounded by orchard	--	●	--	--	--	●	●	Access from unpaved SDG&E road
82	Non-native grassland surrounded by coastal sage scrub	--	●	--	--	--	●	●	Access from unpaved SDG&E road
83	Non-native grassland surrounded by coastal sage scrub	--	●	--	--	--	●	●	Access from unpaved SDG&E road
84	Non-native grassland surrounded by coastal sage scrub	--	●	--	--	--	●	●	Access from unpaved SDG&E road
85	Non-native grassland surrounded by coastal sage scrub	--	●	--	--	--	●	●	Access from unpaved SDG&E road
86	Bare ground surrounded by coastal sage scrub/oak woodland	--	●	--	--	●	●	●	Access from unpaved SDG&E road
87	Pastureland	--	●	--	--	--	○	--	Access though private pasture off of SR 76 and Rice Canyon Rd.

Table 2-1 - TL 698 Re-conductoring Scope of Work and Environmental Setting

Pole Number	Environmental Setting	Top of Pole Work[1]	Pole Replacement[2]	Pole Removal[3]	New Pole Installation[4]	New Foundation[5]	Air Support[6]	Grading/Clearing[7]	Access[8]
88	Bare ground surrounded by disturbed habitat	--	●	--	--	--	--	--	Access from SR 76
89	Bare ground surrounded by disturbed habitat/agricultural field	--	●	--	--	--	--	--	Access from SR 76
90	Bare ground	●	--	--	--	--	--	--	Access from SR 76
91	Disturbed habitat surrounded by agricultural fields	●	--	--	--	--	--	--	Access from SR 76
92	Disturbed habitat	●	--	--	--	--	--	--	Access from SR 76
93	Bare ground surrounded by disturbed habitat and non-native grassland	--	●	--	--	--	--	●	Access from SR 76
94	coastal sage scrub	--	●	--	--	--	●	●	Hike access (no trail) from SR 76
95	Bare ground surrounded by non-native grassland	--	●	--	--	●	○	●	Access from unpaved SDG&E Rd.
96	Non-native grassland	--	●	--	--	●	○	●	Access from unpaved SDG&E Rd.
97	Disturbed habitat surrounded by bare ground, coastal sage scrub and non-native grassland	--	●	--	--	●	○	●	Access from unpaved SDG&E Rd.
98	Orchard/lawn	●	--	--	--	--	--	--	Access through private property on paved private road off of SR 76
99	Bare ground surrounded by disturbed habitat	●	--	--	--	--	--	--	Access from paved private road off of SR 76
100	Bare ground surrounded by disturbed habitat	--	●	--	--	--	--	--	Access from paved private road off of SR 76
101	Disturbed habitat	●	--	--	--	--	--	--	Access from paved private road off of SR 76
102	Disturbed habitat surrounded by non-native grassland	--	●	--	--	●	--	●	Access from SR 76
103	Bare ground surrounded by coastal sage scrub and bare ground	--	●	--	--	●	○	●	Access from unpaved SDG&E road
104	Bare ground surrounded by coastal sage scrub and bare ground	--	●	--	--	●	○	●	Access from unpaved SDG&E road

Table 2-1 - TL 698 Re-conductoring Scope of Work and Environmental Setting

Pole Number	Environmental Setting	Top of Pole Work[1]	Pole Replacement[2]	Pole Removal[3]	New Pole Installation[4]	New Foundation[5]	Air Support[6]	Grading/Clearing[7]	Access[8]
105	Bare ground surrounded by coastal sage scrub	--	--	●	--	--	●	--	Hike access from SR 76
106	Bare ground surrounded by coastal sage scrub	--	●	--	--	--	--	--	Access from unpaved SDG&E road adjacent to Pala substation
107	Bare ground	--	--	--	--	--	--	--	Access from unpaved SDG&E road adjacent to Pala substation
108	Bare ground surrounded by disturbed habitat and bare ground	--	●	--	--	--	--	--	Access from Alta Vista
109	Disturbed habitat	--	--	--	●	--	○	--	Access from unpaved SDG&E road off of Linda Vista Terrace
110	Disturbed habitat surrounded by landscaping	--	--	--	●	●	○	--	Access through private residence at the terminus of Vista Laguna Rd.
111	Disturbed habitat surrounded by coastal sage scrub	--	--	--	●	--	○	--	Access from Via Chiquita
112	Disturbed habitat surrounded by orchard/golf course	--	--	--	●	--	○	●	Access from existing SDG&E access road
113	Disturbed habitat surrounded by orchard and coastal sage scrub	--	--	--	●	--	○	○	Hike access (no trail) from Via Alicia
114	Disturbed habitat	--	--	--	●	--	--	--	Access from Via Alicia
115	Landscaping	--	--	--	●	--	●	○	Access through private residence off of Caballo Ln.
116	Agricultural field	--	--	--	●	--	--	--	Access through Lowell Ranch property off of Gird Rd.
117	Landscaping	--	--	--	●	--	○	○	Access from Sunset Dr.
Stringing Site 1 – located at Monserate Substation	Paved road and disturbed habitat roadside	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Via Encinos Dr.
Stringing Site 2 – located at Pole 11	Gravel/paved road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from terminus of Sunset Grove

Table 2-1 - TL 698 Re-conductoring Scope of Work and Environmental Setting

Pole Number	Environmental Setting	Top of Pole Work[1]	Pole Replacement[2]	Pole Removal[3]	New Pole Installation[4]	New Foundation[5]	Air Support[6]	Grading/Clearing[7]	Access[8]
Stringing Site 3 – located at Pole 20	Disturbed habitat	N/A	N/A	N/A	N/A	N/A	N/A	●	Access from Linda Vista Terrace
Stringing Site 4 – located at Pole 23	Dirt road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Via Chiquita
Stringing Site 5 – located at Pole 29	Paved road, disturbed habitat and dirt road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Via Alicia
Stringing Site 6 – located at Pole 36	Disturbed habitat and landscaping	N/A	N/A	N/A	N/A	N/A	N/A	●	Access through California Koi Farms Property on Gird Rd.
Stringing Site 7 – located at Pole 46	Dirt Road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Pala Mesa Dr. at start of unpaved SDG&E road
Stringing Site 8 – located at Pole 56	Paved road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Daisy Ln.
Stringing Site 9 – located at Pole 56	Paved road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Daisy Ln.
Stringing Site 10 – located at Pole 57	Paved road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Daisy Ln.
Stringing Site 11 – located at Pole 57	Paved road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Daisy Ln.
Stringing Site 12 – Located at Pole 60	Paved road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Los Padres Ln.
Stringing Site 13 – Located at Pole 62	Paved Road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Daisy Ln.
Stringing Site 14 – located at Pole 63	Golf course	N/A	N/A	N/A	N/A	N/A	N/A	--	Access through golf course off of Los Padres Ln.
Stringing Site 15 – Located at Pole 63	Golf Course	N/A	N/A	N/A	N/A	N/A	N/A	--	Access through golf course off of Los Padres Ln.
Stringing Site 16 – located at Pole 71	Disturbed habitat	N/A	N/A	N/A	N/A	N/A	N/A	--	Access through private pasture land off of unpaved SDG&E road.

Table 2-1 - TL 698 Re-conductoring Scope of Work and Environmental Setting

Pole Number	Environmental Setting	Top of Pole Work[1]	Pole Replacement[2]	Pole Removal[3]	New Pole Installation[4]	New Foundation[5]	Air Support[6]	Grading/Clearing[7]	Access[8]
Stringing Site 17 – located at Pole 71	Disturbed habitat	N/A	N/A	N/A	N/A	N/A	N/A	--	Access through private pasture land off of unpaved SDG&E road.
Stringing Site 18 – located at Pole 87	Paved road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Rice Canyon Road
Stringing Site 19 – located at Pole 99	Disturbed habitat	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from private paved road off of SR 76
Stringing Site 20 – located at Pole 99	Disturbed habitat	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from private paved road off of SR 76
Stringing Site 21 – located at Pole 107	Dirt road	N/A	N/A	N/A	N/A	N/A	N/A	--	Access from Pala Del Norte Road
Laydown Site 1 – located at Pole 20	Disturbed habitat	N/A	N/A	N/A	N/A	N/A	●	●	Access from Linda Vista Terrace
Laydown Site 2 – located at Pole 101	Disturbed habitat	N/A	N/A	N/A	N/A	N/A	●	●	Access from private paved road off of SR 76

Legend:
● = Required at this pole location.
-- = Not required at this pole location.
○ = Potentially required at this location.
N/A = Not applicable.
[1]Work confined to top of an existing pole only. Work could include the addition, removal, or replacement of transmission pole hardware such as insulators, line guards and rollers.
[2]Existing pole will be replaced typically within +/- 10 feet of the existing pole. The existing pole will be removed, or cut off approximately 2 feet below grade and filled over if complete removal is impractical.
[3]Existing pole will be removed and not replaced.
[4]A new pole will be added within the existing transmission line ROW.
[5] Some new poles will require a concrete footing to a depth of approximately eight feet below grade. Pole locations with footing work will require approximately 2,500 square feet (50 feet by 50 feet) of work space.
[6]In locations with limited or no vehicular access, helicopters will be utilized to bring in new poles. The new poles are lowered into place by the helicopter and work is completed with minimal disturbance.
[7]Grading and or clearing will be required in order to access the work site or to create the required work space for the scope of work. Clearing could include ground or tree (overhead) clearing.
[8]All named roads are paved
[9]The existing pole # 66 will be cut off at or immediately above the vegetation line in order to avoid direct impacts to riparian habitat and potential jurisdictional waters of the U.S. and jurisdictional waters of the State of California. The replacement pole # 66 will be constructed approximately 15 feet east of the existing pole on bare ground located outside of the boundaries of the potential jurisdictional waters.
[10]The existing pole # 67 will be cut off at or immediately above the vegetation line in order to avoid direct impacts to riparian habitat. Work will be completed from adjacent unpaved road.

Table 2-2 - Summary of Clearing and Grading Activities

Location / Pole #	Scope of Work	Type of Disturbance	Area of Disturbance		Environmental Setting
			Dimensions	Calculated Area	
6	Pole replacement	Potential trimming of trees	N/A	N/A	Landscaping
37	Pole replacement	Potential clearing of disturbed habitat	5’ x 5’	25 sf	Disturbed habitat
40	Pole replacement	Potential clearing of disturbed habitat	5’ x 5’	25 sf	Disturbed habitat surrounded by agricultural fields
65	Pole replacement with concrete foundation	Grading and clearing of turf for concrete foundation	10’ x 10’	100[1] sf	Golf course (turf)
66	Pole replacement with concrete foundation	Minor grading of bare ground area for concrete foundation	10’ x 10’	100[1] sf	Riparian habitat adjacent to bare ground
72	Pole replacement	Potential trimming and/or removal of orchard trees	5’ x 5’	25 sf	Orchard
73	Pole replacement	Potential trimming of trees	N/A	N/A	Orchard
74	Pole replacement	Potential trimming of trees	N/A	N/A	Orchard
81	Pole replacement	Potential trimming and/or removal of orchard trees	5’ x 5’	25 sf	Disturbed habitat surrounded by orchard
82	Pole replacement	Clearing of non-native grassland	5’ x 5’	25 sf	Non-native grassland surrounded by coastal sage scrub
83	Pole replacement	Clearing of non-native grassland	5’ x 5’	25 sf	Non-native grassland surrounded by coastal sage scrub
84	Pole replacement	Clearing of non-native grassland	5’ x 5’	25 sf	Non-native grassland surrounded by coastal sage scrub

Table 2-2 - Summary of Clearing and Grading Activities

Location / Pole #	Scope of Work	Type of Disturbance	Area of Disturbance		Environmental Setting
			Dimensions	Calculated Area	
85	Pole replacement	Clearing of non-native grassland	5’ x 5’	25 sf	Non-native grassland surrounded by coastal sage scrub
86	Pole replacement with concrete foundation	Grading and clearing of coastal sage scrub (CSS) for work space and concrete foundation.	15’ x 25’ of clearing	375[1] sf of clearing	Bare ground surrounded by coastal sage scrub/oak woodland
			15’ x 20’ of disturbance in bare area	300[1] sf of disturbance in bare area	
93	Pole replacement	Minor clearing of non-native grassland for replacement pole	5’ x 5’	25 sf	Bare ground surrounded by disturbed habitat and non-native grassland
94	Pole replacement	Minor clearing of CSS for replacement pole.	10’ x 10’	100 sf	Coastal sage scrub
95	Pole replacement with concrete foundation	Grading and clearing of non-native grassland for work space and concrete foundation	25’ x 50’ of clearing	1,250[1] sf of clearing	Bare ground surrounded by non-native grassland
96	Pole replacement with concrete foundation	Grading and clearing of non-native grassland for work space and concrete foundation	40’ x 50’ of clearing	2,000[1] sf of clearing	Non-native grassland
97	Pole replacement with concrete foundation	Grading and clearing of CSS for work space and concrete foundation	35’ x 50’ of clearing	1,750[1] sf of clearing	Disturbed habitat surrounded by bare ground, coastal sage scrub and non-native grassland

Table 2-2 - Summary of Clearing and Grading Activities

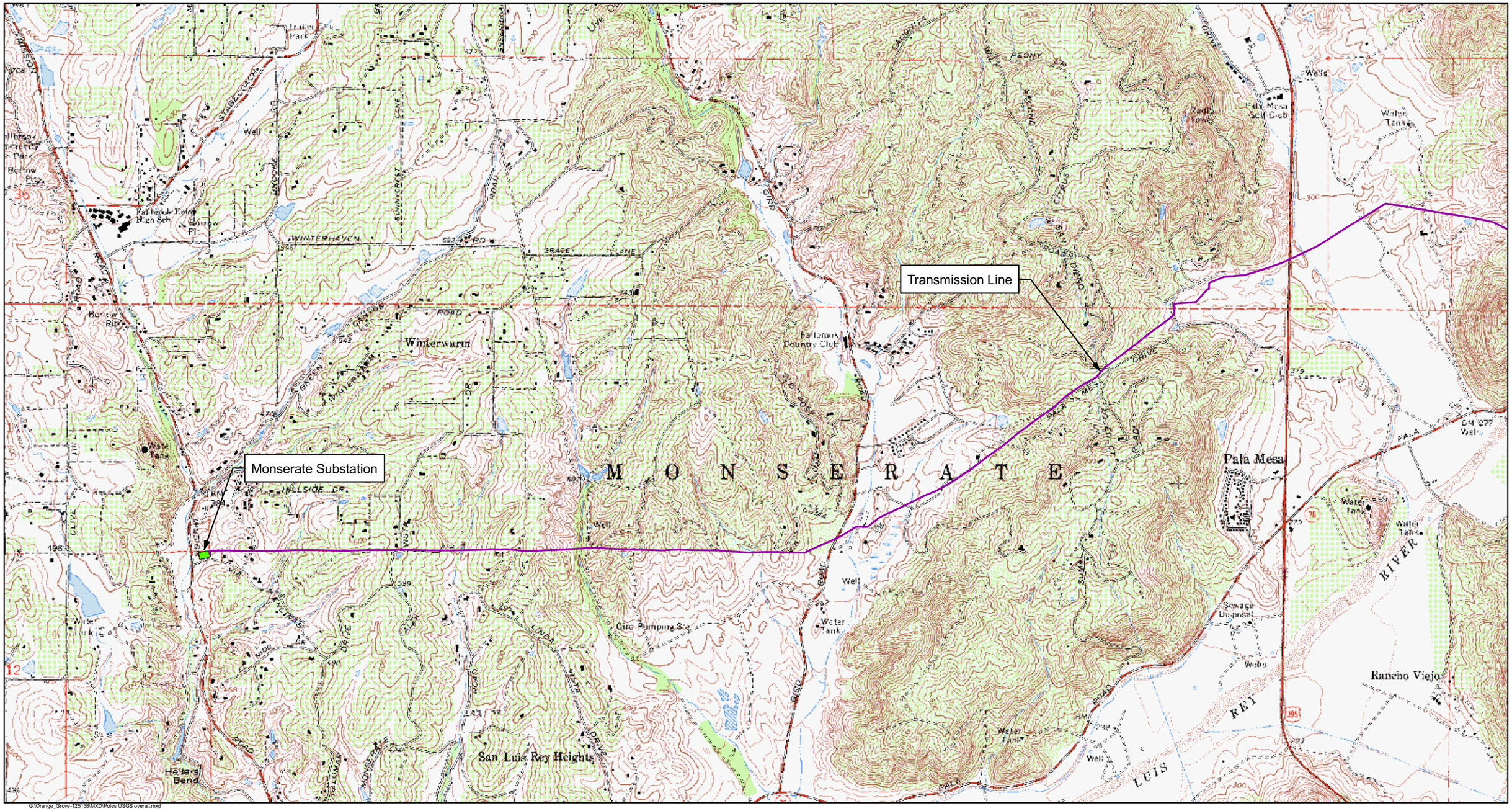
Location / Pole #	Scope of Work	Type of Disturbance	Area of Disturbance		Environmental Setting
			Dimensions	Calculated Area	
102	Pole replacement with concrete foundation	Grading and clearing of disturbed habitat and non-native grassland for work space and concrete foundation	40’ x 50’ of clearing	2,000[1] sf of clearing	Disturbed habitat surrounded by non-native grassland
103	Pole replacement with concrete foundation	Grading and clearing of CSS for work space and concrete foundation	35’ x 50’ of clearing	1,750[1] sf of clearing	Bare ground surrounded by coastal sage scrub and bare ground
104	Pole replacement with concrete foundation	Grading and clearing of CSS for work space and concrete foundation	25’ x 50’ of clearing	1,250[1] sf of clearing	Bare ground surrounded by coastal sage scrub and bare ground
112	New pole installation	Minor clearing of disturbed habitat for pole installation	10’ x 10’ of clearing	100 sf of clearing	Disturbed habitat surrounded by orchard/golf course
113	New pole installation	Potential clearing of disturbed habitat and/or trimming of trees	10’ x 10’ of clearing	100 sf of clearing	Disturbed habitat surrounded by orchard and coastal sage scrub
115	New pole installation	Potential trimming of trees	N/A	N/A	Landscaping
117	New pole installation	Potential tree removal and/or trimming	N/A	N/A	Landscaping
Stringing site # 3	Stringing site	Clearing of disturbed habitat	10’ x 100’ of clearing	1,000 sf of clearing	Disturbed habitat
Stringing site # 6	Stringing site	Clearing of disturbed habitat and landscaping	10’ x 100’ of clearing	1,000 sf of clearing	Disturbed habitat and landscaping

Table 2-2 - Summary of Clearing and Grading Activities

Location / Pole #	Scope of Work	Type of Disturbance	Area of Disturbance		Environmental Setting
			Dimensions	Calculated Area	
Laydown site # 1	Laydown site	Clearing of disturbed habitat	250’ x 240’ x 320’ (triangle)	+/- 30,000 sf	Disturbed habitat
Laydown site # 2	Laydown site	Clearing of disturbed habitat	260’ x 760’	+/- 197,600 sf	Disturbed habitat
Total grading and clearing disturbance			**N/A**	**241,000 sf**	**N/A**

sf – square feet

[1]The indicated area of disturbance is in reference to all areas that require clearing of vegetation or grading. As stated in footnote 5 of Table 2-1, all poles that have a concrete foundation will require 50 feet by 50 feet of work area. The difference between the stated areas and the required 50 feet by 50 feet is equal to the amount of relatively flat, non-vegetated space currently available at each location.



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Transmission Line
Substations

USGS Topographical Quadrangles 1:24000
Bonsall and Pala

1"= 2,000'

2,000 1,000 0 2,000 4,000 6,000 Feet

N

Figure 1-1

Sheet: 1

Location of TL 698E and TL 698B Reconductoring Work

Orange Grove Project

TRC

Pala Substation

Transmission Line

Site Location

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Transmission Line

Substations

USGS Topographical Quadrangles 1:24000
Bonsall and Pala

1"= 2,000'

2,000 1,000 0 2,000 4,000 6,000 Feet

N

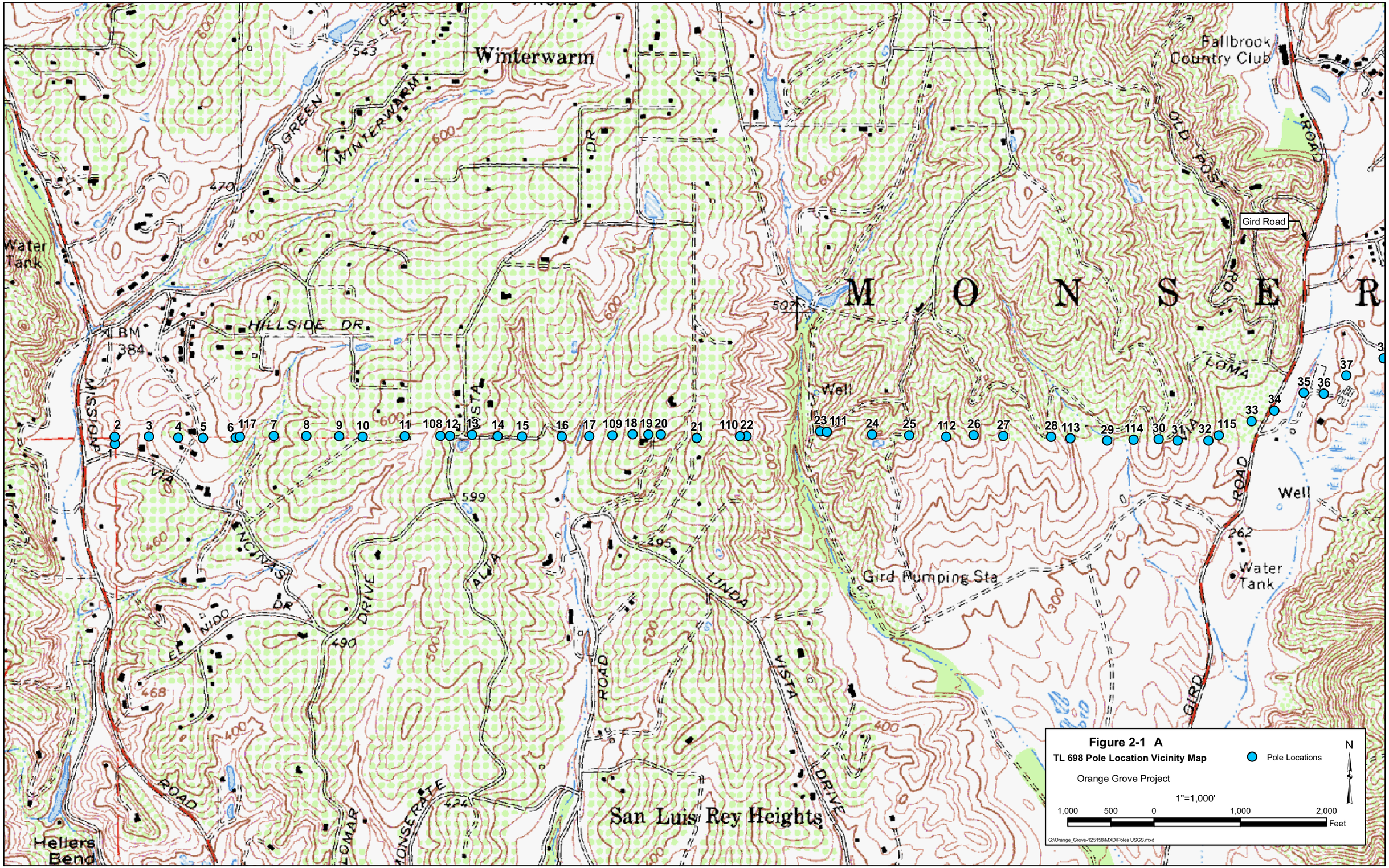
Figure 1-1

Sheet: 2

Location of TL 698E and TL 698B Reconductoring Work

Orange Grove Project

TRC


Winterwarm
Fallbrook Country Club
Gird Road
Water Tank
HILLSIDE DR.
BM 384
GREEN VALLEY
WINTERWARM DR.
OLD POMA ROAD
POMA ROAD
MISSION VIA
ENCINAS DR
EL NIDO DRIVE
ALTA ROAD
LINDA VISTA DRIVE
GIRD ROAD
Well
Gird Pumping Sta
Water Tank
Well
Heilers Bend
San Luis Rey Heights
1 2 3 4 5 6 117 7 8 9 10 11 108 12 13 14 15 16 17 109 18 19 20 21 110 22 23 111 24 25 112 26 27 28 113 29 114 30 31 32 115 33 34 35 36 37
Figure 2-1 A
TL 698 Pole Location Vicinity Map
Orange Grove Project
1"=1,000'
Pole Locations
N
1,000 500 0 1,000 2,000
Feet
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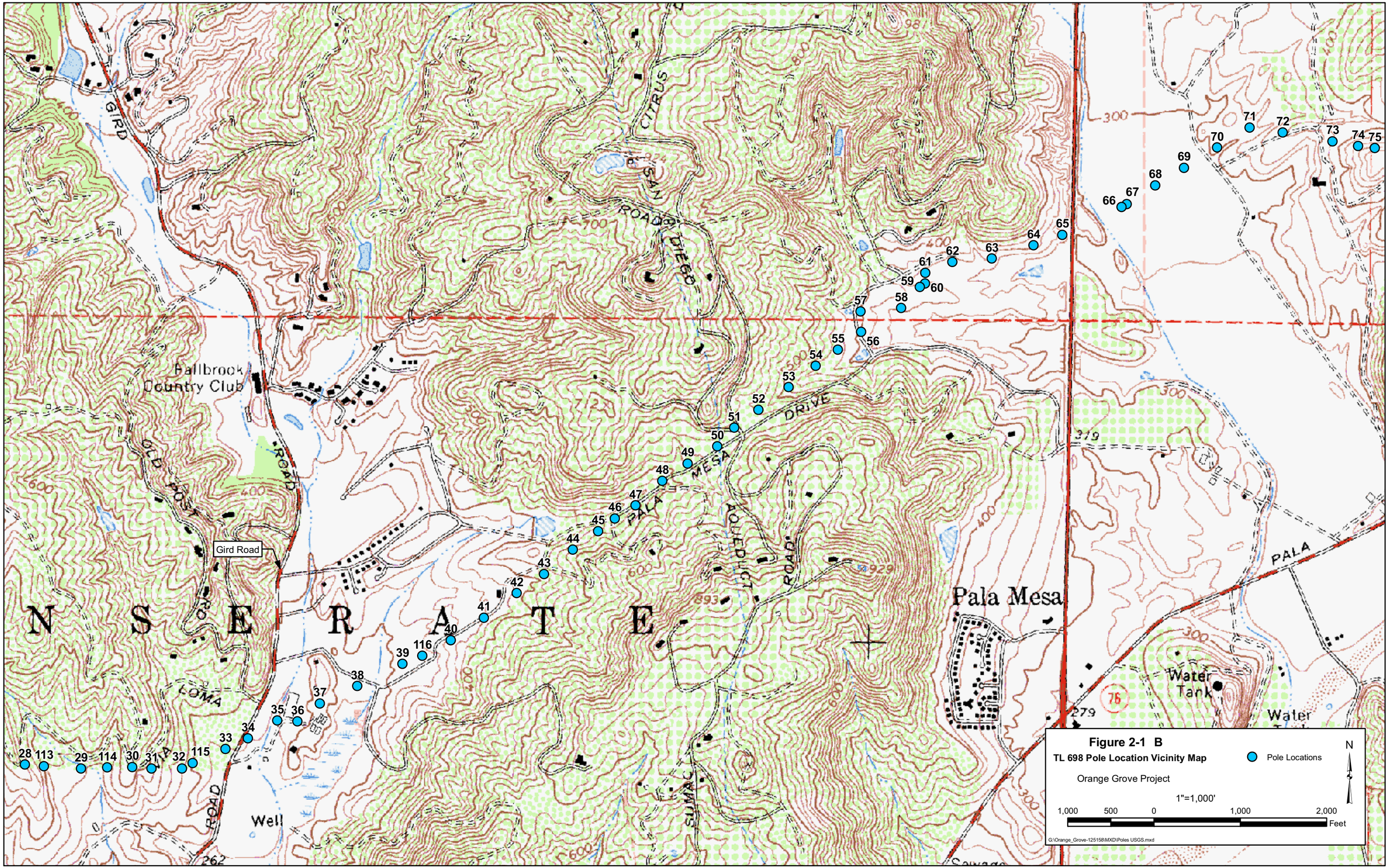
GIRD
CITRUS
SAN DIEGO
ROAD
DRIVE
MESA
PALA
AQUEDUCT
ROAD
OLD POST
ROAD
LOMA
ROAD
SUMAC
ROAD
Ballbrook
Country Club
Gird Road
Well
Pala Mesa
Water
Tank
PALA
N S E R A T E
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Figure 2-1 B
TL 698 Pole Location Vicinity Map
Pole Locations
Orange Grove Project
1"=1,000'
1,000 500 0 1,000 2,000
Feet
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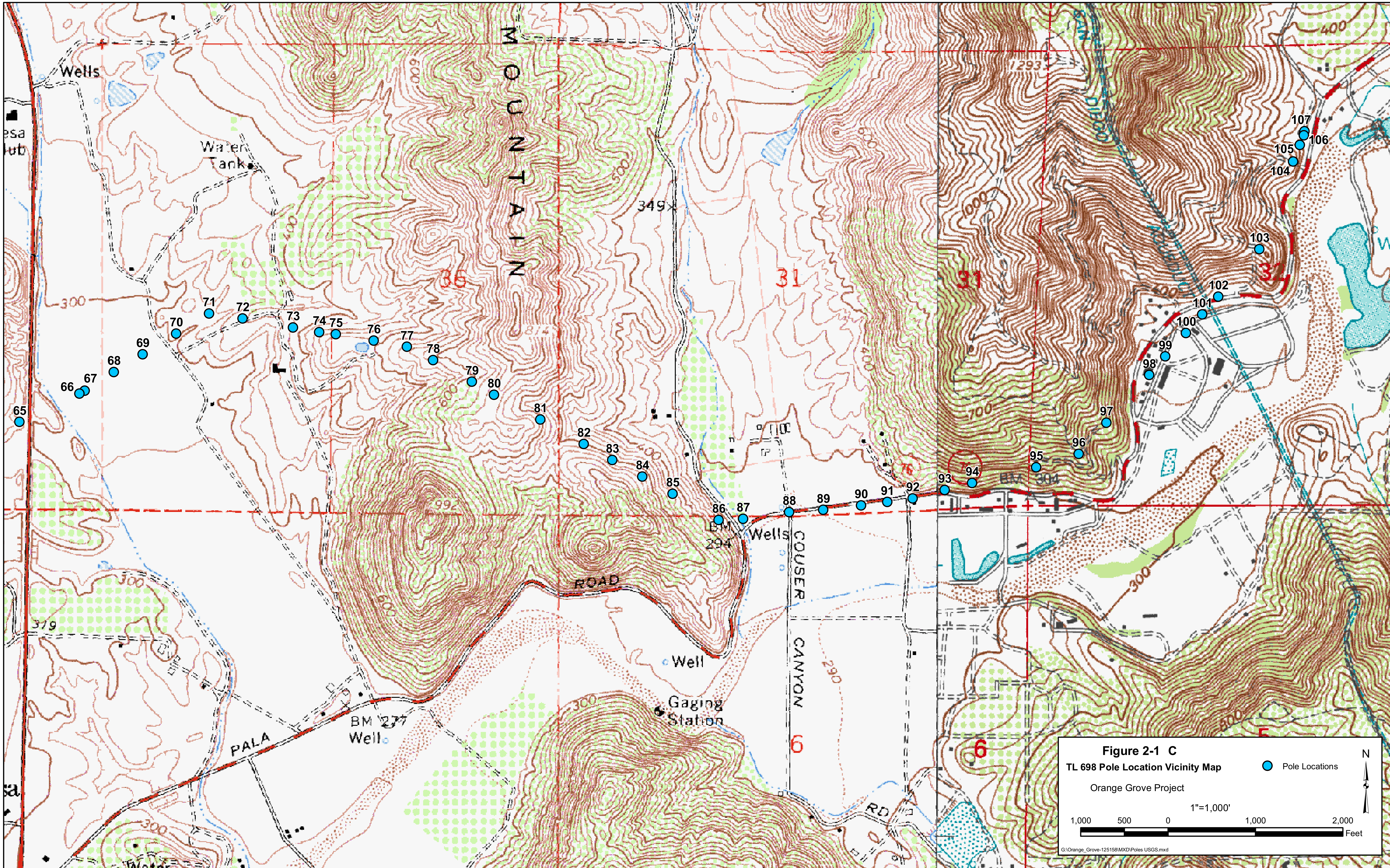
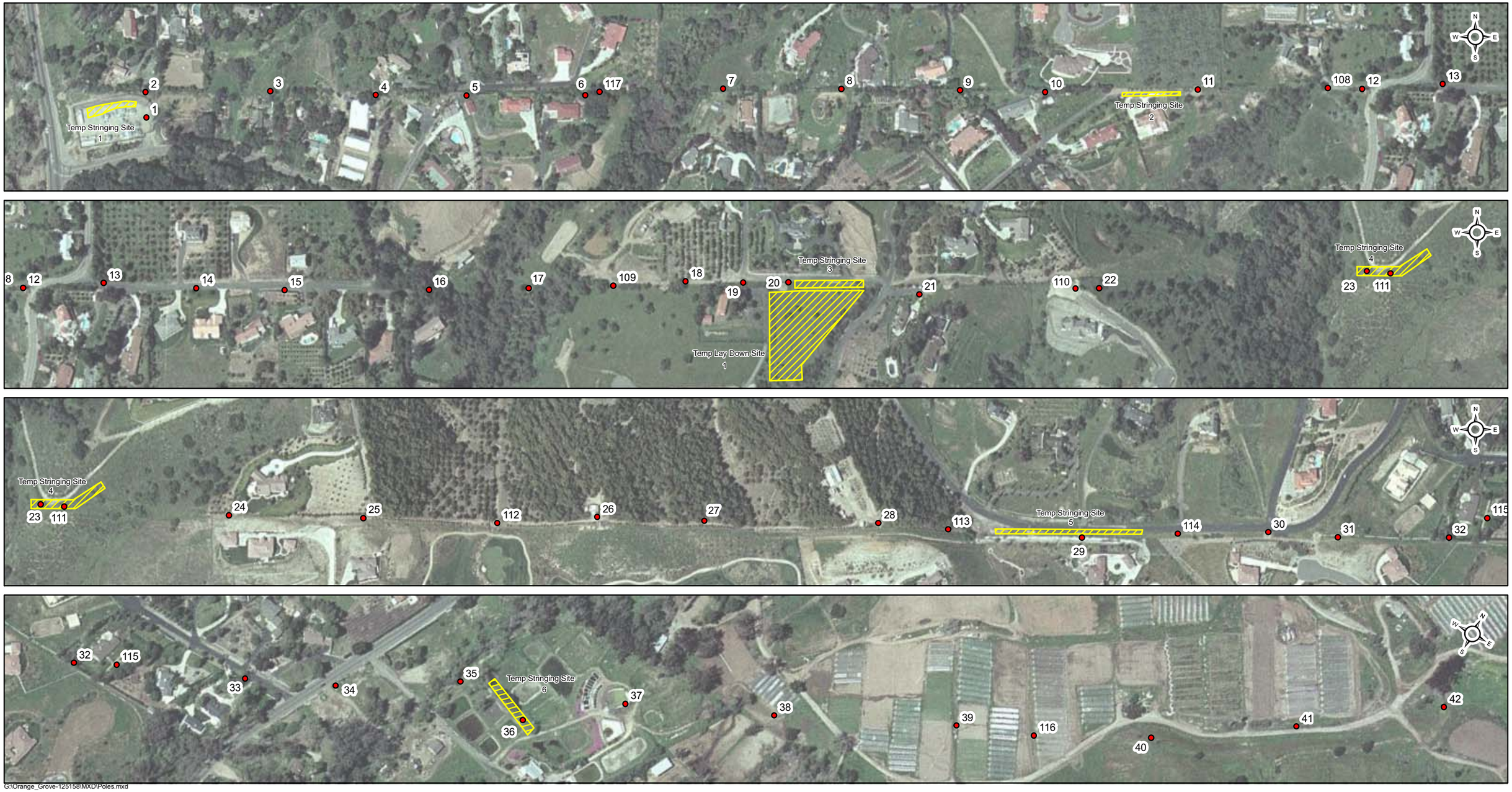


Figure 2-1 C
TL 698 Pole Location Vicinity Map
Orange Grove Project
Pole Locations
1"=1,000'
1,000 500 0 1,000 2,000
Feet
N
MOUNTAIN
Wells
Water Tank
ROAD
PALA
BM 277
Well
Gaging Station
COUSER CANYON
RD
BM 294
BM 304
Water



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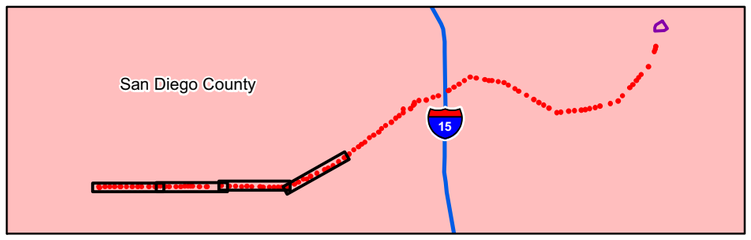


Pole Locations

Potential Laydown Areas & Stringing Sites

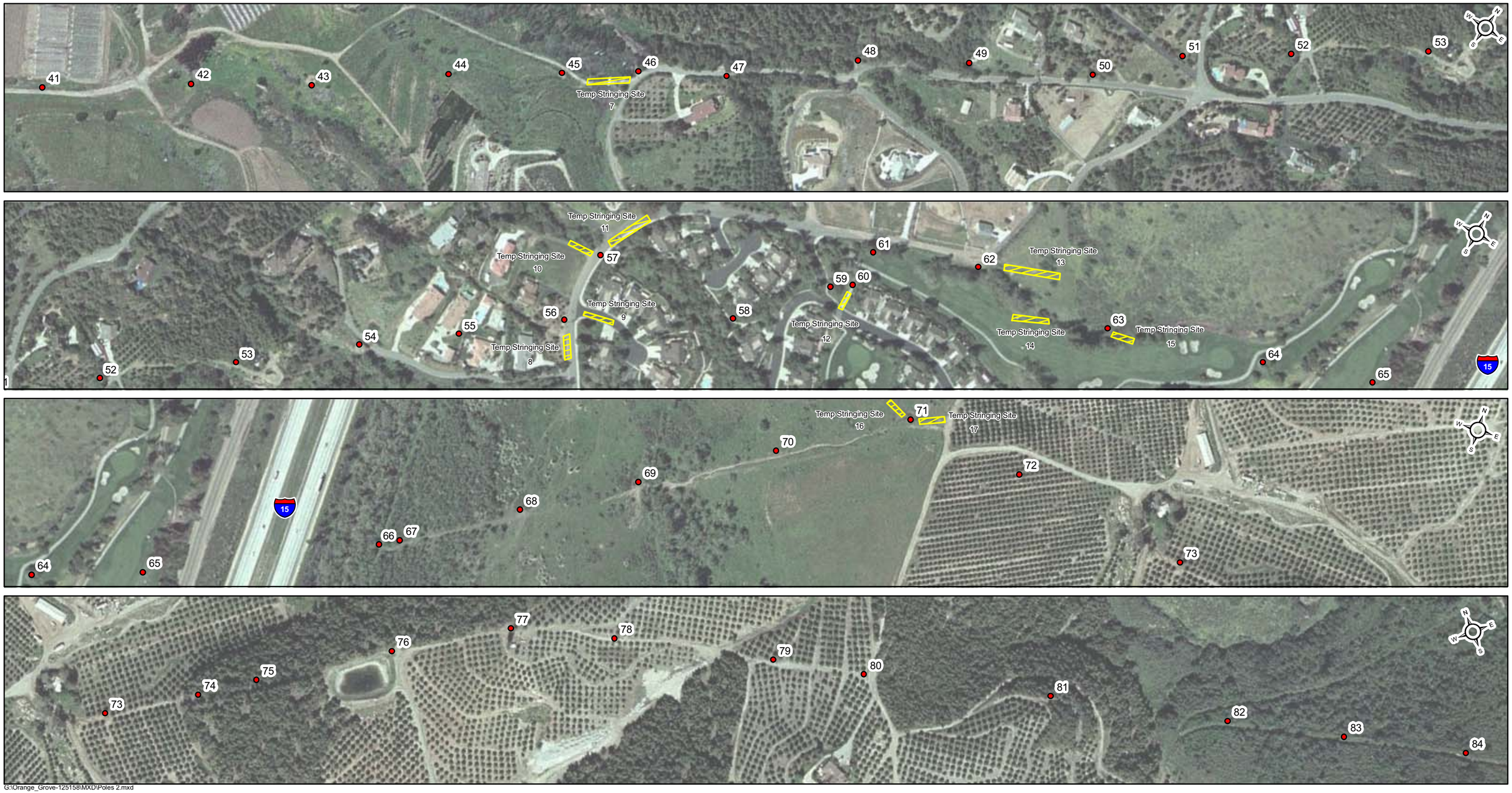
Source:
Aerial Photography from ESRI_Imagery_World_2D

1" = 300'

0 150 300 600 900 1,200 Feet

Figure 2-2 A
TL 698
Reconductoring Overview Map
Orange Grove Project

TRC



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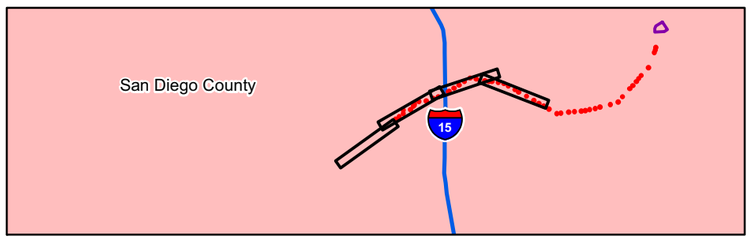

- Pole Locations
- Potential Laydown Areas & Stringing Sites

Source:
Aerial Photography from ESRI_Imagery_World_2D

1" = 300'

0 150 300 600 900 1,200 Feet

Figure 2-2 B

TL 698
Reconductoring Overview Map
Orange Grove Project

TRC

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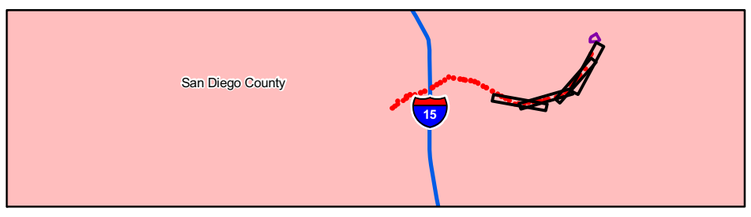

- Pole Locations
- Potential Laydown Areas & Stringing Sites

1" = 300'

0 150 300 600 900 1,200 Feet

Source:
Aerial Photography from ESRI_Imagery_World_2D

Figure 2-2 C

TL 698
Reconductoring Overview Map
Orange Grove Project

TRC