Genesis Solar, LLC
700 Universe Boulevard, Juno Beach, Florida 33408

DOCKET	
09-AFC-8	
DATE	OCT 06 2009
RECD.	OCT 12 2009

October 6, 2009

Ms. Melissa Jones
Executive Director
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Dear Ms. Jones,

Pursuant to the provisions of Title 20, California Code of Regulation, Genesis Solar LLC, a Delaware limited liability company, hereby submits the *Genesis Solar Energy Project Application for Certification Data Adequacy Supplement.* The Genesis Solar Energy Project is a 250 megawatt solar electric generating facility to be located between the community of Desert Center and the city of Blythe in eastern Riverside County, California.

This data adequacy supplement was compiled in response to the Energy Commission's Data Adequacy Recommendation (09-AFC-8) dated September 30, 2009. This document provides the additional information necessary to fulfill the Application for Certification data adequacy requirements for the following technical areas:

- Air Quality
- Biological Resources
- Cultural Resources
- Geological Resources
- Paleontological Resources
- Soils
- Transmission System Design
- Visual Resources
- Water

If you have any questions, please contact Meg Russell at (561) 304-5609 or me at (561) 691-2889.

Sincerely,
Genesis Solar, LLC

Scott Busa
Director

Genesis Solar Energy Project
09-AFC-8
Data Adequacy Supplement

Table of Contents

Table of Contents i
Air Quality 1
Biological Resources 5
Cultural Resources 9
Geological Hazards and Resources 31
Paleontological Resources 39
Soils 41
Transmission System Design 43
Visual Resources 49
Water Resources 53
References 59

Data Adequacy Supplement Attachments:

Attachment A: Air Quality
- Letter: Completeness Letter from Mojave Desert Air Quality Management District

Attachment B: Biological Resources
- Figs. 5.3-2 A through E: Natural Community Types
- Figs. 5.3-6 A through D: Special Status Plants
- Figs. 5.3-7A through J: Waters Evaluation Field Survey Results
- Figs. 5.3-8 A through D: Desert Tortoise Sign
- Figs. 5.3-9 A through D: Other Special Status Wildlife
- Figs. 5.3-10 A through D: Burrowing Owl and Sign

Attachment C: Cultural Resources
- Figure 3a-Current Right of Way and Surveyed Area
- Figure 3b-Current Right of Way and Surveyed Area
- Letter: BLM letter regarding National Historic Preservation Act

Attachment D: Geological Hazards and Resources
- Figure D1-1 Area Geologic Map for offsite linears
- Figure D1-2 Site Geologic Map for offsite linears

Attachment E: Paleontological Resources
- Table - Sensitivity of Geologic Units
- Figure D1-1 Area Geologic Map for offsite linears

Table of Contents (Continued)

Figure D1-2 Site Geologic Map for offsite linears
Figure 5-5-1 Area Geologic Map
Figure 5-5-4 Site Geologic Map
Attachment F: Soils
Figure F- 1.1 Wind Erosion Estimate and Calculation
Attachment G: Transmission System Design
Figure G-1.1: Genesis On-Site Switchyard One-Line Diagram
Figure G-1.2: Genesis On-Site Switchyard Layout Drawing
Figure G-1.3: Colorado River Substation One-Line Diagram
Figure G-1.4: Blythe Energy Project Pole Elevation Drawing
Figure G-1.5: Blythe-Julian Hinds Transmission Line Route
Figure 3.6-1a & 3.6-1b: Transmission line route to the Blythe-Julian Hinds transmission line
Figure 3.4-7: Revised Key One-Line Diagram Transition Cluster Phase I Interconnection Study – Desert Center Blythe Generation Project, Final Report
Revised Table 4.4-1 to include G.O 128
Attachment H: Visual Resources
Figure – Solar Collector Module Conceptual Arrangement
Report – Cooling Tower Plume Modeling Analysis for the Genesis Solar Energy Project
Attachment I: Water Resources
Figure I-1.1 Best Best & Krieger, Water Rights for Project Genesis Solar
Figure I-1.2 Adjudicated Basins and Watermasters in California
Figure I-1.3 Adjudicated Basins Map
Figure I-1.4 Palo Verde Irrigation District Boundary Map

Genesis Solar Energy Project
09-AFC-8
Data Adequacy Supplement

Table of Contents

Table of Contents i
Air Quality 1
Biological Resources 5
Cultural Resources 9
Geological Hazards and Resources 31
Paleontological Resources 39
Soils 41
Transmission System Design 43
Visual Resources 49
Water Resources 53
References 59

Data Adequacy Supplement Attachments:

Attachment A: Air Quality
- Letter: Completeness Letter from Mojave Desert Air Quality Management District

Attachment B: Biological Resources
- Figs. 5.3-2 A through D: Natural Community Types
- Figs. 5.3-6 A through D: Special Status Plants
- Figs. 5.3-7A through J: Waters Evaluation Field Survey Results
- Figs. 5.3-8 A through D: Desert Tortoise Sign
- Figs. 5.3-9 A through D: Other Special Status Wildlife
- Figs. 5.3-10 A through D: Burrowing Owl and Sign

Attachment C: Cultural Resources
- Figure 3a-Current Right of Way and Surveyed Area
- Figure 3b-Current Right of Way and Surveyed Area
- Letter: BLM letter regarding National Historic Preservation Act

Attachment D: Geological Hazards and Resources
- Figure D1-1 Area Geologic Map for offsite linears
- Figure D1-2 Site Geologic Map for offsite linears

Attachment E: Paleontological Resources
- Figure 5-5-1 Area Geologic Map
- Figure 5-5-4 Site Geologic Map

Table of Contents (Continued)

Figure D1-1 Area Geologic Map for offsite linears
Figure D1-2 Site Geologic Map for offsite linears
Table- Sensitivity of Geologic Units
Attachment F: Soils
Figure F- 1.1 Wind Erosion Estimate and Calculation
Attachment G: Transmission System Design
Figure G-1.1: Genesis On-Site Switchyard One-Line Diagram
Figure G-1.2: Genesis On-Site Switchyard Layout Drawing
Figure G-1.3: Colorado River Substation One-Line Diagram
Figure G-1.4: Blythe Energy Project Pole Elevation Drawing
Figure G-1.5: Blythe-Julian Hinds Transmission Line Route
Figure 3.6-1a & 3.6-1b: Transmission line route to the Blythe-Julian Hinds transmission line
Figure 3.4-7: Revised Key One-Line Diagram Transition Cluster Phase I Interconnection Study – Desert Center Blythe Generation Project, Final Report
Revised Table 4.4-1 to include G.O 128
Attachment H: Visual Resources
Figure – Solar Collector Module Conceptual Arrangement
Report – Cooling Tower Plume Modeling Analysis for the Genesis Solar Energy Project
Attachment I: Water Resources
Figure I-1.1 Best Best & Krieger, Water Rights for Project Genesis Solar
Figure I-1.2 Adjudicated Basins and Watermasters in California
Figure I-1.3 Adjudicated Basins Map
Figure I-1.4 Palo Verde Irrigation District Boundary Map

Air Quality

Air Quality: Appendix B (g) (1)

Information Required:

Please provide a discussion of the expected direct, indirect and cumulative impacts due to the maintenance (i.e. mirror washing, soil stabilization) of the project. In addition please provide measures to mitigate these impacts and all other environmental impacts from all project phases.

Response:

Maintenance activities are described in detail in the response below. The primary sources of emissions during maintenance activities will be vehicle exhaust emissions and fugitive emissions from the use of maintenance vehicles on the project road system. As described in the Project Description section of the Application for Certification (AFC), the main access and plant site (power block area) roads will be paved, with the roadways in the solar field portion of the project consisting of maintained gravel surfaces. Appendix B of the AFC, Table B.1-7 presents the emissions estimates for these maintenance activities. The following table summarizes the direct and indirect fugitive emissions estimates presented in Table B.1-7 (Appendix B.1).

Vehicle Exhaust	**NO_x**	**CO**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Lbs/day	3.84	3.4	0.65	0.0055	0.14	0.14
Tons/Year	0.76	0.62	0.12	0.001	0.026	0.026
Fugitive Dust	NO_x	CO	VOC	SO_x	PM_{10}	$PM_{2.5}$
Lbs/day	-	-	-	-	56.1	11.9
Tons/year	-	-	-	-	10.2	2.3

The emissions summarized above are well below the significance thresholds established by the Mojave Desert Air Quality Management District (MDAQMD), both in its source permitting/offset rules and its California Environmental Quality Act (CEQA) guidelines. These significance level values are presented in the AFC Air Quality analysis (Section 5.2, Subsection 5.2.2.4 and Table 5.2-8). Emissions of this small magnitude would not be expected to result in any cumulative impacts considering the remote location of the facility, and the lack of any major stationary sources within an 8 mile radius of the site.

Emissions mitigation measures proposed for maintenance activities are as follows:

- Vehicles (mobile sources) used for maintenance activities will meet all required exhaust standards as implemented and enforced by the California Air Resources Board (CARB) and the United States Environmental Protection Agency.
- Vehicles will use only CARB certified motor vehicle fuels.
- Vehicles will be maintained per the manufacturers' operations and maintenance schedules.
- Vehicles will be "smog" tested (as applicable) on the schedule as determined by the California Department of Motor Vehicles (DMV), i.e., the vehicle registration and test cycle requirements in the DMV regulations.

- On site vehicle speeds will be limited to the following: (1) <=15 mph on onsite paved roads, and (2) <=5 mph on onsite unpaved (gravel) roads.
- Road maintenance will be performed as needed. Paved roads will be swept, sealed, and/or overlaid as needed. Gravel surfaces will inspected and maintained as necessary to insure the integrity of the gravel surface.

Air Quality: Appendix B (g) (8) (A)

Information Required:

Please provide the permit application completeness letter from the Mojave Desert Air Quality Management District. This letter is expected in mid to late September.

Response:

The MDAQMD was supplied the following on or about September 24, 2009: (1) a full copy of the Project AFC (on CD), including the air quality and health risk assessment (HRA) modeling files; (2) the original MDAQMD application forms for the site process equipment and systems; and (3) the permitting filing and review fees. The MDAQMD completeness determination letter is expected in early October 2009 and will be included as Attachment A.

Air Quality: Appendix B (g) (8) (F)(i)

Information Required:

Please provide a description of normal operations maintenance activities, including, but not limited to, mirror washing, ongoing road and soil stabilization etc.

Response:

Normal operations maintenance activities will consist of all the required preventive maintenance activities as specified by the equipment and system manufacturers, as well as all of the repair and maintenance activities that fall outside the preventive maintenance program. Solar field maintenance will consist of activities involving mirror repair and/or replacement, heat transfer fluid (HTF) system component repair and/or replacement, mirror washing, etc. Power block maintenance activities will be focused on maintaining the power conversion, generation, and transmission systems in optimal working order.

Maintenance activities related to the power block processes include the following:

Steam generator – To maintain vessel integrity, water samples from this equipment are tested daily for quality. Visual inspection of external components is also routinely performed.

Steam Turbine – Typical maintenance activities include blade and rotor inspection. In addition, a typical base loaded steam turbine will require a major overhaul every 7 years; however, due to the cycling nature of the turbine in a solar facility, additional maintenance may be required.

Water Cooled Condenser/Air Removal System/Cooling Towers – Inspections and cleaning are performed regularly to prevent tube plugging and a consequent degradation of the

cooling system. Plant maintenance personnel regularly inspect cooling towers and perform routine repairs and upgrades as required.

HTF System – The HTF requires the periodic replacement of a certain volume of HTF to compensate for loss and contamination.

Maintenance activities related to the solar field processes include the following:

Periodic cleaning/washing of the solar collectors or reflectors will be necessary to maintain the desired mirror reflectivity. For a thermal solar facility, it is expected the mirrors will be washed during the-off peak hours for approximately 12 hours. Cleaning activities will be conducted nightly and will cover the entire solar field over a period of 2 weeks. Under normal circumstances, the substation will be controlled remotely, and routine inspections by substation personnel will occur on a monthly basis or as needed under emergency conditions. In addition, all of the substation structures will be inspected from the ground on an annual basis for corrosion, misalignment, and foundation condition. Ground inspection will include the inspection of hardware, insulator keys, and conductors. This inspection will also check conductors and fixtures for corrosion, breaks, broken insulators, and bad splices.

Road maintenance will be performed as needed. Paved roads will be swept, sealed, and/or overlaid as needed. Grading and drainage will be maintained for gravel and earthen roads. Dust palliatives will be applied as required to limit fugitive dust. Regular inspection of electric lines, support systems, and instrumentation and controls is critical for the safe, efficient, and economical operation of the project. The operator has standard operating procedures (SOPs) that outline the uniform process for transmission lines. The process may involve various types of inspections, including aerial inspection, ground inspection, and climbing. The frequency of inspection may vary depending on factors such as the age of the system, structure type, and vegetation conditions. For this transmission line, it is generally assumed the operator's maintenance staff will inspect all structures from the ground annually for corrosion, misalignment, deterioration, and foundation failures. In addition, ground inspection will occur to check the hardware, insulators, and conductors for corrosion, breaks, broken insulators, and failing splices.

Annually or biannually, the maintenance staff will inspect the structures to check the insulators. All power lines will also be inspected for sag to ensure sufficient conductor-to-ground clearance is maintained. The operator will conduct inspections by driving to the structures in a pickup truck where feasible. Maintenance staff will use an all-terrain vehicle or access the area by foot, where needed, to minimize surface disturbance and in certain areas where access is difficult. Aerial inspection using helicopters may be conducted annually using infrared technology.

Other miscellaneous maintenance activities are as follows:

The on-site well will require periodic well work-overs to remove sediment and other debris as needed to maintain the flow. The pump may also require periodic removal and servicing. The water storage tanks that will be installed as part of the project will require frequent inspection and may need occasional repairs. This maintenance will include routine painting of the storage tanks to protect them from corrosion.

Pump maintenance will also be required to ensure it is functioning properly. Routine activities will include inspecting the pump for excessive noise or vibration, applying lubricant

and grease, and checking packing glands and bearings. In the event the water system requires repair because it is broken, corroded, or leaking, the broken pipe section will either be replaced or a repair sleeve will be placed around the outside of the broken pipe section and clamped into place. After the repair is complete, the line will be flushed and disinfected with a chlorine solution. The amount of chlorine used will depend upon the original water quality.

The waste treatment system will require periodic pumping of the septic tank by a local licensed septic tank service.

Air Quality: Appendix B (g) (8) (K)

Information Required:

Please provide a detailed discussion of the mitigation measures that will be proposed to mitigate operations and maintenance project air emissions of pollutants that currently exceed ambient air quality standards (NO_x and VOC as ozone precursors, PM_{10}, and $PM_{2.5}$), but are not subject to offset requirements under the district's new source review rule.

Response:

As discussed in the responses above, maintenance activity emissions of NO_x, VOC, PM_{10}, and $PM_{2.5}$ that are not subject to the offset requirements under the District's New Source Review (NSR) rule and are well below the District CEQA significance thresholds, will be derived primarily from onsite motor vehicle use and fugitive dust emissions from paved and unpaved road use. These emissions, although minor in quantity, will be mitigated as follows:

- Vehicles (mobile sources) used for maintenance activities will meet all required exhaust standards as implemented and enforced by the CARB and the United States Environmental Protection Agency.
- Vehicles will use only CARB certified motor vehicle fuels.
- Vehicles will be maintained per the manufacturers' operations and maintenance schedules.
- Vehicles will be "smog" tested (as applicable) on the schedule as determined by the California DMV.
- Onsite vehicle speeds will be limited to the following: (1) <=15 mph on onsite paved roads, and (2) <=5 mph on onsite unpaved (gravel) roads.
- Road maintenance will be performed as needed. Paved roads will be swept, sealed, and/or overlaid as needed. Gravel surfaces will inspected and maintained as necessary to insure the integrity of the gravel surface.

Operational activity emissions of NO_x, VOC, PM_{10}, and $PM_{2.5}$, which will be derived primarily from limited use of the auxiliary boilers, emergency generator engines, fire pump system engines, and cooling towers, will be mitigated to levels well below significance through the application of Best Available Control Technology (BACT) as described in Appendix B.6 of the AFC, use of clean fuels such as natural gas, and use of CARB certified fuels in the proposed compression ignition engines.

Biological Resources

Biological Resources: Appendix B (g) (13) (B) (i)

Information Required:

Some of the figures are at too coarse a scale to identify the location of biological resources in relation to project features and topography. Please provide maps at 1 inch = 500 feet (1:6000) for the following figures (only those portions of the project site with the resources of interest need be provided):

Fig.5.3-2 Natural Community Types

Fig 5.3-6 Special Status Plants

Fig 5.3-8 Desert Tortoise Sign

Fig 5.3-9 Other Special Status Wildlife

Fig 5.3-10 Burrowing Owl and Sign

Response:

After the data adequacy worksheets were developed, conversations were held with Susan Sanders and Mike Monasmith of the California Energy Commission (CEC). An agreement was made to use a scale of 1:24,000 for the figures listed above. These new figures are provided in Attachment B.

Biological Resources: Appendix B (g) (13) (B) (iii)

Information Required:

Figure 3-1 from the Survey for Jurisdictional Waters report (Appendix C) is at too coarse a scale. Please show the 29 ephemeral drainages depicted on Figure 3-1 at a 1:2400 scale (1 inch = 200 feet).

Response:

After the data adequacy worksheets were developed, conversations were held with Susan Sanders and Mike Monasmith of the CEC. An agreement was made to use a scale of 1 inch = 400 to show the ephemeral drainages. These new figures are provided in Attachment B, and are shown as Figures 5.3-7A through J.

Appendix B (g) (13) (D) (iii)

Information Required:

Please provide a table showing acreage of impacts to ephemeral drainages and waters of the state.

Response:

Table 5.3-2. Ephemeral Wash Data, below, has been revised to show the acreage of impacts to ephemeral drainages.

Map ID	Location [1]	Category [2]	Bed Width (ft.)	Bank Height (in.)	Length (ft.)	Max. Impact Area [3] (acres)	Well Defined	No. of Trees [4]			Avg. Height (ft.)	Notes
								IW	PV	ST		
1	PF	2	10	6	909	0.21	Yes	2	0	0	20	
2	PF	2	5	6	3,886	0.45	No	0	0	0	0	
3	PF	2	3	6	2,879	0.20	No	0	0	0	0	
4	PF	1	18	6	5,388	2.23	No	0	0	0	0	Old road
5	PF	2	7	6	214	0.03	No	0	0	0	0	Continues south of boundary
6	PF	2	8	6	451	0.08	Yes	0	0	0	0	
7	PF	2	4	6	436	0.04	Yes	0	0	0	0	
8	PF	1	24	6	1,076	0.59	Yes	1	1	0	13	
9	PF	2	3	6	1,412	0.10	No	0	0	0	0	
10	PF	2	3	6	334	0.02	No	0	0	0	0	
11	PF	2	3	6	1,238	0.09	No	0	0	0	0	
12	TL, AR	2	3	6	1,413	0.10	No	0	0	0	0	
13	TL, AR	2	3	6	1,475	0.10	No	0	0	0	0	
14	TL, AR	2	9	12	1,593	0.33	Yes	0	0	0	0	Aggrading sands within channel
15	TL, AR	2	9	12	1,473	0.30	Yes	1	0	0	20	
16	TL, AR	2	5	8	1461	0.17	Yes	0	0	0	0	
17	TL, AR	2	5	12	325	0.04	No	0	0	0	0	
18	TL, AR	2	5	12	262	0.03	Yes	0	0	0	0	
19	TL, AR	2	6	8	1,409	0.19	Yes	0	0	0	0	
20	GL	2	5	8	344	0.04	Yes	0	0	0	0	
21	GL	2	7	6	378	0.06	Yes	0	0	0	0	
22	GL	2	5	6	512	0.06	Yes	0	0	0	0	
23	TL, AR	1	25	12	1,130	0.65	Yes	0	7	0	15	
24	TL, AR	2	8	8	1,153	0.21	Yes	0	76	0	15	
25	TL, AR	2	8	8	785	0.14	Yes	0	40	0	15	

Map ID	Location (1)	Category (2)	Bed Width (ft.)	Bank Height (in.)	Length (ft.)	Max. Impact Area (3) (acres)	Well Defined	No. of Trees (4)			Avg. Height (ft.)	Notes
								IW	PV	ST		
26	AR	1	140	24	7,872	16.88	Yes	0	596	0	15	Recommended state jurisdictional
27	TL, AR	1	20	18	807	0.37	Yes	0	28	0	15	Recommended state jurisdictional
28	TL (alternate)	2	6	8	2,725	0.00	Yes	1	11	9	15	Alternate transmission line route
29	TL	2	3	6	90	0.01	Yes	0	0	0	0	Culvert under Wiley's Well Rd.

(1) Type of location in the proposed Project

PF Within the Project footprint

TL Transmission line corridor

AR Access road

GL Gas line corridor

(2) Channel category

1 Large (width > 10 ft.)

2 Small (width ≤ 10 ft.)

(3) As Project design has not been finalized, these values represent the maximum disturbance that could occur based on the total ephemeral areas present. Areas of disturbance will likely be much smaller once the final Project design has been completed

(4) Tree species found along length of wash, including 500 ft buffer on linear facilities

IW Ironwood

PV Palo verde

ST Smoketree

Appendix B (g) (13) (F) (ii)

Information Required:

Please identify contacts that have been made regarding habitat compensation and management for anticipated disturbance to Special Management Areas and habitat.

Response:

The Applicant requests that these contacts be kept confidential and therefore have been submitted separately under confidential cover.

Cultural Resources

Cultural Resources: Appendix B (g) (2) (B)

Information Required:

Applicant needs to provide, under confidential cover, the DPR 523 forms for the following previously recorded archaeological resources: P-33-9037, P-33-9038, P-33-13088, P-33-13089, P-33-13467, P-33-13470, P-33-13471, and P-33-13657.

Applicant needs to provide a map of the records and literature search area displaying the coverage of all past cultural resources surveys, with each survey labeled with its CHRIS number, for the June, 2007 and October, 2008 searches.

Response:

The DPR 523 Forms for the following previously recorded archaeological resources: P-33-9037, P-33-9038, P-33-13088, P-33-13089, P-33-13467, P-33-13470, P-33-13470, P-33-13471, and P-33-13657 are provided under confidential cover.

The USGS 1:24k map that contains all previous surveys within 1 mile of the project ROW as a result of the CHRIS June 2007 and October 2008 record searches has been submitted under confidential cover.

Cultural Resources: Appendix B (g) (2) (C)

Information Required:

Submission contains conflicting data on archaeological survey coverage. Figure 3 and Technical Report (Vol. II, App. G, p. 40) indicate coverage was what Bureau of Land Management (BLM) requires, which is 100 percent of the project footprint, while AFC (p. 5.16-22) states survey coverage met/exceeded Energy Commission data requirements (project footprints plus surrounding 200 feet, except for linear facilities, where 50 feet to either side of the centerline is required). Applicant needs to revise the AFC Sec. 5.16.1.5, the Technical Report, and Figure 3 to clearly state/depict the survey coverage for all project components.

Response:

The area surveyed for the Class III inventory was a large block of 1,890 acres. The project footprint covers a smaller area of just under 1,800 acres within the larger block, allowing for the 200 ft buffer required by Energy Commission data requirements. Rights of way for linear facilities were either located within the large 1,890 acre block, or were surveyed with a 300 ft right of way, in excess of the Energy Commission data requirement for 50 ft either side of the centerline.

A figure showing these areas of potential effects (APEs) is included in Attachment C. The requested changes to the Technical Report (Vol. II, App. G) will be incorporated in the revised draft that is being prepared in response to BLM comments. This revised draft will be submitted to BLM and CEC on or about 23 October 2009.

Please see revised AFC Section 5.16.1.5 below:

5.16.1.5 Cultural Resources Areas of Potential Effect

APEs for the Project have been assigned in accordance with CEC Rules of Practice and Procedure. Pedestrian archaeological surveys were conducted of the Project site and a 200 foot buffer around it. Survey of the linear facility (transmission line, natural gas pipeline, and access road) was conducted 150 feet either side of the center-line, in excess of the CEC required 50 foot buffer on either side of the center-line. The historic architecture field survey was conducted using the one-half mile buffer required for rural areas.

Cultural Resources: Appendix B (g) (2) (C) cont.

Information Required:

Applicant needs to revise and re-submit the archaeological survey technical report (Vol. II, App. G) to conform to ARMR content, including:

- Identification of the geographical boundaries of the study area (define and distinguish the APE(s) and the survey areas) (ARMR V, E); Discussion of previous research and known sites (ARMR, VII, B);
- Full description of survey methods (dates, crew size, visibility conditions) and accurate description and map of survey area coverage (ARMR, VIII, B); and
- Discussion of results related to research questions (ARMR, X, A).

Also, reconcile site count conflicts:

- Between text (p. 42) & Table 7;
- Between text (p. 46) & Table 11;
- Between text (p. 65) & Tables 7, 11, and 20.

Also, correct site counts accordingly in the report Summary (p. i) and Introduction (p.1).

Also, in Table 4, correct duplicate site numbers (P33-13597 and P33-14146) and site number typo (P33-141711).

- Also, in Appendix E, delete repeated text in 2nd & 3rd paragraphs on p. 3-1, add the figure referenced on p. 5-2 (but not included the report), and correct the labeling of the Genesis interconnection line (label now pointing to the access road) on the Blythe-Eagle Mt transmission line DPR 523a location map.
- Add to AFC Sec. 5.16 the technical report's Table 4 (search results for the transmission line survey);
- Add to AFC Table 5.16-3 the additional isolated finds listed in the technical report's Table 5;
- Specify, on AFC p. 5.16-14, the project areas for which the three literature searches were conducted;
- Add to AFC Sec. 5.16.1.3 the date, etc., for the literature search done for the transmission line;
- Add the Energy-Commission required survey coverage for the natural gas pipeline and the access road to AFC Sec. 5.16.1.5;
- Correct the statistics (report count, site count, and search area coverage) provided in the last paragraph on AFC p. 5.16-15; and

- Reconcile the site count between text in the last sentence of the first full paragraph on AFC p. 5.16-23 and Table 5.16-4.

Response:

The requested changes to the Technical Report (Vol. II, App. G) will be incorporated in the revised draft that is being prepared in response to BLM comments. This revised draft will be submitted to BLM and CEC on or about 23 October 2009.

Please see revised AFC Section 5.16.1.3 below:

5.16.1.3 Archival Research

A literature and records search was performed on June 13, 2007, and in October 2008 (for project facility) and on April 28, 2009 (for the Transmission Line Interconnection) by Tetra Tech staff (See Figure in Appendix G, Appendix G filed under confidential cover). The literature and records search included the cultural resources site and project file collection at the Eastern Information Center (EIC) of the California Historical Resources Information System (CHRIS), at the Department of Anthropology, University of California, Riverside, California. The search focused specifically on lands comprising the Genesis Solar Project Area, Transmission Line Interconnection and adjacent areas to a distance of 1 mile as required by CEC Rules of Practice and Procedure. As part of this search, the California Points of Historical Interest (PHI), California Historical Landmarks (CHL), California Register of Historic Places (CRHP), NRHP, California Historic Resources Inventory (HRI), and historic maps were reviewed for the Project. The McCoy Springs National Register District was identified within 15 kilometers (km) (9 miles) of the Project area. In addition, the State Historical Landmark RIV-022 (Desert Training Center), P-33-6835 (Contractors General Hospital), and Blythe Intake Landmark 948 are within the Project region.

In addition, staff visited the BLM State Office Public Records Room (which contains General Land Office (GLO) maps) and obtained copies of GLO maps and surveyor field notes of the Project area. On November 9, 2007, Tetra Tech staff contacted the following entities by mail or e-mail: the City of Blythe Planning Department; Riverside County Planning Department; Coachella Valley Historical Society; the Coachella Valley Archaeological Society; the Colorado Desert Archaeology Society; the George S. Patton Memorial Museum; The Imperial Valley College Desert Museum; the Imperial County Historical Society Pioneers Museum; the Imperial Valley College Desert Museum; the Indio Chamber of Commerce; the Pioneer Historical Society of Riverside; the Twentynine Palms Historical Society; and the Palo Verde Historical Society and Museum. To date, the City of Blythe, Coachella Valley Archaeological Society, Riverside County Planning Department, and Twentynine Palms Historical Society responded they did not have any information regarding potential cultural resources in the Project area.

The literature and record search revealed 30 previously recorded cultural resources investigations within one to approximately three miles of the Project APE (solar facility and linear corridors)(Table 5.16-1). Eighteen previously recorded archaeological sites were identified within one to approximately three miles of the APE (solar facility and linear corridors); (Table 5.16-2). Table 5.16-3 lists isolated finds within 1 mile of the project APE (including the proposed transmission line). None of these resources is located within the Project APE. Table 4 lists previously recorded cultural resources within 1 mile of the proposed transmission line.

Table 5.16-1. Previous Cultural Resource Investigations and Studies within Portions of, and 1 Mile or More of the APE (includes project site and proposed transmission line)

IC Report Number	Report Title	Survey Type/ Acreage	Author	Date	Dist. From APE
RI-00002	**Miscellaneous Field Notes, Riverside County, California.** Series of handwritten archaeological field notes of various areas within Riverside County.	Several areas in region.	M.J. Rogers	1953	Within region
RI-00002	**Miscellaneous Field Notes, Riverside County, California.**	N/A	M.J. Rogers	1953	Within region
RI-00010	**A Cultural Resources Assessment of a Proposed Prison Site Near Blythe in Riverside County, California**	960 acres	D.F. McCarthy	1986	Adjacent
RI-00011	**Letter Report: Addendum to "A Cultural Resources Assessment of a Proposed Prison Site Near Blythe in Riverside County, California"**	15.15 acres	P.J. Wilke	1986	0.1
RI-00092	**Archaeological and Paleontological Impact Evaluation: American Telephone and Telegraph Company's Oklahoma City/Los Angeles "A" Cable Route, Between the Colorado River and Corona, California**	N/A	T.F. King; G.T. Jefferson; M. Gardner	1973	0.05
RI-0160	**Archaeological Resource Survey-West Cost-Mid-Continent Pipeline Project, Long Beach to the Colorado River, Addendum.** Surveys resulted in the identification of one prehistoric lithic scatter (CA-RIV-1216, and one with Tizon pottery (CA-RIV-1215), and two prehistoric isolates, located near the dry lake shoreline. Both sites were within the pipeline ROW and were mitigated by proposed collection and testing.	11 miles linear survey, 30-meter survey corridor.	R. Greenwood	1977	Within 2.5 miles
RI-0161	**Paleontological, Archaeological, Historical, and Cultural Resources-West Coast-Midwest Pipeline Project, Long Beach to the Colorado River.** Literature review of linear pipeline project.	No survey. Literature review for 235 linear miles, 5-mile-wide corridor.	R. Greenwood	1975	Within 3 miles

IC Report Number	Report Title	Survey Type/ Acreage	Author	Date	Dist. From APE
RI-0190	**Archaeological Survey Report for the Proposed Safety Project on Interstate Route 10 Between Chiriaco Summit and Willey's Well Overcrossing, Riverside County, CA.** Report summarizes findings, briefly; 15 prehistoric and isolated sites were recorded.	Intensive Pedestrian Survey, linear survey of over 56 kilometers along I-10.	S.R. Haymond	1981	Within 1 mile
RI-0220	**Interim Report—Fieldwork and Data Analysis: Cultural Resource Survey of the Proposed SCE Palo Verde-Devers 500kV Power Transmission Line.** Archaeological Research Unit. Linear project that extended from near the Colorado River, west to Palm Springs, California. Cowan and Wallof concluded that archaeological sensitivity was high within 20 miles of the Colorado River, and low within the topographic zones of alluvial fans-detrital slopes. Several new prehistoric sites and four historic sites were recorded as a result of the surveys. Site "D-13", a southern extension of prehistoric shoreline site CA-RIV-663, consisted of lithics and pottery and is within 2-3 miles of the project area.	Intensive linear pedestrian survey, 322 kilometers, 123-meter corridor, 12-meter transects.	R. Cowan & K. Wallof	1977	Within 1 mile
RI-00221	**Cultural Resource Inventory and National Register Assessment of the Southern California Edison Palo Verde to Devers Transmission Line Corridor (California Portion)**	6120 acres	Westec Services, Inc.	1982	Adjacent and Intersects
RI-00222	**Final Report: Cultural Resource Survey of the Proposed Southern California Edison Palo Verde-Devers 500kv Power Transmission Line**	N/A	K. Wallof; R.A. Cowan	1977	Adjacent and Intersects
RI-0982	**An Archaeological Survey of Geothermal Drilling Sites in Riverside County. Science Applications, La Jolla, California.** No prehistoric sites were identified; two prehistoric isolated finds were recorded. Report only includes survey results.	101 well sites, 30-meter-diameter around each site, intensive pedestrian survey	H.L. Crew, J.E. Fitting	1980	Within 1 mile
RI-1211	**A Cultural Resources Overview of the Colorado Desert Planning Units**	N/A	R.H. Crabtree et al.	1980	Regional overview

IC Report Number	Report Title	Survey Type/ Acreage	Author	Date	Dist. From APE
RI-1249	**California Desert Program: Archaeological Sample Unit Records for the Big Maria Planning Unit, BLM.** No report, series of BLM *California Desert Program Archaeological Sample Unit Record* field forms. Several sites recorded within region.	Pedestrian intensive survey, sample survey units, sample units 1.6 kilometers linear.	Various BLM Staff	1978	Portions within APE
RI-1279	**A Cultural Resource Inventory of the Ford Dry Lake Known Geothermal Resource Area.** American Pacific Environmental Consultants, Inc. The survey resulted in the identification of 4 prehistoric sites and 10 isolates were identified. The sites included two temporary camps, a processing locus, and a ceramic locus. Based on the presence of milling artifacts and ceramics three sites were assigned to the late period, one site was assigned a possible Pinto or Amargosan period due to artifact assemblage and maximal Ford Dry Lake shoreline locality.	Sample survey, pedestrian 50-meter transects, ~1,600 acres.	J.R. Cook and D.S. Cardenas (Principal Investigators)	1981	Portions within APE
RI-1280	**Draft: Ford Dry Lake Known Geothermal Resource Area Environmental Assessment. BLM.** Literature review and proposed areas of cultural sensitivity. The northern and southern Ford Dry Lake shoreline was considered high due to large but not dense archaeological sites and the presence of recessional shoreline (northern region within Project Genesis APE), Ford Dry Lake and south of Interstate-10 was assigned a moderate sensitivity rating due to low occurrence of archaeological sites.	No survey.	P. Elliott	1981	Portions within APE

IC Report Number	Report Title	Survey Type/ Acreage	Author	Date	Dist. From APE
RI-1341	**Archaeological Appraisal of the Palen Dry Lake, Area of Critical Concern Environmental Concern, Riverside County, California.** Prehistoric and historic resources (primarily associated with General Patton WW II training areas) were observed. Ritter suggests that prehistoric use of Palen and Ford Dry Lake was based on the utilization of seasonal resources and gathering, base camps were focused around major springs (e.g., McCoy Springs). The temporary camps or activities around the lakes could include gathering and processing of resources (e.g., mesquite, palo verde beans, slat brush, grasses or other hard seeds), hunting of rabbits, tortoise, and sheep, etc., cooking and consumption of such resources, water consumption from ephemeral lakes and ponds, limited production or re-shaping of tools.	Pedestrian and vehicle survey.	E.W. Ritter	1981	Regional overview, northwest of project area
RI-01664	**Cultural Resource Inventory of Seisdata Services Chuckwalla Geophysical Test Corridor, Riverside County, California**	85.30	Westec Services, Inc.	1982	Intersects
RI-1973	**Archaeological Assessment of Six Parcels (Northern, Rocky, Metro, Palen, Ironwood, and Cockrell) Near Palen Dry Lake, Desert Center, California.** Cultural resources observed include 5 lithic scatters, a roasting pit site, several prehistoric isolates, and artifacts and features associated with General Patton's WW II Desert Training and Maneuvers area (tank tracks, ration cans, ordinance casings, communication wire).	Pedestrian survey of approximately 5 square miles. 25- to 30-meter transects.	J.M. Mack	1985	Within 12 miles
RI-02210	**Preliminary Cultural Resources Survey Report for the US Telecom Fiber Optic Cable Project, From San Timoteo Canyon to Socorro, Texas: The California Segment**		J. Underwood; J. Cleland; C.M. Wood; R. Apple	1986	Intersects
RI-02897	**Cultural Resource Assessment of 219 Acres of Public Lands Proposed for Exchange to Newport Harbor Development Corp. Letter Report**	219	M. Mitchell	1990	Partial overlap

IC Report Number	Report Title	Survey Type/ Acreage	Author	Date	Dist. From APE
RI-3029	**Cultural Resources Assessment Southern California Gas Company Proposed Line 5000, Riverside County, California. LSA Associates, Inc.** Survey resulted in identifying 6 previously unrecorded sites, 4 previously recorded sites, and 8 isolates. Two of these sites were recorded as late period shoreline sites (RIV-260 and RIV-660)	Linear pedestrian survey, 54 kilometers, 90-meter corridor, transects at 20 meters.	J. Rosenthal, R. Conrard et al.	1990	Within 2 miles
RI-03227	**An Archaeological Assessment of Tracts 19734 and 19735, Lot #8 in the La Sierra Area of the City of Riverside, California**	42	C.R. Demcak	1991	Intersects
RI-3674	**Prehistoric Land Use at McCoy Springs: An Arid-Land Oasis in Eastern Riverside County, California.** Thesis paper. Study area focused on two zones: region and the McCoy District. 85 sites were recorded in the region, 18 of these sites were trails. McCoy Springs District is characterized as a base camp site, with other sites in the region representing limited activity areas. Additional site outside the district include lithic processing and reduction, ceramic scatters, food processing on milling surfaces, and trails. McCarthy suggests that the trails represent travel corridors to and from resources (food, water, and mineral) within the region, many primary trails lead to McCoy Springs, and some trails may predate pottery use. The trails that due exhibit ceramic Buff ware artifacts date to the Patayan I and II period.	Systematic and intuitive intensive pedestrian survey, approximately 300 acres	D. F. McCarthy	1993	Within 9 miles
RI-04082	**Wiley Well Road Land Exchange, Cultural Resource Survey**	470	B.F. Mooney	1990	0.35
RI-04347	**A Phase I Cultural Resources Assessment of General Plan Amendment 500, Change of Zone 6468, +/- 50.0 Acres of Land Near Blythe, Riverside County, California**	50	J.A. Keller	1999	Partial overlap

IC Report Number	Report Title	Survey Type/ Acreage	Author	Date	Dist. From APE
RI-5245	**Southern California Edison Company Blythe-Eagle Mountain 161 kV Deteriorated Pole Replacement Project, BLM State Permit CA#-04-23 Field Authorization #CA-690-05-FA04.** Pole replacement project for 22 pole locations. Negative report, no new Cultural Resources identified. The boundary of one existing archaeological site (CA-RIV-2791), a large lithic scatter, was expanded.	22 pole locations, Pedestrian survey, 40-meter radius around each pole location, zig-zag transects.	J. Schmidt	2005	Within 2 miles
RI-5828	**Project Review and Statistical Summary: Primitive Skills Team-Rehab of Wilderness Area Intrusions, BLM, Palm-Springs South Coast Field Office.** No report, summary. No cultural resources identified.	Intensive Class III pedestrian survey, 7 acres, 10-meter transects	W. Raschkow	2001	Within 2 miles
RI-07192	**Cultural Resource Assessment: AT&T Wireless Services, Facility No.06003, Riverside County, California**	~0.25	C. Duke	2002	Intersects
RI-07315	**Cultural Resource Records Search and Site Visit Results for T-Mobile Telecommunications Facility Candidate IE24133A (ATC Colo at Wiley WII Rd.) Wiley Well Road and Interstate 10, Desert Center, Riverside County, California**	0.25	W. Bonnery; M. Aislin-Kay	2006	0.03

Table 5.16-2. Previously Recorded Cultural Resources within 2 Miles of the Project APE (project facility)

Site Number	Resource Description	Period/Era	Recorder and Date	CRHP/NRHP Eligible	Distance from APE
P-33-1517	Prehistoric Site: Small lithic scatter of jasper and quartz at 120 meters elevation.	Prehistoric unknown	E. Ritter, 1975	UE	Within APE of SOL 2, SOL 2 Relocated
P-33-1483	Historic Military Mound: horseshoe shaped, low earth mound.	Historic c.1940s	S. Crowley, 1978	UE	Within 1 mile
P-33-1132	Historic Hopkins Well Site, constructed in 1910.	Pre-1920 Historic	H. Metcalf, 1982; Cowan, 1976	UE	Within 1 mile
CA-RIV-53T	Prehistoric Trail segment with ceramic distribution along trail.	Prehistoric unknown	McCarthy, 1993	UE	Within 2 miles
P-33-1222	Prehistoric Site: Temporary Camp located near dry lake shore: 7 loci of metates/manos, also few quartz/chalcedony cores/flakes. Site disturbed by ORV.	Late Prehistoric	J. Cook, 1976	UE, PE	Within 2 miles
P-33-1516	Prehistoric Site: Large Temporary Camp along dry lake shoreline: groundstone, lithic scatter, thermal fractured rock, elevation 358 feet. Some WW II military artifacts noted, no details regarding type.	Late Prehistoric	E. Ritter, 1975	RE, PE	Within 2 miles
P-33-2159	Prehistoric Site: Temporary Camp/Lithic Scatter along gravel terraces of dry lake bed: metate/manos fragments, hammerstone/choppers, lithic flakes; rhyolite, basalt, chalcedony, agate, jasper, chert, granite, andesite. 358 feet elevation.	Late Prehistoric	S. Cardenas, 1981	UE, PE	Within 2 miles
P-33-1216	Prehistoric Site: Widely dispersed lithic scatter along maximal shoreline upon the gravel terrace: 7 flakes of chert/jasper, 1 hammerstone/core, and elevation 370 feet. Potential Pinto/Amargosan period site.	Prehistoric unknown	D. McCarthy, 1977	UE	Within 2 miles
P-33-8655 (CA-RIV-6170)	Prehistoric Site: Lithic Scatter along dry lake bed: lithic flakes of quartzite, agate, chalcedony, chert, jasper, 1 chert rose spring project point, 1 point and drill fragment.	Late Prehistoric	M. Mitchell, 1998	UE	Within 2 miles
P-33-663	Prehistoric Site: An extensive series of shoreline temporary camps: metate/mano fragments of green shale, fire affected rock, lithic reduction flakes (jasper, quartzite, rhyolite, chert, and chalcedony), pottery (Parker buff ware and Tizon brown ware, and greyware), rock alignment, 1 corner notched projectile point fragment, 1 biface fragment.	Late Prehistoric	D. Pallette et al., 1989	UE	Within 2 miles
P-33-2206	Prehistoric Site: Sparse Lithic Scatter: 6 flakes (chalcedony, quartz, opal), 1 quartzite cobble core, 393 feet elevation.	Prehistoric unknown	S. Hammond, 1981	UE	Within 2 miles

Table 5.16-2. Previously Recorded Cultural Resources within 2 Miles of the Project APE (project facility)

Site Number	Resource Description	Period/Era	Recorder and Date	CRHP/NRHP Eligible	Distance from APE
P-33-2157	Prehistoric Site: Temporary Camp near dry lake shore: ceramic (buff/brown ware), ground stone fragments (metates/manos), lithic flakes (quartz/green andesitic melavolcanic). 355 feet elevation.	Late Prehistoric	S. Cardenas, 1981	UE, PE	Within 2 miles
P-33-1543	Prehistoric Site: Lithic Scatter (temporary camp): 3 metate fragments-2 flakes, 360 feet elevation.	Late prehistoric	M. Morim, 1976	UE	Within 2 miles
P-33-3802	Prehistoric Site: Temporary Camp near dry lake shore: 1 metate fragment, 2 chalcedony flakes, 1 quartzite hammerstone, fractured cobbles, and possible green shale hearth feature. 110 feet elevation.	Late Prehistoric	D. Pallete et al., 1989	UE	Within 2 miles
P-33-1131	Prehistoric Site: Widely dispersed low density ceramic drop: 50 reddish brown "Tizon" pottery shreds, 1 mano/core fragment.	Late Prehistoric	E. Dittman, 1981	UE	Within 2 miles
P-33-000144	No details on site record. Note: F.R. Johnston on map in Walker's possession.		Eberhart, 1951	UE	Within 2 miles
P-33-3129	Trail segment that leads to the southwestern side of the McCoy Mountains.	Unknown	F. McCarthy, 1991	UE	Within 2 miles

* UE=unevaluated, PE=potentially eligible, RE=recommended eligible.

Table 15.16-3. Sites within 1 mile of the Transmission Line APE

Site Number	Resource Description	Period/Era	Recorder and date	CRHP/ NRHP Eligible	Distance from APE
P-33-000144	No details on site record. Note: F.R. Johnston on map in Walker's possession.	Unknown	Eberhart 1951	UE	Within 1 mile
P33-00259	Rock Rings	Unknown	N. Gester 1965	UE	Within 1 mile
P33-00260	Prehistoric Site: Lithic Scatter (temporary camp): metate fragments, flakes, 360 feet elevation.	Late Prehistoric/unknown	R. Rameriz 2008 (update)	UE	Within 0.25 mile

Site Number	Resource Description	Period/Era	Recorder and date	CRHP/ NRHP Eligible	Distance from APE
P33-00663	Prehistoric Site: Widely dispersed lithics, groundstone, pottery, 360 feet elevation.	Late Prehistoric/unknown	D. Pallette 1989	UE	Within 0.25 mile
P33-001543	Prehistoric (3 metates, lithic flakes)	Late Prehistoric/unknown	M. Morim 1976	UE	Within 1 mile
P33-001818	Prehistoric Potter fragments	Late Prehistoric/unknown	R. Carrico 1980	UE	Within 0.25 mile
P33-001840	Prehistoric lithic scatter.	Unknown	Musser/Boyer 1976	UE	Within 1 mile
P33-2159	Prehistoric Site: Temporary Camp/Lithic Scatter along gravel terraces of dry lake bed: metate/manos fragments, hammerstone/choppers, lithic flakes; rhyolite, basalt, chalcedony, agate, jasper, chert, granite, andesite. 358 feet elevation.	Late Prehistoric/unknown	Cardenas	UE	Within 1 mile
P33-3801	Prehistoric site: pottery scatter	Late Prehistoric/unknown	Pallette 1989	UE	Within 1 mile
P33-003802	Prehistoric Site: lithic scatter and lithic tools, and groundstone	Late Prehistoric/unknown	Pallette 1989	UE	Within 1 mile
P33-003808	Prehistoric Site: ceramic scatter.	Late Prehistoric/unknown	Mooney & Associates 1990	UE	Within 1 mile
P33-003809	Prehistoric Site: ceramic scatter.	Late Prehistoric/unknown	Mooney & Associates 1990	UE	Within 1 mile
CA-RIV-6900	Prehistoric Site: lithic scatter and lithic tools, and groundstone	Unknown	BLM 1977	UE	Within 1 mile
P33-13597	Historic Refuse Scatter	Unknown	Mooney & Associates 2004	UE	Within 1 mile
P33-13598	Historic Refuse Scatter: WW II	1942 post	Mooney & Associates 2004	UE	Within 1 mile

Site Number	Resource Description	Period/Era	Recorder and date	CRHP/ NRHP Eligible	Distance from APE
P33-13655	Historic Refuse Scatter/features: Possible WW II foxholes	1942 post	Mooney & Associates 2004	UE	Within 1 mile
P33-14146	Historic Refuse Scatter	unknown	Mooney & Associates 2005	UE	Within 1 mile
P33-14170	Historic Refuse Scatter	unknown	Mooney & Associates 2005	UE	Within 1 mile
P33-14171	Two Track Road	unknown	Mooney & Associates 2005	UE	Within 1 mile
P33-17326	Historic Refuse Scatter	unknown	ICF Jones & Stokes 2008	UE	Within 1 mile

Table 5.16-4. Previously Recorded Cultural Resources—Isolated Finds

Site Number	Resource Description	Recorder and Date	CRHP/NRHP Eligible	Distance from APE
P-33-1265	Isolate: prehistoric chert flake	N/A	Not eligible	Within 1 mile
P-33-1266	Isolate: prehistoric ceramic fragment	N/A	Not eligible	Within 1 mile
P-33-8578	Isolate: prehistoric ceramic fragment	N/A	Not eligible	Within 1 mile
P-33-9037	Isolate: prehistoric lithic scraper	N/A	Not eligible	Within 1 mile
P-33-9038	Isolate: prehistoric biface fragment	N/A	Not eligible	Within 1 mile
P-33-12820	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-12925	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-12926	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-12928	Isolate: lithic flake (collected)	N/A	Not eligible	Within 1 mile
P-33-12929	Isolate: prehistoric ceramic fragment (collected)	N/A	Not eligible	Within 1 mile
P-33-13087	Isolate: prehistoric lithic core	N/A	Not eligible	Within 1 mile
P-33-13088	Isolate: prehistoric lithic and ceramic fragment	N/A	Not eligible	Within 1 mile
P-33-13089	Isolate: prehistoric lithic core	N/A	Not eligible	Within 1 mile
P-33-13090	Isolate: prehistoric lithic core	N/A	Not eligible	Within 1 mile
P-33-13091	Isolate: prehistoric lithic core	N/A	Not eligible	Within 1 mile
P-33-13467	Isolate: prehistoric flake	N/A	Not eligible	Within 1 mile
P-33-13470	Isolate: prehistoric biface	N/A	Not eligible	Within 1 mile
P-33-13471	Isolate: prehistoric flake	N/A	Not eligible	Within 1 mile
P-33-13473	Isolate: prehistoric lithic core	N/A	Not eligible	Within 1 mile
P-33-13513	Isolate: prehistoric	N/A	Not eligible	Within 1 mile
P-33-13517	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-13518	Isolate: lithic shatter	N/A	Not eligible	Within 1 mile
P-33-13519	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-13520	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-13521	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-13522	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-13523	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-13524	Isolate: lithic core	N/A	Not eligible	Within 1 mile
P-33-13525	Isolate: prehistoric ceramic fragment	N/A	Not eligible	Within 1 mile
P-33-13599	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-14172	Isolate: glass bottle fragment	N/A	Not eligible	Within 1 mile

Site Number	Resource Description	Recorder and Date	CRHP/NRHP Eligible	Distance from APE
P-33-17476	Isolate: lithic flake	N/A	Not eligible	Within 1 mile
P-33-13657	Isolate: prehistoric core	N/A	Not eligible	Within 1 mile
P-33-12926	Isolate: prehistoric flake	N/A	Not eligible	Within 2 miles
P-33-12931	Isolate: prehistoric groundstone	N/A	Not eligible	Within 2 miles
P-33-12932	Isolate: prehistoric flake	N/A	Not eligible	Within 2 miles

Please see revised AFC Section 5.16.1.5 below:

5.16.1.5 Cultural Resources Areas of Potential Effect

APEs for the Project have been assigned in accordance with CEC Rules of Practice and Procedure. Pedestrian archaeological surveys were conducted of the Project site and a 200 foot buffer around it. Survey of the linear facility (transmission line, natural gas pipeline, and access road) was conducted 150 feet either side of the center-line, in excess of the CEC required 50 foot buffer on either side of the center-line. The historic architecture field survey was conducted using the one-half mile buffer required for rural areas.

Cultural Resources: Appendix B (g) (2) (C) (iii)

Information Required:

Applicant needs to provide, under confidential cover, the DPR 523 forms for the following new resources identified by the new archaeological survey: CA-RIV-9084 (whole form) and P-33-17834 (location map missing).

Response:

The DPR 523 Forms CA-RIV-9084 and P33-17834 are provided under confidential cover.

Cultural Resources: Appendix B (g) (2) (C) (iv)

Information Required:

On the map provided as App. H, "Class III Archaeological Site Locations within ROW and Surveyed Corridor," site labels are frequently blotted out by the "bolded" site outlines. Applicant needs to provide, under confidential cover, a revised version of this map on which all site labels are fully legible.

Response:

A revised version of Appendix H "Class III Archaeological Site Locations within ROW and Surveyed Corridor" is provided under confidential cover.

Cultural Resources: Appendix B (g) (2) (D)

Information Required:

BLM's Palm Springs Office Archaeologist sent notification letters to the NAHC-identified Native Americans. Applicant needs to provide copies of the letters sent by BLM to Native Americans.

Response:

The BLM's Palm Springs Office Archaeologist sent notification letters to the NAHC-identified Native Americans on November 26, 2007. These letters are provided in Attachment C.

Cultural Resources: Appendix B (i) (1) (A)

Information Required:

- Applicant needs to add to Table 5.16-8 the AFC page numbers where conformance with each law, during both construction and operation, is discussed.
- Applicant needs to add to Section 5.16 a discussion of the project's conformance with each law, during both construction and operation.

Response:

Please see table provided below.

LORS	Requirements	Conformance Section	Administering Agency
National Historic Preservation Act of 1966 as amended, Public Law 102-575	Requires preservation or mitigation of effects to historic properties that are eligible for inclusion on the National Register of Historic Places	Sections 5.16.2/5.16.3/ 5.16.4	BLM; State Historic Preservation Office
Archaeological Resources Protection Act of 1979 as amended, Public Law 96-95	Provides for the protection of archaeological resources and sites that are on public lands and Indian lands.	Sections 5.16.2/5.16.3/ 5.16.4	BLM
Federal Land Policy and Management Act of 1976 as amended, Public Law 94-579	Establishes policies and goals to be followed in administration of public lands by the Bureau of Land Management to include preservation of historic and archaeological resources.	Sections 5.16.2/5.16.3/ 5.16.4	BLM
Native American Graves Protection and Repatriation Act, Public Law 101-601	Requires federal agencies and institutions that receive federal funding to return Native American cultural items and human remains to their respective peoples. Cultural items include funerary objects, sacred objects, and objects of cultural patrimony.	Sections 5.16.2/5.16.3/ 5.16.4	BLM
Antiquities Act of 1906, as amended	Prescribes penalties for the theft or destruction of archaeological resources on public land and establishes procedure for issuance of permits for the conduct of research on cultural resources on public land.	Sections 5.16.2/5.16.3/ 5.16.4	BLM

LORS	Requirements	Conformance Section	Administering Agency
Executive Order No. 11593: Protection And Enhancement Of The Cultural Environment, 1971	Requires Federal agencies to administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, initiate measures necessary to direct their policies, plans, and programs in such a way that federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved, restored, and maintained and institute procedures to ensure Federal plans and programs contribute to the preservation and enhancement of nonfederally owned sites, structures, and objects of historical, architectural, or archaeological significance.	Sections 5.16.2/5.16.3/ 5.16.4	BLM
National Environmental Policy Act of 1969, as amended, Public Law 91- 190	Requires the analysis of the effect of federal undertakings on the environment to include the effect on cultural resources.	Sections 5.16.2/5.16.3/ 5.16.4	BLM
The Warren- Alquist Act 1974, as amended	Requires cultural, historic, and aesthetic resources be taken into account in consideration of an Application for Certification. Requires that a portion of any such resources on public land be set aside for public access.	Section 5.16.4	CEC
CEQA of 1970, as amended	Applies to discretionary projects causing a significant effect on the environment and a substantial adverse change in the significance of a historical or archaeological resource.	Section 5.16.4	CEC
California PRC Section 5020- 5029.5	Establishes the criterion for the California Register of Historical Resources, and creates the California Historic Landmarks Committee and authorizes the Department of Parks and Recreation to designate Registered Historical Landmarks and Registered Points of Historical Interest; establishes criteria for the protection and preservation of historic resources.	Section 5.16.4	CEC; State Historic Preservation Office; Department of Parks and Recreation
Senate Bill 922 (Ducheny 2005)	Exempts from California Public Records Act Native American graves, cemeteries, archaeological site information, and sacred places in the possession of the Native American Heritage Commission and other state or local agencies.	Section 5.16.4	CEC; Native American Heritage Commission
Senate Bill 18 (Burton 2004)	Protection and preservation of Native American Traditional Cultural Places during city and county general plan development.	N/A	CEC; County of Riverside; Native American Heritage Commission

LORS	Requirements	Conformance Section	Administering Agency
Senate Concurrent Resolution Number 87 (1994)	Provides for the identification and protection of traditional Native American resource gathering sites on state land.	N/A	CEC
Administrative Code, Title 14, Section 4307	No person shall remove, injure, deface, or destroy any object of paleontological, archaeological, or historical interest or value.	Section 5.16.4	CEC
Government Code, Sections 6253, 6254, 6254.10	Disclosure of archaeological site information is not required for records that relate to archaeological site information maintained by the Department of Parks and Recreation, the State Historical Resources Commission, or the State Lands Commission.	Section 5.16.4	CEC
Health and Safety Code, Section 7050.5	Requires construction or excavation to be stopped near human remains until a coroner determines whether the remains are Native American; requires the coroner to contact the NAHC if the remains are Native American.	Section 5.16.4	CEC, County Coroner
Health and Safety Code, Section 7051	Establishes removal of human remains from interment, or from a place of storage while awaiting interment or cremation, with the intent to sell them or to dissect them with malice or wantonness as a public offense punishable by imprisonment in a state prison.	Section 5.16.4	CEC, County Coroner
Health and Safety Code, Section 7052	States that willing mutilation of, disinterment of, removal from a place of disinterment of, and sexual penetration of or sexual contact with any remains known to be human are felony offenses.	Section 5.16.4	CEC, County Coroner
PRC 5097-5097.6	Provides guidance for state agencies in the management of archaeological, paleontological, and historical sites affected by major public works project on state land.	N/A	CEC
PRC 5097.9- 5097.991	Establishes regulations for the protection of Native American religious places; establishes the Native American Heritage commission; California Native American Remains and Associated Grave artifacts shall be repatriated; notification of discovery of Native American human remains to a most likely descendent.	Section 5.16.4	CEC; State Historic Preservation Office; Tribal Historic Preservation Office; Native American Heritage Commission

LORS	Requirements	Conformance Section	Administering Agency
CCR Section 1427	Recognizes that California's archaeological resources are endangered by urban development; the Legislature finds that these resources need preserving; it is a misdemeanor to alter any archaeological evidence found in any cave, or to remove any materials from a cave.	Section 5.16.4	CEC
Senate Concurrent Resolution Number 43	Requires all state agencies to cooperate with programs of archaeological survey and excavation, and to preserve known archaeological resources whenever reasonable.	Section 5.16.4	CEC
Penal Code, Title 14, Section 622.5	Misdemeanor offense for any person, other than the owner, who willfully damages or destroys archaeological or historic features on public or privately-owned land.	Section 5.16.4	CEC
Riverside County General Plan, Conservation/ Open Space Element	Requires the review of all proposed development for the possibility of archaeological sensitivity and requires a Native American Statement as part of the environmental review process on development projects with identified cultural resources.	Section 5.16.4	Planning Department, Riverside County

Please see attached Section 5.16.5.1:

5.16.5.1 Conformance with LORS

National Historic Preservation Act of 1966 as amended, Public Law 102-575. In accordance with Section 106 of the NHPA, the Project has inventoried the project APE to identify cultural resources. Supporting the BLM and SHPO, it will evaluate those resources for eligibility for inclusion on the NRHP, and will develop Historic Property Treatment Plans for any Historic Properties that will be affected by the construction phase of the Project or that remain in the Project Area during Project operation. Project Mitigation Measures prescribe a protocol to be followed in the event of unanticipated discovery of cultural resources during Project construction.

Archaeological Resources Protection Act of 1979 as amended, Public Law 96-95. Project conformance with the NHPA will provide conformance with this regulation.

Federal Land Policy and Management Act of 1976 as amended, Public Law 94-579. Project conformance with the NHPA will provide conformance with this regulation.

Native American Graves Protection and Repatriation Act, Public Law101-601. All Historic Properties Treatment Plans and Project Mitigation Measures dealing with unanticipated discovery of cultural resources will be produced in conformance with this regulation.

Antiquities Act of 1906, as amended. All fieldwork for this Project has been conducted under a Cultural Resources Use Permit issued under this regulation. Project conformance with the NHPA also provides conformance with this regulation.

Executive Order No. 11593: Protection and Enhancement of the Cultural Environment, 1971. Project conformance with the NHPA will provide conformance with this regulation.

National Environmental Policy Act of 1969, as amended, Public Law 91-190. Information on cultural resources in the Project APE, their eligibility for the NRHP, and potential Project impacts on cultural resources collected in conformance to the NHRA, will be used in conducting the analysis required by NEPA and provided in an EIS for the project.

The Warren-Alquist Act 1974, as amended. Information on cultural resources in the Project APE, their eligibility for the NRHP (CRHR), and potential Project impacts on cultural resources collected in conformance to the NHPA, will be used in conducting the analysis required by this regulation and provided in an AFC for the project.

CEQA of 1970, as amended. Project conformance with the Warren-Alquist Act will provide conformance with this regulation.

California PRC Section 5020-5029.5. Project conformance with the Warren-Alquist Act will provide conformance with this regulation.

Senate Bill 922 (Ducheny 2005). All sensitive site location information pertaining to this Project has been kept in limited distribution confidential appendices.

Senate Bill 18 (Burton 2004). As no General Plan Amendment was required by this Project, this regulation does not apply.

Senate Concurrent Resolution Number 87 (1994). As no state land is involved in this project, this regulation does not apply.

Administrative Code, Title 14, Section 4307. Project Mitigation Measures provide for a worker education and awareness program that deals with the prevention of vandalism to cultural resources.

Government Code, Sections 6253, 6254, 6254.10. All sensitive site location information pertaining to this Project has been kept in limited distribution confidential appendices.

Health and Safety Code, Section 7050.5. All Historic Properties Treatment Plans and Project Mitigation Measures dealing with unanticipated discovery of cultural resources will be produced in conformance with this regulation.

Health and Safety Code, Section 7051. All Historic Properties Treatment Plans and Project Mitigation Measures dealing with unanticipated discovery of cultural resources will be produced in conformance with this regulation.

Health and Safety Code, Section 7052. Project Mitigation Measures provide for a worker education and awareness program that deals with the prevention of vandalism to cultural resources.

PRC 5097.9-5097.991. All Historic Properties Treatment Plans and Project Mitigation Measures dealing with unanticipated discovery of cultural resources will be produced in conformance with this regulation.

CCR Section 1427. Project conformance with the Warren-Alquist Act will provide conformance with this regulation.

Senate Concurrent Resolution Number 43. Project conformance with the Warren-Alquist Act will provide conformance with this regulation.

Penal Code, Title 14, Section 622.5. Project Mitigation Measures provide for a worker education and awareness program that deals with the prevention of vandalism to cultural resources.

Riverside County General Plan, Conservation/Open Space Element. As Riverside County does not serve as CEQA lead agency for this project, Project conformance with the Warren-Alquist Act will provide conformance with this regulation.

Cultural Resources: Appendix B (i) (1) (B)

Information Required:

Applicant needs to add to this table the other federal agencies issuing permits or approvals for this project and having Section 106 responsibilities, including the U.S. Army Corps of Engineers and the U. S. Fish and Wildlife Service.

Note, the table following Table 5.16-8 is misnumbered; should be Table 5.16-9.

Response:

Please see table below.

Table 5.16-9. Involved Agencies and Agency Contacts

Agency	Contact	Permits/Reason for Involvement
Bureau of Land Management, Palm Springs Field Office 1201 Bird Center Drive Palm Springs, CA 92262-8001	Chris Delu	NHPA Section 106 Compliance BLM Cultural Resources Use Permit, compliance with CRMMP
California Energy Commission 1516 Ninth Street Sacramento, CA 95814	Beverly Bastian	Compliance with CRMMP
County Archaeologist & Cultural Liaison County of Riverside Planning Department (TLMA) 38686 El Cerrito Road Palm Desert, CA 92211	Leslie Mouriquand M.A., RPA	Compliance with County of Riverside
Native American Heritage Commission	916-653-4082	Native American traditional cultural properties and human remains
Riverside County, Medical Examiner-Coroner, East County Dispatch	760-863-8311	Identification of human remains
State Historic Preservation Officer (SHPO) 916-653-9134	Dwight Dutschke	California Register of Historical Resources and/or Federal agency NHPA Section 106 compliance (if emergency discovery with federal permit involvement)

Table 5.16-9. Involved Agencies and Agency Contacts

Agency	Contact	Permits/Reason for Involvement
US Army Corps of Engineers Los Angeles District 915 Wilshire Blvd., Suite 1101 Los Angeles, CA 90017 213-452-3333	Pamela Maxwell	NHPA Section 106 compliance
US Fish and Wildlife Service Pacific Southwest Region (Region 8) 2800 Cottage Way W2606 Sacramento, CA 95825 916-414-6464	Anan Raymond (located in Region 1 but supports Region 8 requirements) 503-625-4377	NHPA Section 106 compliance

Cultural Resources: Appendix B (i) (2)

Information Required:

Applicant needs to add the contact information for the federal agencies added to the table above.

Response:

Please see table above.

Geological Hazards and Resources

Geological Hazards and Resources: Appendix B(g)(17)(A)

Information Required:

Provide a summary of the geology, seismicity, and geologic resources of the off-site linear facilities.

Response:

The proposed off-site linears for the project include transmission lines, an access road and a gas pipeline. These off-site linears extend south. A map adapted from published geologic maps showing the alignment of the proposed off-site linears and recognized stratigraphic units, and geologic structures is presented as Figure D-1.1. A map showing the alignment of the proposed off-site linears and surficial geologic units and geomorphic features interpreted from published geologic mapping, aerial photograph interpretation, and site reconnaissance is presented as Figure D-1.2. The proposed gas pipeline is not shown but will parallel the transmission line alignment north of Interstate Highway 10 (I-10). Because the proposed off-site linears are located in Chuckwalla Valley within approximately 5 miles of the Project site, the geologic and seismic setting of the off-site linears is identical to the setting of the Project site, and is described in Section 5.5 of the AFC. The geology, geologic hazards, and geologic resources in the vicinity of the off-site linears is similar to the Project site, and is described below.

Physiography

The Project site is located in the distal (lower) portions of bajadas extending southward from the Palen and McCoy Mountains as well as near the southern end of a valley axial drainage that extends southward between these two mountain ranges and terminates at Ford Dry Lake, which is located about 1 to 2 miles southwest of the Project site (refer Section 5.5 of the AFC). The off-site linears extend southeastward from the Project site, skirting ½ to 1 mile northeast of Ford Dry Lake, reach the low point of the valley approximately 1 mile east of Ford Dry Lake, and follow the low point of the valley eastward to near the intersection of I-10 and Wiley's Well Road. The proposed transmission line then crosses I-10 and extends southward, up the lower portions of the southern valley flank, to join the Blythe Transmission Line.

The topography crossed by the off-site linears is virtually level, and ranges between 360 and 390 feet above mean sea level (amsl). Northeast of Ford Dry Lake, the off-site linears cross an alluvial and aeolian plain that represents the distal portions of the valley axial and bajada surfaces that extend southward from the McCoy Mountains. The ground surface in this area slopes very gently to the southwest, toward Ford Dry Lake, at inclinations of approximately ½ percent. Landforms include alluvial and sand plains, local coppice dunes, and local subdued bar and swale topography associated with sheet flood deposits. East of Ford Dry Lake, the off-site linears cross the distal portions of a valley axial drainage that enters Ford Dry Lake from the east. The ground surface in this area slopes westward at less than ½ percent and the alluvial and aeolian plain in this area includes similar landforms as described above. A series of poorly defined, broad, shallow washes run eastward near the off-site linear alignment starting about

1 mile west of the Wiley's Well Road exit and extending along the alignment for approximately 1 mile prior to dissipating into sheet flow and alluvial/aeolian plain deposits. South of I-10, the transmission line crosses similar terrain, but the ground surface slopes northward at inclinations of approximately ½ percent and represents the distal portions of the bajada that extends northward into the valley from the Chuckwalla Mountains.

Geology

A regional geologic map is presented as Figure D-1.1. This map shows that the off-site linears cross an area of younger (Holocene) alluvial deposits located between the younger (Holocene) playa deposits of Ford Dry Lake and older (Early Holocene and Pleistocene) alluvial fan deposits extending southward from the McCoy Mountains. The underlying stratigraphy consists of recent alluvium underlain by Pleistocene alluvium, the Pliocene Bouse Formation, and the Miocene Fanglomerate, as described in Section 5.5 of the AFC.

A map presenting the surficial geology in the off-site linear area is presented as Figure D-1.2. In developing this map, alluvial sediment units established by the USGS (Stone, 2006) have been adopted, with modifications, as summarized in Table D-1.1, and are described in greater detail below.

Table D-1.1 Mapped Surficial Geologic Units

Map Unit	Inferred Age	Descriptive Name
Q_{yma}	Post-late Holocene	Younger Mixed Alluvial and Aeolian Deposits
Q_P	post-LATE Holocene	Playa deposits
Q_{yaf}	Late Holocene	Younger Alluvial Fan Deposits
Q_{oaf}	Late Pleistocene	Older Alluvial Fan Deposits

Older Alluvial Fan Deposits (Q_{oaf}). The upper and middle alluvial fan surfaces, located northeast of, and upslope from, the off-site linears near the McCoy Mountains, consist of coarse to medium grained sandy gravels and gravelly sands and are extensively dissected by deep washes that are up to 1/4 mile wide and over 50 feet deep in the proximal fan areas. Between these incised washes, the remnant alluvial fan surfaces are covered by well developed desert pavement with high proportions of stone cover, dark brown to nearly black desert varnish, and carbonate deposition on the lower sides of the clasts. The desert pavement development is consistent with a Pleistocene surface age and these remnant fan surfaces were mapped as late Pleistocene by USGS (Stone, 2006). These remnant fan surfaces are located upslope of the off-site linears.

Younger Alluvial Fan Deposits (Q_{yaf}). The downslope extent of the Pleistocene terraces at the foot of the McCoy Mountains marks the "intersection point" of the alluvial fans in this area. Downslope of these points, the incised (and confined) washes emerge from an erosional setting and transition into a depositional mode with fan lobes, bar and swale topography, and shallow distributary washes, all of which are consistent with a distal fan environment. These lower fan deposits exhibit a darker color than the adjacent mixed alluvial and aeolian (Q_{yma}). Desert pavement is locally present, but its development is not as extensive, and the individual clasts that comprise the pavement do not exhibit the same degree of desert varnish development as the upslope, and older alluvial fan surfaces. The presumed ancient shoreline feature that trends across the Q_{iaf} surfaces downslope of the Palen Mountains (see Section 5.5 of the AFC) is not

discernible across these fans, and appears to have been covered by deposition during the late Holocene. These Q_{yaf} deposits consist of silty sands and gravelly silty sands, with generally finer grained gravel than the upslope deposits.

Playa Deposits (Q_p). Ford Dry Lake is a playa that represents the terminal sink in the western portion of Chuckwalla Valley. Playa deposits include silt, clay, and sand sheet flood and lacustrine deposits, as well as local aeolian sand sheets and coppice dunes.

Younger Mixed Alluvial and Aeolian Deposits (Q_{yma}). Downslope of the Younger Alluvial Fan deposits, between the Younger Alluvial Fan Deposits and the Playa Deposits of Ford Dry Lake and within the valley axial drainage east of Ford Dry Lake, the alluvial fan and valley axial alluvium grade into a mixture of deposits consisting of distal alluvial deposits, sand and silt sheet flood deposits, and interspersed aeolian sand sheets and local small coppice dunes. The factor that distinguishes these deposits from the upslope alluvial deposits is the presence of less gravel and more fine sand and silt, and an increasing prevalence of aeolian deposits and processes. Several small washes are located within the area of the off-site linears and extend from about 1 to 2 miles west of the Wiley's Well Road exit before dissipating into sheet flood deposits. Younger Mixed Alluvial and Aeolian Deposits underlie the alignment of the off-site linears associated with the Project.

Local Faulting and Seismicity

Although there are several bedrock faults off site in the mountains surrounding Chuckwalla Valley, these do not exhibit recent activity and are presumed to be Tertiary or pre-Tertiary in age (Stone, 2006). In addition, gravity anomalies suggest the presence of several subsurface faults beneath Chuckwalla Valley beneath the off-site linear alignments (Stone, 2006; Rotstein, et al., 1976). The gravity anomalies reflect abrupt changes in basement elevation strongly suggestive of dip-slip movements, and some of these faults may have undergone right-lateral strike slip movements. These faults are presumed Tertiary and likely inactive with very low chance of earthquakes.

The active faults considered most likely to produce large earthquakes potentially affecting the Project off-site linears are located at a considerable distance to the west and southwest and include the San Andreas, Imperial, and San Jacinto-Anza faults. Other smaller faults are located within approximately 100 kilometers (km) of the Site as summarized below. These faults are believed to be capable of producing ground shaking with peak ground accelerations exceeding 0.10 times the force of gravity (0.10 g).

Table D-1.2 Sufficiently Active Faults within 100 Kilometers of the Project Off-Site Linears

Fault Name	Approximate Distance and Direction from Site	Slip Rate (mm/year)	Maximum Earthquake Magnitude
San Andreas Fault	46 miles (74 km) southwest	>5	7.4
Brawley Seismic Zone	47 miles (76 km) miles southwest	1 to >5	7.2
Pinto Mountain Fault	54 miles (86 km) west-northwest	1 to 5	7.0
Pisgah-Bullion Fault	57 miles (91 km) northwest	0.2 to 1	7.1
Imperial Fault	61 miles (98 km) southwest	>5	7.0
San Jacinto-Anza Fault	61 miles (98 km) southwest	1 to >5	7.2

Fault locations and slip rates taken from USGS Earthquake Hazard Program Quaternary Fault and Fold Database

(http://gldims.cr.usgs.gov/qfault/viewer.htm), using lat 33.67, long 115.00 as the Site coordinates.

Maximum Magnitude taken from California Department of Conservation, Division of Mines and Geology, 1998. Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada.

A preliminary estimate of ground motions expected at the site was prepared using source and attenuation models developed by the USGS National Seismic Hazard Mapping Project (NSHMP, 2009). The preliminary results indicate peak ground acceleration (PGA) with a probability of exceedance of 10 percent in 50 years (475 Year Return Period) is 0.14 g. The deaggregation information indicates the mean moment magnitude is 6.8 at a mean distance of 68 km. The PGA with a probability of exceedance of 2 percent in 50 years (2475 Year Return Period) is 0.23 g. The mean moment magnitude is 6.7 at a mean distance of 48 km. The deaggregation data for the 475- and 2475-year return periods was included in Appendix E of the AFC. A site-specific Probabilistic Seismic Hazard Assessment is being completed as part of an ongoing Geotechnical Investigation and will be made available to the CEC.

Table D-1.3, below, presents seismic design parameters based on the 2007 California Building Code (CBC). These seismic design parameters may be used for design of structures where appropriate. On the basis of available data regarding on site geologic conditions and information from subsurface exploration at the well site located east of the power plant sites, the site may be classified as Site Class C, very dense soil and soft rock. The site class and parameters listed below will be updated as appropriate based on the results of the Preliminary and Final Geotechnical Investigations for the Project.

Table D-1.3 2007 CBC Seismic Design Parameters

Parameter	Value
Site Class (see discussion above)	C
Ss- Mapped Spectral Acceleration, Short Period	0.478 g
Ss- Mapped Spectral Acceleration, Long Period	0.249 g
Fa-Site Coefficient, Short Period	1.2
Fv-Site Coefficient, Long Period	1.551
SDs-Design Spectral Response Acceleration, Short Period	0.383 second
SD1-Design Spectral Response Acceleration, Long Period	0.258 second
SMs-MCE* Spectral Response Acceleration, Short Period	0.574 second
SM1- MCE* Spectral Response Acceleration, Short Period	0.387 second

Calculated using USGS Program "Earthquake Ground Motion Parameters" Version 5.0.9 based on the coordinates latitude 33.67, longitude -115.00.

MCE = Maximum Considered Earthquake

Geologic Hazards

Because of the proximity of the off-site linears to the Project site and the generally similar geology, the geologic hazards associated with the off-site linears are generally similar to the geologic hazards associated with the Project site.

Seismic Ground Shaking. Although the off-site linears are not located in a very seismically active area, they may be subjected to ground shaking from movement along one or more of the sufficiently active or well-defined faults in the adjacent, more seismically active areas such as the Salton Trough, the Transverse Ranges, or Central Mojave Block. The California Geological

Survey defines a "sufficiently active fault" (previously referred to as an "active fault") as a fault that has broken the surface in the past 11,000 years. A "well-defined fault" (previously referred to as "potentially active fault") is defined as a fault whose trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface.

The Riverside County General Plan, Safety Element (Riverside County, 2008) indicates the off-site linears associated with the Project are in an area of moderate ground shaking risk, which means peak ground accelerations may reach 0.1 to 0.2 g. A preliminary seismic hazard analysis indicates the peak ground acceleration with a probability of exceedance of 10 percent in 50 years (475 Year Return Period) is 0.14 g. The 0.1 g value is an industry standard for significance in terms of foundation design; however, higher potential accelerations can be routinely managed with proper foundational design and site geotechnical investigation.

Based on the available data, the off-site linears will be subject to low to moderate seismic ground shaking hazard.

Ground Rupture. The off-site linears are not located within a State of California Earthquake Fault Zone designated by the Alquist-Priolo Special Studies Zone Act of 1972 (formerly known as a Special Studies Zone), an area where the potential for fault rupture is considered probable (Riverside County, 2008). In addition, no Quaternary, Sufficiently Active, or Well Defined Faults are located under or near the Site. Based on this information and engineering judgment, earthquake-induced ground rupture is not considered to be a significant hazard in the area of the off-site linears.

Slope Stability. The off-site linears associated with the Project are not considered to be an area with the potential for permanent ground displacement due to earthquake-induced landslides because surface topography at and near the site is relatively flat (Riverside County, 2008). A review of the Riverside County General Plan, Safety Element, did indicate areas considered susceptible to earthquake induced landslides and rockfalls in the Palen and McCoy Mountains; however, these areas are several miles from the Site and are not expected to impact the Project. Based on this information and engineering judgment, slope instability is not considered to be a significant hazard for the off-site linears.

Erosion. Erosion is the displacement of solids (soil, mud, rock, and other particles) by wind, water, or ice and by downward or down-slope movement in response to gravity. Due to generally flat terrain, the area of the off-site linears are not prone to significant mass wasting (gravity-driven erosion and non-fluvial sediment transport) at present. The Riverside County General Plan, Safety Element (Riverside County, 2008), indicates the Site is in an area with moderate potential for wind erosion, the off-site linears are in areas with moderate to high potential for wind erosion. Soil characteristics along the alignment of the off-site linears allow for the potential for wind and water erosion, and significant sediment transport currently occurs across the valley axial drainage located along the off-site linears from 1 to 2 miles west of the Wiley's Well Road exit from I-10. These valley axial deposits are characterized by subdued bar and swale topography and ongoing deposition from sheet floods. Limited sand and aeolian erosion also occurs between depositional episodes.

Soil erosion from wind and water during construction activities is further evaluated in Section 5.6 of the AFC and the Data Adequacy Response below. The implementation of BMPs is expected to reduce water and wind erosion of soils during and after construction of the off-site linears to less than significant levels.

To address the management of sediment transport, erosion and sedimentation during operation, the project design will incorporate diversion berms and channels along the site access road as discussed in Section 5.4 of the AFC. Pole foundations and buried utilities will be installed below the anticipated scour and active sediment transport depths. The final design for these features will be developed during detailed design, and will include industry-standard calculations and modeling to reduce the potential for erosion or sedimentation, and reduce the need for ongoing maintenance. Dirt roads and exposed surfaces will be periodically treated with dust palliatives as needed to reduce wind erosion. Construction and maintenance of the proposed drainage and sediment management system associated with the Project, including the off-site linears, is expected to reduce water and wind erosion at and downstream of the Project and off-site linears to less than significant levels.

Liquefaction. Liquefaction is a soil condition in which seismically induced ground motion causes an increase in soil water pressure in saturated, loose, uniformly-graded sands, resulting in loss of soil shear strength. As a result, the effects of liquefaction can include loss of bearing strength, differential settlement, ground oscillations, lateral spreading, and flow failures or slumping. Liquefaction occurs primarily in areas where the groundwater table is within approximately 50 feet of the surface (Riverside County, 2008). The Riverside County General Plan Safety Element (Riverside County, 2008) indicates the majority of Chuckwalla Valley, including the soils beneath the off-site linears, is mapped as having deep groundwater but underlain by soils with an otherwise moderate susceptibility to liquefaction. The depth to water is estimated to range from approximately 50 to 94 feet bgs (see Section 5.4 and Appendix D of the AFC). In addition, the sandy soils encountered in the upper 100 feet beneath the Site during geotechnical drilling are generally dense and well graded. Dense, well-graded sands are not generally considered susceptible to liquefaction. Based on this information and engineering judgment, the potential for liquefaction hazard at the Site is considered to be low. The potential for liquefaction will be further evaluated as part of the Final Geotechnical Investigation for the Project and off-site linears, and if necessary, design parameters to address identified conditions will be incorporated into the detailed project design.

Subsidence. Based on the general geology of the Chuckwalla Valley, the Riverside County General Plan, Safety Element designates basin fill sediments in the valley as being susceptible to subsidence (Riverside County, 2008). However, subsidence has not been reported in the valley. As discussed in Section 5.4 of the AFC, groundwater demand in the valley was at a maximum in the 1980s and 1990s, when agricultural pumping was estimated to exceed 48,000 acre-feet per year. Current agricultural groundwater demand is estimated to be less than 2,000 acre-feet per year, and with implementation of the proposed project (water demand of approximately 1,600 acre-feet per year) the cumulative water demand in the basin is anticipated to remain well below the historical maximum. As such, it is not likely water levels in the Bouse Formation aquifer will drop below their historical low levels. In addition, the clays encountered during drilling of borings for the test well program at the site were hard and consolidated. Based on this information and engineering judgment, the potential for significant subsidence associated with the pumping of groundwater for the Project is considered low.

Seismically induced settlement can occur during moderate and large earthquakes in soft or loose, natural or fill soils that are located above the ground water table, resulting in differential settlement. The settlement can cause damage to surface and near-surface structures. The most susceptible soils are clean loose granular soils. Due to the expected dense to very dense

nature of the near surface soils, the potential for damage due to seismically induced settlement is considered to be low along the off-site linears. The potential for seismically-induced settlement will be further evaluated as part of the Final Geotechnical Investigation for the Project, and if necessary, design parameters to address identified conditions will be incorporated into the detailed project design.

Collapsible Soil Conditions. Alluvial soils in arid and semi-arid environments can have characteristics that make them prone to collapse with increase in moisture content and without increase in external loads. Soils that are especially susceptible to collapse or hydrocompaction in a desert environment are loose dry sands and silts, and soils that contain a significant fraction of water soluble salts. In the vicinity of the off-site linears, this would include aeolian sand, playa evaporite deposits, and potential loose flash flood deposits. Based on surface reconnaissance, review of geologic mapping, and review of aerial photographs, there are aeolian deposits along the alignment of the off-site linears, but no significant playa or evaporite deposits. Based on this data and engineering judgment, the soils along the alignment of the off-site linears may have a generally low potential for hydrocompaction or collapse, but may have a locally moderate potential for these hazards. The potential for hydrocompaction and soil collapse will be further evaluated as part of the Final Geotechnical Investigation for the Project, and if necessary, design parameters to address identified conditions will be incorporated into the detailed project design.

Expansive Soil. Expansive soil is predominantly fine grained and contains clay minerals capable of absorbing water in their crystal structure. It is often found in areas that were historically a flood plain or lake area, but can also be associated with some types of shale, volcanic ash or other deposits, and can occur in hillside areas also. Expansive soil is subject to swelling and shrinkage, varying in proportion to the amount of moisture present in the soil. As water is initially introduced into the soil (by rainfall or watering), expansion takes place. If dried out, the soil will contract, often leaving small fissures or cracks. Excessive drying and wetting of the soil can progressively deteriorate structures that are not designed to resist this effect, and can lead to differential settlement under buildings and other improvements. The surficial soils along the off-site linears generally consist of predominantly granular soils that do not contain much clay and are not subject to significant expansion hazards. The potential for expansive soils will be further evaluated as part of the Final Geotechnical Investigation for the Project, and if necessary, design parameters to address identified conditions will be incorporated into the detailed project design.

Geological Resources

Recreational and unique geologic resources and features typically include rock or mineral collecting, surface hydrothermal features, or surface expression of geologic features unique enough to generate recreational interests of the general public (natural bridges, caves, waterfalls, etc.). Based on a search of State and BLM recreation-related websites, there are no known recreational or unique geologic resources associated with or in proximity to the Project site or the associated off-site linears.

Based on a review of California Division of Oil, Gas, and Geothermal Resources online mapping system (http://maps.conservation.ca.gov/doms/index.html), there are no oil, gas, or geothermal resources beneath the off-site linear alignments associated with the project, or other nearby areas (CDOGGR, 2007).

According to the Riverside County General Plan, Multipurpose Use Element (Riverside County, 2008), the mineral land classification within 2 miles of the Site and off-site linears is MRZ-4. This designation is defined as an "(a)rea where geologic information does not rule out either the presence or absence of mineral resources."

Geological Hazards and Resources: Appendix B(g)(17)(B)

Information Required:

Provide a map at a scale of 1:24,000 that shows all recognized stratigraphic units, geologic structures and geomorphic features along proposed off-site linears.

Response:

Maps of the off-site linears are provided in Attachment D.

Paleontological Resources

Paleontological: Appendix B (g) (16) (B)

Information Required:

Provide the most recent geologic map at a scale of 1:24,000 which shows all geologic units on and adjacent to the project site, as well as all project linears outside the site. Provide a discussion of the sensitivity of each identified geological unit, including all mapped Quaternary sediments. Also provide rationale as to why sensitivity was assigned.

Response:

Maps, and a table which provides the sensitivity rationale, are provided in Attachment E.

Paleontological: Appendix B (g) (16) (D)

Information Required:

Provide a map at a scale of 1:24,000 showing occurrences of fossil finds within a 1-mile radius of the project and related facilities, including project linears outside the site.

Response:

Maps are provided in Attachment E.

Paleontological: Appendix B (i) (1) (A)

Information Required:

Provide explicit reference for pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed, on the table which identifies LORS.

Response:

See table below.

LORS	Requirements	Conformance Section	Administering Agency
Paleontological Resources Preservation Act (PL 111-011)	Requires the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on Federal land using scientific principles and expertise.	5.17.5.1 5.17.8	BLM
Antiquities Act of 1906	Prohibits appropriation, excavation, injury, and destruction of "any historic or prehistoric ruin or monument, or any object of antiquity" located on lands owned or controlled by the federal government, without permission of the secretary of the federal department with jurisdiction.	5.17.5.1 5.17.1.4	BLM

LORS	Requirements	Conformance Section	Administering Agency
Federal Land Policy and Management Act of 1976 as amended (PL 96-95)	Gives Federal land management agencies the authority and the mandate to protect public resources of scientific value such as fossilized paleontological specimens.	5.17.5.1	BLM
NEPA, 1969	Requires Federal agencies to take practicable measures to preserve important historic, cultural, and natural aspects of our national heritage including paleontology	5.17.7 5.17.5.1	BLM
The Warren – Alquist Act of 1974, as amended	Requires the CEC to evaluate energy facility siting in unique areas of scientific concern (Section 25527). CEC guidelines for paleontological resources assessment follow the professional standards as set forth by the Society of Vertebrate Paleontology	5.17.8 5.17.1.4 5.17.5.2 5.17.1.3	CEC
CEQA, Appendix G	Paleontological resources are included in the definition of "historical resources" covered by the act. Impacts to "unique paleontological resource or site or unique geologic feature" are also listed as issues that must be evaluated.	5.17.5.2 5.17 5.17.1.3	CEC
Public Resources Code, Sections 5097.5/5097.9	Prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any paleontologic feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission	5.17.5.2 5.17 5.17.1.3	CEC
County of Riverside General Plan, Multipurpose Open Space Element	Whenever existing information indicates that a site proposed for development may contain biological, paleontological, or other scientific resources, a report shall be filed stating the extent and potential significance of the resources that may exist within the proposed development and appropriate measures through which the impacts of development may be mitigated.	5.17.5.3 5.17	County of Riverside, Planning Department

Soils

Soils: Appendix B (g)(1 5)(B)(i)

Information Required:

The AFC did not quantify and provide supporting information and calculations for all potential soil loss scenarios.

1. Please quantify the potential annual soil loss due to wind erosion under a no-project scenario, during construction of the proposed project, and during operation of the proposed project.
2. Please quantify the annual soil loss due to water erosion during operation of the proposed project.
3. For all soil loss estimates, please provide supporting information and calculations.

The volume of soil loss due to accelerated wind and water erosion must be numerically quantified using the Revised Universal Soil Loss Equation (RUSLE2 model) and the Wind Erosion Prediction System (WEPS model) or similarly accepted methods.

Response:

The Wind Erosion Prediction System (WEPS) model was used to estimate soil loss due to wind erosion. Wind erosion rates at this project are an order of magnitude higher than soil erosion by rainfall runoff at this location due to the relatively low annual rainfall amount and the presence of fine, sandy soils. The results are presented in the new table 5.6-1b presented below. The supporting information and calculations are included in Attachment F.

Table 5.6-1b. Estimate of Soil Loss by Wind Erosion Using Wind Erosion Prediction System (WEPS)[a] Model

Description	Acres[b]	Predicted Soil Loss (tons/acre/year)	Wind Erosion Soil Loss (tons/year)
No Project	1,800	72.88	131,184
On Site Project Construction No BMPs	1,800	27.82	50,076
On Site Project Construction With BMPs	1,800	1.25	2,250
Off Site Linear Construction With BMPs	61	0.63	11
Project Operation With BMPs	1,650	1.25	2,063

Notes:

[a] Wind Erosion Soil losses (tons/acre/year) are estimated using WEPS software (NRCS, 2008).
The soil characteristics were estimated using WEPS soil profiles corresponding to the mapped soil unit.
Estimates of annual soil losses use the WEPS soil loss times the affected area.
Off site linear construction will take less than one year.

[b] Project Acreages based on the assumption that 100% of the project site will be graded.
Off-site area acreages are based on project disturbance table for acreage outside the project footprint.

WEPS Assumptions:
Climate and wind data from Blythe, CA.
BMPs for the project site include fencing the area and applying dust palliatives at least annually.
BMPs for the off site linears do not include fencing the area.

Quantitative calculation of potential soil loss due to water erosion using the Universal Soil Loss Equation (RUSLE2) was included in the original AFC submittal. However, the original table 5.6-1 included in the AFC has been updated to include the annual soil loss due to water erosion for the project during operations. In addition, the original table 5.6-1 assumed only 75% of the project site would be graded. The table has been updated to assume 100% of the project site would be graded. The updated estimate of soil loss by water erosion has been renamed Table 5.6-1a.

The RUSLE2 and WEPS soil loss calculations are included in Data Adequacy Supplement Attachment F: Soils.

Table 5.6-1a. Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation (RUSLE2)[a]

Feature (acreage)[b]	Activity	Duration (months)	Soil Loss (tons) without BMPs	Soil Loss (tons) with BMPs	Soil Loss (tons/yr) No Project
Project Site (1,800 acres total graded)	Grading Construction	6 19	441.0 1396.5	6.93 21.95	1.53 --
Roads (15.76 acres)	Grading Construction	3	1.931	0.0303	0.0134
Transmission Lines (9.18 acres for construction; 0.05 acre for pole footprints)	Grading Construction	2 4	0.0041 1.499	0.000064 0.0236	0.00043 --
Natural Gas Pipeline (36.36 acres for construction; 2.91 acres for trench)	Grading Construction	2 3	0.238 4.454	0.0037 0.0699	0.00247 --
Project Soil Loss Estimates *Construction*	All activities listed above		1845.63	29.00	1.16
Project Annual Soil Loss Estimate *Operation* (1650 acres exposed soil)		12		12.71	

Notes:

[a] Water Erosion Soil losses (tons/acre/year) are estimated using RUSLE2 software. (NRCS, 2002)
The soil characteristics were estimated using RUSLE2 soil profiles corresponding to the mapped soil unit.
Estimates of actual soil losses use the RUSLE2 soil loss times the duration and affected area.
The No Project Alternative estimate does not have a specific duration, and loss is given in tons/year.

[b] Project Acreages based on the assumption that 100 % of the project site will be graded.
Off-site area acreages are based on project disturbance table for acreage outside the project footprint.

[c] Duration of activities based upon assumptions in the Plan of Development (Genesis Solar, LLC, 2009)

RUSLE2 Assumptions:
100-ft slope length, 2% slope
Construction and Grading soil losses assume the following inputs: Management – bare ground; Contouring – None, rows up and down hill; Diversion/terracing – None; Strips and Barriers – None.
Construction and Grading with BMP and Annual Operational soil losses assume the following inputs: Management – Silt fence; Contouring – Perfect, no row grade; Diversion/terracing – None; Strips and Barriers- 2 fences, 1 at end of slope.
No Project soil losses assume the following inputs: Management – Dense grass, not harvested; Contouring –None, rows up and down hill; Diversion/terracing – None; Strips and Barriers – None.

Transmission System Design

Transmission System Design: Appendix B(b)(2)(C)

Information Required:

1. Provide a one-line diagram for the proposed 230kV Genesis Switchyard after interconnection of the project. Show proposed bay arrangement of the equipments with ratings such as breakers, disconnect switches and relays, etc. which are required to interconnect the project.
2. Provide a electrical one-line diagram showing the planned SCE 500/230 kV Colorado River Substation with the proposed 230kV generator tie-line interconnection facilities along with the existing/planned SCE 500/230kV transmission lines (identify the transmission lines for the first point of interconnection), for buses, breakers, and disconnect switches and their respective sizes and/or ratings.
3. Provide a detailed drawing of the proposed 230kV mono-pole structure configuration to be utilized to interconnect the project to the SCE 500/230kV Colorado River substation.
4. Provide a detailed one-line diagram illustrating the routing of the generator tie-line including length, conductor type, conductor current carrying capacity, line clearances at circuit crossings and mono-pole structure locations.

Response:

In response to item one above, Figure G-1.1, which has been included in Attachment G, shows the proposed one-line diagram for the on site 230 kV switchyard. The drawing includes breaker ratings, disconnect switches, relays, and protection information. Also included in Attachment G, as Figure G-1.2, is the proposed on site 230 kV switchyard layout that indicates the location of disconnect switches, breakers, and bay arrangement. In response to item two above, the Colorado River Substation design by SCE has not been completed. An engineering representation, Figure G-1.3, has been included in Attachment G and provides a potential design for the 230/500 kV Colorado River Substation. The 230 kV portion shows breakers, disconnect switches, and relays and protection. The 500 kV portion shows disconnect switches and breakers. In response to item three above, please refer to Figure G-1.4, which provides an elevation view of the proposed pole structure for the Blythe-Julian Hinds Transmission line [1]. It should be noted the existing poles that are part of the Blythe Transmission Line are not considered part of the Genesis Solar Energy Project.

In response to item four, Figure G-1.5 indicates the routing of the existing Blythe Transmission Line to the Colorado River Substation [2]. It should be noted the existing poles that are part of the Blythe Transmission Line are not considered part of the Genesis Solar Energy Project.

Figure 3.6-1 was provided in the AFC and has been updated for clarity to provide information requested in item four. The revised figure is included in Attachment G as Figure 3.6-1a and 3.6-1b and shows the route of the Genesis Transmission Line to the Blythe Julian-Hinds Transmission Line. The drawing indicates where the Eagle Mountain crossing will occur and

provides lengths for each section of the transmission line. AFC Figure 3.4-7, which is included in Attachment G, has also been revised to include conductor type and capacity.

[1] Blythe Energy Project (99-AFC-8C) Figure 2-4.
[2] Blythe Energy Project (99-AFC-8C) Figure 2-3

Transmission System Design: Appendix B(b)(2)(E)

Information Required:

Please provide signed System Impact Study Agreement with the California Independent System Operator and proof of payment or provide a completed System Impact Study (SIS).

The Study should analyze the system impact with and without the project during peak and off-peak system conditions, which will demonstrate conformance or non-conformance with the utility reliability and planning criteria with the following provisions:

a. Identify major assumptions in the base cases including imports to the system, major generation and load changes in the system and queue generation.

b. Analyze system for N-0, important N-1 and critical N-2 contingency conditions and provide a list of criteria violations in a table showing the loadings before and after adding the new generation.

   Analyze the SCE system for Short Circuit currents with and without the Genesis Solar Energy Plant at strategic buses for three-phase and single phase line to ground faults. Provide a summary of results in a table.

c. Analyze system for Transient Stability and Post-transient voltage conditions under critical N-1 and N-2 contingencies, and provide related plots, switching data and a list for voltage violations in the studies .Provide a list of contingencies evaluated for each study.

d. List mitigation measures considered (required) and those selected (optional- Data Requests will follow) for all criteria violations.

e. Provide electronic copies of *.sav and *.drw PSLF files.

f. Provide power flow diagrams (MW, % loading & P. U. voltage) for base cases with and without the project. Power flow diagrams must also be provided for all N-0, N-1 and N-2 studies where overloads or voltage violations appear.

Response:

On May 15, 2008, the CAISO filed to implement the Generator Interconnection Process Reform (GIPR) with FERC including a Petition for Waiver of the existing Tariff Provisions. FERC granted the waiver on July 14, 2008 and the CAISO filed draft GIPR LGIP tariffs on July 28, 2008. On September 26, 2008, FERC approved the CAISO's GIPR Amendment tariff, which reformed CAISO's Large Generator Interconnection Procedures (LGIP) tariff. One of the changes to the new CAISO tariff at FERC established that two (2) four-month Queue Cluster Windows would be opened each year (April 1 – July 31, and October 1 – January 31). During these windows, Interconnection Customers (ICs) must submit a completed Interconnection Request (IR) to include all of the information currently required by the CAISO LGIP process. After the Scoping Meetings, at the CAISO's option and in coordination with the Participating

Transmission Owner, an IR may be studied individually or in a group study based on their interconnection points and shared transmission needs. If the IR is designated for group study, the CAISO shall coordinate a Phase I Interconnection Study with the PTO and any affected System Operators. This study essentially replaces the Feasibility and System Impact Studies performed as part of the LGIP process. As required by the GIPR LGIP tariff, the final Phase I Interconnection Study report shall be issued within 270 Calendar Days after the close of the Queue Cluster Window, which will:

a) Evaluate the impact of all IRs received during the Queue Cluster Window on the CAISO Controlled Grid

b) Preliminarily identify all Network Upgrades needed to address the impacts on the CAISO Controlled Grid of the IRs

c) Preliminarily identify for each IR required Interconnection Facilities

d) Assess the POI selected by each IC and potential alternatives to evaluate potential efficiencies in overall transmission upgrade costs

e) Establish the maximum cost responsibility for Network Upgrades assigned to each IR

f) Provide a good faith estimate of the cost of Interconnection Facilities for each IR

g) Provide a short circuit, stability, and power flow analysis including off-peak analysis, and an On-Peak and Off-Peak Deliverability Assessment [in accordance with NERC/FERC reliability standards].

Genesis Solar, LLC filed an interconnection request with the CAISO for interconnection of a new 500MW solar steam generation facility deemed Desert Center Blythe Generation Project, here in referred to as the Genesis Solar Energy Project, to Southern California Edison's portion of the Julian Hinds 230kV substation. In this scheme, the project would connect to the 230kV Blythe-Julian Hinds 230kV line and utilize this private line connection at Julian Hinds. CAISO and Southern California Edison (SCE) assessed Genesis Solar Energy's original Point of Interconnection (POI) request and concluded the original POI was not viable. Further analysis established that the SCE Colorado River 500/230 kV Substation was found to be superior to the original POI.

Following the May 5, 2009 meeting with CAISO, Genesis Solar, LLC and SCE, Genesis Solar, LLC accepted the alternate POI as recommended. Genesis Solar, LLC will build 12 miles of generation tie line to the new Colorado River 500/230 kV Substation. On July 27, 2009, the Final Phase I Interconnection Study Report for the Desert Center Blythe Generation Project was issued and in the study, the Project was modeled to connect to the Colorado River Substation located within SCE's Eastern Bulk System. The project was studied on a cluster basis along with other similarly situated projects located in the Eastern Bulk System. The full report is included in Attachment G. If required, the *.sav and *.drw PSLF files can be obtained from SCE upon request, but cannot be provided at this time as they contain confidential information regarding other Interconnection Customers in the cluster.

The Blythe Energy Project Transmission Line and Staff-Approved Modifications to Support Interconnection of the Project.

The Blythe Energy Project (BEP) is a 520-megawatt (MW) combined cycle natural gas-fired electric energy generating facility located in Blythe and owned by Blythe Energy, LLC. The original Blythe Energy Project (BEP) was licensed by the Energy Commission on March 21, 2001 and started commercial operation in December of 2003. The Blythe Energy Project Transmission Line (BEPTL), also owned by Blythe Energy, was subsequently certified on October 11, 2006, amending the Energy Commission Decision and modifying the generation facility to develop the Blythe-to-Julian Hinds and the Buck-to-Colorado River lines as well as the Colorado River substation for the existing BEP. The transmission modifications proposed in the amendment were proposed to increase the electrical capability of transmission paths between the BEP and the CAISO-controlled electrical transmission system. In July 2009, the Energy Commission approved BEPTL Modifications including the replacement of up to 34 single circuit poles on the Blythe-Julian Hinds line with double circuit-ready poles. This modification was proposed to carry the conductors of the Genesis Project to the Colorado River substation.

Discussion of Regional Transmission Infrastructure as it pertains to The California Public Utilities Commission (CPUC), the Devers-Palo Verde No. 2 Transmission Project, the Colorado River Substation, and the Harness of Renewable Energy.

The CPUC approved SCE's application, A.05-04-015, for a Certificate of Public Convenience (CPCN) for the Devers-Palo Verde No. 2 Transmission Line Project in decision D.07-01-040 on January 25, 2007 on the basis that the Project would generate significant economic benefits to California ratepayers. The DPV2 project in the decision was originally comprised of two major transmission lines, one from SCE's Devers substation to SCE's Valley substation and one from the Devers substation to a location in Arizona near the Palo Verde nuclear generating plant. On June 6, 2007, the Arizona Corporate Commission (ACC) denied SCE's application to construct the project in Arizona. On May 14, 2008, SCE filed a Petition for Modification of the commission decision to allow SCE to construct the project in phases. Specifically to allow SCE to construct all of the California portions of the project up to and including the proposed Midpoint (Colorado River) substation in order to access potential new renewable and conventional gas-fired generation in the Blythe area.

In the DRAFT Proposed Decision of [Administrative Law Judge] ALJ Kolakowski (Mailed 9/28/09), "the benefits of the California-only Project constitute an overriding consideration warranting approval of the California-only Project" and that construction of the California-only Project "is necessary, reasonable and prudent, subject to approval by the CAISO's board of directors." In a June 19, 2009 letter to Judge Kolakowski, referenced in the decision, Michael D. Dozier, Senior Council of the CAISO, explains CAISO's approval of the California-only Project is contingent upon the execution of a sufficient number of LGIAs for interconnection to the California-only Project. For the complete DRAFT Decision Modifying Decision 0701-040, see Attachment G. The CPUC can act on the proposed decision no sooner than 30 days after the decision was mailed.

The decision is based on the need to harness the renewable energy from "Renewable Energy Transmission Initiative (RETI)-identified economically and environmentally desirable Competitive Renewable Energy Zones (CREZs) accessible to the California-only Project" and RETI-inclusion of the California-only portion of the DPV2 line in its Conceptual Transmission Plan for California. The DRAFT decision states, "Given RETI's assumption of the California-only

Project segments in its base case, it would be difficult for California to achieve its goal of 33% renewable resources by 2020 without being able to access these CREZs." The DRAFT decision is also based on "the substantial work and study already completed on the Project including certification of the final EIR, the constrained environmental impacts of building in an existing corridor, the lack of environmental opposition, and the uncertainty in terms of delay and cost in considering an alternative project to access these CREZs." This project is being proposed in the Riverside East CREZ accessible to the California-only Project.

Transmission System Design: Appendix B(i)(1)(A)

Information Required:

CPUC G.O. 95 and G.O 128 rules for overhead and underground Electric Line construction need to be discussed.

Response:

The CPUC G.O. 95 is discussed in section 3.6.1, Table 4.4-1 and 4.2.2.2 of the AFC. G.O. 128 was referenced in 4.2.2.2 of the AFC. The Laws, Ordinance, Regulations, and Standards table 4.4-1 has been updated to include both G.O 05 and 128 rules. A revised Table 4.4-1 has been included in Attachment G.

Transmission System Design: Appendix B(i)(2)

Information Required:

Provide names, phone numbers, address and e-mail address of the official contact person of each agency.

Response:

The following agency contacts have been made:

Transmission Agencies and Agency Contacts		
Judy Brown, Project Manager CAISO 151 Blue Ravine Road Folsom, CA 95630	(916) 608-7062	Generator interconnection
Jorge Chacon, Project Manager SCE 2244 Walnut Grove Ave. Rosemead, CA 91770	(626) 302-9637	Generator Interconnection
John Tucker, Project Manager SCE 2244 Walnut Grove Ave. Rosemead, CA 91770	(626) 302-8623	Transmission and Distribution Regulatory and Contracts
Allison Shaffer, Senior Environmental Planner/Project Manager Bureau of Land Management Palm Springs/South Coast Field Office 1201 Bird Center Drive Palm Springs, CA 92262	(760) 833-7104	Project Permitting on lands managed by the BLM
Jack W. Caswell California Energy Commission Energy Facilities Siting and Environmental Protection Division 1526 Ninth Street, MS-15 Sacramento, CA 95814 (916)653-0062	(916) 653-0062	BEPL contact

Transmission System Design: Appendix B(i)(3)

Information Required:

Provide a schedule when transmission related permits/study reports will be obtained.

Response:

Below is a list of permitting related items that will need to be obtained for the transmission line.

Permit Schedule

Permit/Approval Required	Due Date
Riverside County Encroachment Permit (for work in County Rights of way)	Submit plans showing work at least 14 working days prior to construction work in public ROW.
CEC and BLM	Ongoing consultation; obtain permit prior to start of construction activities.
Caltrans Encroachment Permit	Ongoing consultation; obtain permit prior to start of construction activities.
SCE Encroachment Permit (for work in SCE Rights of Way)	Ongoing consultation; obtain permit prior to start of construction activities.
Bureau of Land Management, ROW Grant for solar energy project and associated transmission line	1-2 years for processing and approval.

Visual Resources

Visual Resources: Appendix B (g) (6) (C)

Information Required:

Because KOPs on I-10 occur within the middle-ground distance zone, and the site directly adjoins the Palen/McCoy Wilderness, CEC staff requires additional information on KOP selection process.

Response:

Please see personal conversation report below between BLM and the Genesis Visual Resource analyst.

LEE ROGER ANDERSON

PERSONAL CONVERSATION REPORT

PROJECT NAME:	**GENESIS SOLAR PROJECT**
CONVERSATION WITH:	**GREG HILL, PLANNING AND ENVIRONMENTAL COORDINATOR**
REPRESENTING:	**BLM, PALM SPRINGS OFFICE**
DATE:	**JULY 8, 2009**
SUBJECT:	**BLM RECOMMENDATIONS FOR KOP LOCATIONS**

On July 8, 2009, Lee Anderson (senior visual analyst - Tetra Tech contractor) and Andrea Slusser (Tetra Tech environmental planner) met with Mr. Greg Hill of the BLM Palm Springs-South Coast Field Office. The purpose of the meeting was to coordinate with Greg Hill, the BLM visual analyst, to determine the best locations for the three (3) key observation points (KOPs) for the Genesis Solar Project, to ascertain Interim VRM Classes for the project area, and to determine recreation use areas in the Palen-McCoy Wilderness.

Prior to this meeting, on July 6 and 7, 2009, Anderson and Slusser had performed an independent site visit and detailed study of possible KOP locations. Mr. Anderson had taken photographs from these possible KOP locations and had recorded the exact camera locations using GPS technology. On the afternoon of July 7, Tetra Tech GIS staff prepared a map of these possible KOP locations based on the GPS coordinates. On July 8, 2009, Anderson and Slusser presented this map of possible KOPs to Mr. Hill at his Palm Springs office.

Mr. Hill had recently completed a site visit and analysis of possible KOPs for another project that is located just west of the proposed Genesis project site, so he was very familiar with the project vicinity and location of visually sensitive receptors.

Mr. Anderson pointed out that his and Slusser's investigation indicated there were no foreground sensitive receptor locations, and Mr. Hill agreed the Interstate 10 (I-10) freeway has the closest sensitive receptors. Mr. Hill agreed with Anderson and Slusser that the bridge over I-10 at the Ford Dry Lake Exit was the closest sensitive receptor location, and this would be a foreground/middleground viewing distance zone, according to the BLM VRM system. Mr. Hill agreed this location should be one of the three KOPs.

Mr. Anderson recommended a vantage point at Wiley's Well Rest Area be used as a KOP, such as the bridge over the freeway at the rest area, an elevated vantage point, and Mr. Hill agreed. Because of the distances involved, 8 to 12 miles from the proposed project site, this is a background viewing distance zone, according to the BLM VRM system. Mr. Hill agreed this location should be the second KOP.

Mr. Anderson asked Mr. Hill for his suggestions of which other locations along I-10 to use, or for a location inside the Palen-McCoy Wilderness, such as the "cherry stem road" directly north of the proposed project site. Mr. Hill said the "cherry stem road" is not a recreation road, there is no recreation use in the Palen-McCoy Wilderness, and the wilderness was not created for recreation use. Therefore, there are no sensitive receptors in the wilderness, and re-affirmed there are no foreground views of the proposed project site for any sensitive receptors.

Mr. Hill suggested Anderson and Slusser investigate possible KOPs on the Corn Springs BLM road that leads into Corn Springs Campground and trailhead to the Chuckwalla Wilderness, rather than any other location along I-10. Based on this meeting with Mr. Hill, on July 8, 2009, Anderson and Slusser investigated the BLM Corn Springs Road and identified two additional possible KOP locations. Upon review of the photographs and GPS coordinates of these two additional locations, the better one was selected as a KOP. Therefore, after consultation with the BLM, Anderson and Slusser selected these three locations as KOPs for detailed analysis of the Genesis Solar Project.

- KOP-1 – Located on the Ford Dry Lake Bridge Over I-10, looking north.
- KOP-2 – Located on the Wiley's Well Bridge Over I-10, looking northwest.
- KOP-3 – Located on the Corn Springs BLM Road, looking east.

Contact Information:

Greg Hill
Planning and Environmental Coordinator
Palm Springs-South Coast Field Office
1201 Bird Center Drive
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Greg_Hill@blm.gov

Lee Roger Anderson
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Andrea Slusser
Environmental Planner
Tetra Tech EC, Inc.
19803 North Creek Parkway
Bothell, WA 98011
andrea.slusser@tetratech.com

Visual Resources: Appendix B (g) (6) (D)

Information Needed:

No detailed description of the solar collector arrays and mirrors was provided; no visual depictions of the units are provided.

Response:

See Figure in Attachment H.

Visual Resources: Appendix B (g) (6) (E)

Information Required:

AFC indicates that a SACTI plume analysis will be conducted. However, the AFC does not include that analysis.

Response:

The plume analysis is provided in Attachment H.

Visual Resources: Appendix B (g) (6) (G)

Information Required:

No plume study was provided. Necessary data for conducting a plume analysis has not been provided. Please provide modeling data, or indicate when it will be forthcoming.

Response:

The plume analysis is provided in Attachment H.

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Water Resources

Water Resources: Appendix B (g)(14)(C)(v)

Information Required:

Please provide documentation showing that the applicant has authority to extract groundwater from beneath the project site and that water use will be consistent with the Law of the River.

Response:

All types of water rights, diversions, and uses of water in California are governed by principles contained in Article 10, Section 2 of the California Constitution which requires that all uses of water be put to beneficial and reasonable use, and that waste or unreasonable use or unreasonable method of use of water be prevented.

The right to divert or extract water under an overlying right is obtained by the acquisition of real property that abuts, adjoins, or overlies a natural watercourse or a groundwater basin. The overlying rights are vested property rights which are annexed to the soil and are "part and parcel" of the overlying land. Water rights are appurtenant to the land and remain with the land unless divested by prescription or severance. Because the Property is owned by the Bureau of Land Management, a federal agency, water rights generally follow local customs or laws. Accordingly, California water law governs the water rights of the Property. According to the evaluation completed by Best Best & Krieger, Attorneys at Law, providing that the lease and right-of-way grant obtained from BLM for the Property did not place any restrictions or reservations on the water rights, Genesis Solar LLC appears to have the right to pump percolating groundwater for the reasonable and beneficial use of the Project. This information is referenced in Attachment I -1.1, Best Best & Krieger, Water Rights for Project Genesis Solar.

The U.S. Department of the Interior, Bureau of Reclamation ("Bureau") has proposed a rule intended to regulate unlawful use of lower Colorado River water. The proposed rule provides a framework for identifying unlawful use, which includes a "River Aquifer/Accounting Surface" methodology used by the Bureau to identify groundwater wells that pump water replaced with water drawn from the lower Colorado River. Such wells may require an entitlement to divert Colorado River water. The study area includes the valley adjacent to the lower Colorado River and parts of some adjacent valleys in Arizona, California, Nevada, and Utah and extends from the east end of Lake Mead south to the southerly international boundary with Mexico.

A method was developed by the United States Geologic Society (USGS), in cooperation with the Bureau, to identify groundwater wells outside the flood plain of the lower Colorado River that yield water that will be replaced by water from the river. Wells in the flood plain are assumed based on their location to yield water from the Colorado River. For basins that are tributary to the flood plain, an accounting surface was developed by the USGS to assess whether wells would yield water that would be replaced by Colorado River water. According to the Colorado River Board of California, pumping water levels are permitted to drop below the elevation of the accounting surface; however, if static water levels remain below the accounting surface following a period of no groundwater withdrawal, groundwater withdrawn from the well would be considered Colorado River water.

However, as summarized in the AFC, as indicated by the groundwater modeling completed to evaluate the results of expected groundwater pumping on the Genesis Solar LCC project site, the static water table will not be drawn down below the Colorado River Accounting Surface. Based on this modeling, Genesis Solar LLC will not violate the Accounting Surface regulations.

According to the various compacts, agreements, court decisions, decrees, contracts and regulatory guidelines collectively known as the "Law of the River," the Colorado River Accounting Surface as defined by the USGS is not included in the "Law of the River" as administered by the Bureau. As such, proposed groundwater use will be permissible and consistent with the "Law of the River."

Genesis Solar LLC is located within the Chuckwalla Valley Groundwater Basin per the State of California Department of Water Resources. Figure I – 1.2 contains a comprehensive list of all adjudicated basins within California. The closest adjudicated basin within Riverside County is the Beaumont Groundwater Basin, the area of jurisdiction of which overlies a portion of the Santa Ana River Watershed and is traversed by San Mateo Creek, a tributary to the Santa Ana River. The most eastern portion of the Beaumont Groundwater Basin borders Banning, California, which is approximately 125 miles west of the Genesis Solar LLC project site.

The adjudicated Santa Margarita Valley Groundwater Basin is also located in Riverside County, the area of jurisdiction of which underlies the western part of Santa Margarita Valley in northern coastal San Diego County. The basin is controlled by the drainage of the Temecula Creek, Murietta Creek and Santa Margarita River. The most eastern portion of the Santa Margarita Valley encompasses Temecula, California, which is approximately 145 miles west of the Genesis Solar LLC project site. Figure I – 1.3 illustrates the boundary maps of the Beaumont Groundwater Basin and the Santa Margarita Valley Groundwater Basin.

As a result, Genesis Solar LLC is not located in either of the Riverside County adjudicated groundwater basins. The watersheds of the basins are not recharged nor receive inflow from the other basins as they do not share aquifers or are adjacent to one another. The surface areas of the basins do not have analogous boundaries nor are they calculated collectively, thus substantiating that Genesis Solar LLC, being located in the Chuckwalla Valley Groundwater Basin, is not within an adjudicated basin and the project is not bound or restricted by the conditions of adjudicated basin water rights by definition of the California Water Code.

West from the Genesis Solar LLC project site is the Palo Verde Irrigation District (PVID) territory. PVID occupies approximately 189 square miles of territory in Riverside and Imperial Counties including 131,298 acres, 26, 798 acres of which are on the Palo Verde Mesa Groundwater Basin. The Palo Verde Mesa Groundwater Basin and the PVID both lie west of the Chuckwalla Valley Groundwater Basin. As identified in Figure I -1.4, Palo Verde Irrigation District Boundary Map, the Genesis Solar LLC project site is not located within the boundaries of the Palo Verde Irrigation District (PVID). Thus, Genesis Solar LLC is not constrained under the rules of PVID as relating to groundwater extraction within the boundaries of the District.

Water Resources: Appendix B (g)(14)(D)(i)

Information Required:

Please provide mapping showing the pre- and post-development 100-year floodplains.

Response:

The Genesis Solar Energy Project ("Project") conceptual drainage study was provided in Appendix A of the Application for Certification (AFC) within the Drainage, Erosion and Sediment Control Plan (DESCP). As outlined in the conceptual drainage study, the Federal Emergency Management Agency (FEMA) has not mapped the Project site for the presence of flood plains (allocated as Zone D on FIRM Map Number 06065CIND2A Sheet 2, which equates to an area with possible but undetermined flood hazards).

Ford Dry Lake playa is located at the topographic low-point of the 440,000 acre Ford Dry Lake watershed, which is located about 1 mile south of the Project site (CASIL, 2008). Under existing conditions, stormwater runoff from the upstream catchment (approximately 90,000 acres) crosses the Project site in a broad, relatively level, valley axial drainage that is about 3 ½ miles wide and generally characterized by subdued bar and swale morphology indicative of a depositional surface under sheet flood conditions (refer to Section 5.4 of the AFC). Numerous ephemeral washes, ranging from small, weakly expressed features to broad (over 10 feet wide), shallow features have been observed at the site (refer to Appendix C.1 of the AFC, "Jurisdiction Waters and Wetlands," which includes a location map of 29 washes). A majority of these washes terminate prior to reaching Ford Dry Lake and transition into broad, shallow surface flow (refer to Appendix C.1 of the AFC, "Jurisdiction Waters and Wetlands"). Generally stormwater infiltrates through to the groundwater before reaching Ford Dry Lake; however, Ford Dry Lake may retain stormwater in shallow ponds for days or weeks. This occurs on average approximately once every 20 years (RCFCWCD, 2009).

Under developed conditions, the upstream offsite stormwater runoff in a 100 year, 24 hour storm event will be contained within three drainage channels, aligned around the solar field modules (refer to Appendix A of the AFC for alignments). Bentley PondPack software was used to determine the stormwater run off rates in the 100 year 24 hour storm event. Bentley FlowMaster software was used to determine the preliminary capacity requirements of the drainage channels using open flow criteria, and preliminary cross sections were provided within the DESCP (Appendix A of the AFC). The Conceptual Drainage Study contains copies of the model outputs from Bentley PondPack software. Copies of the actual PondPack models can be provided. In addition, copies of Bentley FlowMaster cross sections can also be provided.

The lowest elevation on the Project Site is 370 feet above mean seal level (amsl) at the South west corner of both 125 MW Unit Modules. Ford Dry Lake covers approximately 14,000 acres with a base elevation of approximately 361 feet amsl (GeoNames, 2009 and Airborne 1 2008). Therefore Ford Dry Lake would have to fill to an elevation of 370 feet amsl, before the surface elevation of the flood water would impact the Project site. This equates to a lake depth of 9 feet in the center, with a volume of approximately 101,000 acre-feet of water, based on the LiDAR (Light Detection and Ranging) survey undertaken in 2008. Interstate 10, south of Ford Dry Lake, is also at an elevation of approximately 370 feet amsl, with small roadside berms at 372 feet amsl.

In a 100 year, 24 hour storm event, approximately 3.5 inches of rain falls across the approximate 440,000 acre Ford Dry Lake catchment (NOAA, 2006; CASIL, 2008). If there was a complete lack of infiltration anywhere within the basin during this rain event, the volume of stormwater that would drain into Ford Dry Lake would be approximately 129,000 acre-feet. However, most stormwater infiltrates through to the groundwater during a storm event, reducing the volume of water draining into Ford Dry Lake. Based on the Conceptual Drainage Study, the

ratio of watershed area to volume of water run off in a 100 year 24 hour storm event (volume of stormwater under the hydrograph) is approximately 16% (refer to below calculations).

	Area (acres)	Hydrograph Volume (acre-feet)	Ratio of Area to Volume
Sub Catchment A	17,910	2,562	14%
Sub Catchment B	10,990	1,709	16%
Sub Catchment C	62,795	8,604	14%
Ford Dry Lake	*440,709*	*68,532*	*16%*

(Refer to Appendix D of the Conceptual Drainage Study for Sub Catchment Values)

Therefore, based on the ratio of 16%, in the 440,000 acre Ford Dry Lake watershed, approximately 69,000 acre-feet of stormwater runoff would accumulate in Ford Dry Lake in a 100 year 24 hour storm event. This volume of stormwater run off is less than the capacity of Ford Dry Lake and therefore, the flood level would not reach the Project site in a 100 year event. The additional stormwater runoff storage in Palen Dry Lake, located northwest of Ford Dry Lake within the same watershed, has not been accounted for in this storage calculation.

Additionally, any flow from the 100 year storm event leaving the Project site will be controlled and discharged through the use of the detention basin at flow rates equal to or less than prior to the Project development, negating any effect from the Project site runoff.

For the purposes of preliminary design, it has been assumed all offsite water from the upstream catchment will be contained within the planned channels and stormwater run-off routed around the Project site, therefore detailed flood mapping was not undertaken during this phase of the project. This level of modeling was considered appropriate as there are no existing flood hazards mapped, flood flows occur through a broad, shallow, sheet flow drainage area, there are no properties downstream of the Project site impacted by flooding, and the channel and berm system around the Project site will protect the onsite infrastructure.

However, flood modeling is required prior to detailed design of the Project to determine the Hydraulic Grade Line (HGL) of the 100 year storm flow within the diversion channels. The HGL will be calculated to confirm the sizing and geometry of the diversion berm and channel system to contain the 100 year storm flows are contained within the diversion channels, pass them around the Project site, and disperse them back to sheet flow downstream of the Project site. This will be undertaken prior to detailed design using Bentley Flowmaster or similar software.

Water Resources: Appendix B (g)(14)(vi)

Information Required:

Please provide mapping showing the 100-year flood plain and the model input files used for modeling along with a copy of the drainage report.

Response:

Refer to response to "Water Resources: Appendix B (g)(14)(D)(i)."

Water Resources: Appendix B (g)(14)(vii)

Information Required:

Please provide all assumptions, evidence, references, and calculations used in the analysis to assess the effects of the project on the 100-year floodplain.

Response:

Refer to response to "Water Resources: Appendix B (g)(14)(D)(i)."

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Attachment A

Air Quality

(To Be Provided At A Later Date)

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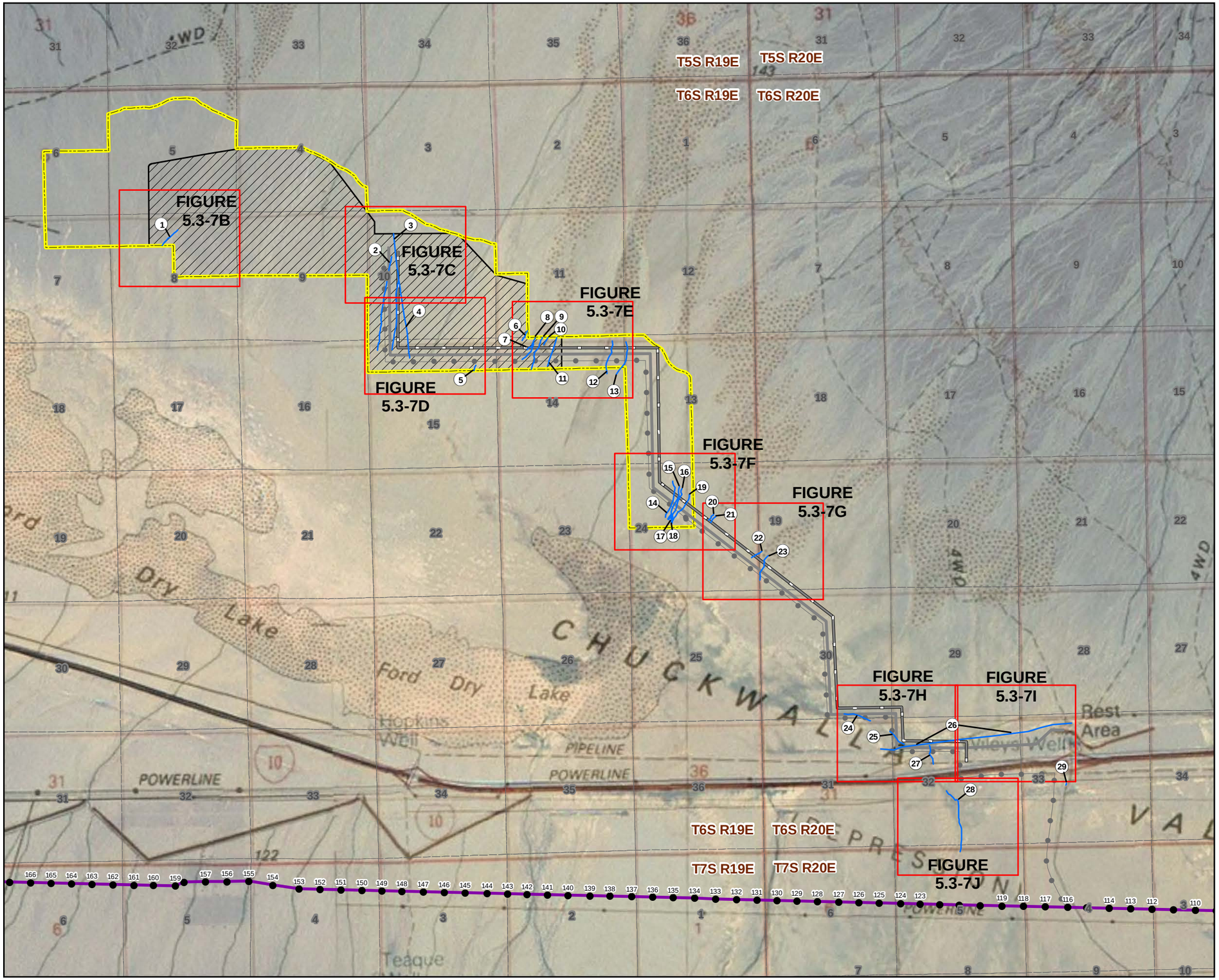

GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA

Legend

- Washes 1 - 29
- Proposed Gas Line
- Proposed Access
- Proposed Transmission Interconnect
- Blythe Transmission Line
- Blythe Transmission Line Structure
- Project Site
- Facility Footprint
- Section Line
- 1:4800 Detail Map Sheet

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7A
WATERS EVALUATION
FIELD SURVEY RESULTS

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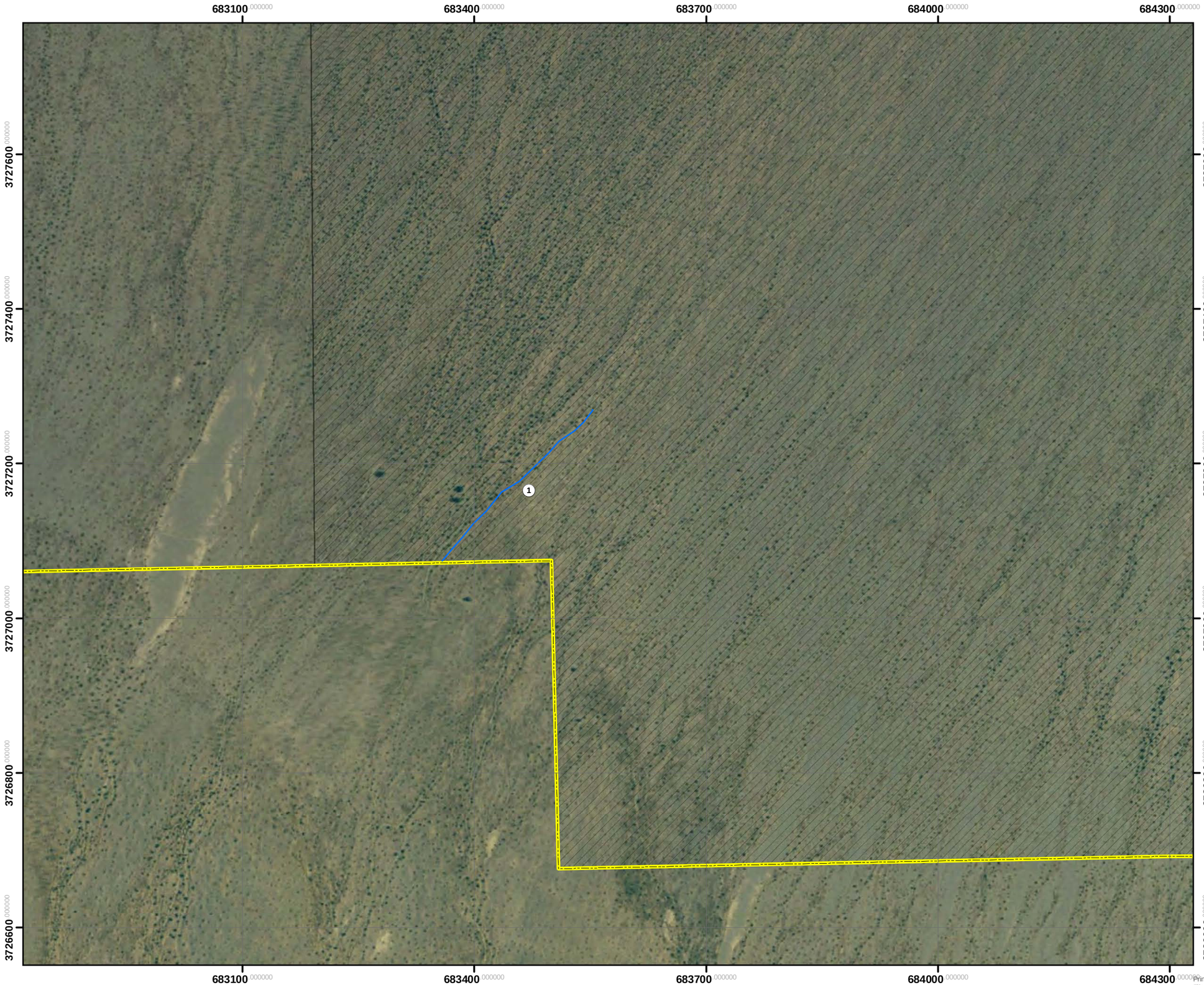
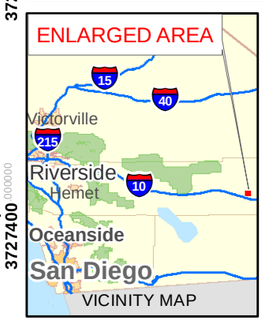
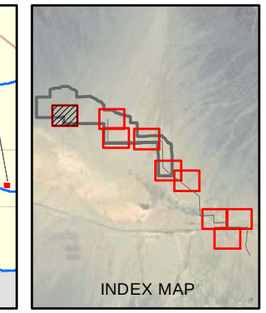


GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- Washes 1 - 29
- Project Site
- Facility Footprint

N

0 250 500 1,000
Feet
1"=400'

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7B
WATERS EVALUATION
FIELD SURVEY RESULTS

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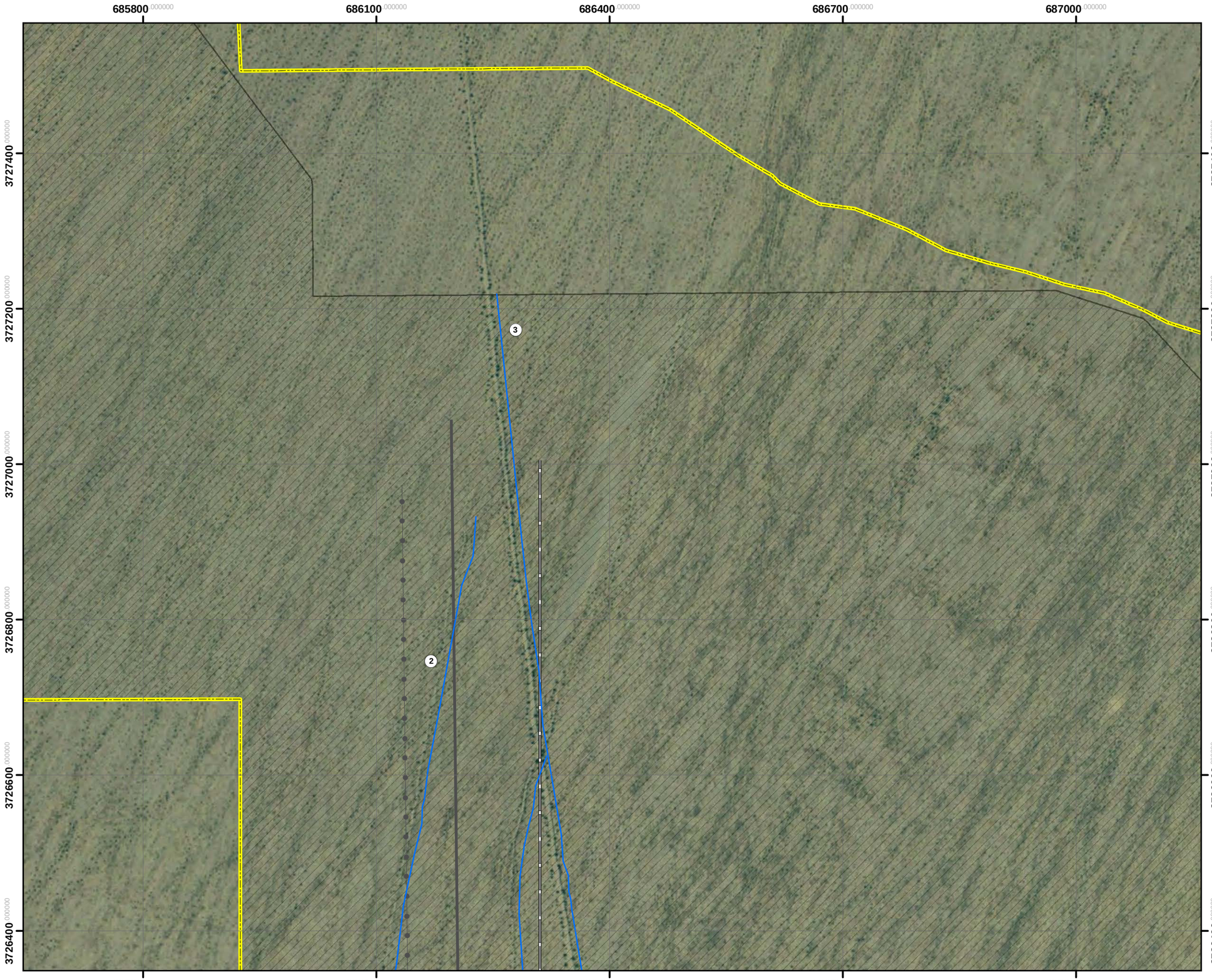

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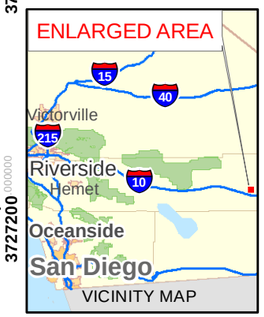
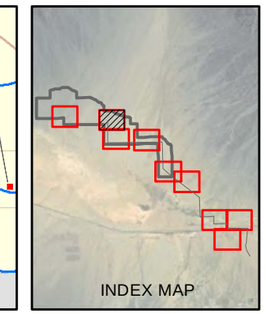
GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- Washes 1 - 29
- Project Site
- Facility Footprint
- Proposed Transmission Interconnect
- Proposed Access
- Proposed Gas Line

N

0 250 500 1,000
Feet
1"=400'

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7C
WATERS EVALUATION
FIELD SURVEY RESULTS

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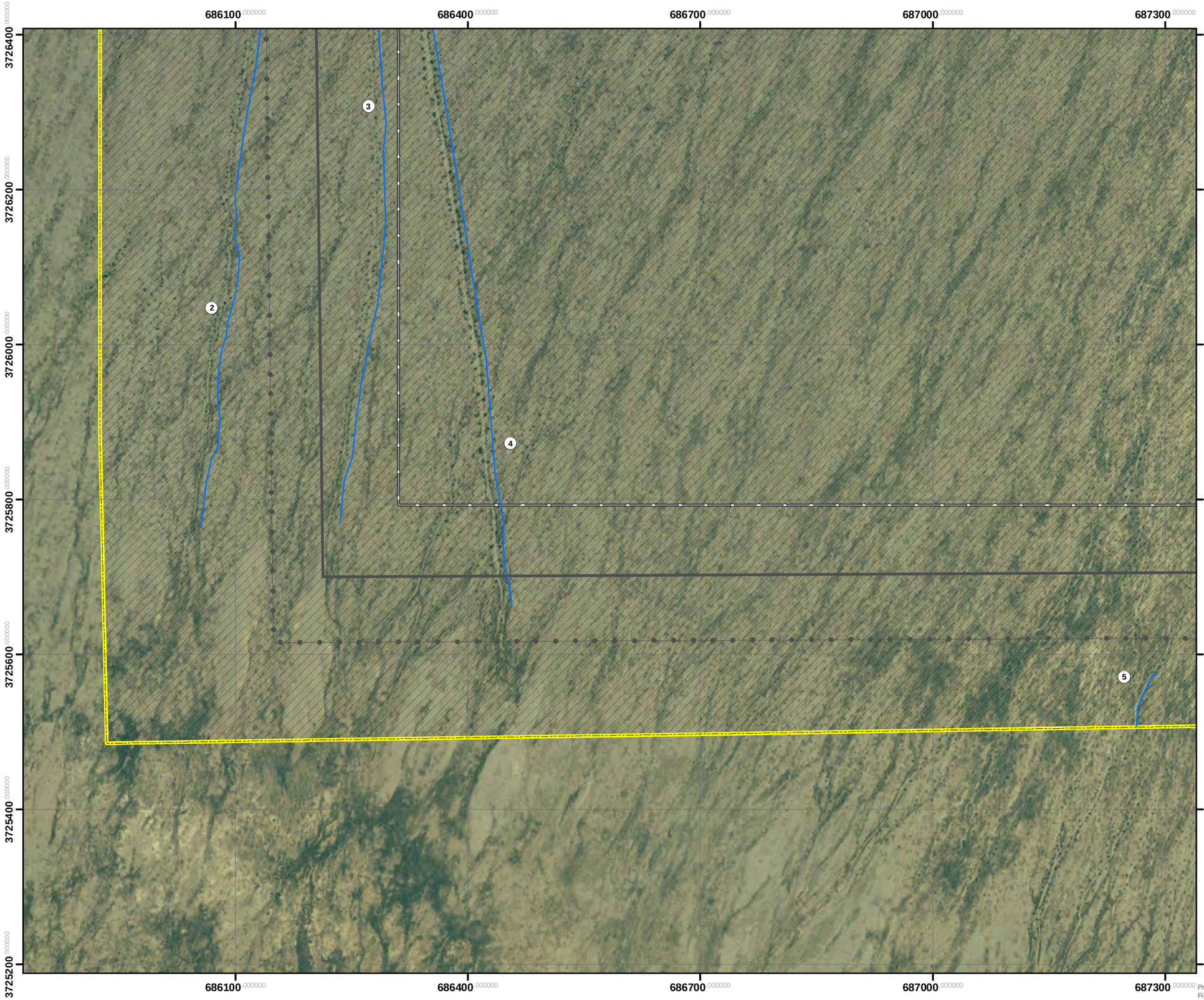

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GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
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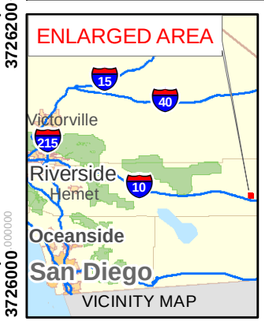

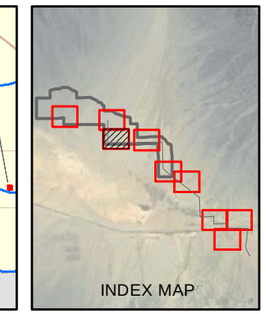

Legend

- Washes 1 - 29
- Project Site
- Facility Footprint
- Proposed Transmission Interconnect
- Proposed Access
- Proposed Gas Line

N

0 250 500 1,000
Feet
1"=400'

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7D
WATERS EVALUATION
FIELD SURVEY RESULTS

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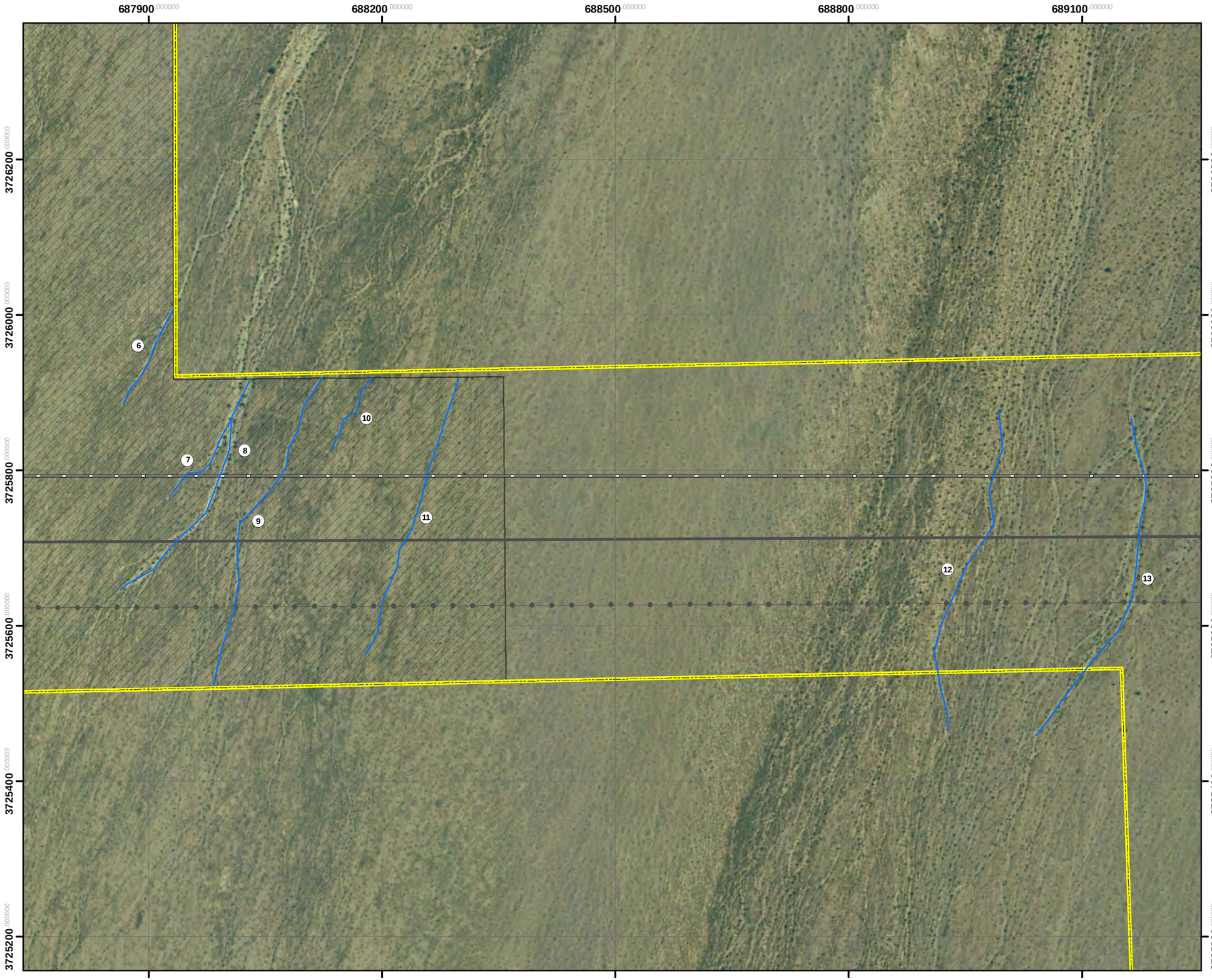

GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
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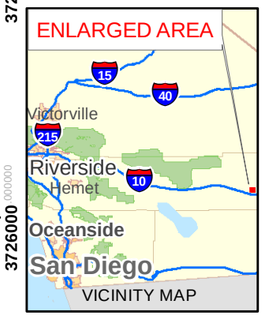

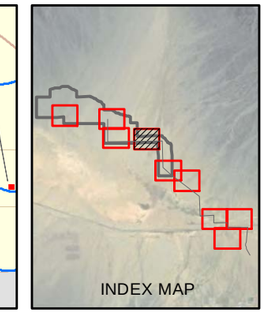

Legend

- Washes (1) - (29)
- Project Site
- Facility Footprint
- Proposed Transmission Interconnect
- Proposed Access
- Proposed Gas Line

N

0 250 500 1,000
Feet
1"=400'

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7E
WATERS EVALUATION
FIELD SURVEY RESULTS

TETRA TECH EC, INC

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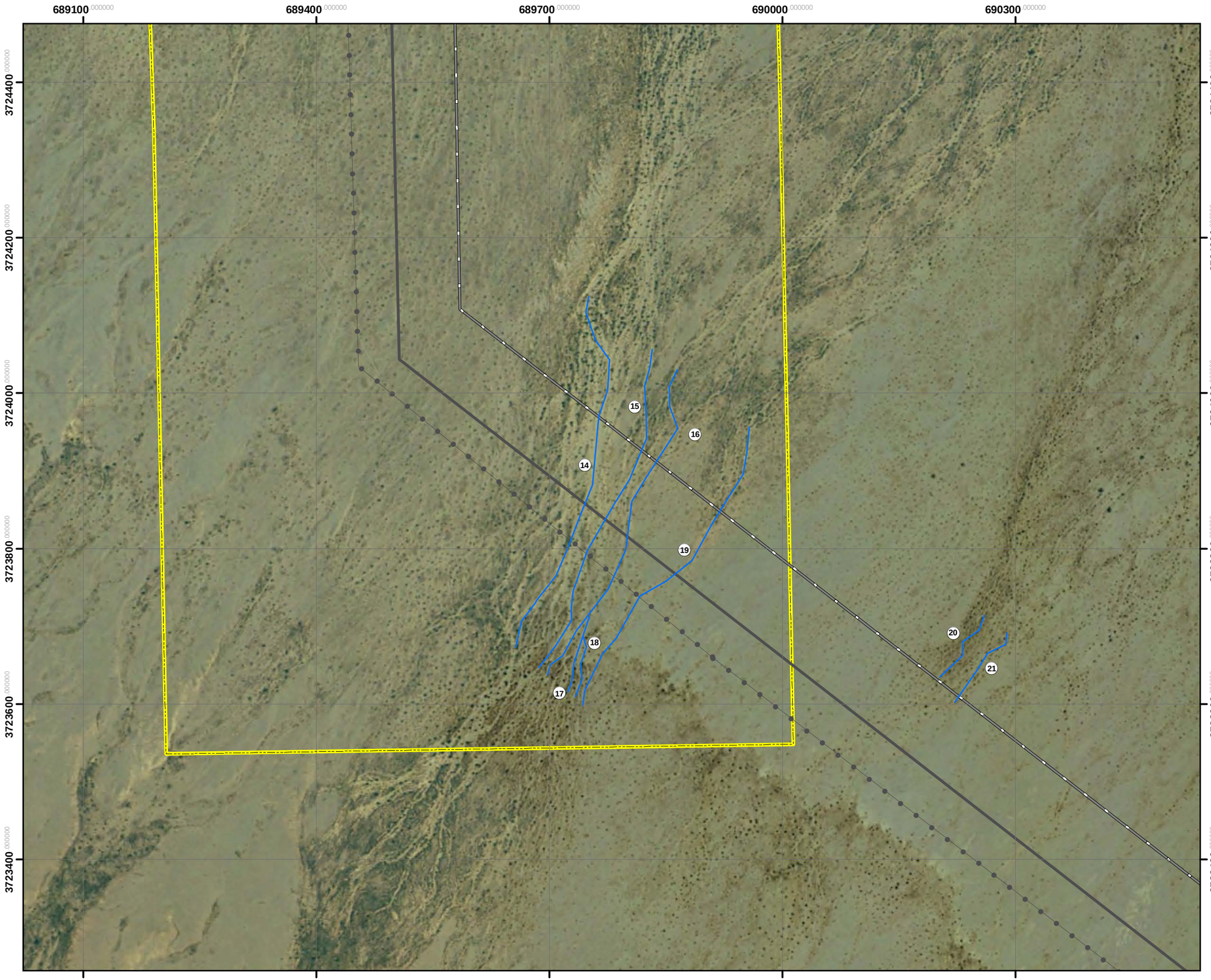

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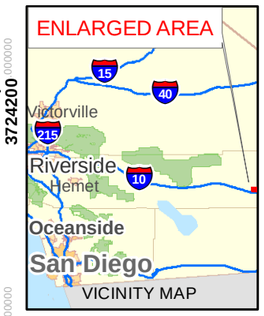

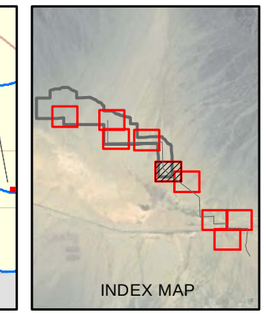

Legend

- Washes (1) - (29)
- Project Site
- Facility Footprint
- Proposed Transmission Interconnect
- Proposed Access
- Proposed Gas Line

N

0 250 500 1,000
Feet
1"=400'

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7F
WATERS EVALUATION
FIELD SURVEY RESULTS

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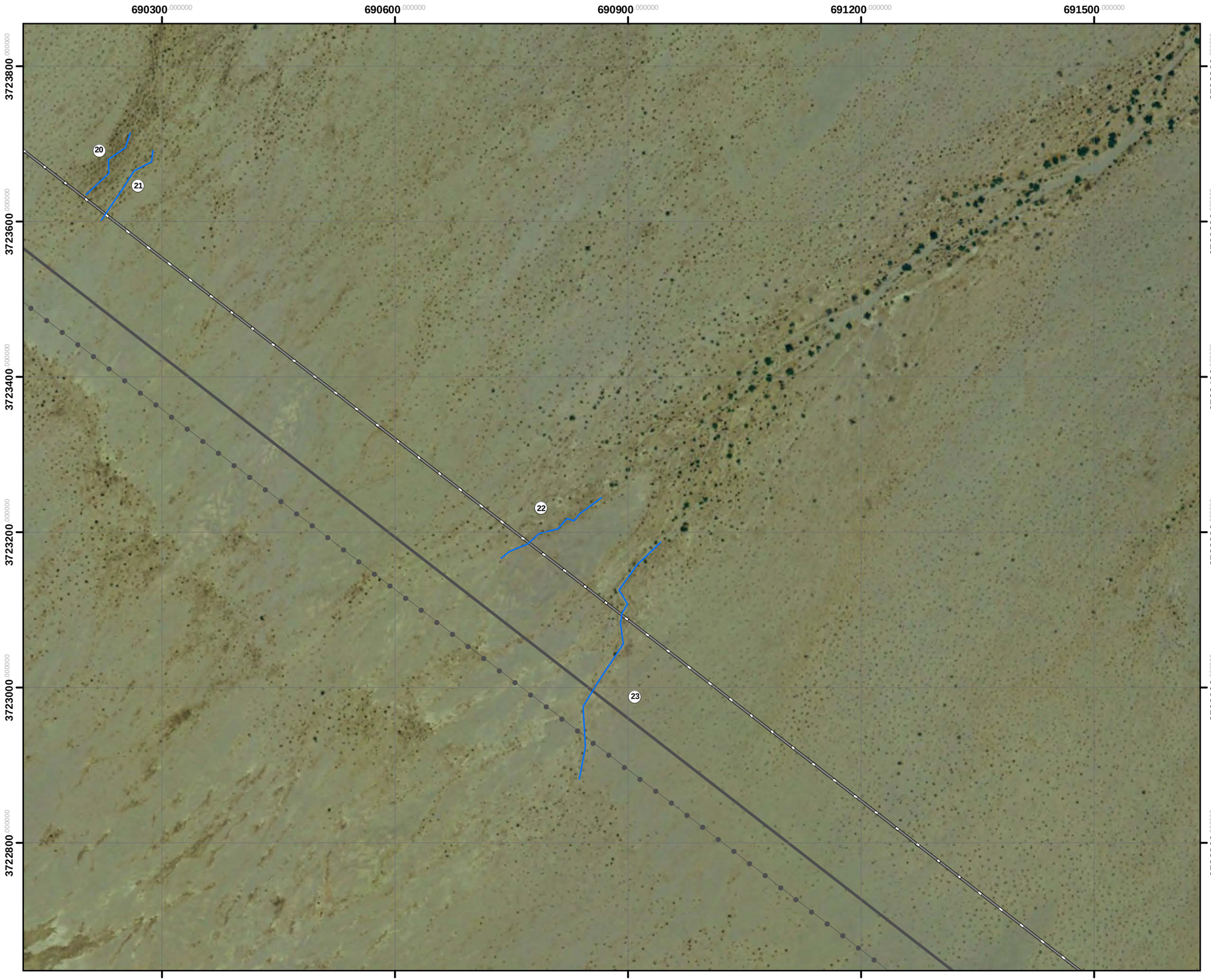
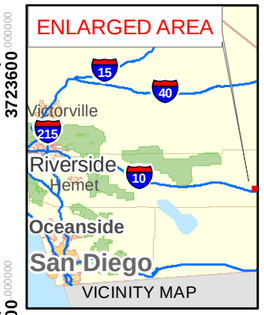
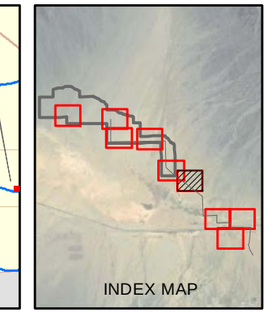


GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- Washes 1 - 29
- Project Site
- Facility Footprint
- Proposed Transmission Interconnect
- Proposed Access
- Proposed Gas Line

N

0 250 500 1,000
Feet
1"=400'

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7G
WATERS EVALUATION
FIELD SURVEY RESULTS

TETRA TECH EC, INC

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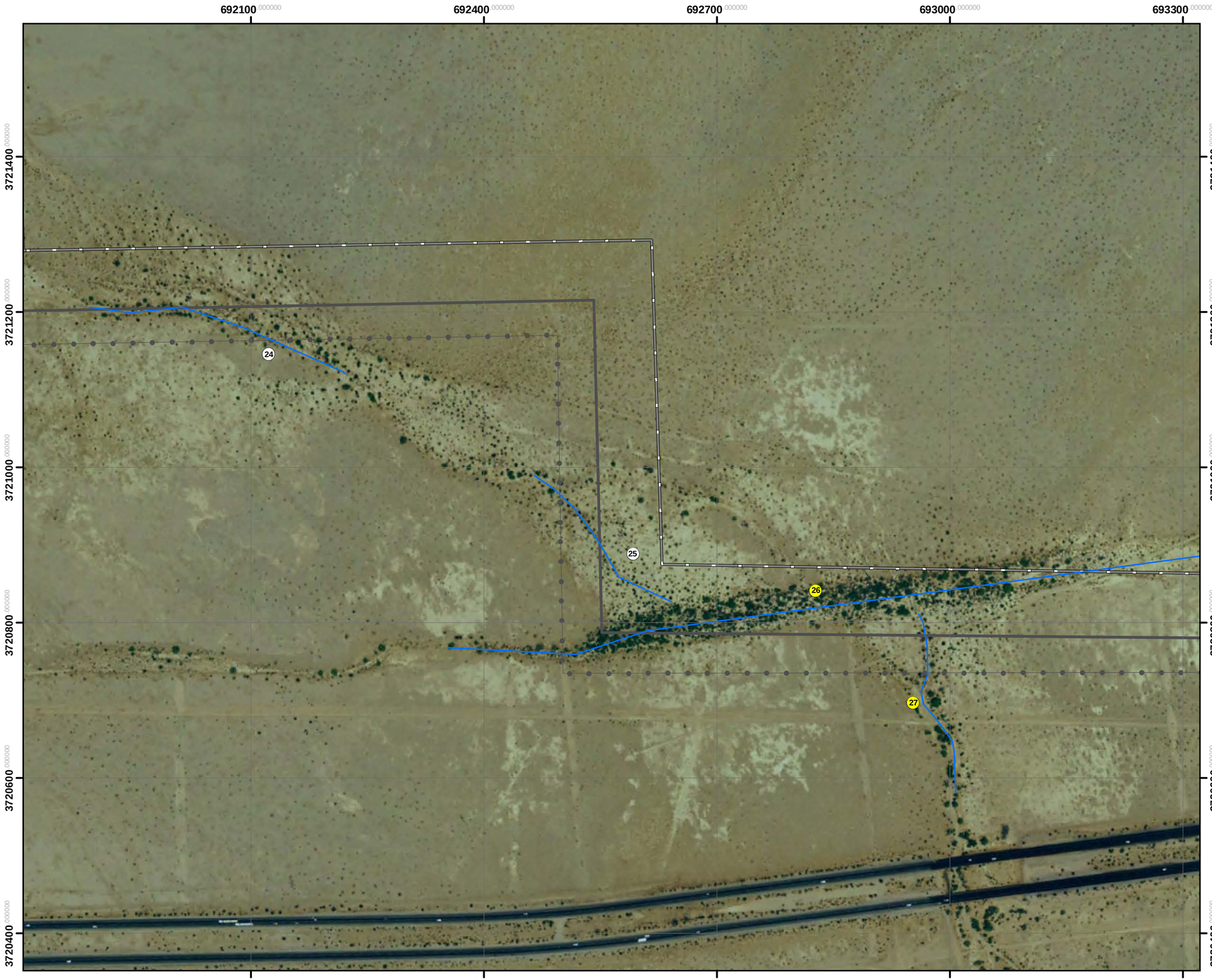
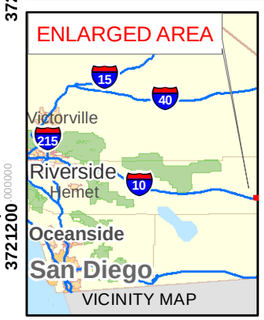
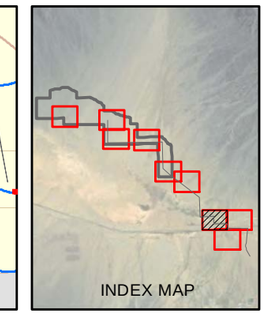


GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA





Legend

- Washes 1 - 29
- 26 27 Recommended State Jurisdictional
- Project Site
- Facility Footprint
- Proposed Transmission Interconnect
- Proposed Access
- Proposed Gas Line

N

0 250 500 1,000
Feet
1"=400'

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7H
WATERS EVALUATION
FIELD SURVEY RESULTS

TETRA TECH EC, INC

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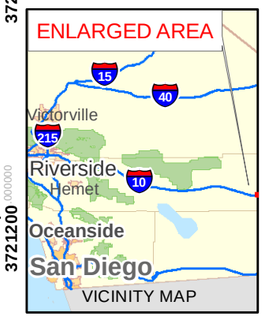
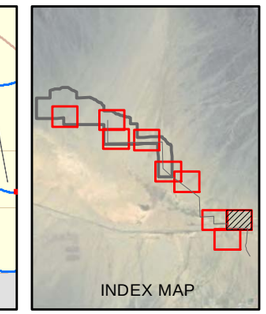
GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- Washes 1 - 29
- 26 Recommended State Jurisdictional
- Project Site
- Facility Footprint
- Proposed Transmission Interconnect
- Proposed Access
- Proposed Gas Line

N

0 250 500 1,000
Feet
1"=400'

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7I
WATERS EVALUATION
FIELD SURVEY RESULTS

TETRA TECH EC, INC

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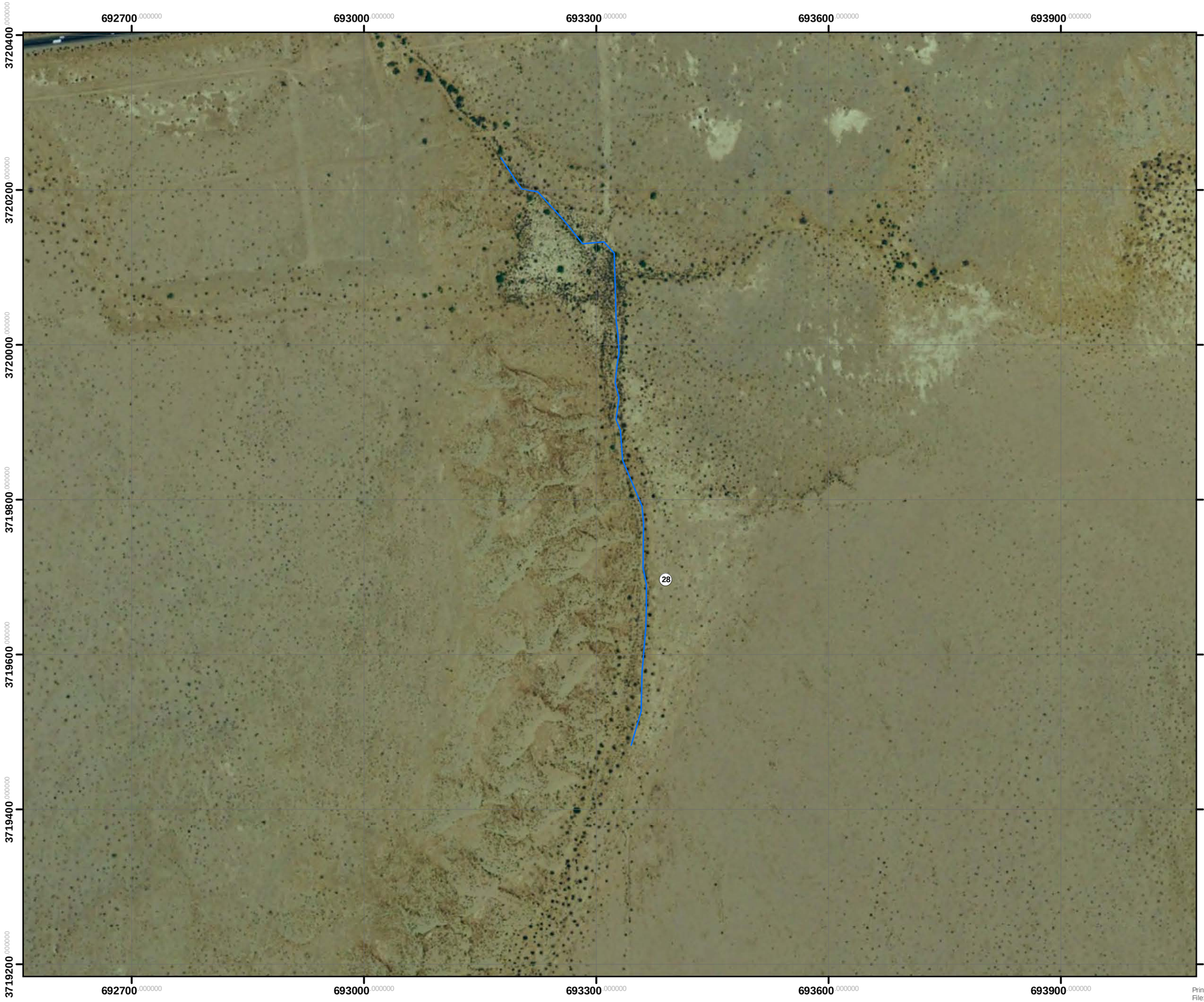

GENESIS SOLAR, LLC

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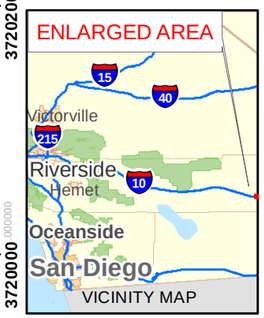
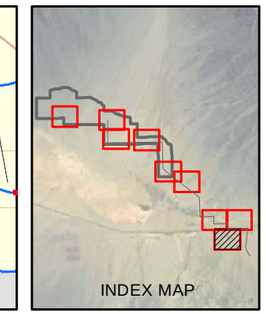
CALIFORNIA





Legend

- Washes (1) - (29)
- Project Site
- Facility Footprint
- Proposed Transmission Interconnect
- Proposed Access
- Proposed Gas Line

N

0 250 500 1,000
Feet
1"=400'

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

FIGURE 5.3-7J
WATERS EVALUATION
FIELD SURVEY RESULTS

TETRA TECH EC, INC

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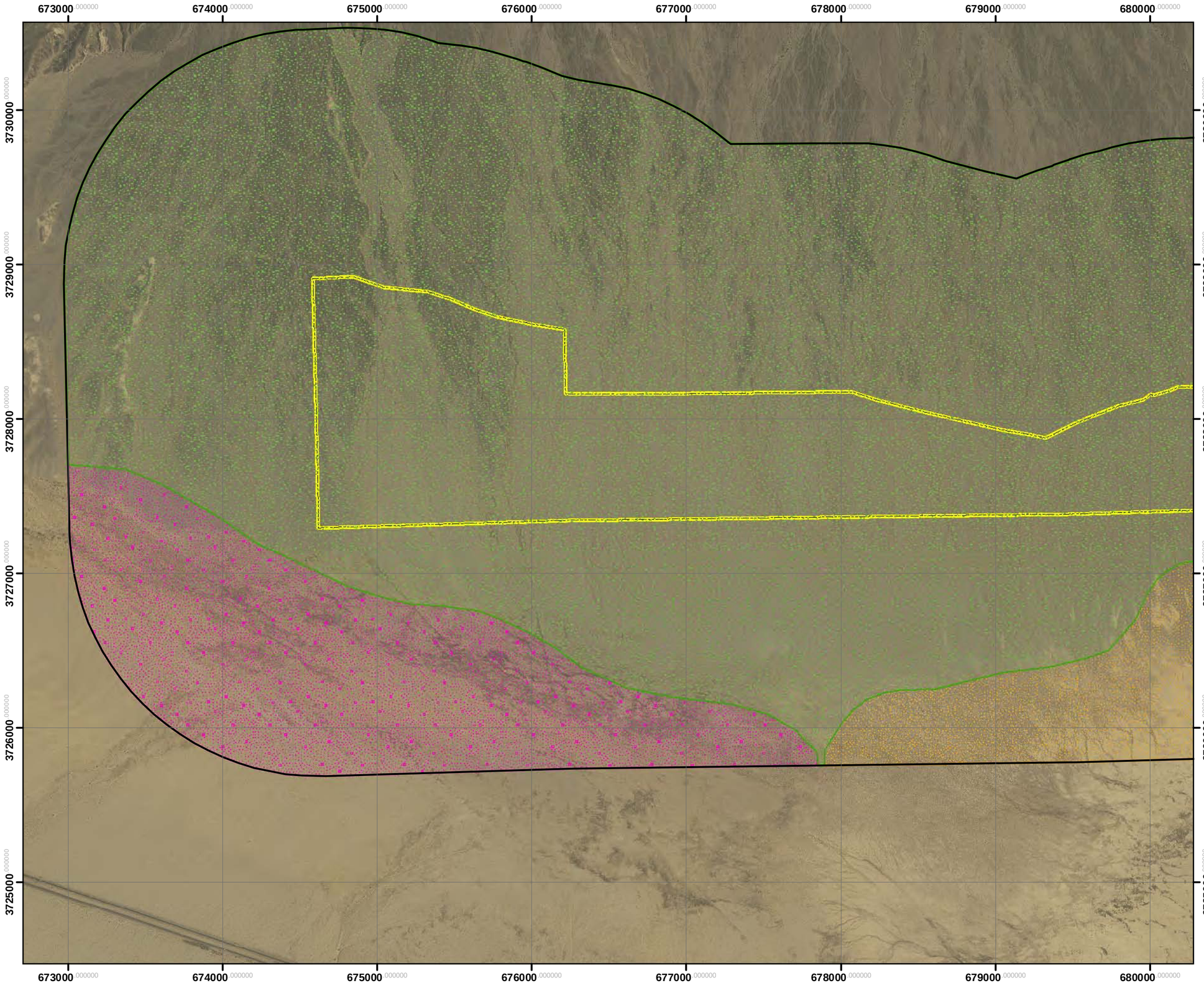

Genesis Solar, LLC

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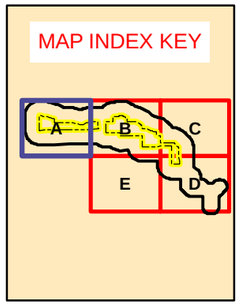
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Chenopod Scrub
- Sonoran Creosote Bush Scrub
- Dry Desert Wash Woodland
- Playa and Sand Drifts over Playa
- Stabilized and Partly-Stabilized Sand Dune
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Extent of Surveyed Area
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-2 A
Natural Community Types within the Genesis Solar Energy Project and Vicinity

TETRA TECH EC, INC

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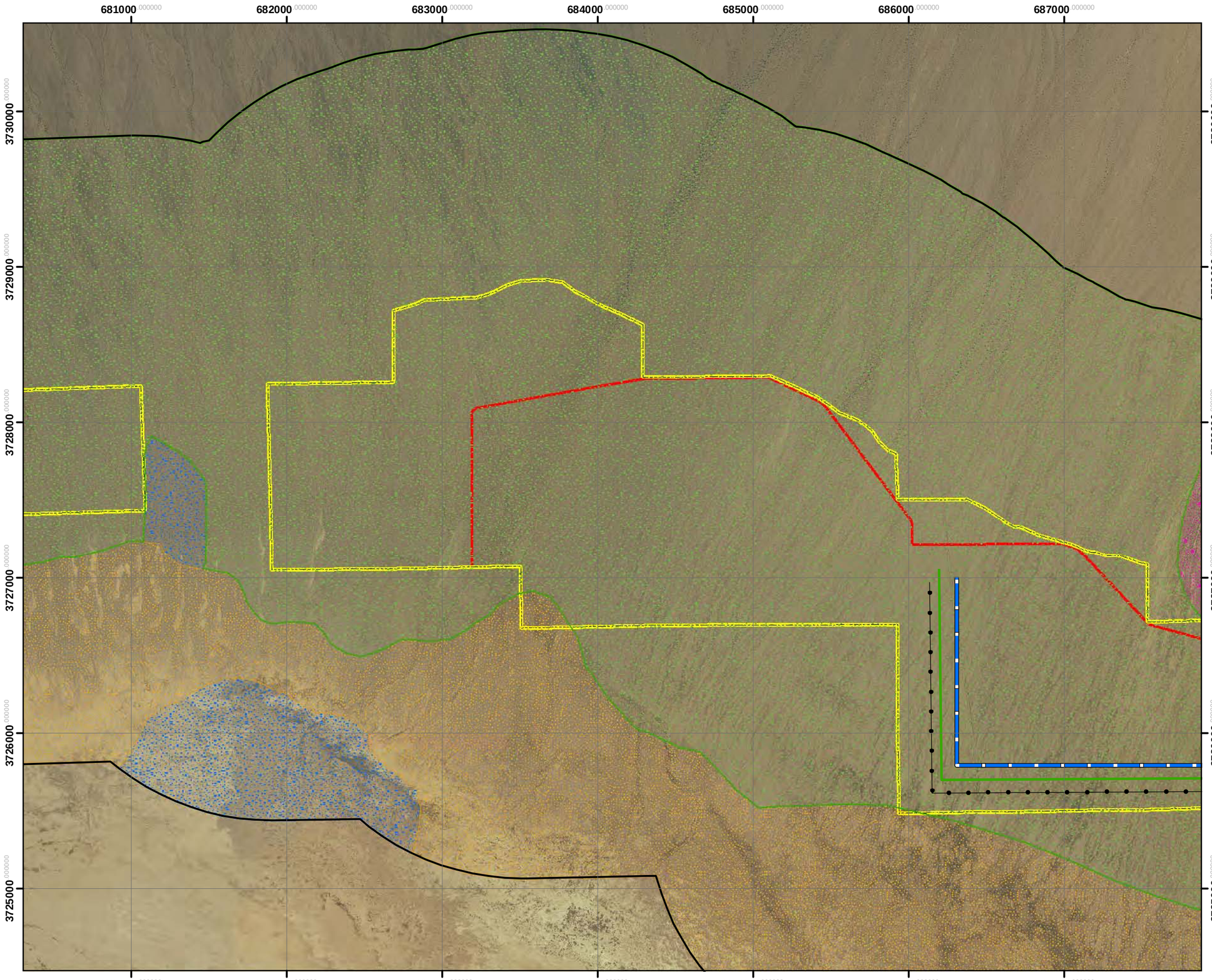
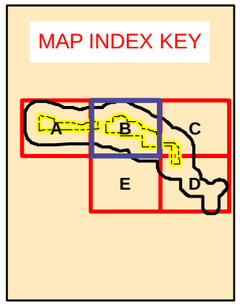


Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Chenopod Scrub
- Sonoran Creosote Bush Scrub
- Dry Desert Wash Woodland
- Playa and Sand Drifts over Playa
- Stabilized and Partly-Stabilized Sand Dune
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Extent of Surveyed Area
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-2 B
Natural Community Types within the Genesis Solar Energy Project and Vicinity

TETRA TECH EC, INC

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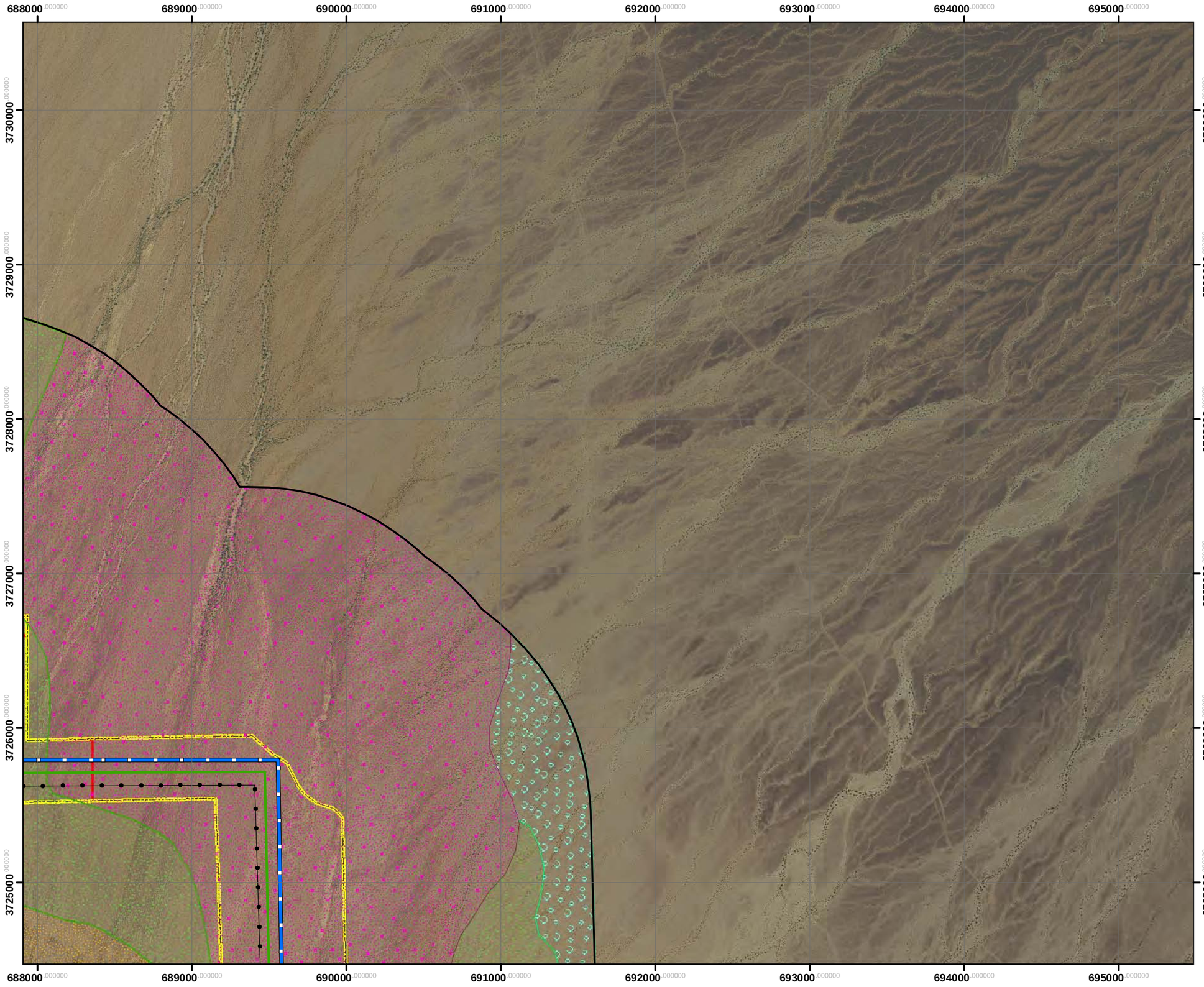
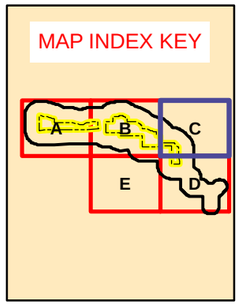


Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Chenopod Scrub
- Sonoran Creosote Bush Scrub
- Dry Desert Wash Woodland
- Playa and Sand Drifts over Playa
- Stabilized and Partly-Stabilized Sand Dune
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Extent of Surveyed Area
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-2C
Natural Community Types within the Genesis Solar Energy Project and Vicinity

TETRA TECH EC, INC

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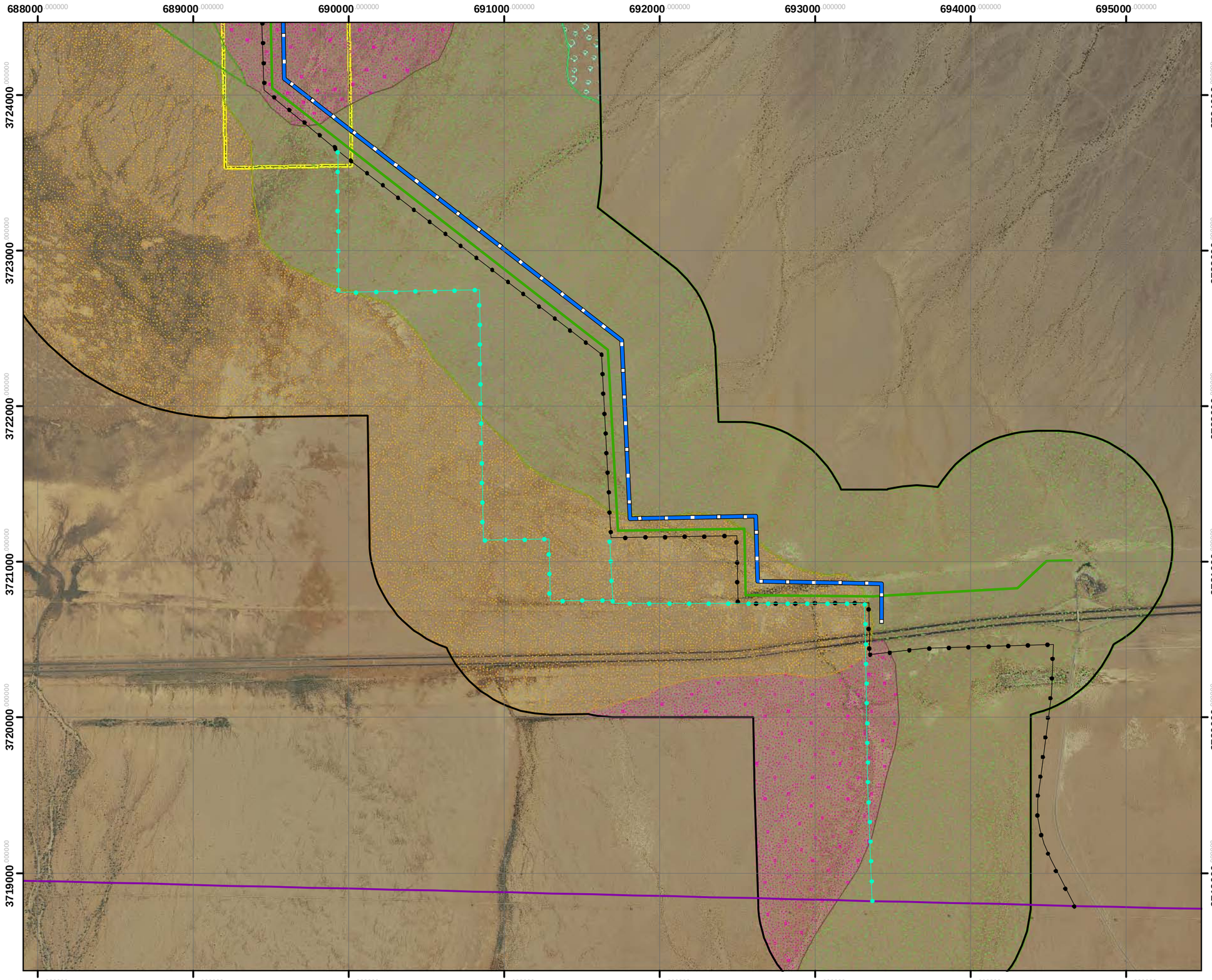
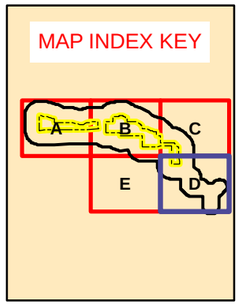


Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Chenopod Scrub
- Sonoran Creosote Bush Scrub
- Dry Desert Wash Woodland
- Playa and Sand Drifts over Playa
- Stabilized and Partly-Stabilized Sand Dune
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Extent of Surveyed Area
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-2D
Natural Community Types within the Genesis Solar Energy Project and Vicinity

TETRA TECH EC, INC

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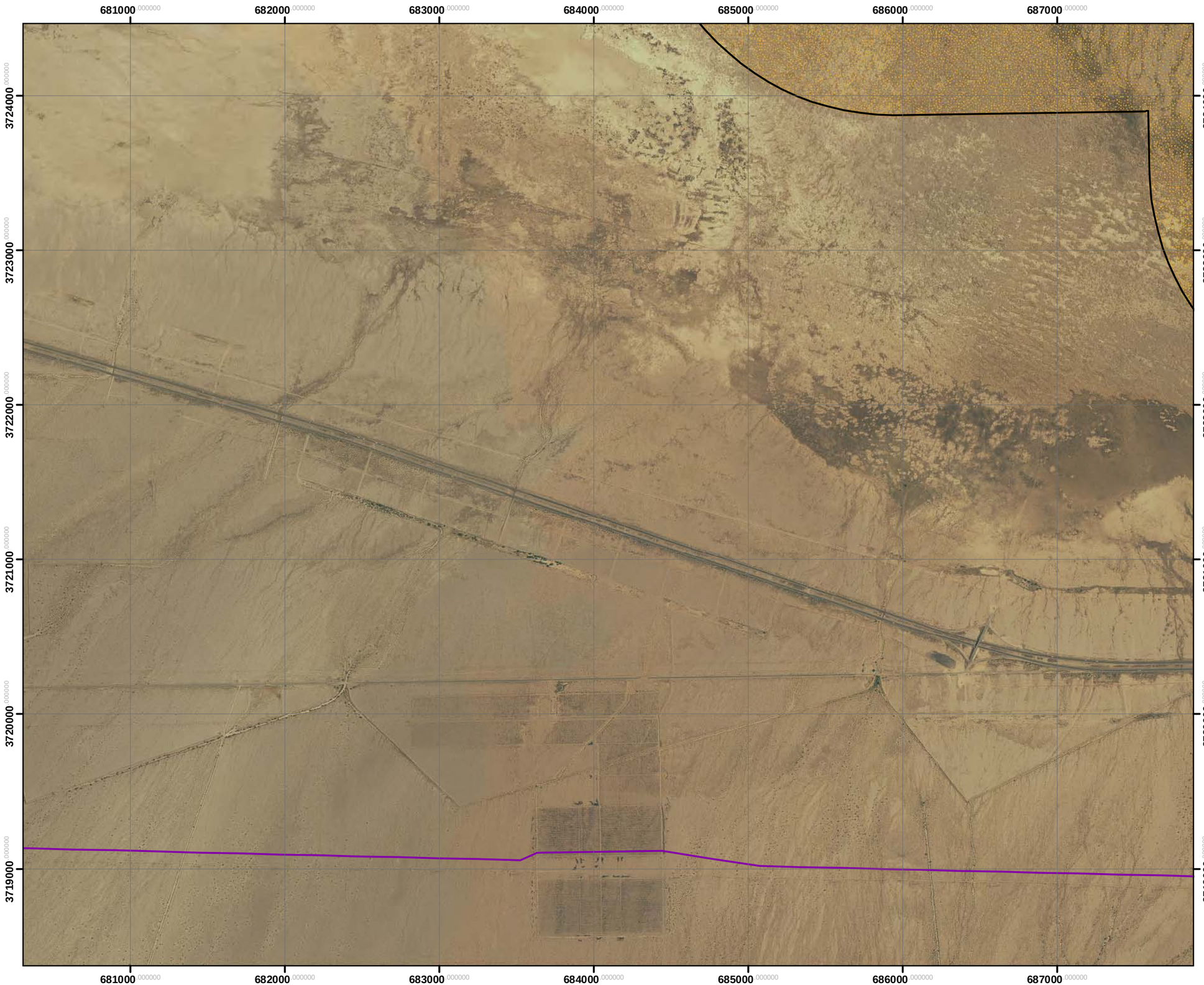
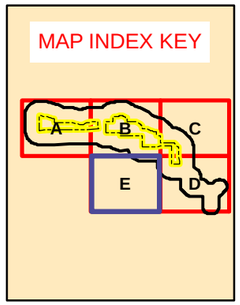


Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Chenopod Scrub
- Sonoran Creosote Bush Scrub
- Dry Desert Wash Woodland
- Playa and Sand Drifts over Playa
- Stabilized and Partly-Stabilized Sand Dune
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Extent of Surveyed Area
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-2 E
Natural Community Types within the Genesis Solar Energy Project and Vicinity

TETRA TECH EC, INC

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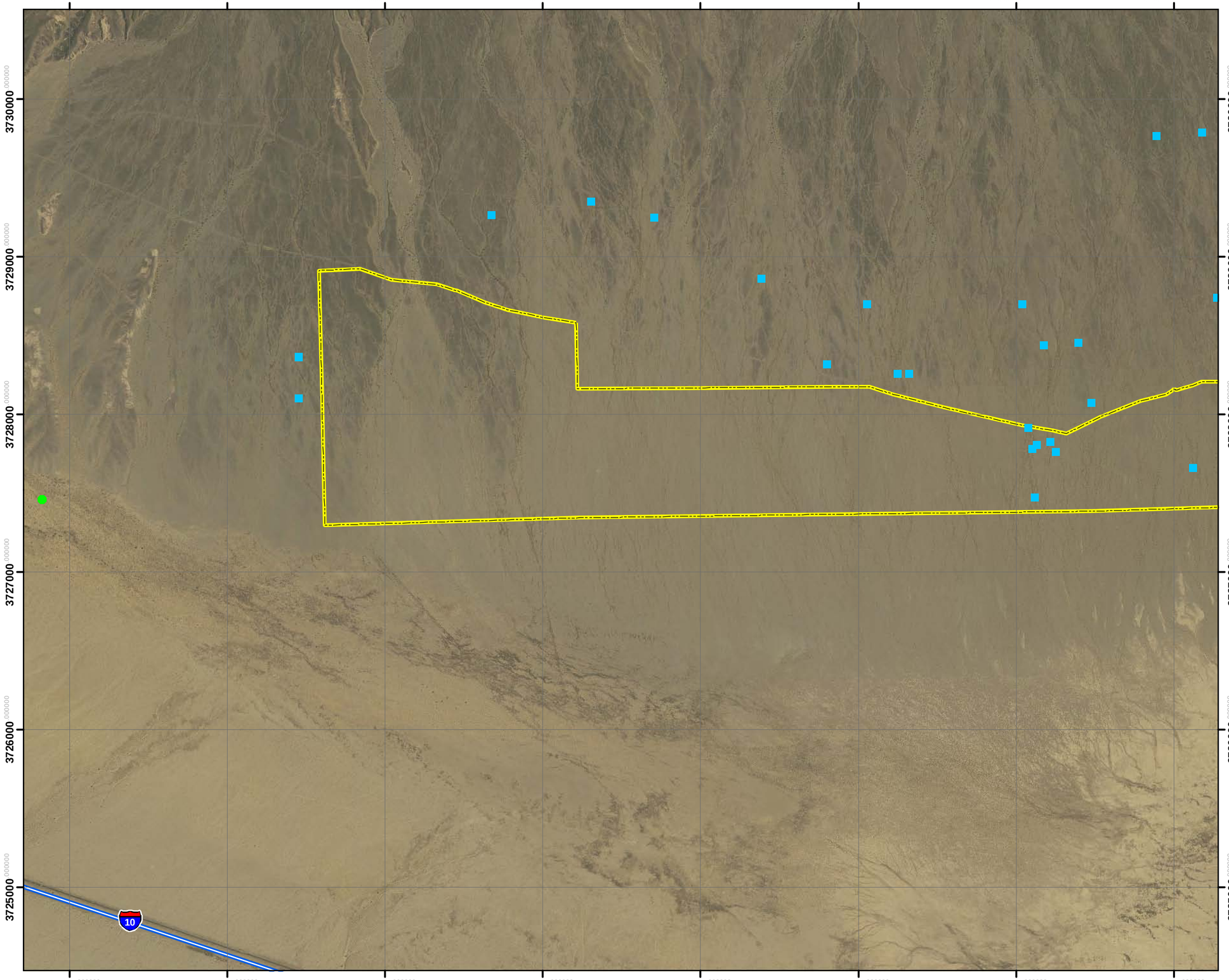
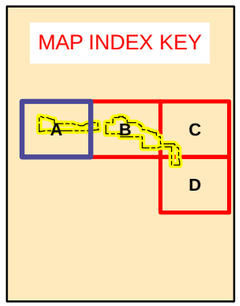
Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- Harwood's Milkvetch
- Las Animas Colubrina
- Wiggins' Cholla [Possible]
- Harwood's Phlox [Possible]
- Desert Unicorn Plant
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-6 A
Special Status Plants
Observed During Field Surveys

TETRA TECH EC, INC

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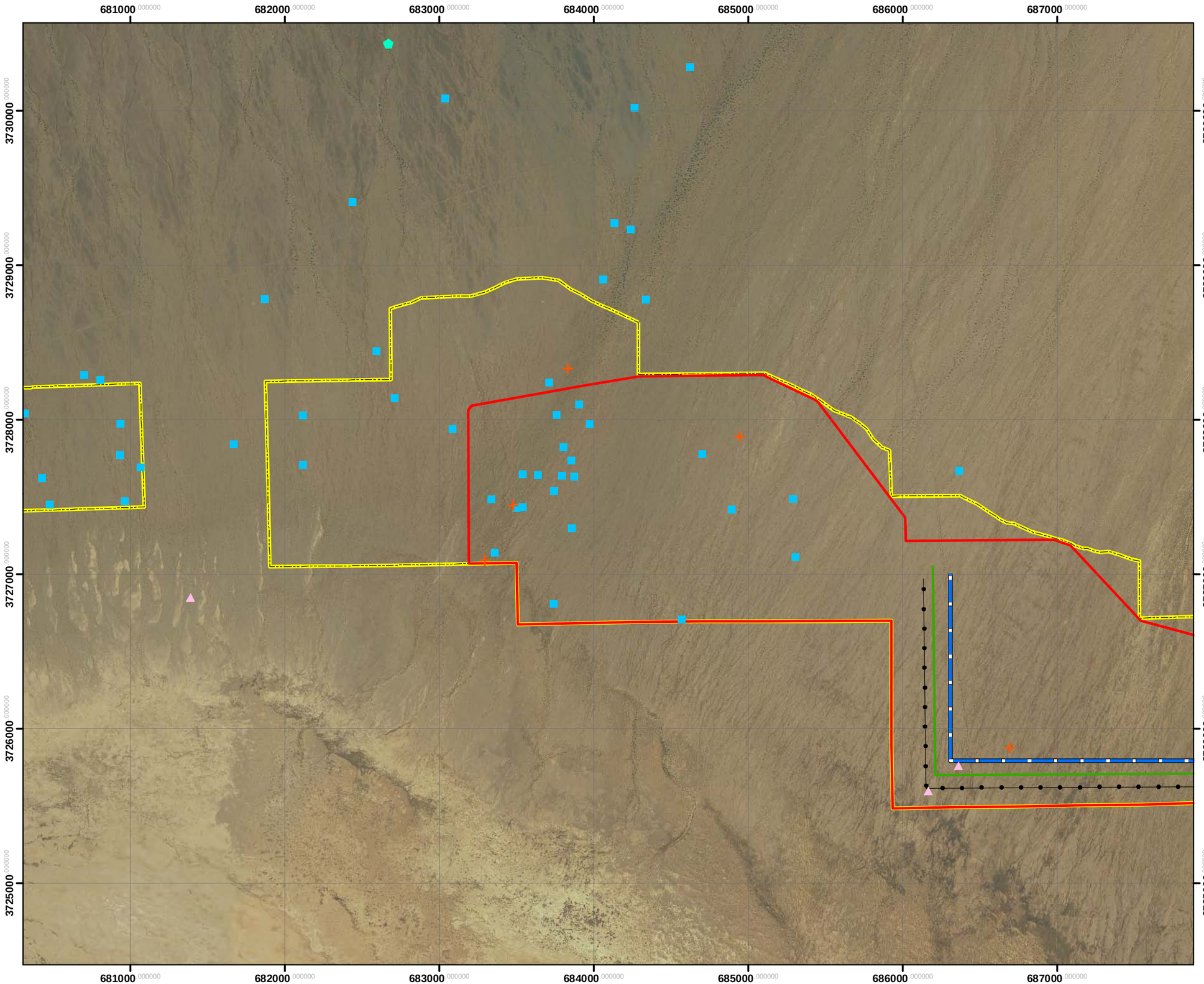
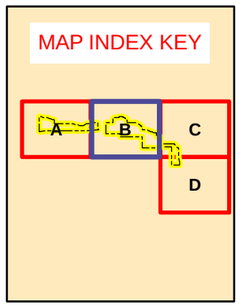


Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Harwood's Milkvetch
- Las Animas Colubrina
- Wiggins' Cholla [Possible]
- Harwood's Phlox [Possible]
- Desert Unicorn Plant
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-6 B
Special Status Plants
Observed During Field Surveys

TETRA TECH EC, INC

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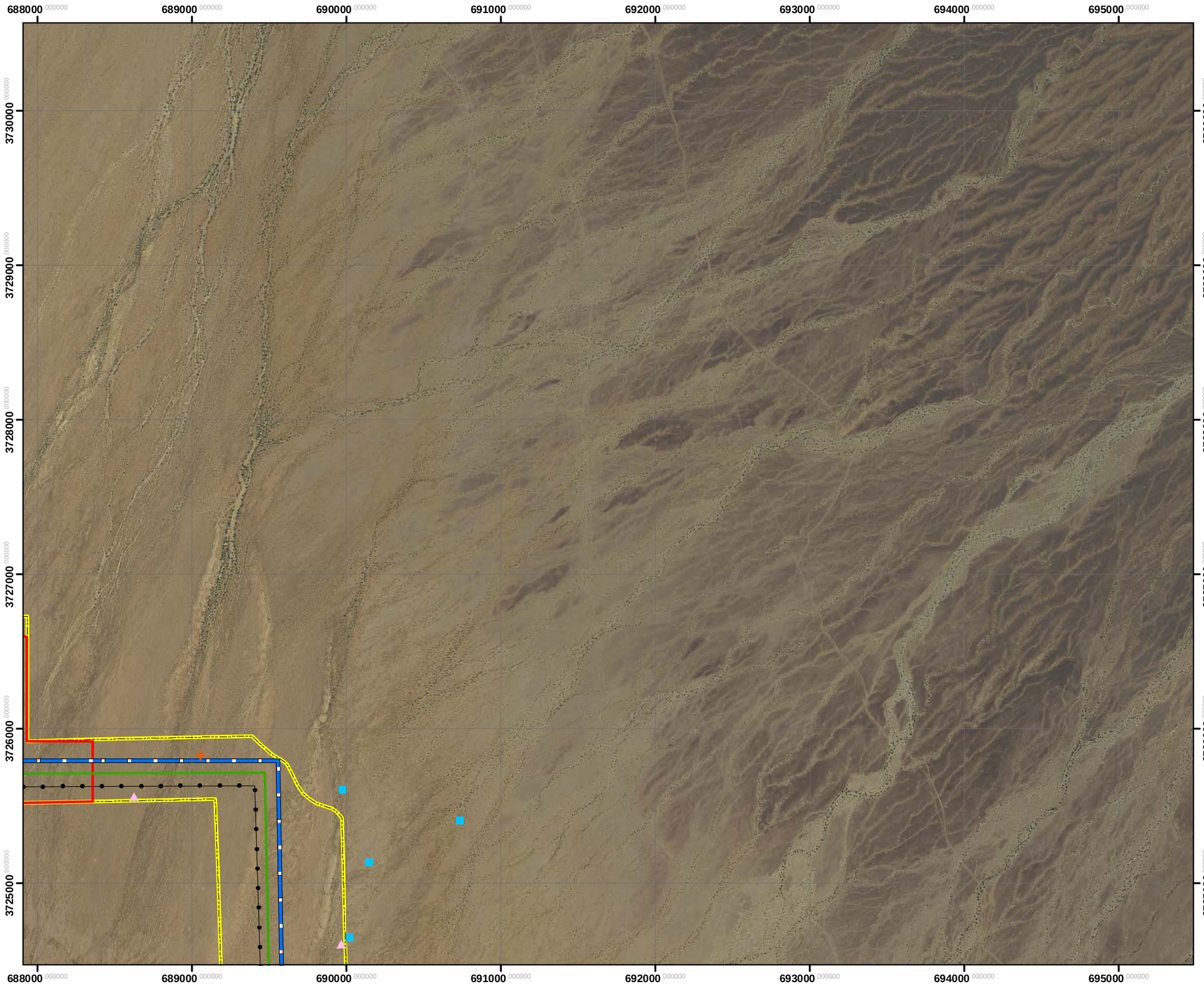
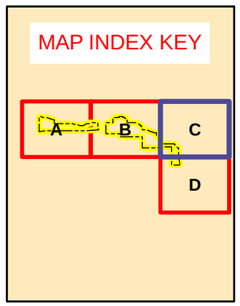


Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Harwood's Milkvetch
- Las Animas Colubrina
- Wiggins' Cholla [Possible]
- Harwood's Phlox [Possible]
- Desert Unicorn Plant
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-6 C
Special Status Plants
Observed During Field Surveys

TETRA TECH EC, INC

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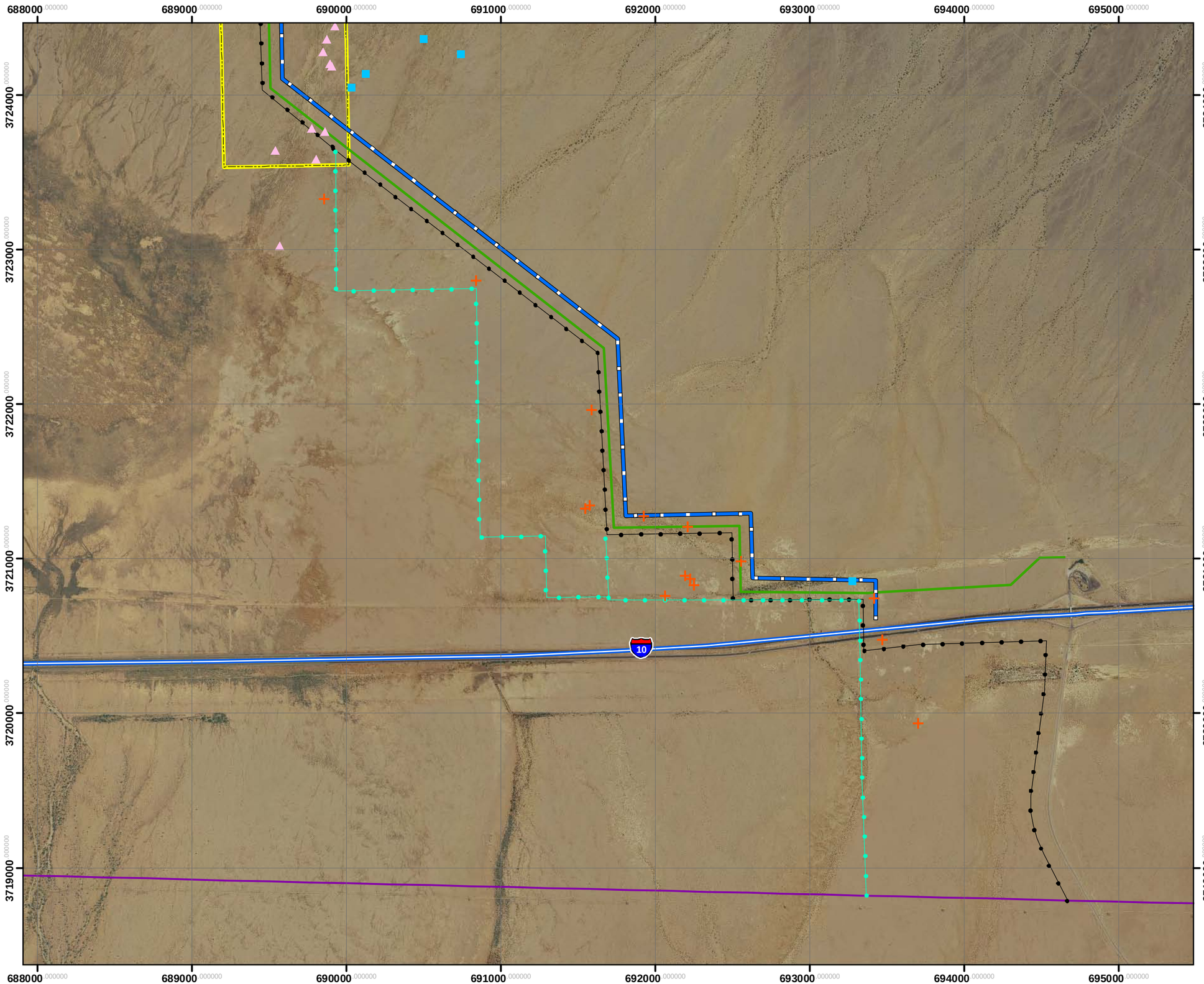
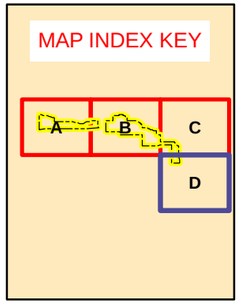
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- Harwood's Milkvetch
- Las Animas Colubrina
- Wiggins' Cholla [Possible]
- Harwood's Phlox [Possible]
- Desert Unicorn Plant
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-6 D
Special Status Plants
Observed During Field Surveys

TETRA TECH EC, INC

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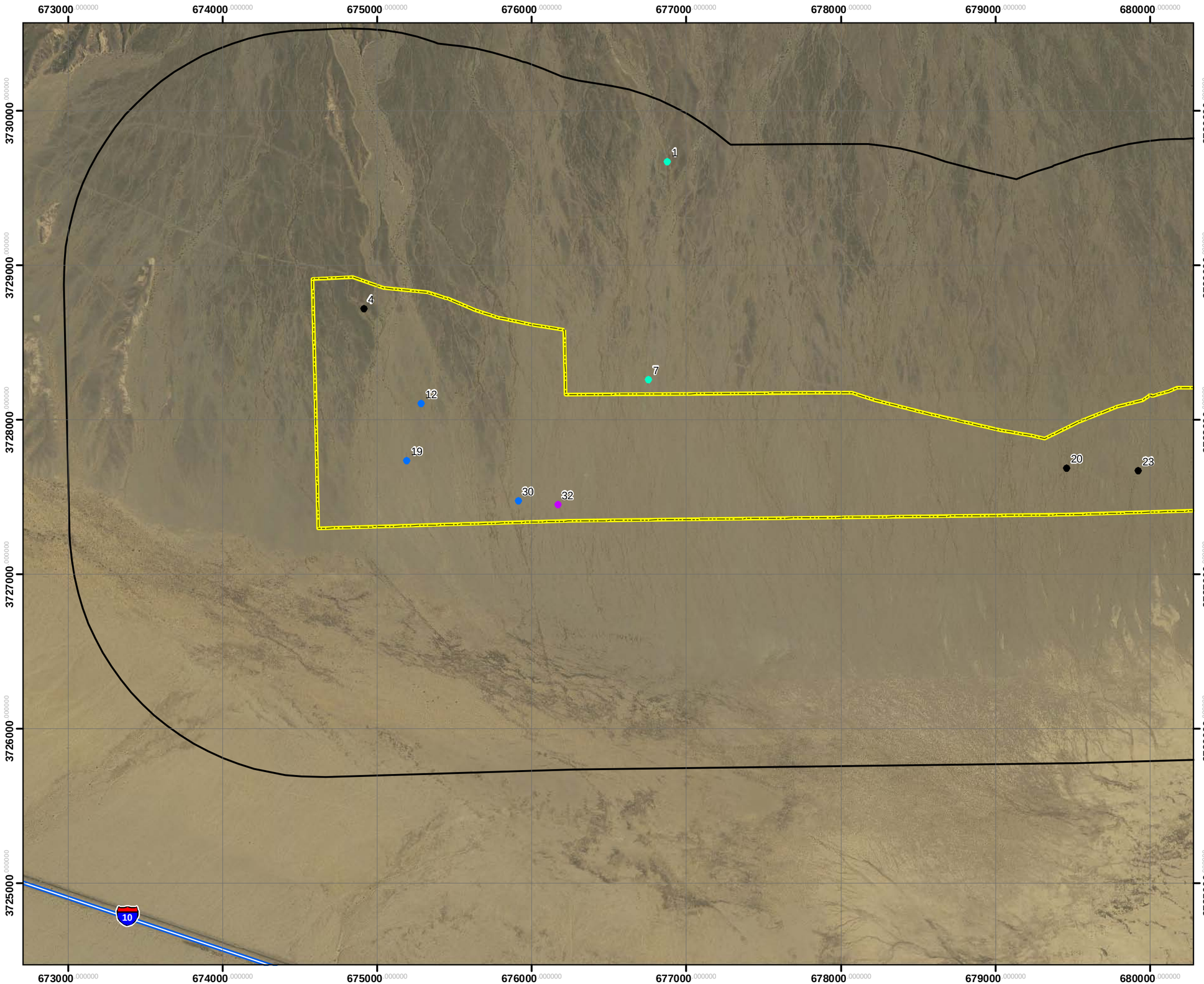

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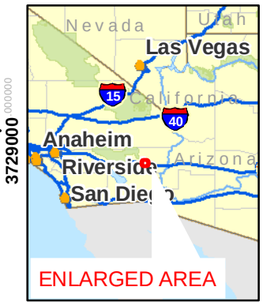
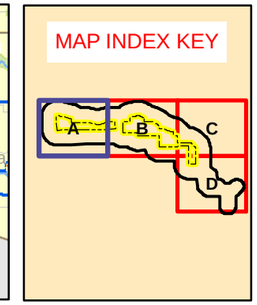
CALIFORNIA





Legend

(Reference Table 4)

- Burrow
- Carcass
- Bone Fragments 10-15 years old
- Bone Fragments 3,000 - 5,000 years old
- Tracks
- Previously Proposed Linear Route
- Proposed Gas Line
- Proposed Access Road
- Proposed Transmission Interconnect
- Blythe Energy Project Transmission Line
- Extent of Surveyed Area
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-8A
Desert Tortoise Sign Observed During Field Surveys

TETRA TECH EC, INC

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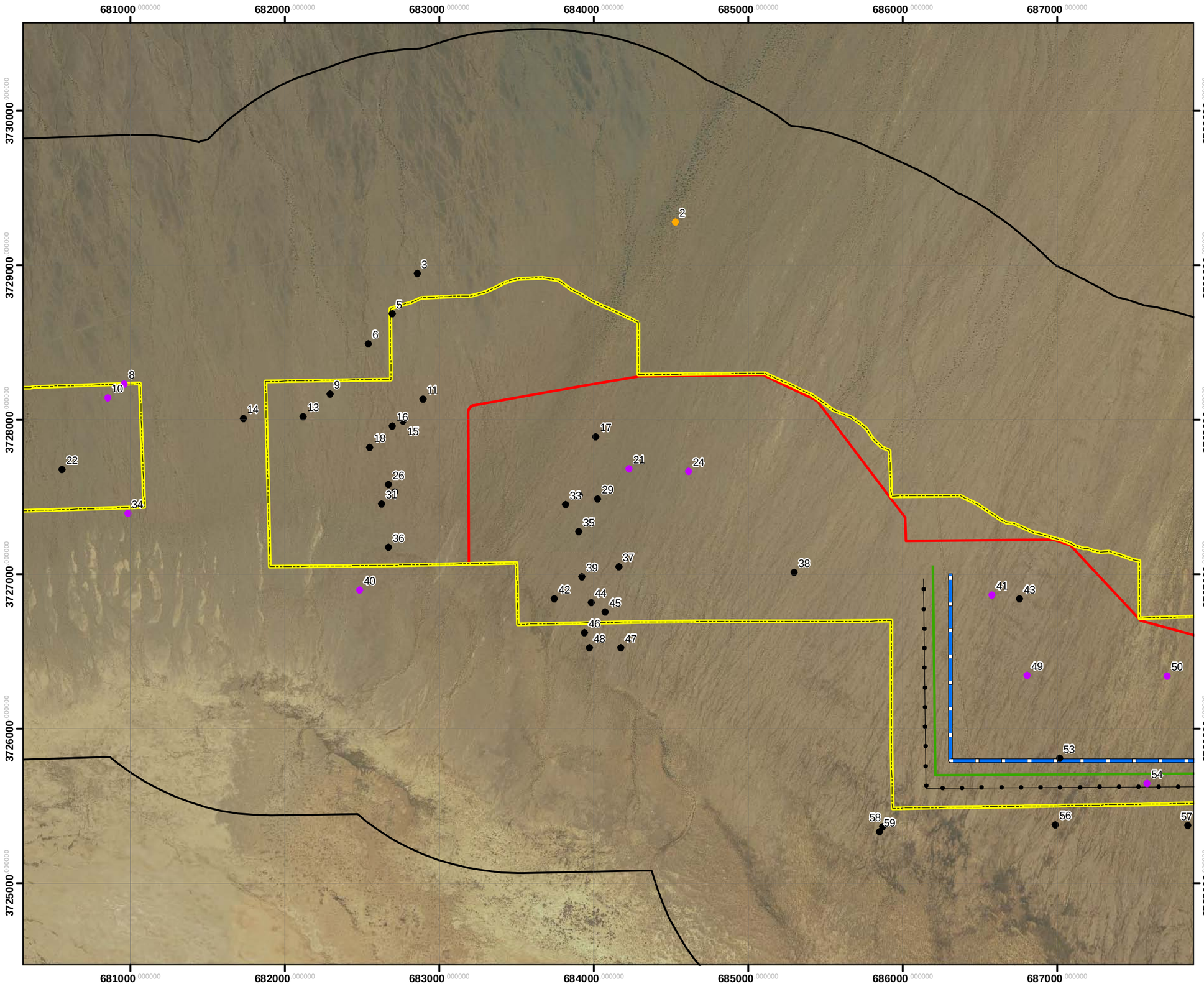

Genesis Solar, LLC

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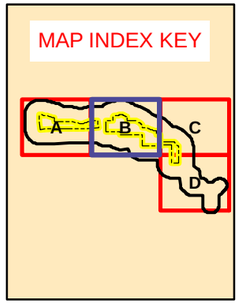
RIVERSIDE COUNTY,
CALIFORNIA



Legend

(Reference Table 4)

- Burrow
- Carcass
- Bone Fragments 10-15 years old
- Bone Fragments 3,000 - 5,000 years old
- Tracks
- Previously Proposed Linear Route
- Proposed Gas Line
- Proposed Access Road
- Proposed Transmission Interconnect
- Blythe Energy Project Transmission Line
- Extent of Surveyed Area
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-8B
Desert Tortoise Sign Observed During Field Surveys

TETRA TECH EC, INC

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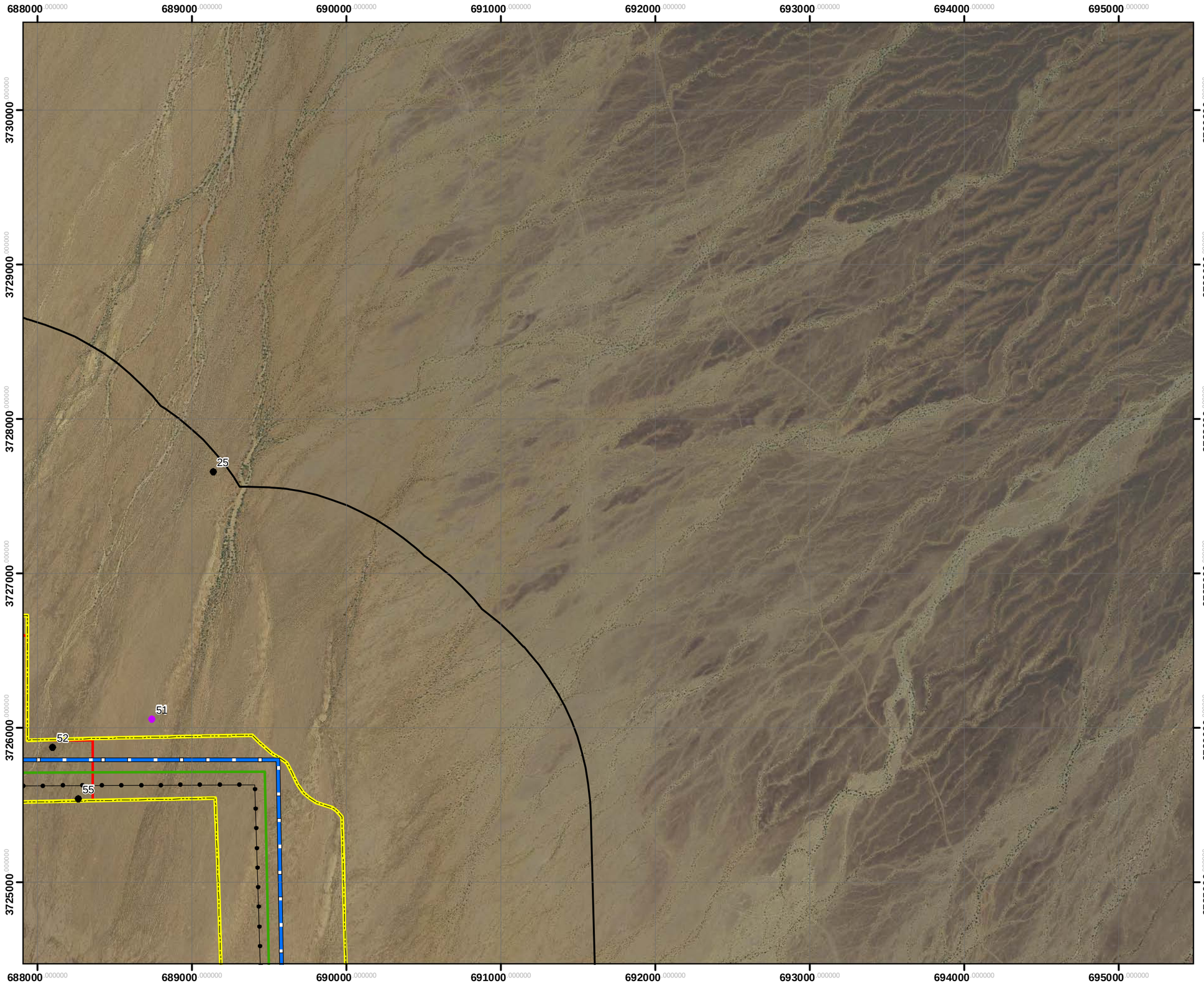
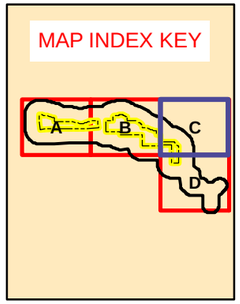


Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA



Legend

(Reference Table 4)

- Burrow
- Carcass
- Bone Fragments 10-15 years old
- Bone Fragments 3,000 - 5,000 years old
- Tracks
- Previously Proposed Linear Route
- Proposed Gas Line
- Proposed Access Road
- Proposed Transmission Interconnect
- Blythe Energy Project Transmission Line
- Extent of Surveyed Area
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-8C
Desert Tortoise Sign Observed During Field Surveys

TETRA TECH EC, INC

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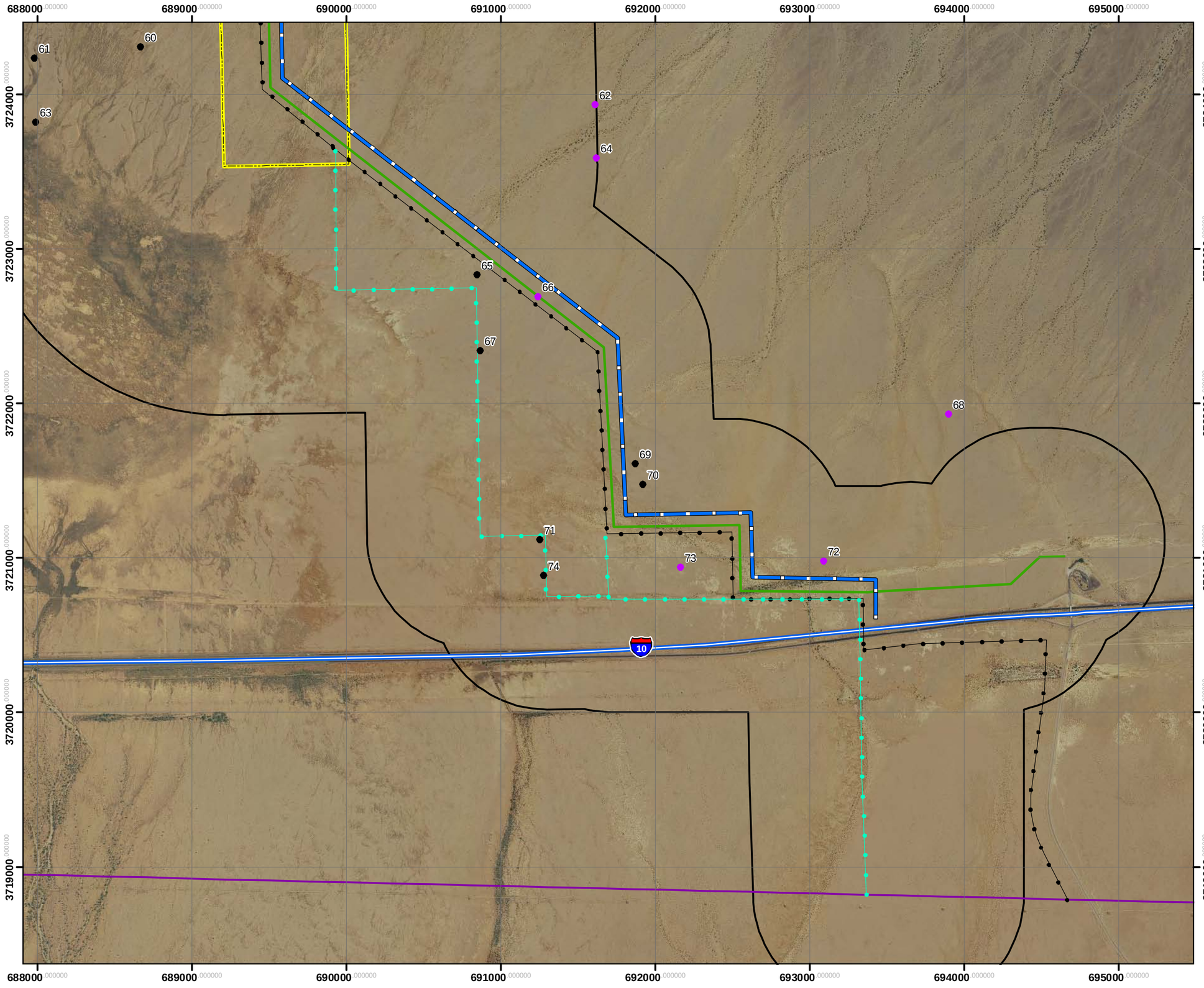
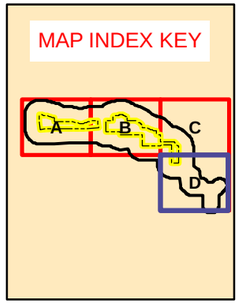
Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

(Reference Table 4)

- Burrow
- Carcass
- Bone Fragments 10-15 years old
- Bone Fragments 3,000 - 5,000 years old
- Tracks
- Previously Proposed Linear Route
- Proposed Gas Line
- Proposed Access Road
- Proposed Transmission Interconnect
- Blythe Energy Project Transmission Line
- Extent of Surveyed Area
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-8D
Desert Tortoise Sign Observed During Field Surveys

TETRA TECH EC, INC.

Last Saved: Tuesday, October 6, 2009 12:38 PM
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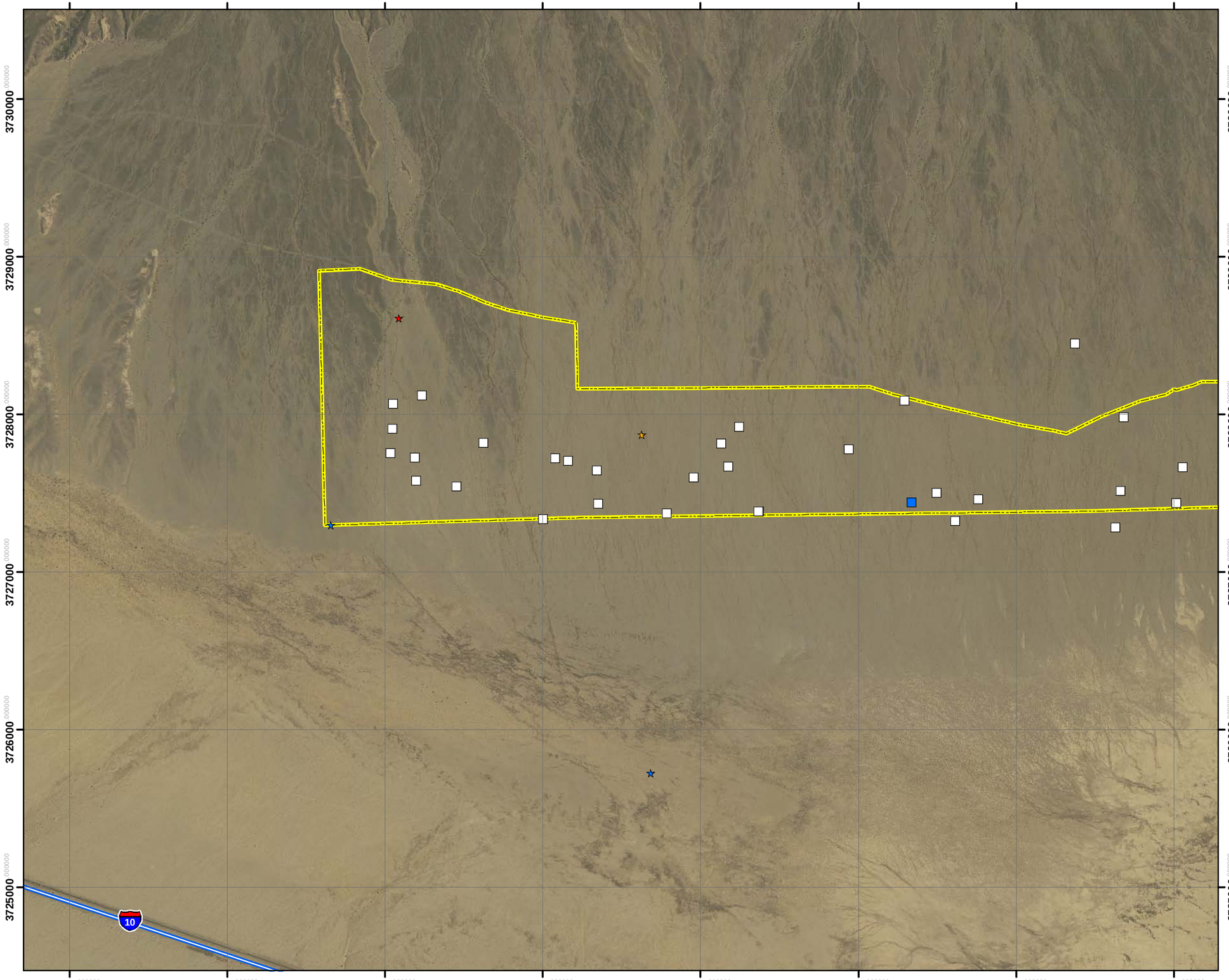
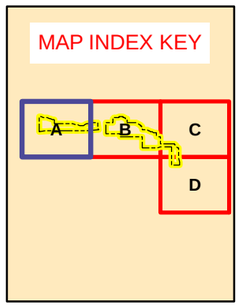
Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- American Badger Burrow
- Burro Deer (Tracks)
- Kit Fox Burrow Complex
- Loggerhead Shrike
- Northern Harrier
- Short-eared Owl
- Mojave and/or Colorado Fringe-toed Lizard
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

FIGURE 5.3-9A
Other Special Status Wildlife Species Sign Observed During Field Surveys

TETRA TECH EC, INC

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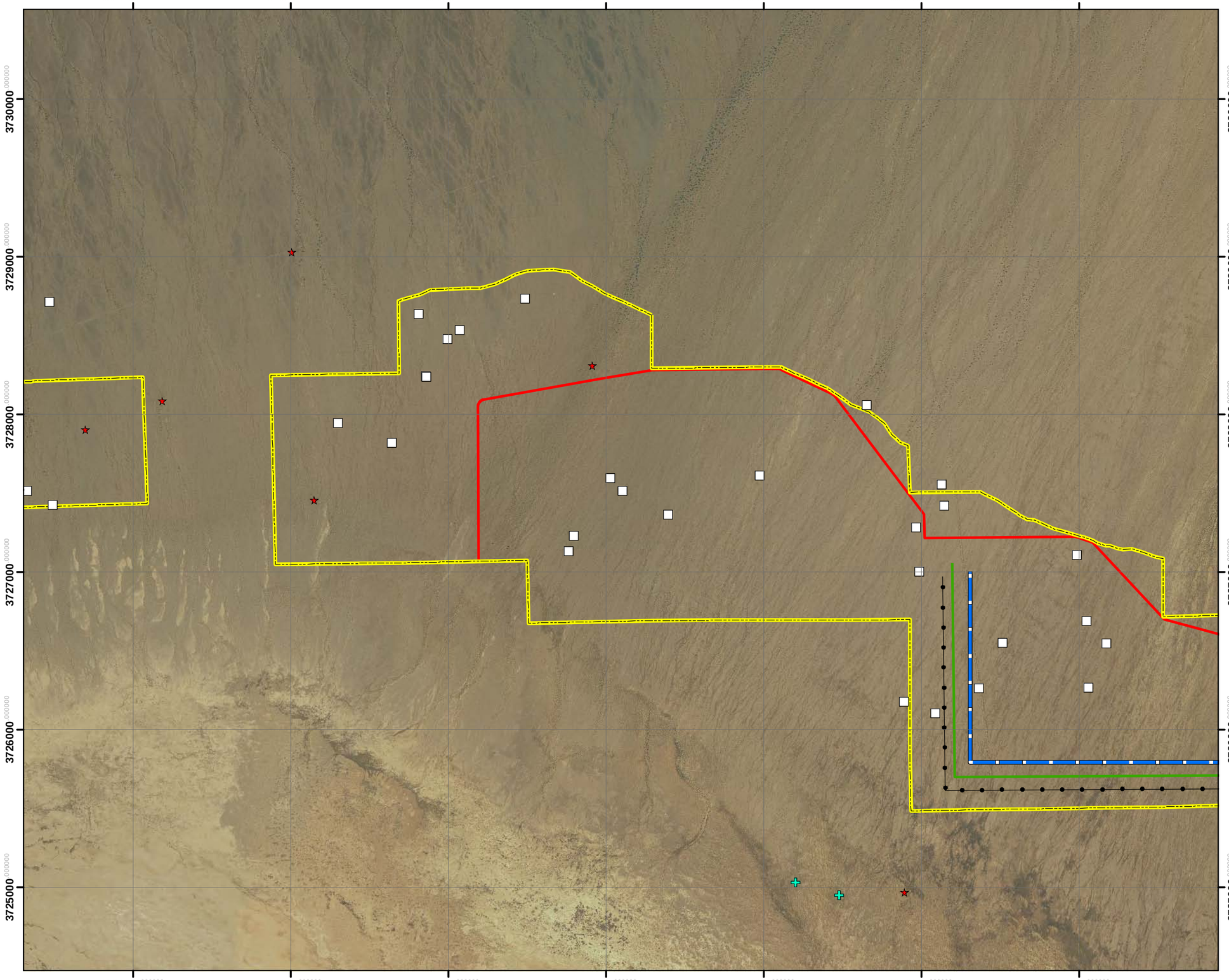
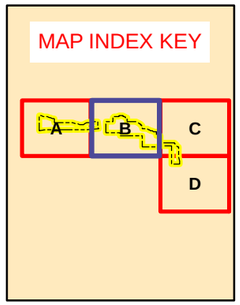
Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- American Badger Burrow
- Burro Deer (Tracks)
- Kit Fox Burrow Complex
- Loggerhead Shrike
- Northern Harrier
- Short-eared Owl
- Mojave and/or Colorado Fringe-toed Lizard
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

FIGURE 5.3-9B
Other Special Status Wildlife Species Sign Observed During Field Surveys

TETRA TECH EC, INC

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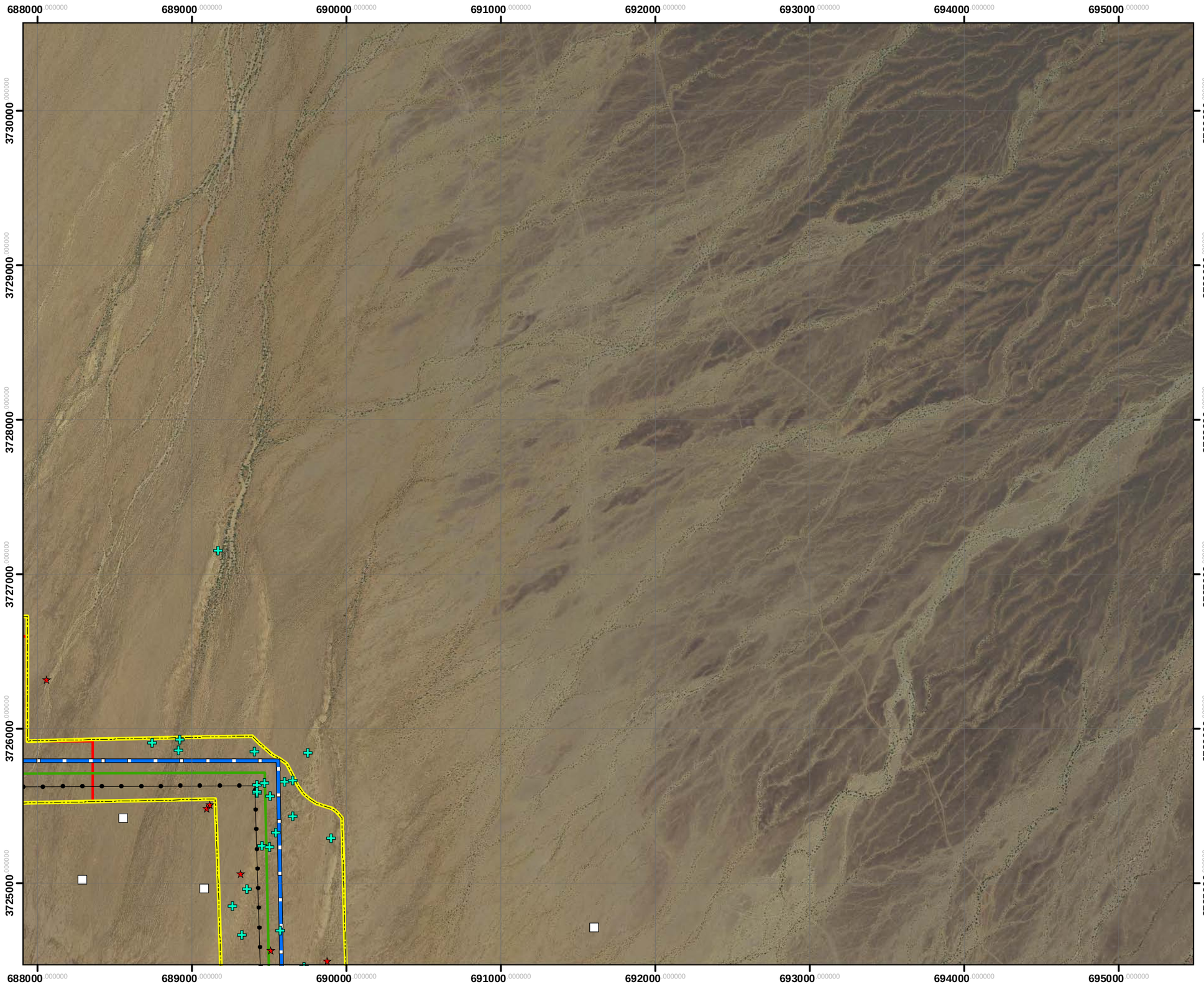

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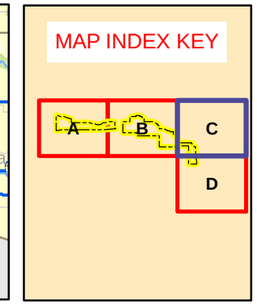
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- American Badger Burrow
- Burro Deer (Tracks)
- Kit Fox Burrow Complex
- Loggerhead Shrike
- Northern Harrier
- Short-eared Owl
- Mojave and/or Colorado Fringe-toed Lizard
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

FIGURE 5.3-9C
Other Special Status Wildlife Species Sign Observed During Field Surveys

TETRA TECH EC, INC

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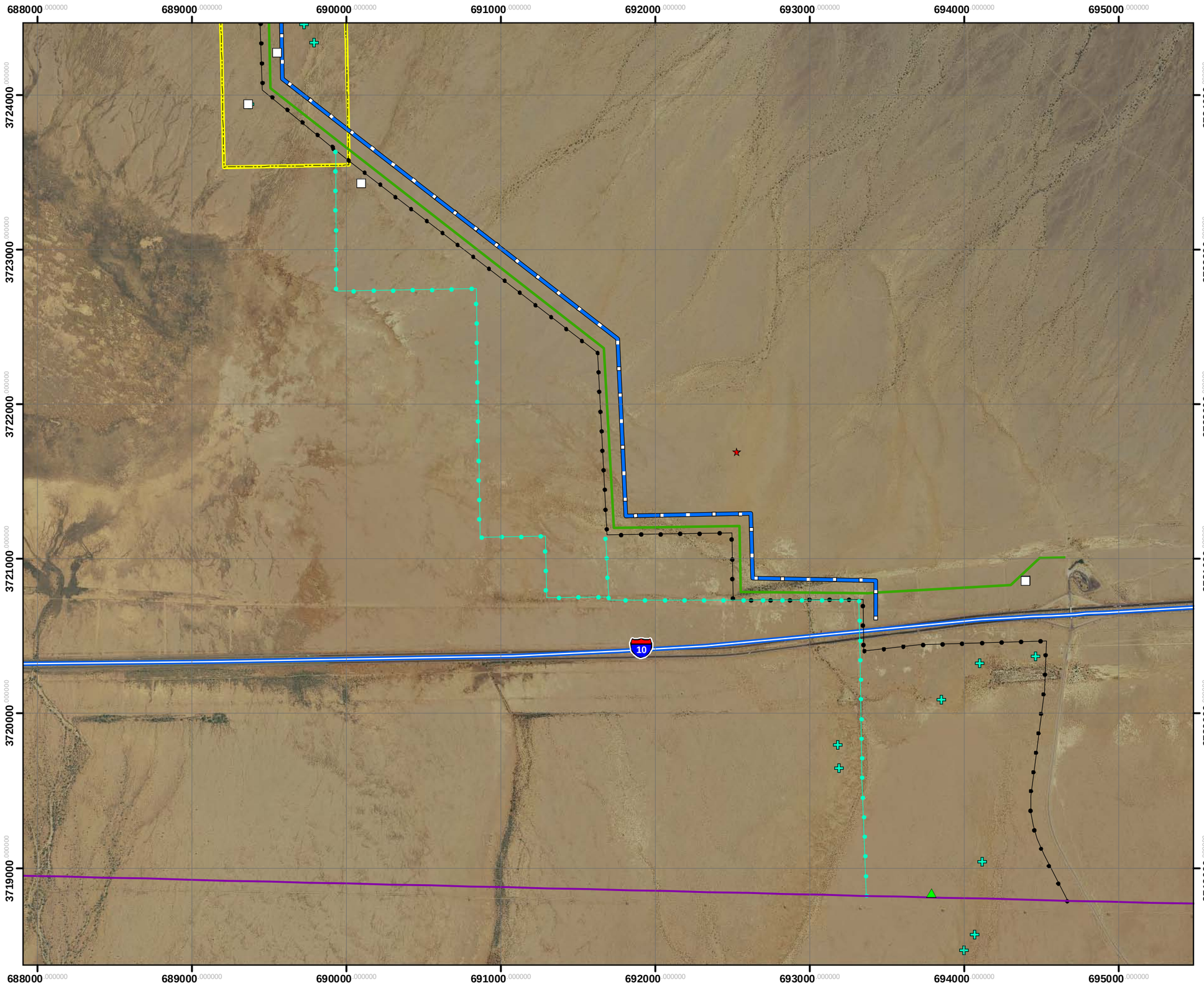
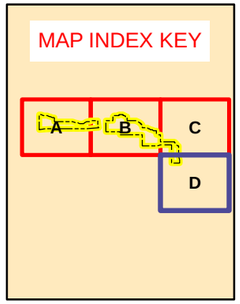
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- American Badger Burrow
- Burro Deer (Tracks)
- Kit Fox Burrow Complex
- Loggerhead Shrike
- Northern Harrier
- Short-eared Owl
- Mojave and/or Colorado Fringe-toed Lizard
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Gas Line
- Proposed Access Road
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

FIGURE 5.3-9D
Other Special Status Wildlife Species Sign Observed During Field Surveys

TETRA TECH EC, INC.

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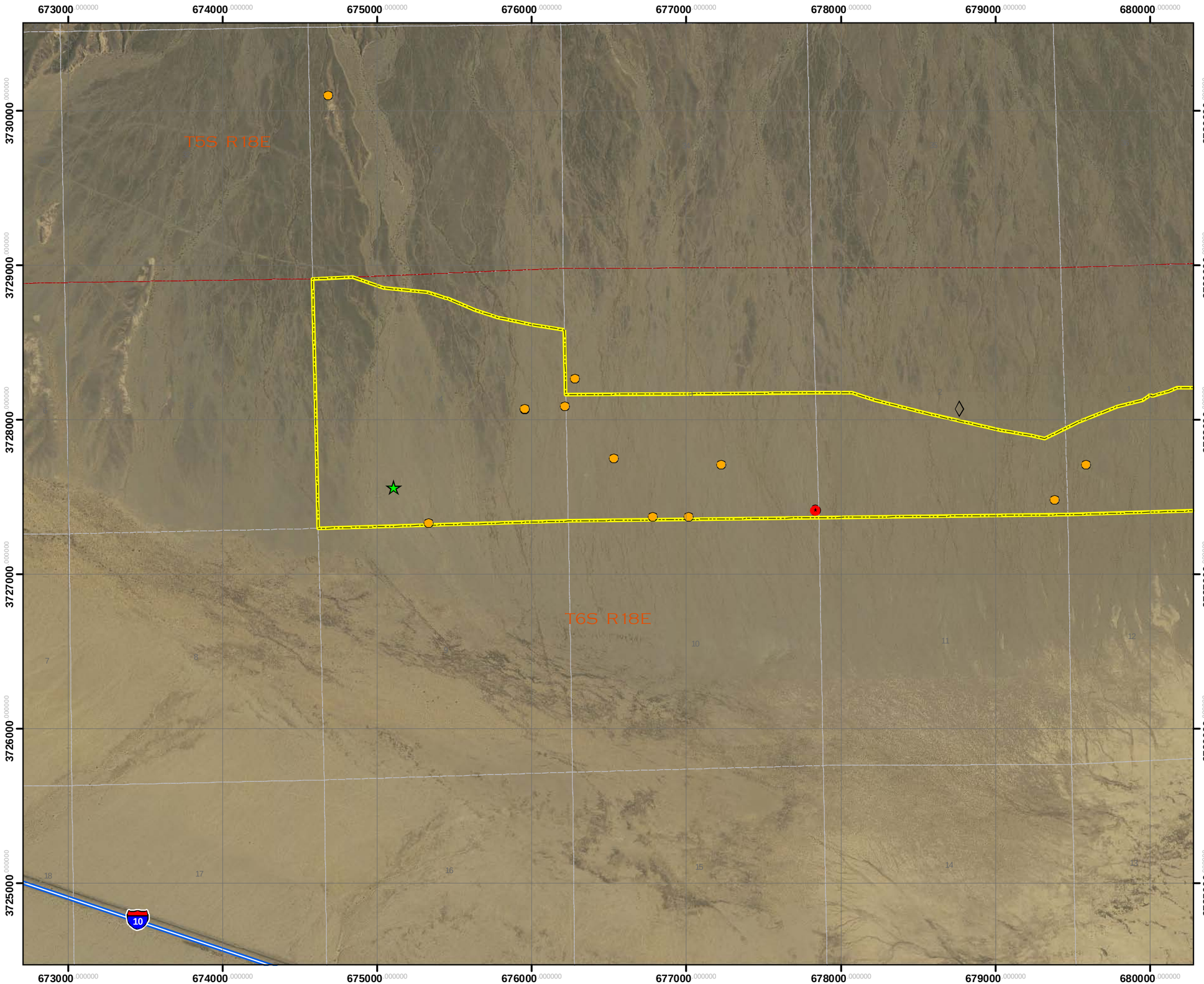
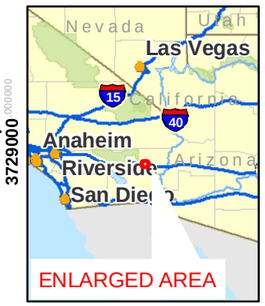
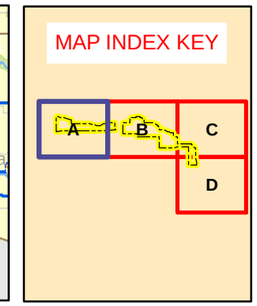


Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- Owl
- Inactive Burrow
- Active Burrow
- Pellet
- Previously Proposed Linear Route
- Proposed Gas Line
- Proposed Access Road
- Proposed Transmission Interconnect
- Blythe Energy Project Transmission Line
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-10 A
Burrowing Owls and Sign
Observed During Field Surveys

TETRA TECH EC, INC

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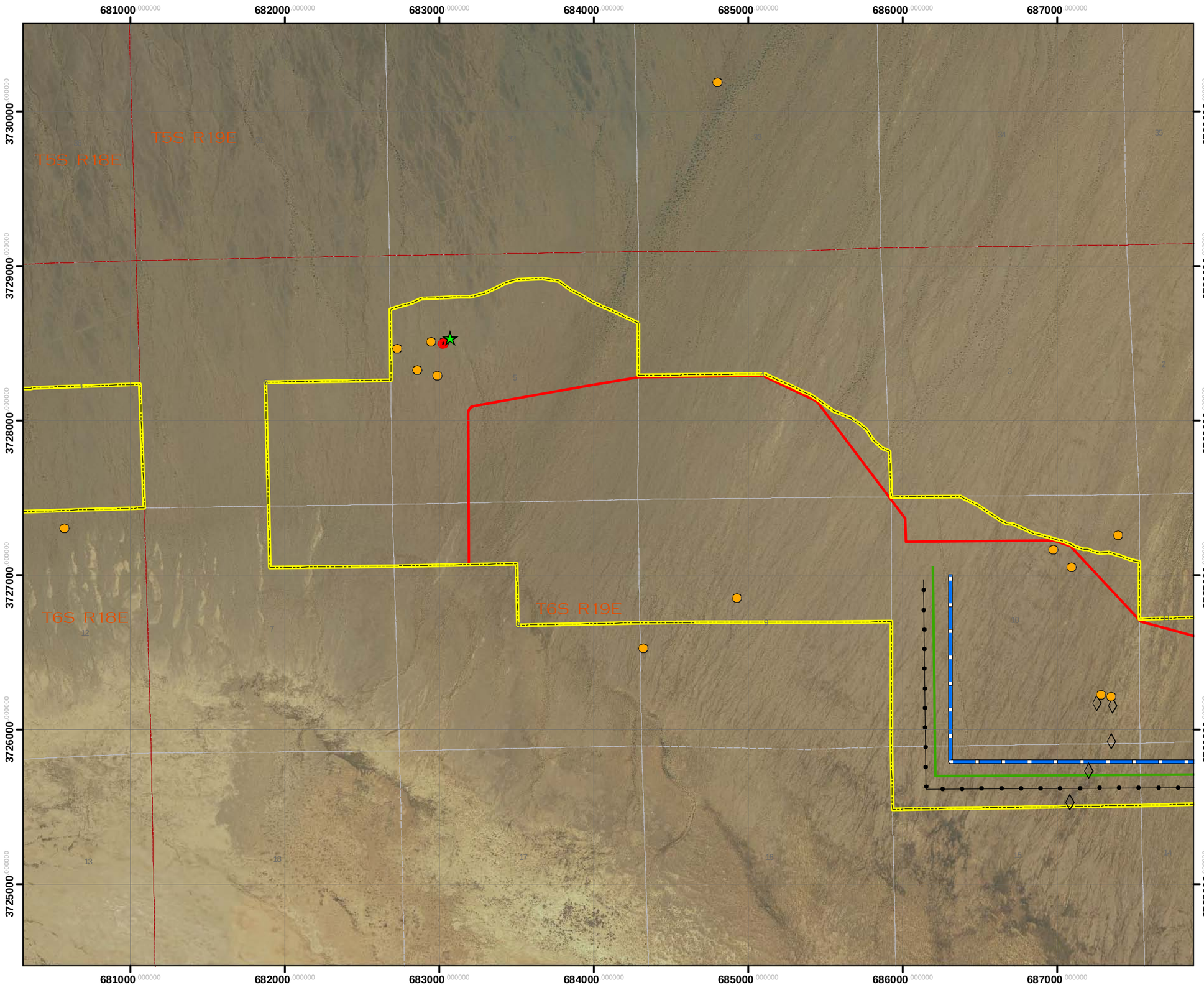

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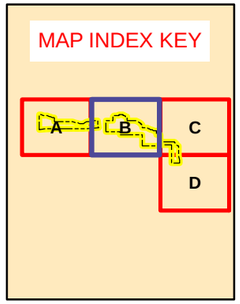
CALIFORNIA



Legend

- Owl
- Inactive Burrow
- Active Burrow
- Pellet
- Previously Proposed Linear Route
- Proposed Gas Line
- Proposed Access Road
- Proposed Transmission Interconnect
- Blythe Energy Project Transmission Line
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-10B
Burrowing Owls and Sign Observed During Field Surveys

TETRA TECH EC, INC.

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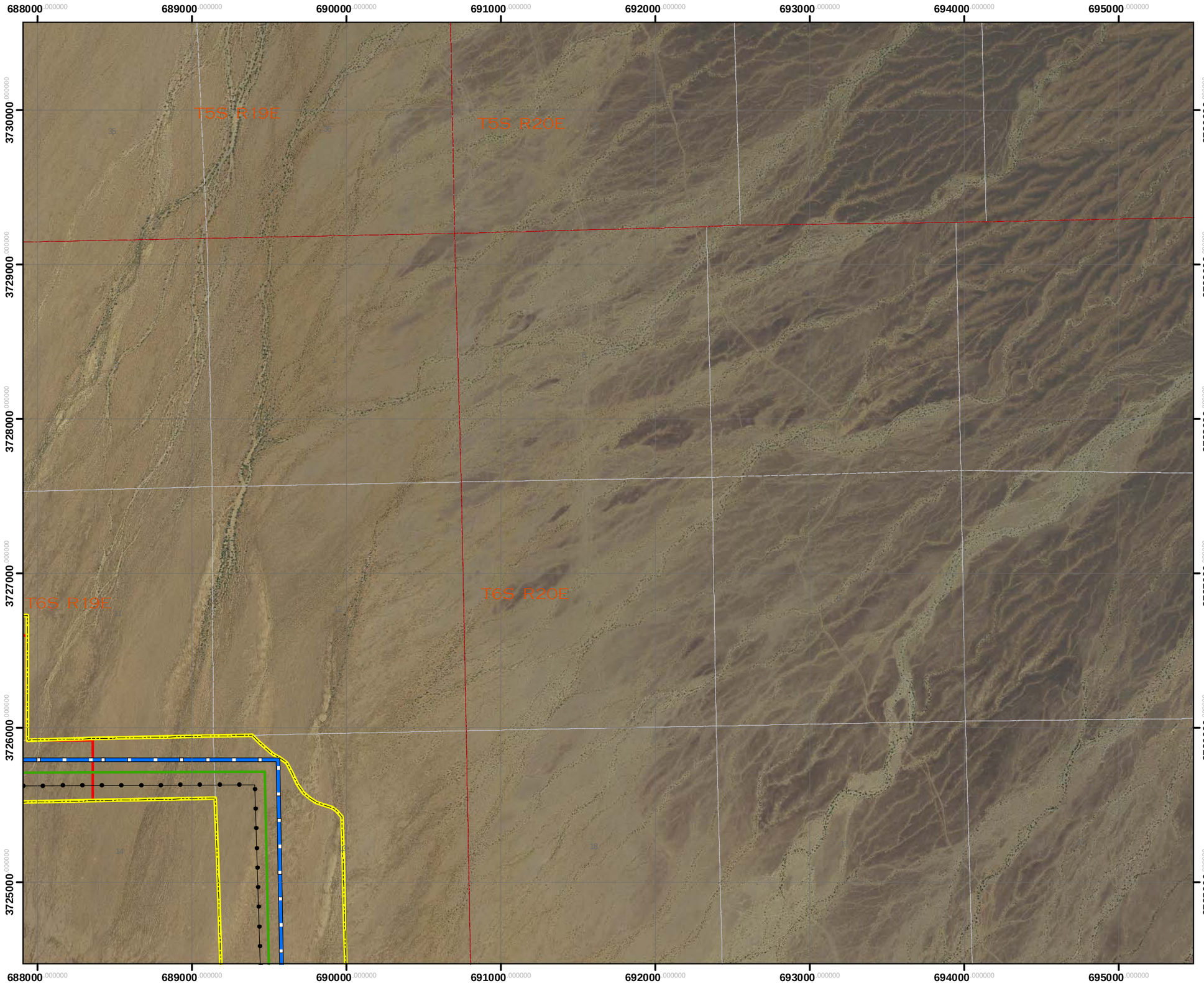
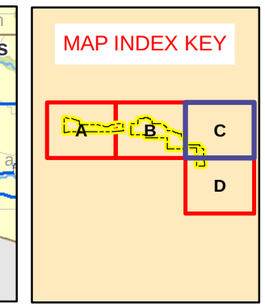


Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Owl
- Inactive Burrow
- Active Burrow
- Pellet
- Previously Proposed Linear Route
- Proposed Gas Line
- Proposed Access Road
- Proposed Transmission Interconnect
- Blythe Energy Project Transmission Line
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-10C
Burrowing Owls and Sign
Observed During Field Surveys

TETRA TECH EC, INC

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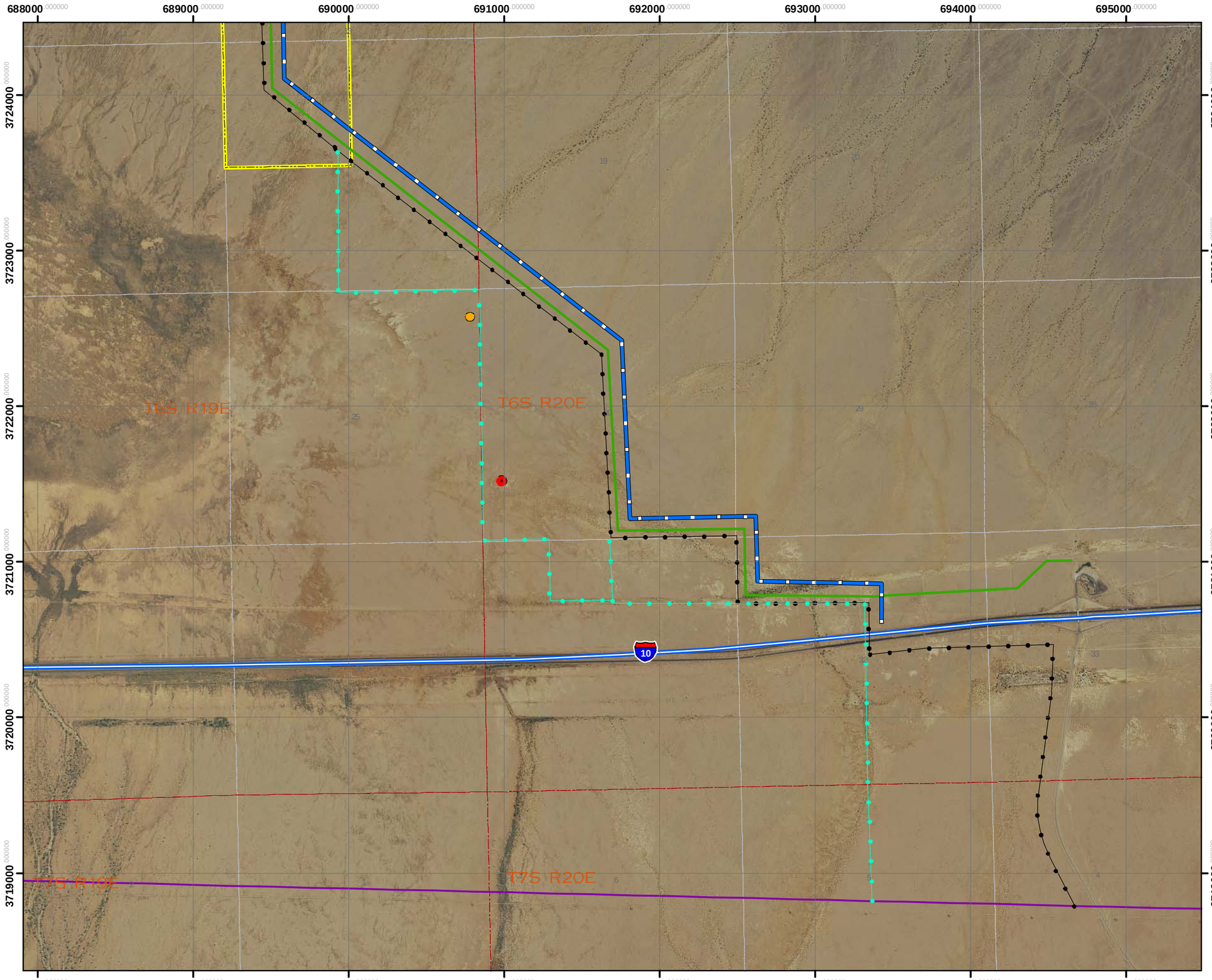
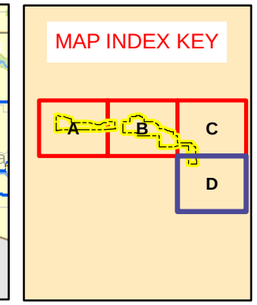
Genesis Solar, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA





Legend

- Owl
- Inactive Burrow
- Active Burrow
- Pellet
- Previously Proposed Linear Route
- Proposed Gas Line
- Proposed Access Road
- Proposed Transmission Interconnect
- Blythe Energy Project Transmission Line
- Project Site
- Solar Facility

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl & Assoc. ESRI, USDA, TTEC
(c) Main Map Scale: 1:24,000

Figure 5.3-10D
Burrowing Owls and Sign
Observed During Field Surveys

TETRA TECH EC, INC

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United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Palm Springs-South Coast Field Office
690 West Garnet Avenue
P.O. Box 581260
North Palm Springs, CA 92258-1260

IN REPLY REFER TO:
8120P
Genesis Solar Project
(CA-660.27)

NOV 26 2007

CERTIFIED MAIL-REPLY REQUESTED

Chairman Richard Milanovich
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs, CA 92264

Chairman Milanovich:

The National Environmental Policy Act of 1969 and the National Historic Preservation Act of 1966, as well as other laws and regulations, direct the BLM to consult with Native Americans when a federal undertaking has the potential to affect their interests or concerns. The Palm Springs-South Coast Field Office of the Bureau of Land Management (BLM) would like to initiate government to government consultation for two proposed solar energy projects. Boulevard Associates, LLC (Boulevard) is proposing to develop a 250 or 500-megawatt (MW) thermal power generating project, called Project Genesis, on sites located between Desert Center and Blythe, California, on land managed by the Bureau of Land Management (BLM).

Boulevard has filed an application with the BLM for a right-of-way (ROW) grant on each of two sites. One site is located near Ford Dry Lake; the second is near McCoy Wash. The locations of the two parcels are described below and depicted on the enclosed maps. The proposed solar plants would be sited within these locations, but would not encompass the entire area.

Boulevard is considering several project alternatives for the Project Genesis solar electric power generation facilities in eastern Riverside County areas specified above. Each alternative is based on the concept of a solar plant "unit," which includes a solar power plant that uses steam turbine technology, a large solar collection field (capable of producing 250 MW of electricity), electrical transmission facilities, a natural gas pipeline, a water supply, and waste water treatment system.

Ford Dry Lake Solar Project Area. The Ford Dry Lake area is located north of Interstate Highway 10 (I-10) approximately 24 miles west of Blythe, Riverside County, California. Specifically, the Ford Dry Lake Solar Project Area involves all of Sections 4, 9, 10, 11, 12, 13, and 14 and portions of Sections1, 2, 3, 23, and 24 of Township 6 South, Range 18 East, San Bernardino Base Line and Meridian (SBBM). It also includes all of Sections 10, 14, 15, 22, 23, and 24, and portions of Sections 9, 11, 13, 16, and 21 T. 6 S., R. 19 E., SBBM. These areas are depicted on the Ford Dry Lake and Hopkins Well, California U.S. Geological Survey 7.5' topographic quadrangles (see enclosed map).

The Ford Dry Lake project area is located within an arid playa and low dune desert environment. The area is typically devoid of any vegetation. The elevation is approximately 120 feet above mean sea level (amsl). The McCoy Mountains are to the east and Palen Mountains are to the north/northwest.

McCoy Solar Project Area. The McCoy proposed project area is located north of I-10 approximately seven miles west/northwest of Blythe, Riverside County, California. Specifically, the McCoy Solar Project Area involves all of T. 5 S., R. 21 E., SBBM except Section 1. These areas are depicted on the Inca and McCoy Peak, California U.S. Geological Survey 7.5' topographic quadrangles (see enclosed map).

The McCoy project area is located on alluvium southeast of the McCoy Mountains. Elevations in the project area range from 490 to 650 feet amsl. The area is characterized by alluvial silts, sands and gravels, with patches of true desert pavement. The area is dissected by several small washes that extend from McCoy Wash.

BLM would value the participation of the tribe in identifying any issues or concerns that the tribe may have regarding this proposed project. BLM would be glad to meet with the tribe to brief you and to assist in identifying any issues or concerns. We particularly invite your comments regarding potential impacts to cultural resources or areas of traditional cultural importance within the area of the above project. We would also appreciate notification if the project lies outside your area of interest and you do not wish to consult or be contacted about this project in the future. Project contacts are:

Claude Kirby, Project Manager
Phone: 760-251-4850
Email: Claude_Kirby@ca.blm.gov

Wanda Raschkow, Cultural Resources Specialist
Phone: 760-251-4824
Email: Wanda_Raschkow@ca.blm.gov

Written comments on the project are appreciated and may be sent to:

John Kalish
Field Manager
Palm Springs-South Coast Field Office, BLM
PO Box 581260
North Palm Springs, CA 92258-1260

Thank you for your consideration of these matters.

Sincerely,

John Kalish

John Kalish
Field Manager
Palm Springs-South Coast Field Office

cc: File
Richard Begay, THPO

Mr. Richard Milanovich, Chairman
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs , CA 92264

Ms. Maryann Green, Chairperson
Augustine Band of Mission Indians
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Coachella, CA 92236

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Thermal, CA 92274-1160

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Anza, CA 97539

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Soboba Band of Mission Indians
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San Jacinto, CA 92581-0487

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Daniel Eddy Jr., Chairman
Colorado River Indian Tribes
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Anza, CA 92539-1760

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Somerton, AZ 85350

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Fountain Hills, AZ 85269

Mr. Richard Narcia, Governor
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Sacaton, AZ 85247

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Havasupai Tribe
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Supai, AZ 86435

Mr. Charles Vaughan, Chairman
Hualapai Indian Tribe
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Peach Springs, AZ 86434

Ms. Carmen Bradley, Chairwoman
Kaibab-Paiute Tribe
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Fredonia, AZ 86022

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Community Council
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Kykotsmovi, AZ 86039

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Sells, AZ 85634

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Camp Verde, AZ 86322

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Ak-Chin Indian Community
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Supai, AZ 86435

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Yavapai-Apache Nation
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Camp Verde, AZ 86322

Mr. Ernie Jones Sr., President
Yavapai-Prescott Indian Tribe
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Prescott, AZ 86301

CC'S No certified

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Soboba Band of Luiseno Indians
Cultural Resources Department
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Linda Otero, Director
AhaMakav Cultural Society
Ft. Mojave Indian Tribe
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Indio, CA 92201-3499

Richard Begay, THPO
Agua Caliente Band of Cahuilla Indians
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Palm Springs , CA 92264

Michael Tososie, Cultural Contact
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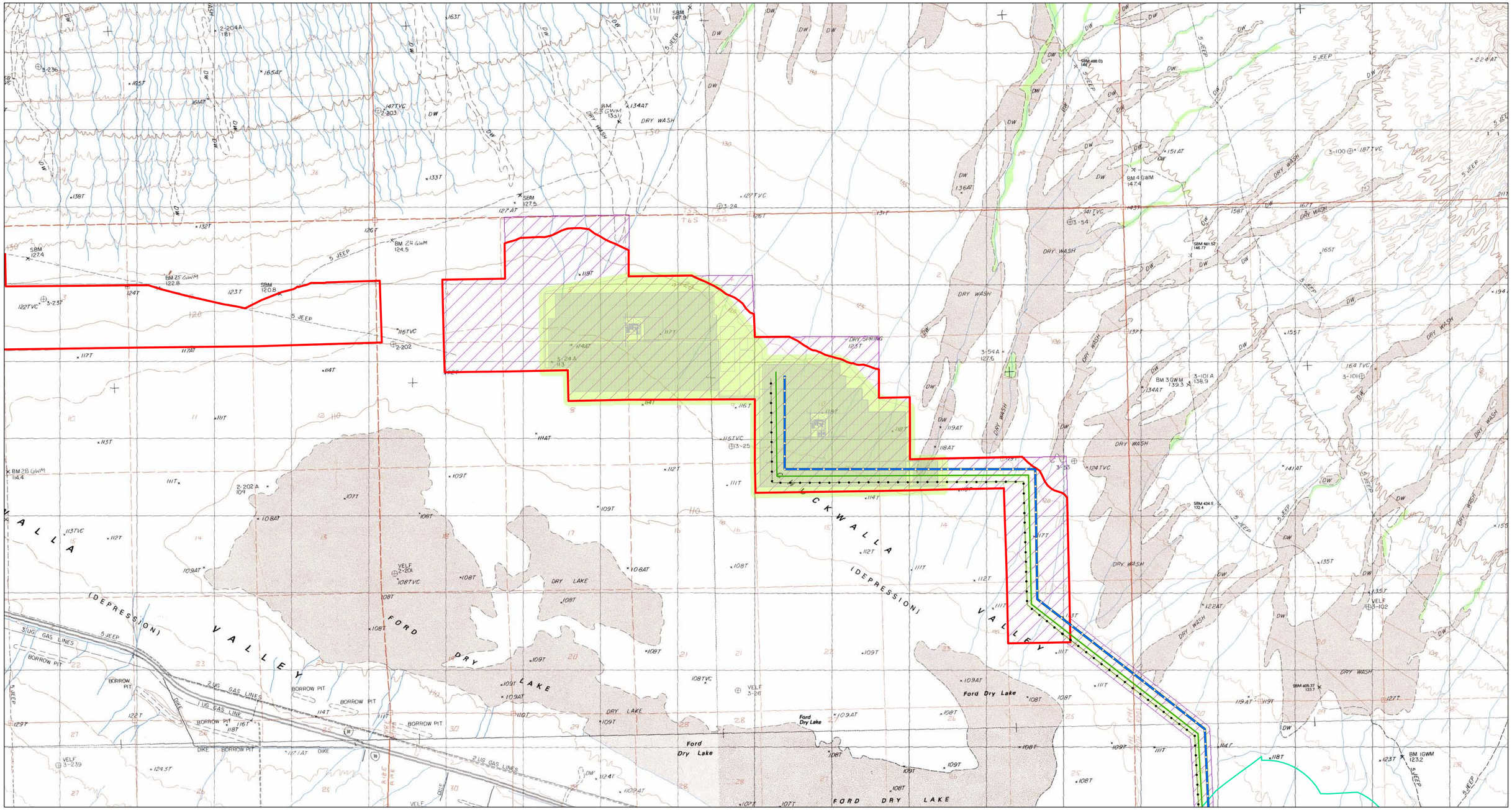

Proposed Transmission Interconnect
Proposed Gas Line
Proposed Access Road
Final Proposed Project Boundary
CEC Data Survey Requirement
Class III Survey Area
Faclitiy Construction

N

0 0.5 1 2
Miles

USGS 1:24K Quadrangles: Aztec Mines, Sidewinder Well, Ford Dry Lake, McCoy Springs, Hopkins Well, East of Aztec Mines

GENESIS SOLAR, LLC

Figure3-a. Genesis Solar Energy Project Project Area Current Proposed Right-of-Way and Surveyed Area

TETRA TECH

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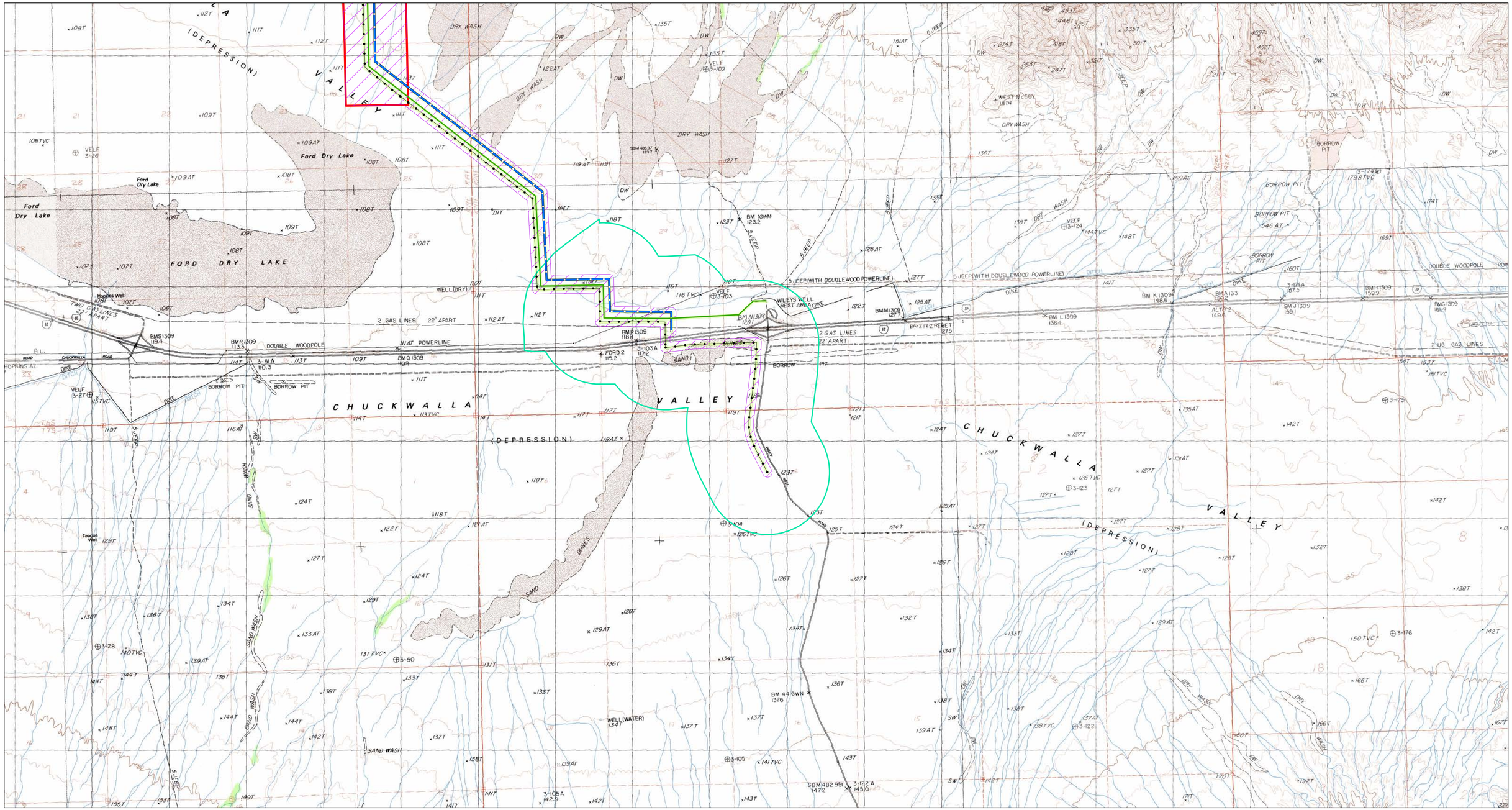


Proposed Access Road
Proposed Gas Line
Proposed Transmission Interconnect
Final Proposed Project Boundary
CEC Data Survey Requirement
Built Environment (Architectural Survey) Surveyed Area
Class III Survey Area

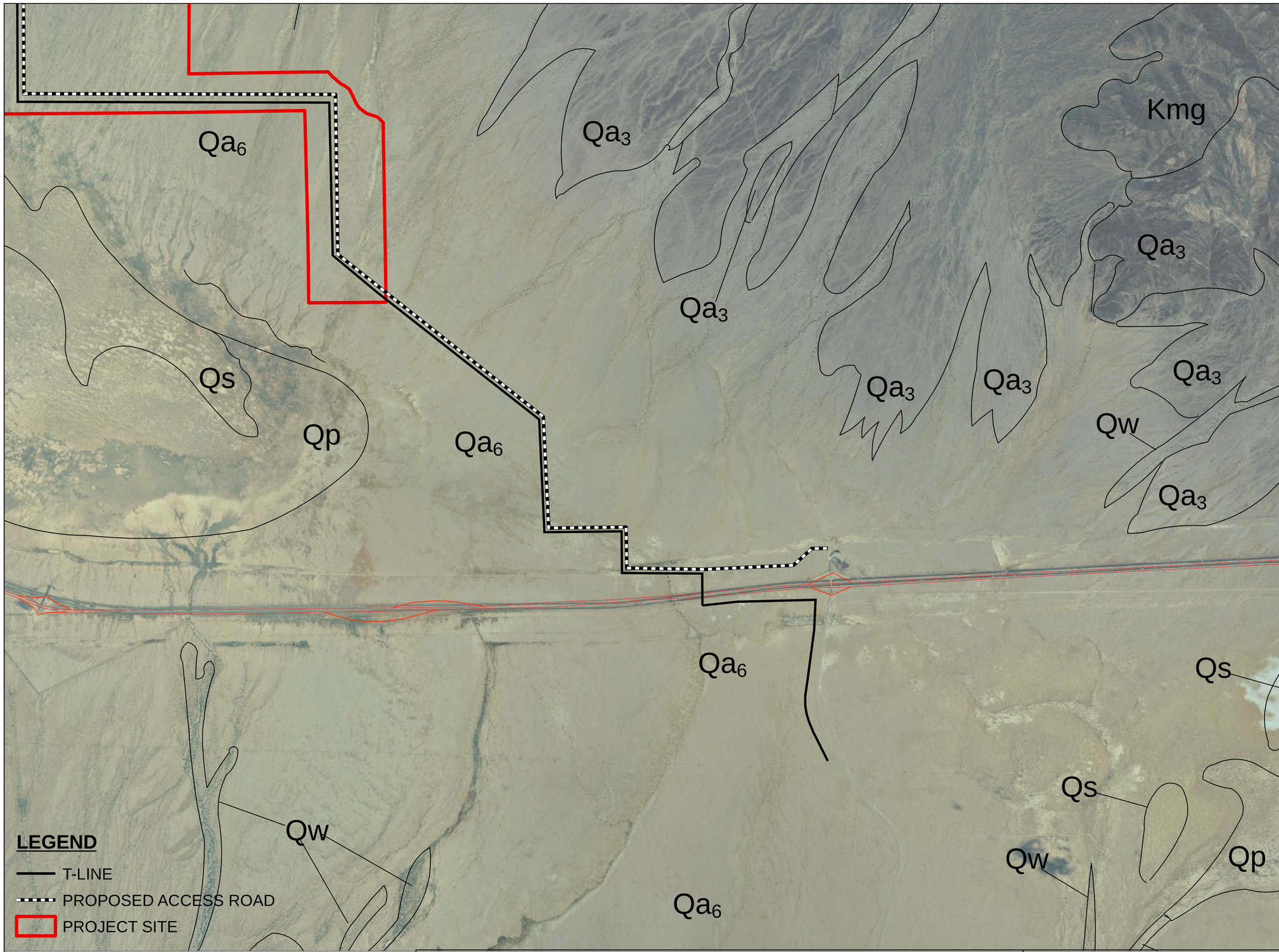
0 0.5 1 2
Miles

USGS 1:24K Quadrangles: Aztec Mines, Sidewinder Well, Ford Dry Lake, McCoy Springs, Hopkins Well, East of Aztec Mines

GENESIS SOLAR, LLC

Figure3-b. Genesis Solar Energy Project Interconnect Current Proposed Right-of-Way and Surveyed Area

TETRA TECH



Qw **Alluvium of modern washes (Holocene)**—Unconsolidated, angular to subangular gravel and sand derived from local mountain ranges. Boulder- and cobble-rich wash deposits proximal to mountain fronts grade downstream into pebbly and sandy distal deposits. Mapped areas include both large individual washes and closely spaced smaller washes. Wash deposits commonly grade laterally and downstream into young alluvial sand and gravel of Qa_6. Equivalent to deposits forming geomorphic surface Q4b of Bull (1991)

Qp **Playa lake deposits (Holocene)**—Unconsolidated clay, silt, and sand. Vegetative cover sparse. Locally includes thin veneer of eolian sand

Qs **Eolian sand (Holocene)**—Unconsolidated sand dunes and sheets. Dunes are partially stabilized by vegetation.

Alluvial-fan and alluvial-valley deposits (Holocene to Miocene)—Angular to subangular gravel and sand derived from local mountain ranges. Mostly unconsolidated to weakly consolidated; oldest deposits are locally well consolidated. Divided into six units distinguished by contrasting surficial and geomorphic characteristics:

Qa_6 **Unit 6 (Holocene)**—Young alluvial-fan and alluvial-valley deposits characterized by a lack of desert varnish, generally fine grain size, and evidence of recent sediment transport. Consists mostly of sand, pebbly sand, and sandy pebble-gravel; forms very gently sloping to nearly flat valley floors marginal to older, varnished alluvial-fan deposits. Surfaces are covered by sparse to moderately dense vegetation and commonly are transected by shallow channels of active sediment transport. Thin accumulations of eolian sand, not mapped separately, are present locally. Near mountains, unit includes relatively coarse, youthful, unvarnished gravel deposits of alluvial fans that grade downslope into the fine-grained deposits; some of these gravels form surfaces that may be inactive and equivalent to some deposits mapped elsewhere as Qa_5. Unit also includes deposits of many minor washes and channels (equivalent to Qw) too small to be mapped separately. Probably equivalent primarily to deposits forming geomorphic surface Q4a of Bull (1991), which is interpreted to range in age from 0.1 to 2 ka

Qa_5 **Unit 3 (Holocene and Pleistocene)**—Alluvial-fan deposits of gravel and sand that form relatively old, dissected surfaces mostly characterized by smooth, varnished desert pavement. Typical pavements have little or no surface relief and are composed of tightly to moderately packed, angular to subangular rock fragments averaging 2 to 10 cm across and generally less than 30 percent interstitial sand. Most surfaces have a dark brown to nearly black desert varnish, but some surfaces are lighter in color owing either to a relative abundance of unvarnished or lightly varnished granitic gravel or to vehicular or other human disturbances that have disrupted and crushed the original pavement. Pavement surfaces are dissected and drained by dendritic networks of sandy channels that vary in depth from less than 1 m to several meters; vegetation is typically dense in these channels but is sparse to absent on the pavement surfaces. Unit includes surfaces that range from only slightly dissected to deeply dissected, and that probably represent a wide range in age. Unit also includes some bar-and-swale surfaces similar morphologically to those of unit 5 (Qa_5) but most of which are moderately to darkly varnished, probably older than most surfaces of that unit, and difficult to distinguish on aerial photographs from the smoother desert pavements. Probably equivalent primarily to deposits forming geomorphic surfaces Q3a to Q2a of Bull (1991), which are interpreted to range in age from 8 to 730 ka

QTa_2 **Unit 2 (Pleistocene to Miocene)**—Alluvial-fan deposits of fine to coarse, poorly sorted gravel and sand that typically form high, deeply dissected, narrow ridges extending away from mountain fronts. Some ridge crests are relatively flat, narrow plateaus that preserve small tracts of smooth desert pavement like that of Qa_3, but most ridge crests are sharp to rounded and presumably have been eroded to a level below that of any preexisting alluvial surface. The youngest deposits assigned to this unit may overlap in age with the oldest deposits assigned to unit 3 (Qa_3); the oldest deposits assigned to this unit may be coeval with TaE. In two places, alluvium assigned to this unit depositionally overlies limestone or tufa of the Bouse Formation (Tbl). Probably largely equivalent to deposits forming geomorphic surface Q1 of Bull (1991), which is interpreted to be older than 1.2 Ma

Kmg **McCoy Mountains Formation, Member G (Cretaceous)**—Upper part consists of dark-greenish-gray, fine-grained arkosic to volcanic-lithic sandstone; lower part consists of light-gray to tan phyllitic and calcareous shale, tan calcareous sandstone, and conglomerate containing clasts of quartzite and carbonate rocks. Lower contact truncates beds in member F (unit Kmf) at a low angle and is interpreted as an intraformational unconformity. Thickness about 200 to 600 m. Locally contains fragments of late Early Cretaceous or younger fossil wood (Pelka, 1973; Stone and others, 1987). Contains detrital zircons as young as

SOURCE:
Geologic Map of the West Half of the Blythe
30' x 60' Quadrangle
Scale 1:24,000 at original print size 28" x 22"
All locations approximate

N W E S

0 2,000

1" = 1,000 Feet

GENESIS SOLAR, LLC.

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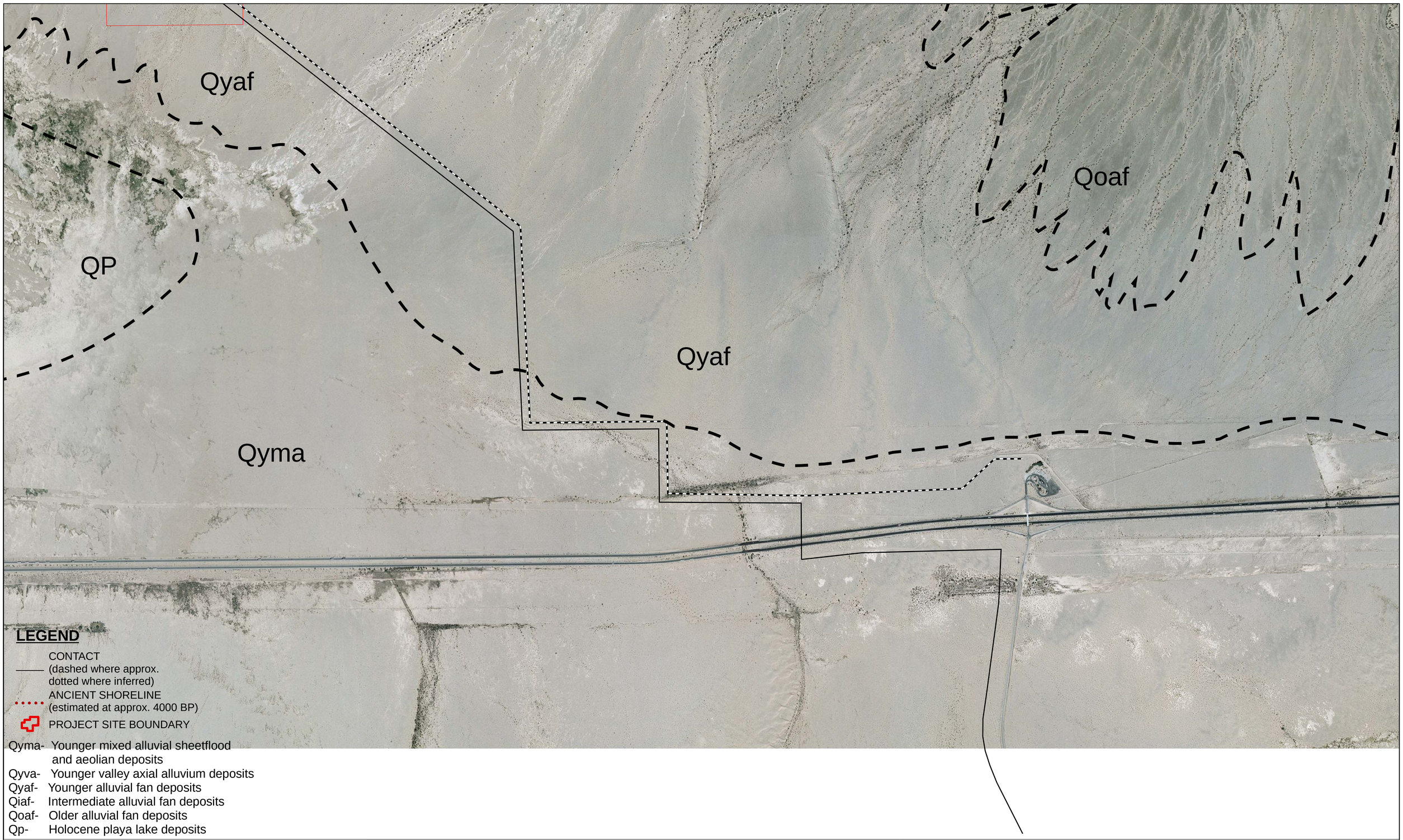
AREA GEOLOGIC MAP FOR OFF-SITE LINEARS

SWL	MT	10/2009
52004617	D-1.1	



LEGEND

CONTACT
(dashed where approx.
dotted where inferred)

ANCIENT SHORELINE
(estimated at approx. 4000 BP)

PROJECT SITE BOUNDARY

Qyma- Younger mixed alluvial sheetflood and aeolian deposits
Qyva- Younger valley axial alluvium deposits
Qyaf- Younger alluvial fan deposits
Qiaf- Intermediate alluvial fan deposits
Qoaf- Older alluvial fan deposits
Qp- Holocene playa lake deposits

SOURCE:
RIVERSIDE COUNTY TLMA
Scale 1:12,000 at original print size 28" x 22"
All locations approximate

N
W E
S

0 2,000
1" = 1,000 Feet

GENESIS SOLAR, LLC.

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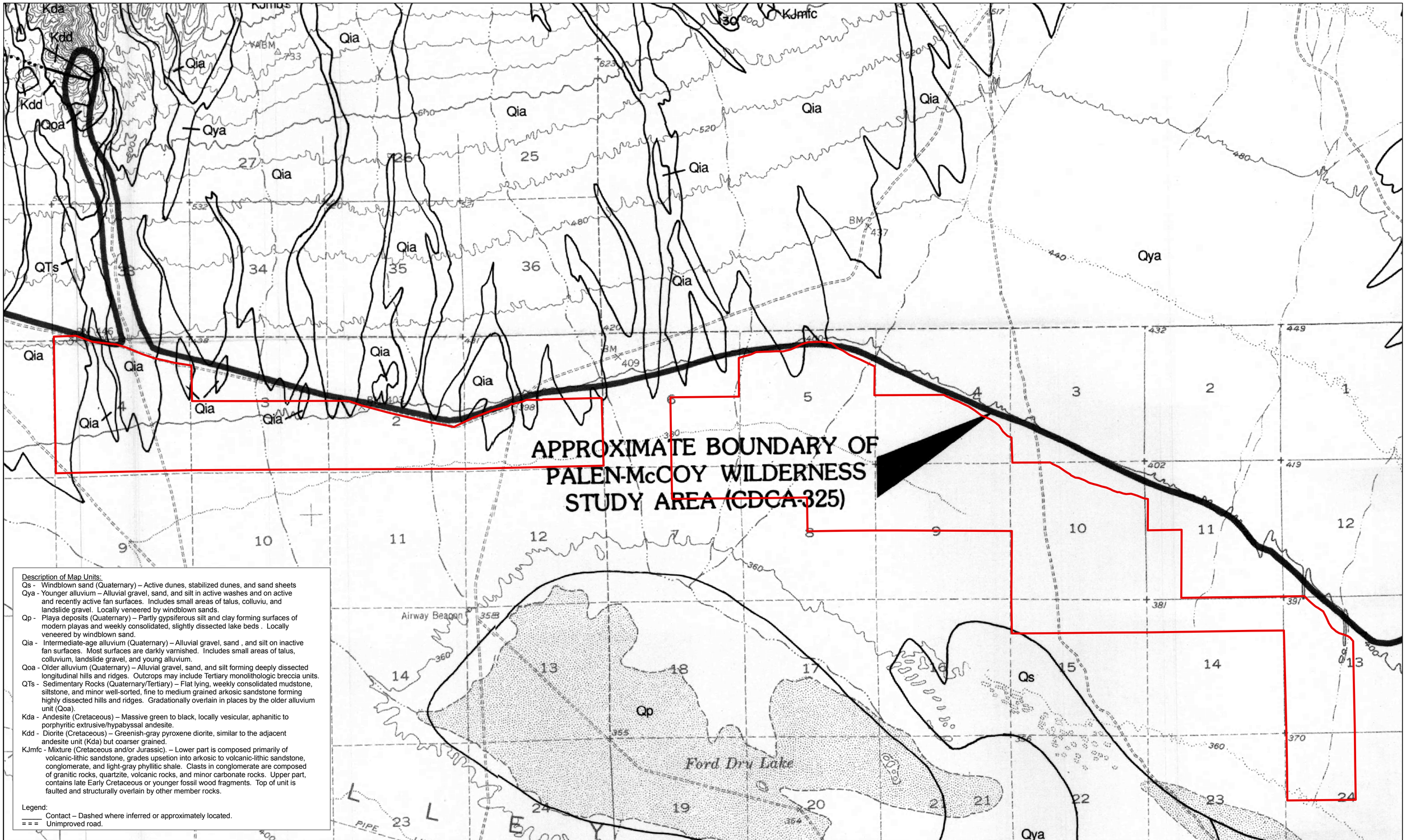
SITE GEOLOGIC MAP FOR OFF-SITE LINEARS

SWL	MT	10/2009
52004617	D-1.2	



Description of Map Units:

Qs - Windblown sand (Quaternary) – Active dunes, stabilized dunes, and sand sheets

Qya - Younger alluvium – Alluvial gravel, sand, and silt in active washes and on active and recently active fan surfaces. Includes small areas of talus, colluviu, and landslide gravel. Locally veneered by windblown sands.

Qp - Playa deposits (Quaternary) – Partly gypsiferous silt and clay forming surfaces of modern playas and weekly consolidated, slightly dissected lake beds . Locally veneered by windblown sand.

Qia - Intermediate-age alluvium (Quaternary) – Alluvial gravel, sand , and silt on inactive fan surfaces. Most surfaces are darkly varnished. Includes small areas of talus, colluvium, landslide gravel, and young alluvium.

Qoa - Older alluvium (Quaternary) – Alluvial gravel, sand, and silt forming deeply dissected longitudinal hills and ridges. Outcrops may include Tertiary monolithologic breccia units.

QTs - Sedimentary Rocks (Quaternary/Tertiary) – Flat lying, weekly consolidated mudstone, siltstone, and minor well-sorted, fine to medium grained arkosic sandstone forming highly dissected hills and ridges. Gradationally overlain in places by the older alluvium unit (Qoa).

Kda - Andesite (Cretaceous) – Massive green to black, locally vesicular, aphanitic to porphyritic extrusive/hypabyssal andesite.

Kdd - Diorite (Cretaceous) – Greenish-gray pyroxene diorite, similar to the adjacent andesite unit (Kda) but coarser grained.

KJmfc - Mixture (Cretaceous and/or Jurassic). – Lower part is composed primarily of volcanic-lithic sandstone, grades upsetion into arkosic to volcanic-lithic sandstone, conglomerate, and light-gray phyllitic shale. Clasts in conglomerate are composed of granitic rocks, quartzite, volcanic rocks, and minor carbonate rocks. Upper part, contains late Early Cretaceous or younger fossil wood fragments. Top of unit is faulted and structurally overlain by other member rocks.

Legend:

_____ Contact – Dashed where inferred or approximately located.

= = = Unimproved road.

"GEOLOGIC MAP OF THE PALEN-McCOY WILDERNESS STUDY AREA AND VICINITY, RIVERSIDE COUNTY, CALIFORNIA", Stone and Pelka, 1989
All locations approximate Scale is 1:24,000.

PROJECT SITE BOUNDARY

N
W E
S

0 4,000

1" = 2,000 Feet

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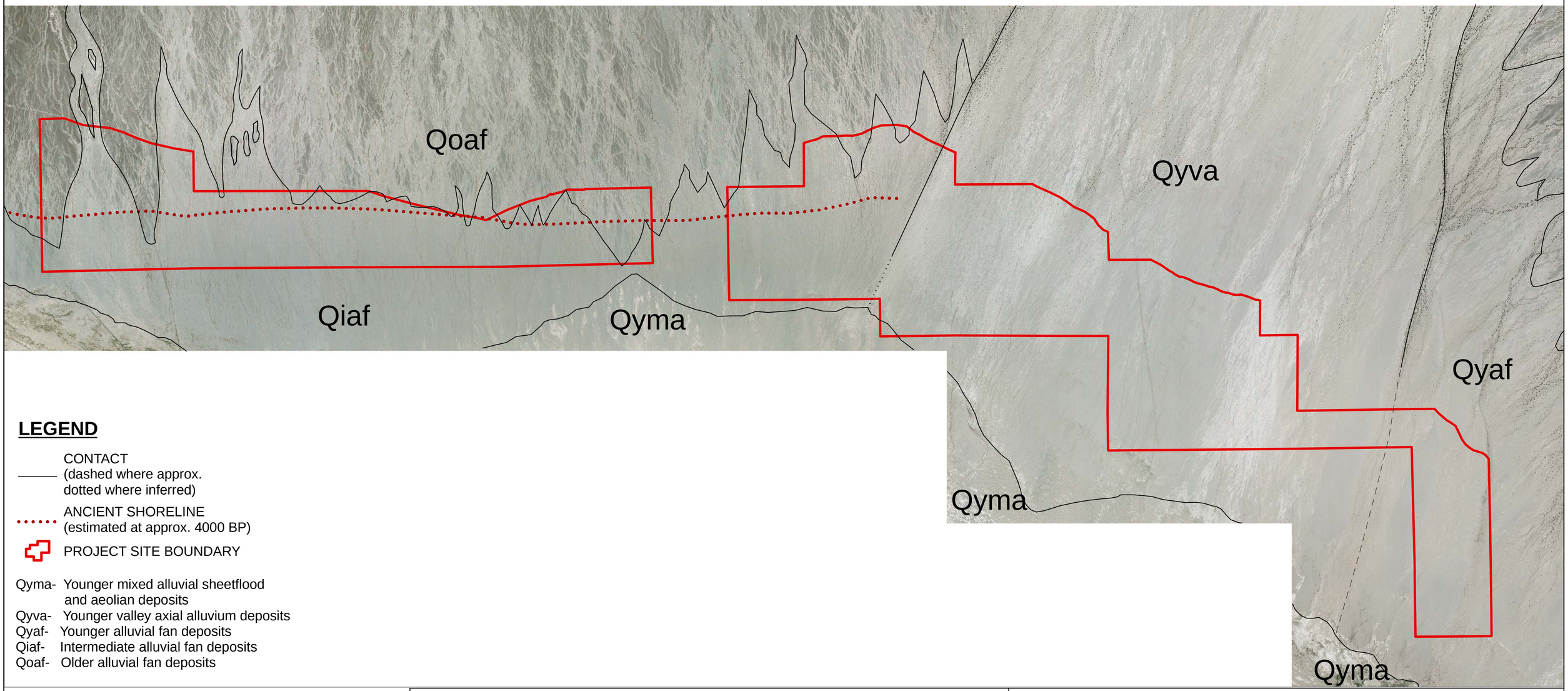
AREA GEOLOGIC MAP

SWL	MT	8/2009
52004617	5.5-1	



LEGEND

CONTACT
(dashed where approx.
dotted where inferred)

ANCIENT SHORELINE
(estimated at approx. 4000 BP)

PROJECT SITE BOUNDARY

Qyma- Younger mixed alluvial sheetflood and aeolian deposits
Qyva- Younger valley axial alluvium deposits
Qyaf- Younger alluvial fan deposits
Qiaf- Intermediate alluvial fan deposits
Qoaf- Older alluvial fan deposits

Riverside County Land Informaiton System Composite Aerial Photographs (March 2007). Riverside County Geographic Information System Website
Scale 1:24,000

N
W E
S

0 4,000
1" = 2,000 Feet

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SITE GEOLOGIC MAP

SWL	MT	8/2009
52004617	5.5-4	

Sensitivity of Geologic Units on Site and in the Vicinity

Geologic symbol on map	BLM * Ranking of fossil probability	Subjective ranking of fossil probability	Geologic unit and sensitivity rationale
Qs	3	NA	Wind blown sand, active dunes that are too young (Holocene age**) to yield fossils
Qya	3	NA	Younger alluvium of sand, gravel and clay of Holocene age, too young to yield fossils
Qp	3	Extremely low	Playa deposits of Quaternary age, the dry environmental setting of these sediments are not conducive to extensive biomass nor are they conducive to preservation of fossils
Qla	3	Very low	Intermediate alluvium of sand and gravel, alluvial surfaces of talus, landslides and similar sediment settings in this arid climate are not conducive to support extensive life forms or for preservation of fossils.
Qoa	3	Very low	Dissected alluvial deposits of older alluvium; units are Pleistocene but in an arid climate not conducive to supporting vertebrate populations or preserving the bones.
QTs	3	Low	Sediments of Quaternary and Tertiary age; this unit is a possible repository for vertebrates although highly unlikely. It is ranked low here because 3 days of intensive survey failed to turn up any remains.
Kda	3	NA	Cretaceous aged andesite (crystalline igneous volcanic rocks) probability of holding or preserving vertebrate fossils nil.
Kdd	3	NA	Cretaceous diorite (crystalline igneous plutonic rock); possibility of yielding fossils nil.
KJmfc	3	Extremely low	Cretaceous/Jurassic volcanic sandstones ranging from arkose to shale, some chips of fossil wood have been recorded from this unit in the literature but no known fossils of any other description have been reported. During surveys no fossils of any description were noted.

*** BLM ranking for fossil resource probability**

Condition 1- areas known to yield vertebrate fossils
Condition 2- areas with high potential to yield vertebrate fossils
Condition 3- areas with rocks of metamorphic or igneous origin or otherwise extremely unlikely to yield fossils of any description

**** The definition of fossils is objects older than 11,000 years of Pleistocene or older age. Holocene or recent aged biologic objects are, by definition, not fossils.**

Figure F - 1.1

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Wind Erosion Estimate
NextEra - Genesis Solar Energy Project

REV A By: J. Marchek
10/2/2009

Basis:
Figure 5.6.1-2 Soils Map

Project Size	1800 acres =	78408000	square feet
	Treat as two rectangles	39204000	per rectangle
	with height =	5000	ft per height
		7840.8	per width

Description	Acres	Predicted soil loss tons/acre/ year	Soil loss tons/year
No Project	1800	72.88	131,184
Project Construction no BMPs	1800	27.82	50,076
Project Construction with BMPs	1800	1.25	2,250
Offsite Linear Construction with BMPs*	61.3	0.63	11
Project Operation with BMPs	1650	1.25	2,063

Notes:
Used NCRS (Natural Resources Conservation Sevice)
WEPS (Wind Erosion Prediction System) version 1.0 (9/28/08)
Model Inputs
Riverside County, CA nearest Climate & Wind Stations were Blythe
Cherioni Soil
No project model - no change - modeled for weed growth only
Project with no BMPs - no fencing, only bulldozing, weed growth, and graze (normal disturbance)
Project with BMPS - fencing on all sides, bulldozing, irrigation & mulch (simulates dust palliatives) and graze
*Offsite linear construction will take less than one year as described below

Offsite Linears Acreage - assume same wind erosion factor as Project with BMPs

Roads	15.76 acres
Transmission Line	9.18 acres
Pipeline	36.36 acres
	61.3 acres

Feature (acreage)	Activity	Acres	Duration (months)	Soil Loss tons/acre/year with BMPs	Soil Loss (tons) with BMPs
Roads	Grading & Construction	15.76	3	0.63	2.4822
(15.76 acres)					
Transmission Lines	Grading	0.05	2	0.63	0.00525
(9.18 acres for construction; 0.05 acre for pole footprints)	Construction	9.18	4	0.63	1.9278
Natural Gas Pipeline	Grading	2.91	2	0.63	0.30555
(36.36 acres for construction; 2.91 acres for trench)	Construction	36.36	3	0.63	5.7267
Off Site Linears Soil Loss Estimates (Construction)	All activities listed above				**10.45**

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Soil Erosion Estimate (by Water)
NextEra - Genesis Solar Energy Project

REV A By: J. Marchek
10/2/2009

Basis:
Attached Tables

				Estimates Using Revised Universal Soil Loss Equation					
Feature (acreage)	Activity	Acres	Duration (months)	Soil Loss tons/acre/ year without BMPs	Soil Loss (tons) without BMPs	Soil Loss tons/acre/ year with BMPs	Soil Loss (tons) with BMPs	Soil Loss tons/acre/ year no Project	Soil Loss (tons/yr) No Project
Project Site	Grading	1800	6	0.49	441	0.0077	6.93	0.00085	1.53
(1,800 acres to be graded)	Construction	1800	19	0.49	1396.5	0.0077	21.945	0.00085	
Roads	Grading & Construction	15.76	3	0.49	1.9306	0.0077	0.030338	0.00085	0.013396
(15.76 acres)									
Transmission Lines	Grading	0.05	2	0.49	0.004083	0.0077	6.41667E-05	0.00085	0.0000425
(9.18 acres for construction; 0.05 acre for pole footprints)	Construction	9.18	4	0.49	1.4994	0.0077	0.023562	0.00085	
Natural Gas Pipeline	Grading	2.91	2	0.49	0.23765	0.0077	0.0037345	0.00085	0.0024735
(36.36 acres for construction; 2.91 acres for trench)	Construction	36.36	3	0.49	4.4541	0.0077	0.069993	0.00085	
Project Soil Loss Estimates (Construction)	All activities listed above				**1845.626**		**29.00**		**1.545912**
Project Soil Loss Estimates (Operation) Annual		**1650**	**12**			**0.0077**	**12.71**		

Notes:
Soil losses (tons/acre/year) are estimated using RUSLE2 software. (NCRS 2002)
The soil characteristics were estimated using RUSLE2 soil profiles corresponding to the mapped soil unit
Estimates of actual soil losses use the RSLE2 soil loss times the duration and affected area.
The No Project Alternative estimate does not have a specific duration, and loss is given in tons/year.
Project Acreages based on the assumption that 75 % of the project site will be graded.
Other areas based project disturbance table for acreage outside the project footprint.
Duration of activities based upon assumptions in the Plan of Development (Genesis Solar, LLC, 2009)
RUSLE2 Assumptions:
100-ft slope length, 2% slope
Construction and Grading soil losses assume the following inputs: Management – bare ground; Contouring – None, rows up and down hill; Diversion/terracing – None; Strips and Barriers – None.
Construction and Grading with BMP soil losses assume the following inputs: Management -- Silt fence; Contouring – Perfect, no row grade; Diversion/terracing -- None; Strips and Barriers- 2 fences, 1 at end of slope.
No Project soil losses assume the following inputs: Management – Dense grass, not harvested; Contouring --None, rows up and down hill; Diversion/terracing -- None; Strips and Barriers -- None.

Rositas - loamy fine sand 85% 0-2% slopes (assumed 2% slope)
Assumed R of 10

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NextEra - Genesis Solar Energy Project
Estimated area of exposed soil.

REV A	By:	J.Foster
10/1/2009	Checked:	J. Moore

Purpose:
The purpose of the calculation is to determine the amount of exposed soil during operations for use in an erosion calculation.

References:
Drawing GENI-0-SK-111-002-001 REV D
Genesis Solar Energy Project AFC Section 3.4.8.1 and 3.5.5
EuroTrough - Parabolic Trough Collector, developed for Cost Efficient Solar Power Generation

Assumptions:
Pier foundation diameter for solar collector assumed to be 2 feet.
Calculation does not include pipe or electrical foundations.
Calculation does not include roads treated with dust palliative.

Description	Value	Units	Reference
Site Footprint (within fenceline)	1769	Acre	Site Plan
Power Block Footprint	24	Acre	AFC & Site Plan
Paved Roads	35	Acre	AFC & Site Plan
Admin Building	0.31	Acre	Site Plan
Evaporation Ponds	48	Acre	AFC & Site Plan
Land Treatment Unit	10	Acre	AFC & Site Plan
Number of Loops	440	EA	Solar Field Sizing Sheet
Number of SCA per loop	4	EA	Solar Field Sizing Sheet
Total SCA for Project	1760	EA	Solar Field Sizing Sheet
Number of Foundations per SCA	13	EA	Paper, EuroTrough - Parabolic Trough Collector, developed for
Foundation Diameter	2	ft	(assumed)
Total SCA Foundation Area	1.7	Acre	
Total Area Exposed to Erosion	1650	Acre	

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NextEra - Genesis Solar Energy Project

Disturbance Summary

	Dimensions	Quantity	Acres
Temporary Disturbance:			
Transmission Line			
Construction laydown/assembly areas	100' X 200'	1	0.46
Conductor Pulling Area	50' X 140'	25	4.02
Crossing Structures	100' X 100'	4	1.84
Pole Pad Construction Areas	50' X 50' (see note 1)	59	2.86
Transmission Line Total			9.18
Gas Line			
Construction Right of Way	50' X 5 miles (see note 2)	1	36.36
Roads			
Site Access Road Construction	50' X 6.5 miles (see Note 3)	1	15.76
Total Disturbed Area			**61.30**
Permanent Disturbance:			
Transmission Pole Pads	6' X 6'	59	0.05
Spur Roads	70' X 14'	59	1.87
Substation Expansion	75' X 240'	87499.45	0.41
Site Access Road	30' X 6.5 miles	1	23.64
Gas Line	N/A	N/A	N/A
Project Site	varies	1	1800.00
Total Disturbed Area			**1825.97**

Notes

1. The 50' X 50' Pole Pad Construction area does not include the 6' X 6' permanent pole pad disturbance or the portion of the spur road that is coincident with the 50'X50' pole pad construction area.

2. Approximately 20' of the gas line construction right of way will overlap the access road construction right of way; therefire, has not been included in the temporary disturbance calcualtion.

3. The temporary distrubance shown excludes the permanent disturbance for the access road.

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NextEra - Genesis Solar Energy Project

Transmission Line Temporary and Permanent Disturbance

REV A | **By:** | **J.Foster**

7/21/2009 | **Chkd** | **S. Richards**

T-Line Length 8 miles

Maintanence Road Lenth 0 miles

Average Pole Spacing 820

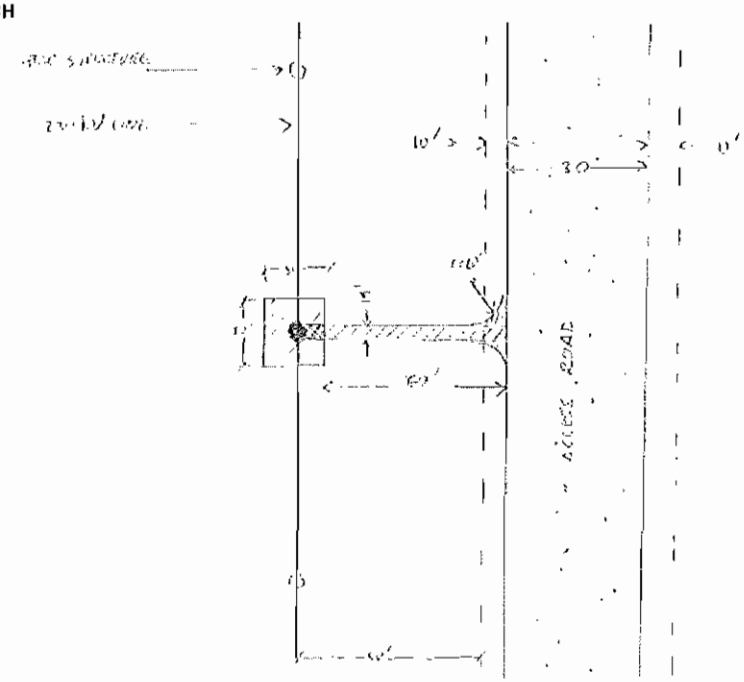
The site access road and Wiley Well Rd. will be used for T-Line access

Permanent Distrubance				
Feature	Qty	Distrubance Assumption	Disturbance (acres)	
Standard Pole Pads	59	6' X 6'	0.049	Includes only the poles outside the solar field
Spur Roads	59	70' X 14'	1.327	
Radius from access road to spur road	59	20' radius	0.542	
Substation/Substation Expansion	1	75 X 240	0.413	At the proposed Colorado River Substation
		Total	2.331	
Temporary Disturbance				
Conductor Pulling Area	25	50' X 140'	4.02	
Construction Laydown Area (see Note 4)	1	100' X 200'	0.46	1 per mile and 1 on site
Crossing Structures	4	100'X100'	1.84	
Pole Pad Construction Area	59	50' X 50' (see Note 3)	2.86	
		Total	9.18	

Notes

1) Transmission line length based on SF299 document. From interconnection point to the Unit 2 solar field.
2) Pole Spacing has been based on Blythe-Julian Hinds AFC Petition for Post-certification Ammendment 99-AFC-08
3) Less portion of the spur road that is coincident with the 50' X 50' pole pad construction area. Less pole pad permanent Disturbance (8' X 6')
4) Assume one laydown area is onsite and one is offsite.

SKETCH



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NextEra - Genesis Solar Energy Project
Gas line distrubance
REV A **By:** **J.Foster**
7/21/2009 **Chkd**

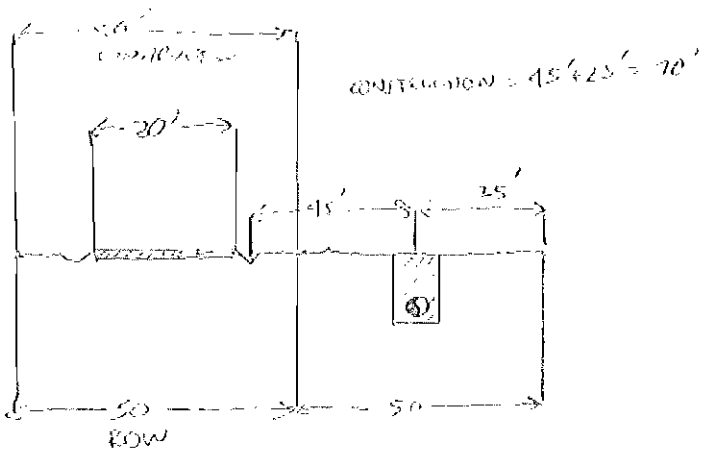
Gas Line Length	6	miles
Construction Width	50	ft
Trench Width	4	ft

Permanent Distrubance			
Feature	Qty	Distrubance Assumption	Disturbance (acres)
None	N/A	N/A	N/A
		Total	N/A
Temporary Disturbance			
Construction Right of Way (TOTAL)	1	50 feet wide	36.36
Trench Disturbane	1	4 feet wide	2.91

(since next to road which is already accounted for, use 50')

Notes
1) Gas line length estimate based on SF299 figure and USGS topo maps
2) Assume no permanent disturbance off site.
3) A portion of the construction right of way will be shared with access road ROW.

SKETCH



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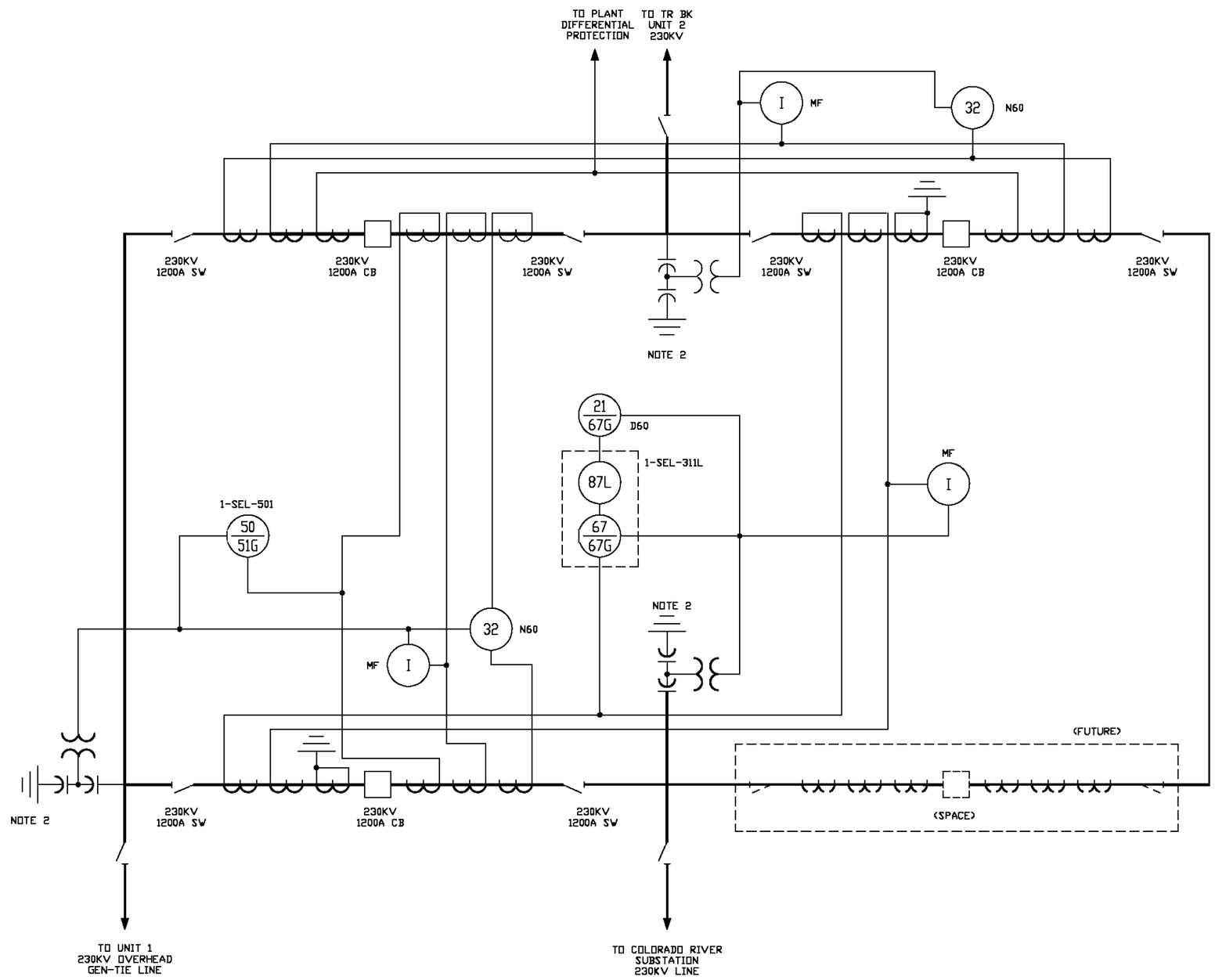
NextEra - Genesis Solar Energy Project
Access Road disturbance
REV A **By:** **J.Foster**
7/21/2009 **Chkd** **B.Anders**

Access Road Length 6.5 miles
Access Road Width 30 ft

Permanent Distrubance			
Feature	Qty	Distrubance Assumption	Disturbance (acres)
Access Road	1	30 feet wide	23.64
		Total	23.64
Temporary Disturbance			
Construction Right of Way	1	50' feet wide	39.39
Difference Between Permanent and Construction		50 - 30 = 20	15.7575758

Notes
1) Access road length based on SF299 figure. Road width based on 24' wide road with 3' shoulders.

NOTES
1. (3) CLASS 'A' CCVT'S, 0.003 µf.
2. (MF) MULTIFUNCTION DIGITAL METER.
3. NOT FOR CONSTRUCTION.



REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH SPEC	PROJECT ENGINEER	PROJECT MANAGER
A	10 02 09	ISSUED FOR REVIEW	AP	EP	PL	EP	EP	NC

PRELIMINARY STATUS — DATE — LINE
REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.

APPROVED STATUS — DATE — LINE
REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED 'HELD' RETAINS PRELIMINARY STATUS.

ORIGINATING PERSONNEL
DRAWN BY: A. PRATT
CHECKED BY: E. PABON
LEAD DESIGNER: P. LOUEN
ENGINEER/TECH SPECIALIST: E. PABON
PROJECT ENGINEERING MANAGER:
PROJECT MANAGER: N. CHRISTO

PROFESSIONAL ENGINEER'S SEAL

Zero Harm — Leadership, No Incidents, Safe Behavior

ORIGINALLY PREPARED UNDER THE RESPONSIBLE SUPERVISION OF
PE: STATE:
LIC. NO.: DATE:

WorleyParsons resources & energy

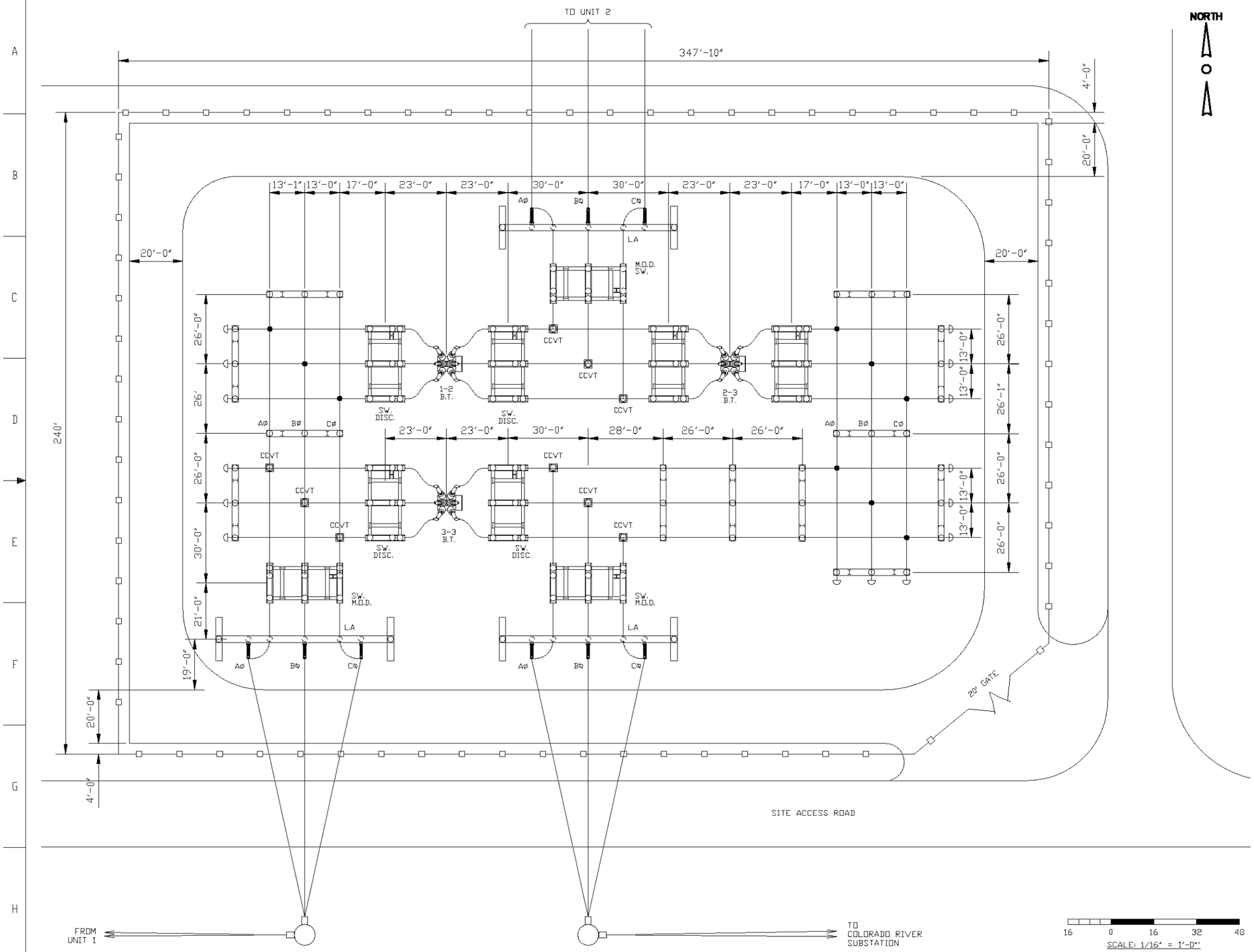
CLIENT/PROJECT TITLE
GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

CONCEPTUAL
230KV SWITCHYARD
ONE LINE DIAGRAM

SCALE: NONE
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-0-SK-662-206-001
REV: A

GENI-0-SK-662-206-001-RA.dwg
09-Oct-2009 13:59

FIGURE G - 1.1



NORTH

NOTES:

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REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH SPEC	PROJ ENGINEER	PROJECT MANAGER
A	11 05 09	ISSUED FOR REVIEW	SC	SR	PL	EP		JF CN

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PROJECT ENGINEERING MANAGER: J. FOSTER
PROJECT MANAGER: C. NITOFF

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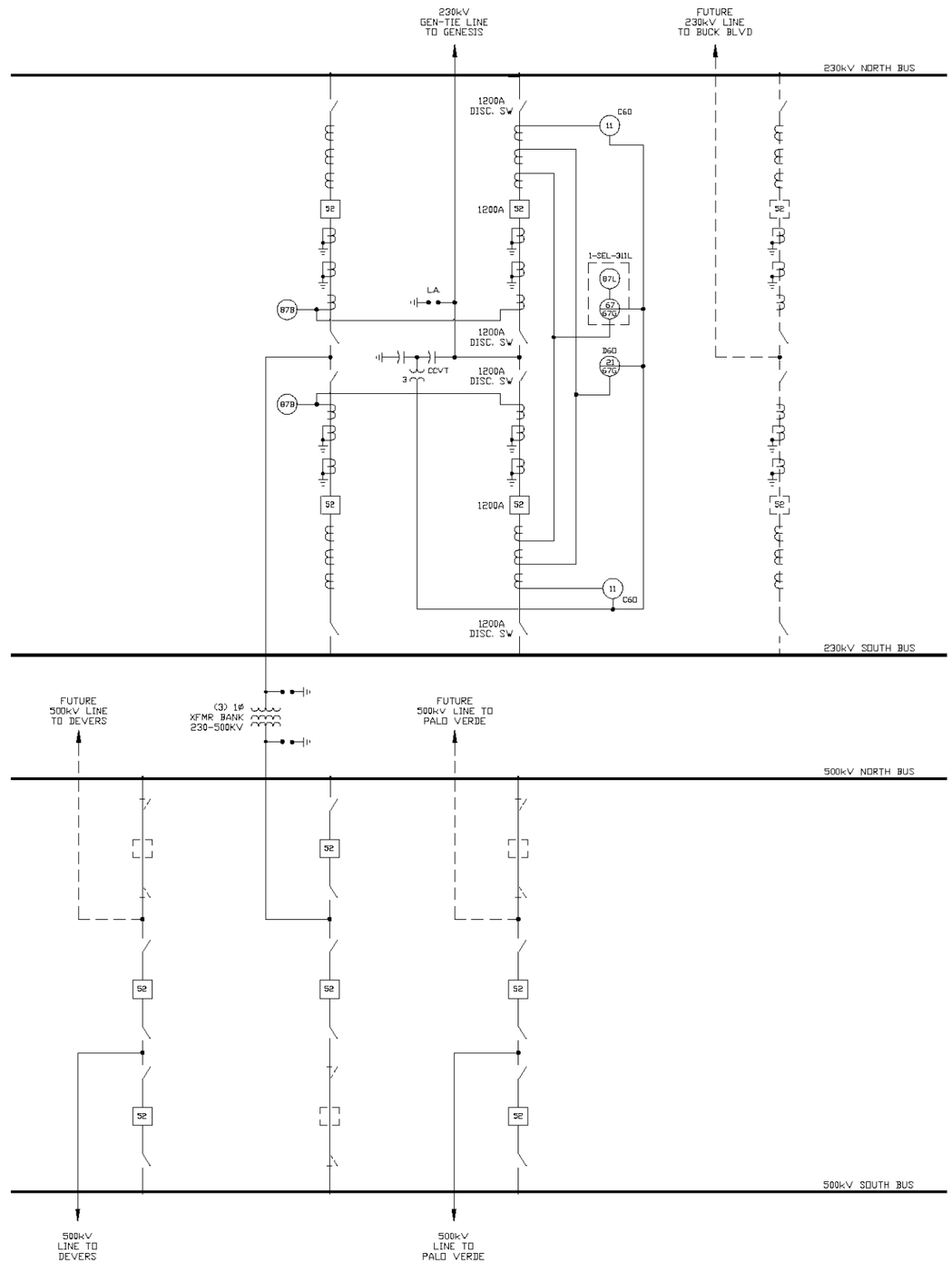
CLIENT/PROJECT TITLE
GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

CONCEPTUAL
GENERAL ARRANGEMENT
UNIT 2 230KV SWITCHYARD

SCALE 1/16"=1'-0" — DRAWING SIZE ARCH D (36" x 24")
WORLEYPARSONS DWG. NO. GENI-2-SK-661-201-001 — REV A

GENI-2-SK-661-201-001-RA.dwg
05-Oct-2009 - 14:46

FIGURE G - 1.2



NOTES

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A	11/25/09	ISSUED FOR REVIEW	SC	SR	PL	EP	EP	CN

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PROJECT MANAGER: C. NITOFF

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GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

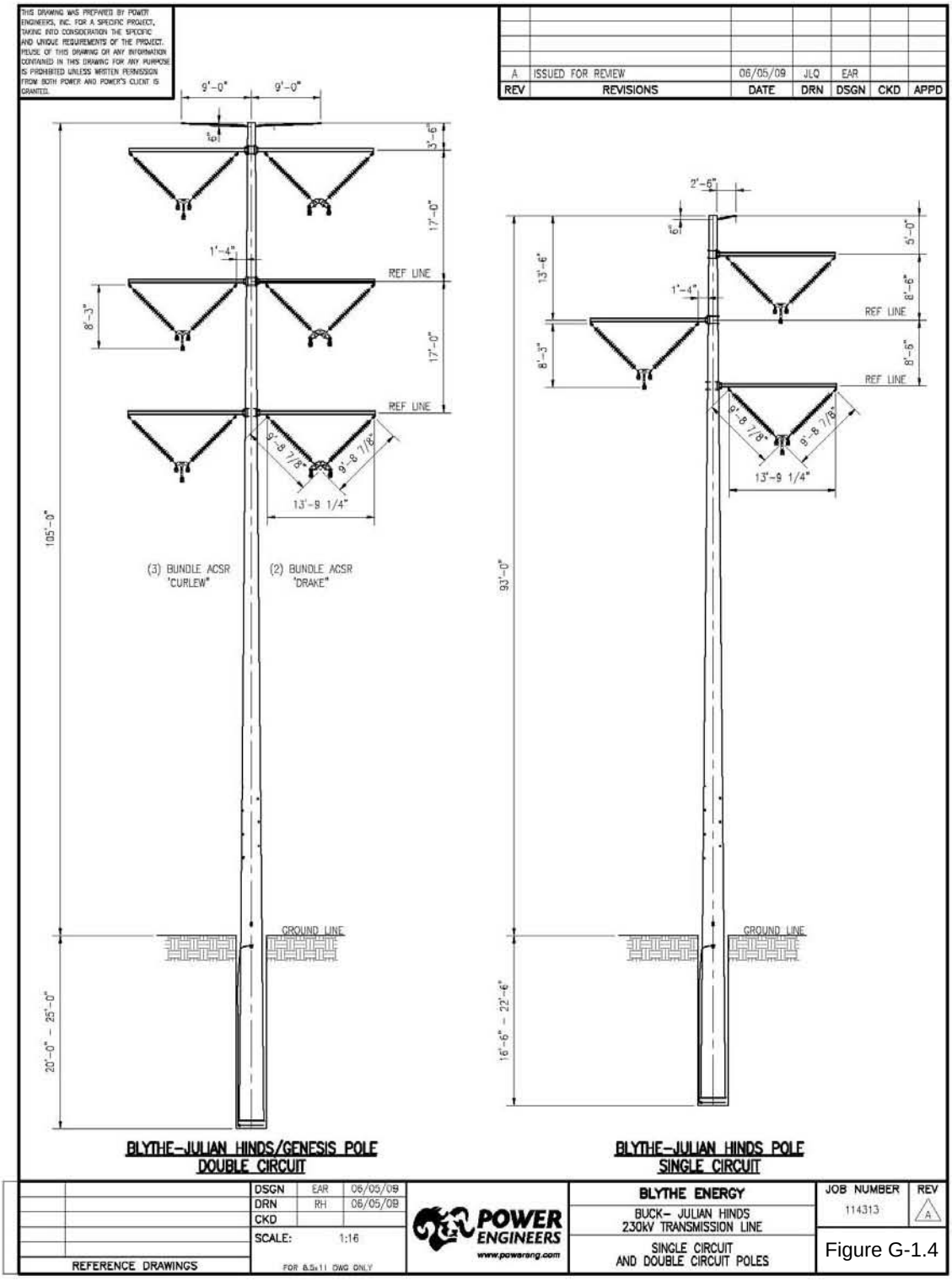
CONCEPTUAL
ONE LINE DIAGRAM
COLORADO RIVER SUBSTATION 230KV/500KV

SCALE: NTS
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-0-SK-662-206-002
REV: A

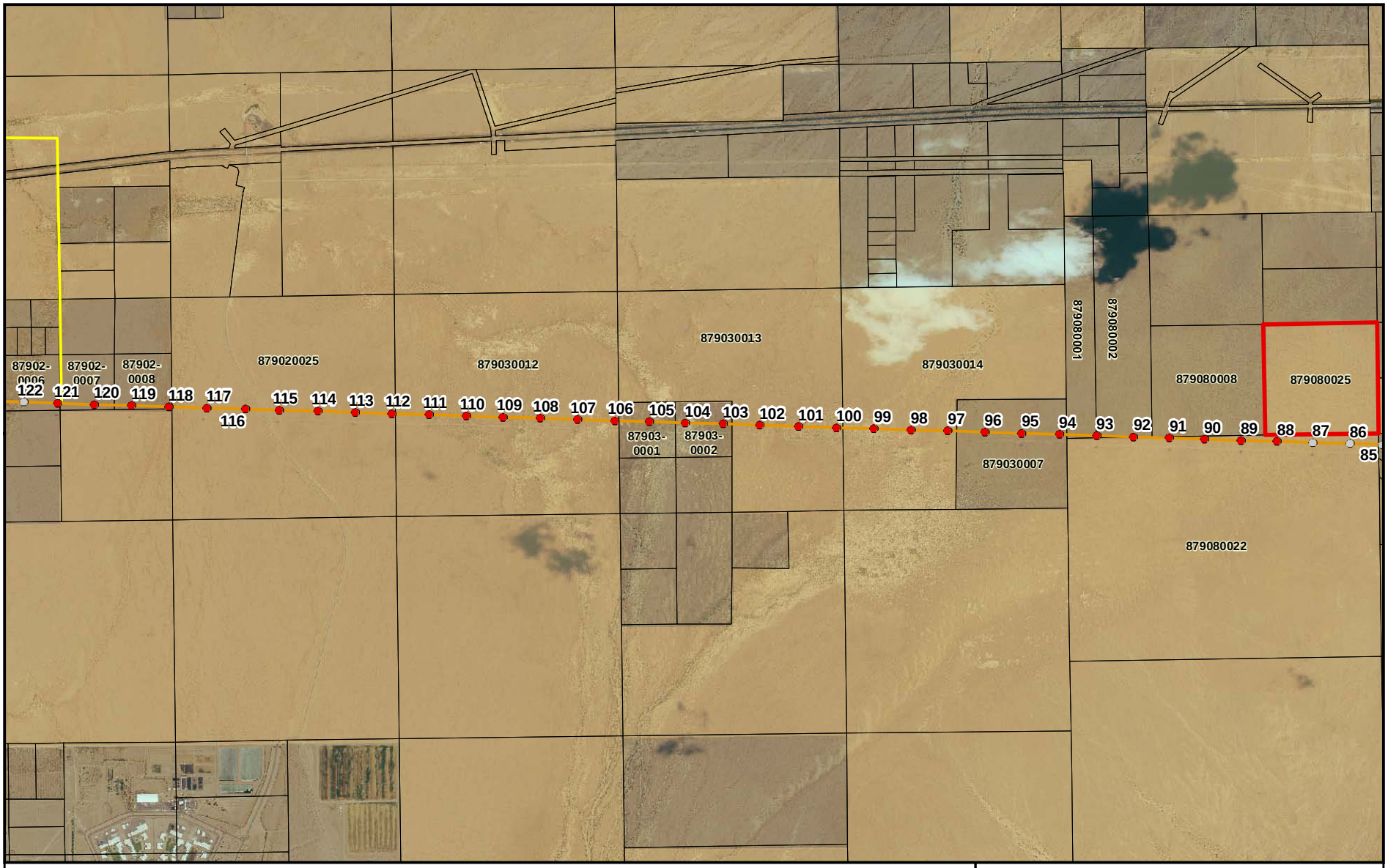
GENI-0-SK-662-206-002-RAdwg
05-Oct-2009 - 14:52

FIGURE G - 1.3

Figure G - 1.4 **Comparison of Existing and Replacement Structures.**



Source: Blythe Energy Project (99-AFC-8C)



Legend

- Blythe Structures for Replacement
- Blythe Structures
- Proposed Blythe Transmission Line
- Parcels
- Project Genesis Intertie Transmission Line
- Proposed Location of Colorado River Substation (SCE)
- Public Lands

Source: Riverside County, 2008.

N

0 1,000 2,000 4,000

Feet

TETRA TECH EC, INC.

Blythe Energy Project Transmission Line

Blythe Energy, LLC

Figure G - 1.5

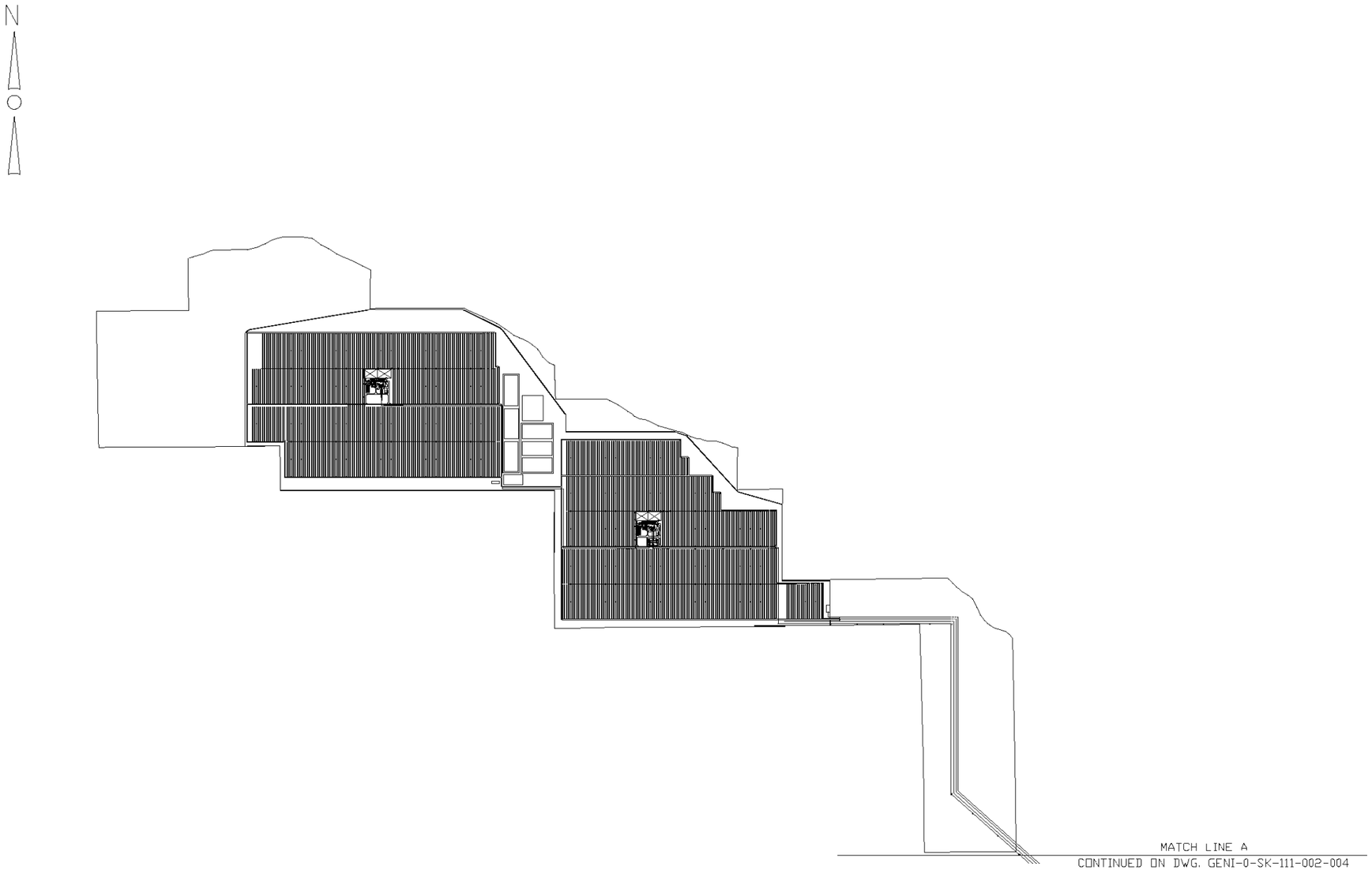
Overview of Proposed Structure Changes on the Blythe Energy Project Transmission Line

R:\projects_2005\fpl_blythe_tline\maps\InsigChange20090612\Figure2-3.mxd
Date: 6/16/2009

Source: Blythe Energy Project (99-AFC-8C)

NOTES:

1. NOT FOR CONSTRUCTION.
2. SEE GENI-0-SK-111-002-003 FOR LINEAR CROSS SECTION.



REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH SPEC	PROJECT ENGINEER	PROJECT MANAGER
C	10 Fl 09	SPLIT DRAWING INTO 2 SHEETS	PL	JH	PL	JH	JH	JF	CN
B	09 11 09	CHANGED FIGURE NUMBER	PL	JH	PL	JH	JH	JF	CN
A	08 11 09	ISSUED FOR INITIAL REVIEW	SC	JH	PL	JH	JH	JF	CN

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PROJECT MANAGER: C. NITOFF	

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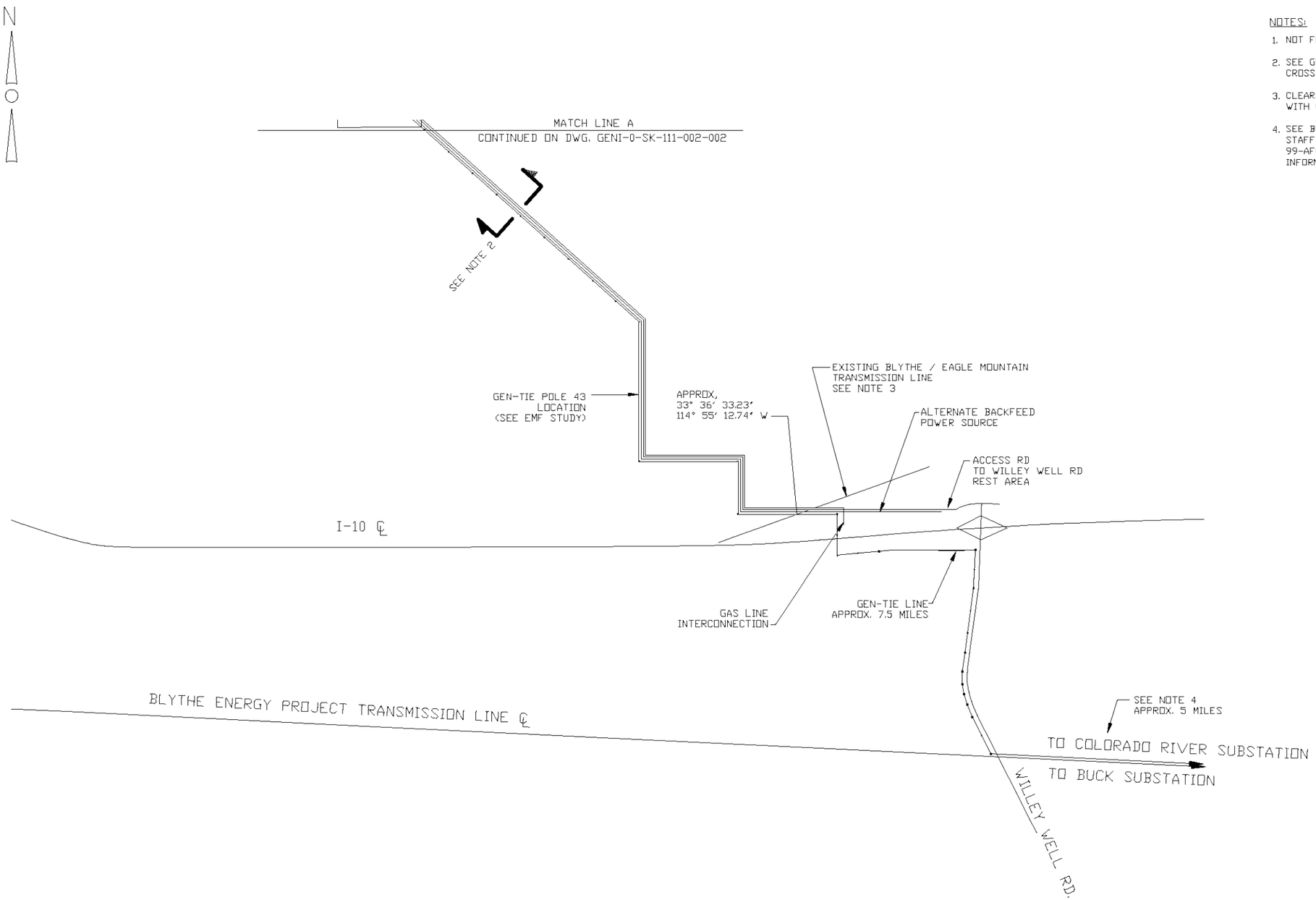
GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

GENERAL ARRANGEMENT
GEN-TIE AND GAS LINE ROUTE
FIGURE 3.6-1A

SCALE: NTS
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-0-SK-111-002-002
REV: C

GENI-0-SK-111-002-RC.dwg
05-Oct-2009 - 15:04



NOTES:

1. NOT FOR CONSTRUCTION.
2. SEE GENI-0-SK-111-002-003 FOR LINEAR CROSS SECTION.
3. CLEARANCE AT CROSSING WILL BE IN ACCORDANCE WITH CPUC G.O. 95 AND THE NESC.
4. SEE BLYTHE ENERGY PROJECT REQUEST FOR STAFF APPROVED PROJECT MODIFICATIONS 99-AFC-SC, FIGURE 2-3 & 2-4 FOR POLE INFORMATION.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/ TECH SPEC	PROJECT ENGINEER	PROJECT MANAGER
A	10 09 05	SPLIT DWG GENI-0-SK-111-002-002 AND ISSUED FOR REVIEW	SC	JH	PL	JH	JH	JF	CN

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PROJECT MANAGER: C. NITOFF

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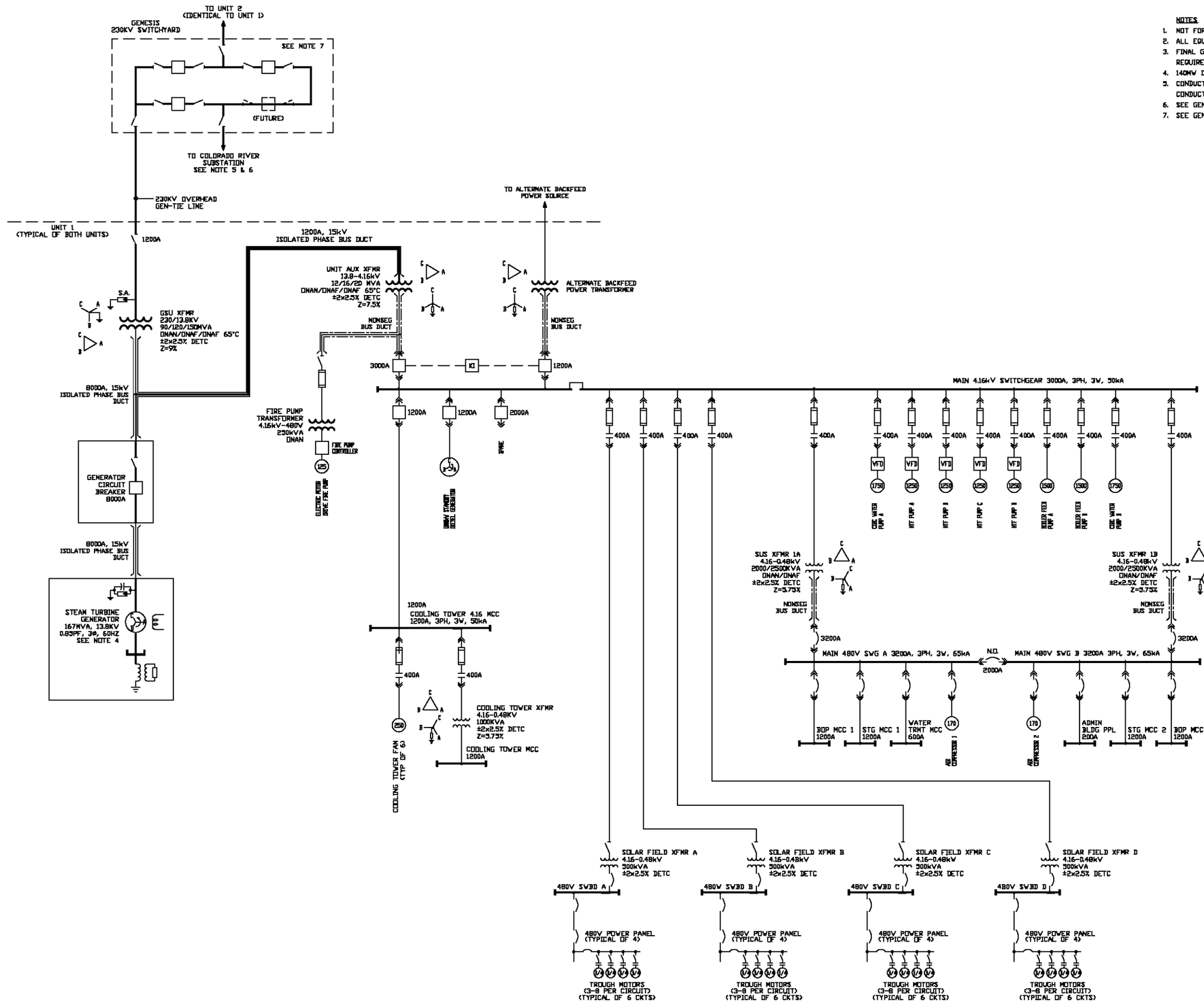
GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

GENERAL ARRANGEMENT
GEN-TIE AND GAS LINE ROUTE
FIGURE 3.6-1B

SCALE: NTS
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-0-SK-111-002-004
REV: A

GENI-0-SK-111-002-004-RA.dwg
05-Oct-2009 - 15:16



NOTES

1. NOT FOR CONSTRUCTION.
2. ALL EQUIPMENT SIZING IS PRELIMINARY AND SUBJECT TO CHANGE.
3. FINAL GSU VOLTAGE AND IMPEDANCE RATINGS TO BE CHOSEN TO MEET VAR FLOW REQUIREMENTS FOR SPECIFIC SITE.
4. 140MW IS THE MAXIMUM ESTIMATED OUTPUT FROM THE GENERATOR.
5. CONDUCTOR TYPE: (2) 795KCMIL (DRAKE)
   CONDUCTOR CAPACITY: (2) 907 AMP.
6. SEE GENI-0-SK-111-002-002 AND GENI-0-SK-111-002-004 FOR GEN-TIE ROUTE.
7. SEE GENI-0-SK-662-206-001 FOR ONE LINE DETAIL.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/ TECH SPECIALIST	PROJECT ENGINEER	PROJECT MANAGER
C	10/5/09	CHANGED 230KV SWITCHYARD ADDED NOTE 7	TZ	SR	PL	EP	JH	NC
B	10/15/09	CHANGED FIGURE NUMBER	PL	JH	PL	JH	JH	NC
A	10/14/09	ISSUED FOR REVIEW	PL	JH	PL	JH	JH	NC

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ENGINEER/TECH SPECIALIST: J. HODAPP
PROJECT ENGINEERING MANAGER:
PROJECT MANAGER: C. NITOFF

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CLIENT/PROJECT TITLE

GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT
(TYP. 1 OF 2 UNITS)

CONCEPTUAL
KEY ONE LINE DIAGRAM
FIGURE 3.4-7

SCALE: NONE
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-0-SK-623-206-001
REV: C

GENI-0-SK-623-206-001-NC.dwg
05-Oct-2009 13:53

California Independent
System Operator Corporation

August 5, 2009

Guillermo Narvaez
Transmission Business Manager
NextEra Energy Resources, LLC
700 Universe Boulevard
Juno Beach, FL 33408

Subject: Desert Center Blythe Generation Project Transition Cluster Phase I Interconnection Study

Dear Bill:

Attached is the amended Transition Cluster Phase I Interconnection Study Report for the interconnection of the proposed Desert Center Blythe Generation Project (Project) to the CAISO Controlled Grid. The CAISO and SCE performed the Phase I Interconnection Study in accordance with the CAISO's LGIP tariff.

Results of the Phase I Interconnection Study establish the maximum cost responsibility for Network Upgrades assigned to the Project in accordance with the CAISO's LGIP tariff. The cost for Network Upgrades assigned to the Project is $217,786,000 In addition, the study report provides a non-binding cost estimate of the Interconnection Facilities and Distribution System Upgrades to interconnect the Project to the CAISO Controlled Grid.

Please review the report and prepare comments and questions for the Results Meeting. The Phase I Interconnection Study Results Meeting will be coordinated and scheduled within 60 calendar days following receipt of this Phase I Interconnection Study report.

Sincerely,

Judy Brown
Project Manager

Attachment

via e-mail:
Guillermo Narvaez (Guillermo.Narvaez@nexteraenergy.com)
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CAISO via email:

Judy Brown (JBrown@caiso.com)
CAISO Regional Transmission South

Transition Cluster Phase I Interconnection Study

Generation Interconnection

NextEra Energy Resources

Desert Center Blythe Generation Project

Final Report

July 24, 2009

This study has been completed in coordination with
Southern California Edison per the Large Generator Interconnection Procedure

Confidential: Contains Critical Energy Infrastructure Information (CEII)

Table of Contents

1. Introduction 5
1.1 Grouping Interconnection Requests 5
1.2 Group Study Designation 5

2. Project Description 5
2.1 Point of Interconnection 5
2.2 Generation Requests within the Eastern Bulk System 10

3. Point of Interconnection Assessment 11
3.1 Original Point of Interconnection Request 11
3.2 Potential Alternatives to the Original Point of Interconnection Request 11

4. Study Results Related to Interconnection Facilities 11
4.1 Participating Transmission Owner Interconnection Facilities 11
4.2 Phase I Facilities Study Assumptions 12
4.3 Phase I Facilities Installed by SCE 12

5. Study Related to Network Upgrades 13

6. Study Related to Distribution Upgrades 13

7. Facilities Requirements and Cost Responsibility 13
7.1 PTO Interconnection Facilities 13
7.2 Distribution Upgrades 15
7.3 Reliability Network Upgrades 15
7.4 Delivery Network Upgrades 15

8. Estimated Construction Schedule 15

9. Other Study Assumptions and Responsibilities 15
9.1 Conceptual Plan of Service 15
9.2 Customer's Technical Data 15
9.3 Study Impacts on Neighboring Utilities 15
9.4 Use of SCE Facilities 15
9.5 SCE Interconnection Handbook 16
9.6 Western Electricity Coordinating Council (WECC) Policies 16
9.7 System Protection Coordination 16

Tables

Table 2.1 - Steam Turbine Generator Model (GENROU) 8
Table 2.2 - Steam Turbine Excitation System Model (EXST4B) 9
Table 2.3 - Steam Turbine Governor Model (TGOV1) 9
Table 2.4 - Steam Turbine Power System Stabilizer Model (PSS2A) 10
Table 7.1 - Summary of Cost Estimates 14

Figures

Figure 2.1 - Desert Center Blythe Generation Project POI Diagram 6
Figure 2.2 - Eastern Bulk System Google Earth Map 7

Appendices

Appendix A Group Network Analysis Report

Executive Summary

NextEra Energy Resources (NextEra) applied to the California Independent System Operator (CAISO) for interconnection of a new 500 MW solar steam generation facility deemed *Desert Center Blythe Generation Project* (Project). NextEra requested and paid for Interconnection Studies in accordance with Section 3.5.1 of Appendix Y of the CAISO LGIP Tariff. The CAISO assigned Queue Position 193 to the Project.

CAISO and Southern California Edison (SCE) assessed Next Era's original Point of Interconnection (POI) request to connect the Project to the Blythe-Julian Hinds 220 kV line. SCE concluded the original POI was not viable. A detailed discussion of the issues associated with the original POI is provided in *Section 3.1 Original Point of Interconnection Request.* Further analysis established that SCE Colorado River 500/220 kV[1] Substation was found to be superior to the original POI.

Following the May 5, 2009 meeting with CAISO, NextEra, and SCE, NextEra accepted the alternate POI as recommended. NextEra will build 12 miles of generation tie line to the new Colorado River 500/220 kV Substation. Consequently, the Project was modeled to connect to the Colorado River Substation located within the Eastern Bulk System.

The Eastern Bulk System constitutes a portion of the CAISO Controlled Grid whereby generation located within this area electrically affects other Interconnection Customer (IC) projects and SCE's transmission system. Consequently, while independent analysis was conducted on the Project, group network analysis was performed in relation to other interconnection projects located within the Eastern Bulk System. Details related specifically to the network analysis are provided in Appendix A.

Section 6.2 of Appendix Y of the CAISO LGIP Tariff requires SCE provide a good faith estimate on costs pertaining to the Project. Additionally, the Tariff states Network Upgrades are to be estimated as a maximum cost exposure for any network enhancements listed in the Phase I Study. Based on NextEra's requirements, SCE estimated the Project costs as follows:

Component	**Estimated Costs**
SCE Interconnection Facilities	$4,000,000
Reliability Network Upgrades	$56,617,000
Delivery Network Upgrades	$161,169,000
Distribution System Upgrades	$76,000
TOTAL ESTIMATED COST	**$221,862,000**

[1] Identification of facility voltages (220 kV) in this Phase I Study are shown consistent with SCE System Operating Bulletin 123. However, all studies were predicated on the base voltages reflected in the Western Electricity Coordinating Council (WECC) base cases. For the SCE bulk power system, the WECC base cases reflect 230 kV and 500 kV base voltages; consequently, all per-unit calculations presented were based on 230 kV and 500 kV voltages.

1. Introduction

NextEra applied to the CAISO for interconnection of a new 500 MW solar steam generation facility pursuant to Section 25 and Appendix Y of the CAISO Generation Interconnection Process Reform Amendment (Tariff) approved by FERC on September 26, 2008. The Project consists of two individual steam generation turbines.

1.1 Grouping Interconnection Requests

SCE's electrical system can be described as having one network system and three electrical radial systems. The one network system is comprised of the Metro Area (sometimes referred to as the Los Angeles Basin area). Generation interconnection applications requesting interconnections to facilities within the Metro Area are to be studied on a group basis if they electrically affect one another; otherwise they are to be studied on an individual basis (i.e. serial project). The three electrical radial systems consist of the Northern Bulk System, Eastern Bulk System, and the East of Lugo Bulk System. Generation interconnection applications requesting interconnections to facilities within one of the three electrical radial systems are to be studied on a group basis. However, these generalized groups are primarily used for organizational purposes and management of work load among the various ISO and SCE engineers performing the studies. For cost allocation purposes the Groups are determined by the study results. For example, for Delivery Network Upgrades the Groups are determined by the Deliverability Assessment Methodologies http://www.caiso.com/1c44/1c44b5c31cce0.html

1.2 Group Study Designation

Individually or in mutual agreement with the CAISO and SCE, NextEra indicated the Project would interconnect to a Colorado River 500/220 kV Substation located within the Eastern Bulk System. The Project will be studied on a cluster basis along with other similarly situated projects located in the Eastern Bulk System. Details related specifically to the Eastern Bulk System Network Analysis are provided in Appendix A.

2. Project Description

2.1 Point of Interconnection

The Desert Center Blythe Generation Project is to be connected by a radial 220 kV generation tie line (constructed, owned, maintained, and operated by the project developer) to the Colorado River 500/220 kV Substation where the transformation is triggered by the LGIP projects. The project developer proposes to utilize two individual GE steam turbines to produce a total of 500 MW. The voltage output of the generators will be 18 kV and each of the generators will be connected to a step up transformer which provides voltages at 220 kV.

This arrangement is shown next in Figure 2.1. Figure 2.2 provides the geographical point of connection for the Desert Center Blythe Generation Project.

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Figure 2.1
Desert Center Blythe Generation Project POI Diagram

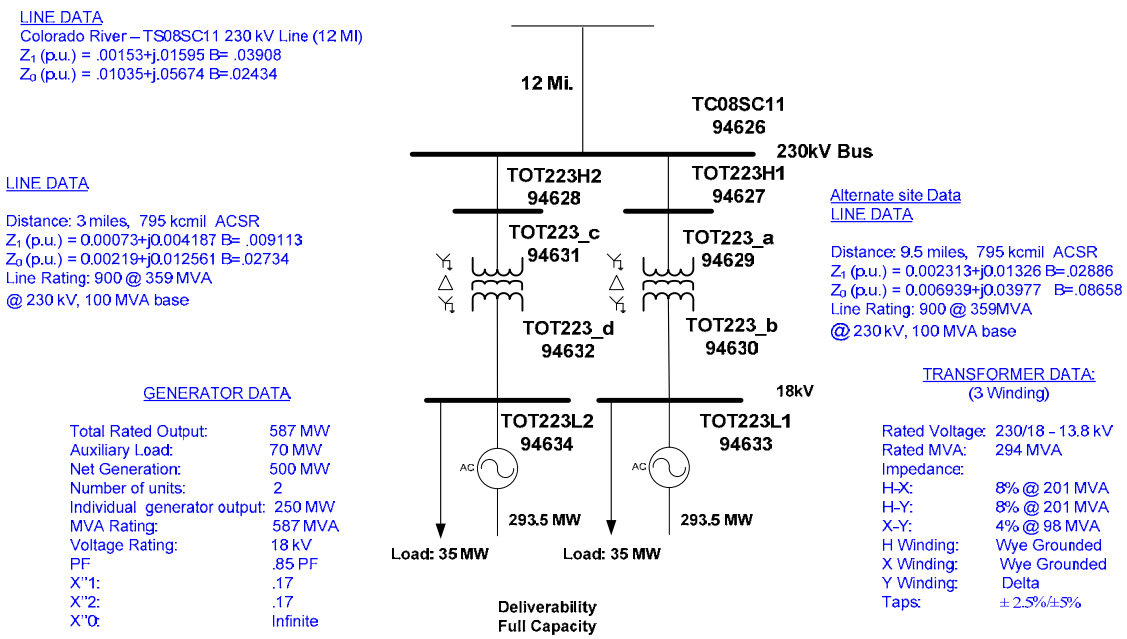

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Figure 2.2
Eastern Bulk System Google Earth Map
Desert Center Blythe Generation Project

Solar Thermal Trough Technology

The project includes a solar concentrating thermal power plant, based on parabolic trough technology. The parabolic trough is a solar thermal energy collector constructed as a long parabolic mirror. Each solar trough mirror will track the sun throughout the day and reflect concentrated solar energy to a receiver tube known as a Dewar tube, which runs the length of the parabolic trough. The receiver tube is filled with a heat transfer fluid, such as oil, which absorbs the concentrated sunlight and is used to heat steam in a standard turbine generator. The high temperature oil circulates through a heat exchanger to generate steam which is used to run a conventional steam turbine. Dynamics data used to represent the steam turbine generator in the GE PSLF Dynamic Software, as provided by the project developer, are shown below in Table 2.1 (generator), Table 2.2 (excitation system), Table 2.3 (governor), and Table 2.4 (power system stabilizer).

Table 2.1
Steam Turbine Generator Model (GENROU)

Variable	Value	Description
MVA	587.0	Generator MVA Base
Tpdo	6.310	D-axis transient rotor time constant, sec
Tppdo	0.0370	D-axis sub-transient rotor time constant, sec
Tpqo	0.507	Q-axis transient rotor time constant, sec
Tppqo	0.073	Q-axis sub-transient rotor time constant, sec
H	3.710	Inertia constant, sec
D	0.000	Damping factor, per-unit
Ld	1.772	D-axis synchronous reactance, per-unit
Lq	1.691	Q-axis synchronous reactance, per-unit
Lpd	0.258	D-axis transient reactance, per-unit
Lpq	0.454	Q-axis transient reactance, per-unit
Lppd	0.200	D-axis sub-transient reactance, per-unit
Lppq	0.200	Q-axis sub-transient reactance, per-unit
Ll	0.151	Stator leakage reactance, per-unit
S1	0.051	Saturation factor at 1.0 per-unit flux
S12	0.0462	Saturation factor at 1.2 per-unit flux
Ra	0.0025	Stator resistance, per-unit
Rcomp	0.000	Compounding resistance for voltage control, per-unit
Xcomp	0.000	Compounding reactance for voltage control, per-unit

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Table 2.2
Steam Turbine Excitation System Model (EXST4B)

Variable	Value	Description
Tr	0.000	Filter time constant, sec
Kpr	3.99	Proportional Gain, pu
Kir	3.99	Integral Gain, pu
Ta	0.01	Time constant, sec
Vrmax	1.0	Maximum control element output, pu
Vrmin	-0.870	Minimum control element output, pu
Kpm	1.0	Prop. Gain of field voltage regulator, pu
Kim	0.0	Integral Gain of field voltage regulator, pu
Vmmax	1.0	Maximum field voltage regulator output, pu
Vmmin	-0.870	Minimum field voltage regulator output, pu
Kg	0.00	Excitation limiter gain, pu
Kp	5.01	Potential source gain, pu
Angp	0.0	Phase angle of potential source, degree
Ki	0.0	Current source gain, pu
Kc	0.08	Exciter regulation factor, pu
Xl	0.0	P-bar leakage reactance, pu
Vbmax	6.27	Maximum excitation voltage

Table 2.3
Steam Turbine Governor Model (TGOV1)

Variable	Value	Description
R	0.050	Permanent droop, p.u.
T1	0.5	Steam bowl time constant, sec
Vmax	1.0	Maximum valve position, p.u. of mwcap
Vmin	0.0	Minimum valve position, p.u. of mwcap
T2	3.0	Numerator time constant of T2, T3 block, sec.
T3	10.0	Reheater time constant, sec.
Dt	0.0	Turbine damping coefficient, p.u.

Table 2.4
Steam Turbine Power System Stabilizer Model (PSS2A)

Variable	Value	Description
J1	1.0	Input signal #1 code
K1	0.0	Input signal #1 remote bus number
J2	3.0	Input signal #2 code
K2	0.0	Input signal #2 remote bus number
Tw1	2.0	First washout on signal #1, sec
Tw2	2.0	Second washout on signal #1, sec
Tw3	2.0	First washout on signal #2, sec
Tw4	0.0	Second washout on signal #2, sec
T6	0.0	Time constant on signal #1, sec
T7	2.0	Time constant on signal #2, sec
Ks2	0.35	Gain on signal #2
Ks3	1.0	Gain on signal #2
Ks4	1.0	Gain on signal #2
T8	0.5	Lead ramp tracking filter
T9	0.1	Lag ramp tracking filter
n	1.0	Order of ramp tracking filter
m	5.0	Order of ramp tracking filter
Ks1	10.0	Stabilizer gain
T1	0.25	Lead/lag time constant, sec
T2	0.04	Lead/lag time constant, sec
T3	0.20	Lead/lag time constant, sec
T4	0.03	Lead/lag time constant, sec
Vstmax	0.1	Stabilizer output max limit, per-unit
Vstmin	-0.1	Stabilizer output min limit, per-unit
a	1.0	Lead/lag num. gain (not in IEEE model)
Ta	0.0	Lead/lag time constant, sec (not in IEEE model)
Tb	0.0	Lead/lag time constant, sec (not in IEEE model)

2.2 Generation Requests within the Eastern Bulk System

High level detail and location of these generation resources are shown on Table 1-1 and Figure 1-1 of Appendix A.

3. Point of Interconnection Assessment

The assessment to identify the most viable POI was done by mutual agreement among the Interconnection Customer, CAISO and SCE. Conclusions drawn from the assessment typically considered multiple disciplines, including but not limited to engineering, operations, project permitting and licensing, land use, and ongoing transmission projects in this area. This was a preliminary assessment and was based on information at hand as well as best engineering judgment.

It should be acknowledged that any conclusions drawn in this Phase I Report related to a preferred POI should not be taken as the final recommendation. Many factors will likely influence the final selection of the POI as the Interconnection Request moves through planning and development processes.

3.1 Original Point of Interconnection Request

SCE performed an assessment to identify interconnection facilities that are required to tie in the Project to the Blythe-Julian Hinds 220 kV line. Based on information provided by NextEra in their Interconnection Request and known information about the geographic area surrounding the POI, SCE assessed the viability of the original POI. Based on this assessment, the original POI was not viable for the following reasons:

1. Low voltage at Julian Hinds Substation and MWD system. The mitigation for the low voltage problem would require expanding Julian Hinds Substation at an unreasonably high cost. The ability to expand Julian Hinds Substation is uncertain.

2. Base case overload on Julian Hinds-Mirage 220 kV line and Julian Hinds-Eagle Mountain 220 kV line. SCE is anticipating a high cost to rebuild those two lines because:

    a. the existing lines are not upgradable
    b. of the need to build new lines to keep the existing line in service during construction
    c. the rebuild is expected to delay the operating date

3. Base case and contingency overloads on MWD 220 kV lines. The mitigation for the overloads would require modification to the proposed SPS from previous projects. The modification of the SPS might put the Project at risk of reducing its MW output on a regular basis.

3.2 Potential Alternatives to the Original Point of Interconnection Request

From the information provided by NextEra in their Interconnection Request and known information about the geographic area surrounding the POI, SCE assessed potential alternatives to the original POI. Based on information at hand during this assessment, an alternative was found to be superior to the original POI request. The new POI is Colorado River 500/220 kV Substation.

Following the May 5, 2009 meeting with CAISO, NextEra, and SCE, NextEra accepted the alternate POI as recommended. NextEra will build 12 miles of generation tie line to the new Colorado River 500/220 kV Substation.

4. Study Results Related to Interconnection Facilities

4.1 Participating Transmission Owner Interconnection Facilities

SCE performed an assessment to identify PTO Interconnection Facilities required to connect the Desert Center Blythe Generation Project to Colorado River 500/220 kV Substation. Based on information provided by NextEra in their Interconnection Request and known information about the geographic area surrounding the POI, SCE identified the following interconnection facilities that need to be installed between the Point of Change of Ownership and the CAISO Controlled Grid:

4.2 Phase I Facilities Study Assumptions

4.2.A Assumptions Included in Phase I Study

1. SCE will install the additional telecommunications path from the generating facility to SCE Colorado River Substation as noted in Appendix A.
2. The last structure of the 220 kV generation tie line outside Colorado River Substation property line would be at a distance from the Substation switchyard that it requires one additional dead end structure and a total of two spans of line to reach the proposed 220 kV line position. SCE will install the additional structure and conductors between the last generator-owned structure and the Substation switchyard.
3. SCE will install the required revenue metering cabinet and retail load meters at the generating facility.
4. SCE will install the required remote terminal unit (RTU) at the generating facility.

4.2.B Assumptions NOT Included in Phase I Study

1. The Desert Center Blythe 220 kV generation tie line from the generating facility to the last structure outside SCE Colorado River Substation property line will be installed by the generator.
2. The 220 kV generation tie line must be equipped with optical ground wire (OPGW) to provide <u>one of the two</u> telecommunication paths required for the line protection scheme and SPS. The OPGW is an element of the generator-owned line.
3. All required CAISO metering equipment at the generating facility will be provided by the generator.
4. All required revenue metering equipment to meter the generating facility retail load will be specified by SCE and installed by the generator at their end of the 220 kV generation tie line.
5. The following 220 kV generation tie line protection and SPS relays to be installed at the generating facility will be specified by SCE and provided by the generator:
    a. *One G.E. D60 distance relay with dual dedicated digital channels to Colorado River Substation*
    b. *One SEL 311L current differential relay with dual dedicated digital channels to Colorado River Substation*
    c. *Two N60 relays (one each for SPS A and B) to trip the main generator breaker*
    d. *One SEL-2407 satellite synchronized clock*

4.3 Phase I Facilities Installed by SCE

A. Transmission

Desert Center 220 kV Generation Tie Line

Install one 220 kV dead end structure, two spans of conductors, OPGW and 12 dead end insulator / hardware assemblies between the last Desert Center structure and the Colorado River Substation dead end rack at the 220 kV switchyard.

B. Substation

Colorado River 500/220 kV Substation

Install the following interconnection facilities components of a new dedicated double breaker 220 kV line position to terminate the new 220 kV generation tie line.

- One dead end structure (60 ft. high x 45 ft. wide)
- Three 220 kV coupling capacitor voltage transformers
- Two GE C60 breaker management relays
- One GE D60 distance relay (digital communication channel)
- One SEL-311L line current differential relay (digital communication channel)

C. Metering Services Organization

Install a revenue metering cabinet and revenue meters required to meter the retail load at the generating facility. The generator will provide the required metering equipment (voltage and current transformers).

D. Power System Control

Install one RTU at the generating facility to monitor the typical generation elements such as MW, MVAR, terminal voltage, and circuit breaker status at each generating unit and the plant auxiliary load and transmit this information to the SCE Grid Control Center.

5. Study Related to Network Upgrades

Given that Desert Center Blythe Generation Project is part of the Eastern Bulk System, all Network Upgrade requirements were identified within that Group Study. The CAISO and SCE have identified Network Upgrades to deliver the power of the Project and to mitigate impacts on the SCE portion of the CAISO Controlled Grid caused by the Desert Center Blythe Generation Project. Details of these results are provided in Appendix A.

6. Study Related to Distribution Upgrades

Given that the Desert Center Blythe Generation Project is part of the Eastern Bulk System, all impacts related to the Distribution System were identified within the Group Study. This Group Study identified impacts to the Distribution System caused by Interconnection Requests connecting to the CAISO Controlled Grid and impacts on the SCE portion of the CAISO Controlled Grid caused by Interconnection Requests connecting to the Distribution System. Details of these results are provided in Appendix A.

7. Facilities Requirements and Cost Responsibility

The following facilities requirements and associated costs have been determined to be the responsibility of NextEra. The CAISO applied distribution factors to those transmission elements identified in Appendix A as Delivery Network Upgrades to determine Desert Center Blythe's share of the total cost responsibility.

7.1 PTO Interconnection Facilities

This Phase I Study identified the following interconnection facilities located between the Point of Change of Ownership and the CAISO Controlled Grid. For a description of the facilities, please refer to Section 4, *Study Related to Interconnection Facilities*. For cost information, please refer to *Table 7.1, Summary of Cost Estimates* located below.

Table 7.1
Summary of Cost Estimates

Desert Center-Blythe - T193

Interconnection Facilities Cost Estimate Summary (2009 Dollars)

Scope: Install All Direct Assignment Facilities to Interconnect 500MW of Generation to the CAISO Grid at the Colorado River Substation 220kV Bus.

No.	ELEMENT	INTERCONNECTION FACILITIES (Subject to ITCC)	ITCC ** (35%)	ONE-TIME PAYMENT
1	**Transmission**			
	220kV Gen Tie Segment into Colorado River Substation	$ 1,882,000	$ 659,000	$ 2,541,000
2	**Colorado River Substation**			
	220kV Gen Tie Line Drop incl. support structure and line protection elements	$ 682,000	$ 239,000	$ 921,000
3	**Metering Services**			
	Retail Metering Equipment at the Generation Facility	$ 12,000	$ 4,000	$ 16,000
4	**Power System Control**			
	RTU at Generation Facility	$ 91,000	$ 32,000	$ 123,000
5	**General Contractor**			
	Project Management	$ 267,000	$ 93,000	$ 360,000
	Totals	**$ 2,934,000**	**$ 1,027,000**	**$ 3,961,000**
				$ 4,000,000

This document includes confidential trade secrets and proprietary information of Southern California Edison, to be used only by the Interconnection Customer in connection with its evaluation of this Facility Study Proposal. Southern California Edison retains all rights to maintain the confidentiality of this information and requests the Interconnection Customer preserve its confidentiality.

* Pursuant to FERC Order 2003A, ITCC is not collected on Reliability Upgrades.
** ITCC cost (calculated at 35% based on Customer Operating Date after 2009) may be satisfied with a letter of credit in accordance with the tax provisions of the LGIA.

7.2 Distribution Upgrades

This Phase I Study identified Distribution Upgrades required to mitigate impacts on SCE's distribution system caused by the connection of and power deliveries from the Desert Center Blythe Project to the CAISO Controlled Grid. Details of these results are provided in Appendix A.

7.3 Reliability Network Upgrades

This Phase I Study identified Reliability Network Upgrades required to mitigate impacts on SCE's transmission system caused by the connection of and power deliveries from the Desert Center Blythe Project to the CAISO Controlled Grid. Details of these results are provided in Appendix A.

7.4 Delivery Network Upgrades

This Phase I Study identified Delivery Network Upgrades required to mitigate impacts on SCE's transmission system caused by the connection of and power deliveries from the Desert Center Blythe Project to the CAISO Controlled Grid. Details of these results are provided in Appendix A and Attachments 1 and 2 to Appendix A. Although this project is located in the Eastern Bulk System, it is identified that this project also contributes to some upgrades on parallel branches that are within CAISO's Controlled Grid. The associated costs of upgrades that this project contributes to are provided in Attachment 1 to Appendix A.

8. Estimated Construction Schedule

The estimated time to construct the required PTO's Interconnection Facilities, any Distribution Upgrades, Reliability Network Upgrades, and Delivery Network Upgrades will be provided in the Phase II Study. Given the magnitude of the Network Upgrades required to interconnect the generation, as requested in the Transition Cluster, the non-binding estimated date the PTO's interconnection facilities, network upgrades, and distribution upgrades will be completed as identified in the Phase I Study could take up to 96 months from execution of an LGIA to engineer, license, permit, and construct.

9. Other Study Assumptions and Responsibilities

9.1 Conceptual Plan of Service

The results provided in this Phase I study are based on conceptual engineering and a preliminary Plan of Service and are not sufficient for permitting of facilities. The Plan of Service is subject to change as part of the Phase II Interconnection Study.

9.2 Customer's Technical Data

Additional technical data related to the Interconnection Customer's project may be required as part of the Phase II Study. The study accuracy and results for the Phase I Study are contingent upon the accuracy of the technical data provided by the Interconnection Customer. Any changes from the data provided could void the study results.

9.3 Study Impacts on Neighboring Utilities

Results or consequences of this Phase I Study and/or to-be-performed Phase II Interconnection Study may require additional studies, facility additions, and/or operating procedures to address impacts to neighboring utilities and/or regional forums. For example, impacts may include but are not limited to WECC Path Ratings, Short Circuit Duties outside of the CAISO Controlled Grid, and Sub-Synchronous Resonance (SSR).

9.4 Use of SCE Facilities

The Interconnection Customer is responsible for acquiring all property rights necessary for the Interconnection Customer's Interconnection Facilities, including those required to cross SCE facilities and property. This Interconnection Study does not include the method or estimated cost to the Interconnection Customer of SCE mitigation measures that may be required to accommodate any proposed crossing of SCE facilities with Interconnection Customer's Interconnection Facilities. The use of SCE property rights shall

only be permitted upon written agreement between SCE and the Interconnection Customer. Any proposed use of SCE property rights may require a separate study and/or evaluation, at the Interconnection Customer's expense, to determine whether such use may be accommodated.

9.5 SCE Interconnection Handbook

The Interconnection Customer shall be required to adhere to all applicable requirements in the SCE Interconnection Handbook. These include, but are not limited to, all applicable protection, voltage regulation, VAR correction, harmonics, switching and tagging, and metering requirements.

9.6 Western Electricity Coordinating Council (WECC) Policies

The Interconnection Customer shall be required to adhere to all applicable WECC policies including, but not limited to, the WECC Generating Unit Model Validation Policy.

9.7 System Protection Coordination

Adequate Protection coordination will be required between SCE-owned protection and Interconnection Customer-owned protection. If adequate protection coordination cannot be achieved, then modifications to the Interconnection Customer-owned facilities (i.e., generation tie line or substation modifications) may be required to allow for ample protection coordination.

CAISO GIPR Transition Cluster Window
Phase I – Interconnection Study Report

Eastern Bulk System Group Network Analysis

APPENDIX A

July 24, 2009

This study has been completed in coordination with Southern California Edison per the Large Generator Interconnection Procedure

EXECUTIVE SUMMARY

Introduction

In accordance with Section 6.1 of Appendix Y of the CAISO LGIP Tariff, and in coordination with the applicable Participating Transmission Owner (PTO), the CAISO may study Interconnection Requests individually or in a Group Study for the purpose of conducting one or more of the analyses forming the Interconnection Studies.

The Eastern Bulk System constitutes a portion of the CAISO Controlled Grid whereby generation located within this area electrically affects other Interconnection Customer (IC) projects and SCE's transmission system with respect to the analysis being performed. Consequently, group network analysis was conducted jointly with other similar situated generation projects interconnecting to the Eastern Bulk System. Details related specifically to the Group Network Analysis for the Eastern Bulk System are provided in this report.

Details that relate uniquely to each individual Interconnection Request, including Point of Interconnection and Interconnection Facilities requirements are presented in the individual CAISO LGIP Transition Cluster Phase I Interconnection Study Report (Phase I Report).

Overall Network Upgrade Facilities Costs

Overall Network Upgrade costs include costs of all elements of the Plan of Service (POS) required for reliability and delivery purposes.

Total Network Cost Estimate for the Eastern Bulk System ***$2,538,356,000***

The cost breakdown in 2009 dollars for each Reliability Network Upgrade element and Delivery Network Upgrade element is provided in Table A below. The cost allocation on each individual project is given in the Attachment 1 to Appendix A.

Table A – Reliability Network Upgrades

1	Short Circuit Duty (SCD) Mitigation	$	35,546,000
2	Devers SPS	$	392,000
3	Devers-Mirage SPS	$	784,000
4	East of Colorado River SPS	$	7,959,000
5	East of Colorado Loop-in	$	24,639,000
6	Colorado River New Transformer	$	48,625,000
7	Plan of Service Network Upgrades	$	440,817,000
	TOTAL		**$558,760,000**

Table B – Delivery Network Upgrades

1	West of Devers 220 kV Upgrades	$	217,614,000
2	Colorado River Substation	$	49,504,000
3	Red Bluff Collector Station	$	49,367,000
4	Serrano-Valley Upgrade	$	750,605,000
5	West of Colorado River Upgrade	$	882,427,000
	TOTAL		**$1,949,517,000**

Table C – Distribution Network Upgrades

1	Short Circuit Duty (SCD) Mitigation	$	1,478,000
2	Substation Light and Power (SL&P)	$	28,600,000
	TOTAL	**$**	**30,078,000**

Network Upgrades Not Included in this Phase I Report

The reliability assessment was performed by SCE and the deliverability assessment was performed by the ISO. These two studies were closely coordinated and overall direction was provided by the ISO. SCE identified the potential need for additional network upgrades in the reliability assessment considered in the Phase I study but they were not included in the Reliability Network Upgrades or the Delivery Network Upgrades described in the Tables above. This is because Delivery Network Upgrades are determined by the deliverability assessment based on the Deliverability Assessment Methodologies posted on the ISO web-site, and because the ISO determined that sufficient justification of reliability need, or sufficient definition of scope, was not found as part of the Phase I study.

Certain elements of these upgrades may still be identified as part of the overall plan of service for the Eastern Bulk System during the Phase II study which will be performed in conjunction with the ISO Transmission Planning Process.

Overall Network Upgrade Development Schedule

The estimated time to construct the required PTO's Interconnection Facilities, any Distribution Upgrades, Reliability Network Upgrades, and Delivery Network Upgrades will be provided in the Phase II Study. Given the magnitude of the Network Upgrades required to interconnect the generation in the Transition Cluster, the non-binding estimated date the PTO's interconnection facilities, network upgrades, and distribution upgrades will be completed as identified in the Phase I Study could take as long as 96 months from execution of an LGIA to engineer, license, procure, and construct. This timeframe is subject to the availability of resources.

1. Grouping Interconnection Requests

1.1 Description of Transition Clusters

In accordance with Section 6.1 of Appendix Y to the CAISO LGIP Tariff, an Interconnection Request may be studied individually or in a Group Study for the purpose of conducting one or more of the analyses forming the Interconnection Studies. SCE's electrical system can be described as having one network system and three electrical radial branch groups. The one network system is comprised of the Metro Area or sometimes referred to as the LA Basin area. The three electrical radial branch groups consist of the Northern Bulk system, the East of Lugo Bulk System and the Eastern Bulk System.

Generation interconnection applications requesting interconnections to facilities within the Metro Area are to be studied on a group basis if they electrically affect one another; otherwise they are to be studied on an individual basis (i.e. group of one). Generation interconnection applications requesting interconnections to facilities within one of the three electrical radial branch groups are to be studied on a group basis.

For cost allocation purposes the Groups are determined by the study results. For example, for Delivery Network Upgrades the Groups are determined by the Deliverability Assessment Methodologies.

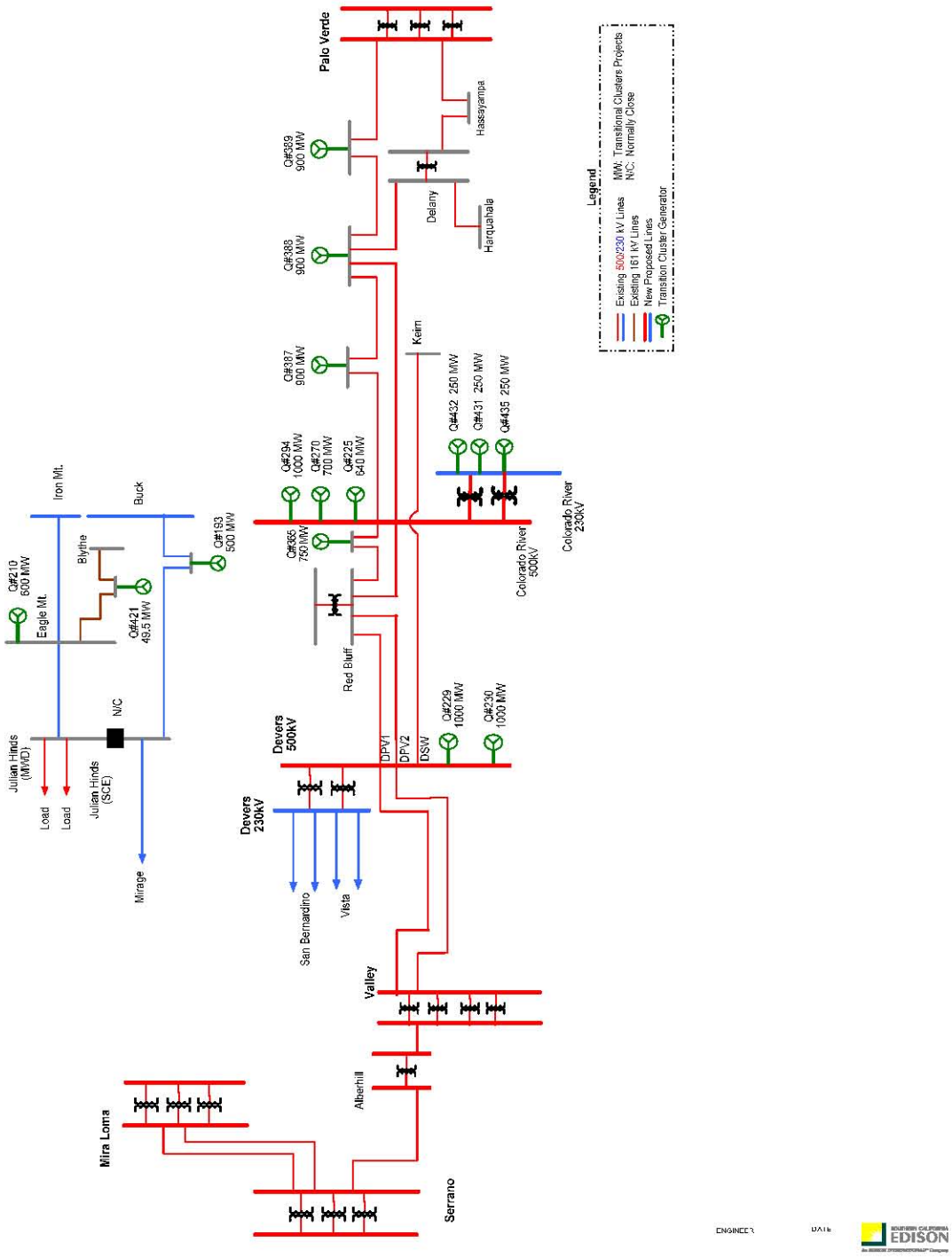
1.2 Transition Cluster Phase I Interconnection Study

These Transition Cluster Phase I Interconnection Group Studies are being conducted for the Eastern Bulk System, which in aggregate include 15 generation projects representing a total of 9,690 MW of generation capacity. High level details and locations of these generation resources are shown on Table 1.1 and Figure 1.1, respectively.

Table 1.1
Eastern Bulk System Cluster Window

CAISO Queue Position	Resource Type	Size (MW)	Interconnection Type
CAISO Queue #193	Solar Project	500	Full Capacity
CAISO Queue #210	Photovoltaic Project	600	Full Capacity
CAISO Queue #225	Natural Gas Project	640	Full Capacity
CAISO Queue #229	Solar Project	1000	Full Capacity
CAISO Queue #230	Solar Project	1000	Full Capacity
CAISO Queue #270	Photovoltaic Project	700	Full Capacity
CAISO Queue #294	Solar Project	1000	Full Capacity
CAISO Queue #365	Solar Project	750	Full Capacity
CAISO Queue #387	Solar Project	900	Energy Only
CAISO Queue #388	Solar Project	900	Energy Only
CAISO Queue #389	Solar Project	900	Energy Only
CAISO Queue #421	Solar Project	49.5	Full Capacity
CAISO Queue #431	Solar Project	250	Full Capacity
CAISO Queue #432	Solar Project	250	Full Capacity
CAISO Queue #435	Solar Project	250	Full Capacity
Total Phase I Cluster		**9689.5MW**	

Figure 1.1
Transition Cluster Eastern Bulk System Diagram –
Originally Proposed POIs



2. Study Scope and Purpose

In accordance with Section 6.2 of Appendix Y to the CAISO LGIP Tariff, this group analysis is to follow the scope and purpose as stated below.

> "The Phase I Interconnection Study shall (i) evaluate the impact of all Interconnection Requests received during the Queue Cluster Window on the CAISO Controlled Grid, (ii) preliminarily identify all Network Upgrades needed to address the impacts on the CAISO Controlled Grid of the Interconnection Requests, (iii) preliminarily identify for each Interconnection Request required Interconnection Facilities, (iv) assess the Point of Interconnection selected by each Interconnection Customer and potential alternatives to evaluate potential efficiencies in overall transmission upgrades costs, (v) establish the maximum cost responsibility for Network Upgrades assigned to each Interconnection Request in accordance with LGIP Section 6.3, and (vi) provide a good faith estimate of the cost of Interconnection Facilities for each Interconnection Request.
>
> The Phase I Interconnection Study will consist of a short circuit analysis, a stability analysis to the extent the CAISO and applicable Participating TO(s) reasonably expect transient or voltage stability concerns, a power flow analysis, including off-peak analysis, and an On-Peak and Off-Peak Deliverability Assessment(s), as applicable, in accordance with LGIP Section 6.3.2. The Phase I Interconnection Study will state for each Group Study or Interconnection Request studied individually (i) the assumptions upon which it is based, (ii) the results of the analyses, and (iii) the requirements or potential impediments to providing the requested Interconnection Service to all Interconnection Requests in a Group Study or to the Interconnection Request studied individually. The Phase I Interconnection Study will provide, without regard to the requested Commercial Operation Dates of the Interconnection Requests, a list of Network Upgrades to the CAISO Controlled Grid that are preliminarily identified as required as a result of the Interconnection Requests in a Group Study or as a result of any Interconnection Request studied individually and Participating TO's Interconnection Facilities associated with each Interconnection Request, and an estimate of any other financial impacts (i.e., on Local Furnishing Bonds)."

3. Cost Allocation of Network Upgrades

In accordance with Section 6.3 of Appendix Y to the CAISO LGIP Tariff, the method for allocating costs of Network Upgrades to specific Interconnection Customers in the Phase I Study is stated below.

> "The CAISO, in coordination with the applicable Participating TO(s), will perform short circuit and stability analyses for each Interconnection Request either individually or as part of a Group Study to preliminarily identify the Reliability Network Upgrades needed to interconnect the Large Generating Facilities to the CAISO Controlled Grid. The CAISO, in coordination with the applicable Participating TO(s), shall also perform power flow analyses, under a variety of system conditions, for each Interconnection Request either individually or as part of a Group Study to identify Reliability Criteria violations, including applicable thermal overloads, that must be mitigated by Reliability Network Upgrades.
>
> The cost of all Reliability Network Upgrades identified in the Phase I Interconnection Study shall be estimated in accordance with LGIP Section 6.4. The estimated costs of Reliability Network Upgrades identified as a result of an Interconnection Request studied separately shall be assigned solely to that Interconnection Request. The estimated costs of Reliability Network Upgrades identified through a Group Study shall be assigned to all Interconnection Requests in that Group Study pro rata on the basis of the maximum megawatt electrical output of each proposed new Large Generating Facility or the amount of megawatt increase in the generating capacity of each existing Generating Facility as listed by the Interconnection Customer in its Interconnection Request."

Also, in accordance with Section 6.4 of Appendix Y to the CAISO LGIP Tariff, unit costs were developed and provided the basis for preparing cost estimates for Network Upgrades as stated below.

> "Prior to the commencement of the initial Queue Cluster Window for each calendar year, each Participating TO, under the direction of the CAISO, shall publish per unit costs for facilities generally required to interconnect Generation to their respective systems. These per unit costs shall reflect the anticipated cost of procuring and installing such facilities during the current Interconnection Study Cycle, and may vary among Participating TOs and within a PTO Service Territory based on geographic and other cost input differences, and should include an annual adjustment for the following ten (10) years to account for the anticipated timing of procurement to accommodate a potential range of Commercial Operation Dates of Interconnection Requests in the Interconnection Study Cycle. The per unit costs will be used to develop the cost of Reliability Network Upgrades, Delivery Network Upgrades and Participating TO's Interconnection Facilities under this LGIP Section 6."

4. Study Procedures

In accordance with Section 6.6 of the CAISO LGIP Tariff, Phase I Interconnection studies were conducted following the procedures stated below.

> "The CAISO shall coordinate the Phase I Interconnection Study with applicable Participating TO(s) pursuant to LGIP Section 3.2 and any Affected System that is affected by the Interconnection Request pursuant to LGIP Section 3.7. Existing studies shall be used to the extent practicable when conducting the Phase I Interconnection Study. The CAISO will coordinate Base Case development with the applicable Participating TOs to ensure the Base Cases are accurately developed. The CAISO shall use Reasonable Efforts to complete and publish to Interconnection Customers the Phase I Interconnection Study report at a maximum within two hundred seventy (270) calendar days after the close of the Queue Cluster Window and approximately one hundred eighty calendar days after the final Scoping Meeting held for the Interconnection Study Cycle; however, each individual study or Group Studies may be completed prior to this maximum time where practicable based on factors, including, but not limited to, the number of Interconnection Requests in the Queue Cluster Window, study complexity, and reasonable availability of subcontractors as provided under LGIP Section 13.2. The CAISO will share applicable study results with the applicable Participating TO(s) for review and comment and will incorporate comments into the study report. The CAISO will issue a final Phase I Interconnection Study report to the Interconnection Customer. At the time of completion of the Phase I Interconnection Study, the CAISO may, at the Interconnection Customer's request, determine whether the provisions of LGIP Section 7.6 apply.
>
> At any time the CAISO determines that it will not meet the required time frame for completing the Phase I Interconnection Study due to the large number of Interconnection Requests in the Queue Cluster Window, study complexity, or unavailability of subcontractors on a reasonable basis to perform the study in the required time frame, the CAISO shall notify the Interconnection Customers as to the schedule status of the Phase I Interconnection Study and provide an estimated completion date with an explanation of the reasons why additional time is required.
>
> Upon request, the CAISO shall provide the Interconnection Customer all supporting documentation, workpapers and relevant pre-Interconnection Request and post- Interconnection Request power flow, short circuit and stability databases for the Phase I Interconnection Study, subject to confidentiality arrangements consistent with LGIP Section 13.1."

5. Classification of Network Upgrades as Reliability or Deliverability

In the performance of power flow, post-transient, or stability studies, if network upgrades are found to be needed, the following are the CAISO guidelines used for classifying reliability and delivery network upgrades.

1. **Reliability Network Upgrades** are transmission facilities at or beyond the point of interconnection "necessary to interconnect" the generation in order to remedy short circuit or stability problems, or thermal overloads. However, they shall only be deemed necessary for thermal overloads, occurring under any system condition, where such thermal overloads cannot be adequately mitigated through Congestion Management, Operating Procedures, or Special Protection Systems based on the characteristics of the Large Generating Facilities included in the Interconnection Studies, limitations on market models, systems, or information, or other factors specifically identified in the Interconnection Studies. Reliability Network Upgrades also include, consistent with WECC practice, the facilities necessary to mitigate any adverse impact the Large Generating Facility's interconnection may have on a path's WECC rating. [CAISO Tariff Definition]

2. **Delivery Network Upgrades** are transmission facilities at or beyond the Point of Interconnection, other than Reliability Network Upgrades, identified in the Interconnection Studies **to relieve Constraints on the CAISO Controlled Grid**. [CAISO Tariff Definition]

3. Network upgrades necessary to interconnect the generation and inject a particular generation project's full output into the grid under favorable system dispatch conditions are Reliability Network Upgrades. Favorable system dispatch conditions can include counterflows and reasonable displacement of other local generation.

4. Network upgrades necessary to deliver the projects output under system dispatch conditions consistent with the CAISO's Deliverability Assessment Methodologies are Delivery Network Upgrades.

5. Low cost (e.g., less than $1 million) network upgrades identified under system dispatch conditions more stressed than the CAISO's Deliverability Assessment Methodologies are Reliability Network Upgrades. This is because overburdening the CAISO's congestion management system can increase processing time to a point that could create reliability concerns.

6. Network upgrades necessary to mitigate stability problems caused by delivering generation under system dispatch conditions consistent with the CAISO's Deliverability Assessment Methodologies, and are not Reliability Network Upgrades identified in item 3 above, are Delivery Network Upgrades.

6. Study Conditions and Assumptions

6.1 Master and Study Level Power Flow Cases

Two master power flow base cases (Master Cases) representing on-peak and off-peak conditions were developed as the starting point for the Transition Cluster Phase I Interconnection Study based on the 5-year base case developed for the 2009 SCE Transmission Reliability Assessment and Compliance Plan. These two Master Cases included all load, generation, transmission and critical path flow assumptions to reflect accurately the entire SCE grid in the year and season of interest. From these two Master Cases, study level power flow base cases (Study Cases) for each Individual and Group Study area were developed in accordance with Interconnection Requests that entered the Transition Cluster Window. Generation entering in the

Transition Cluster through the CAISO LGIP and the SCE Wholesale Distribution Access Tariff (WDAT) Clustering Large Generation Interconnection Procedures (CLGIP) process were modeled. Refinements were made to the Master Case to create each Study Case to more accurately evaluate the individual generator or group of generators within their respective local or regional electrical area.

However, generation and transmission projects with lead times longer than 5 years were included in the base cases. Further refinements were made to the Master Cases to create study cases to more accurately evaluate the individual generator or group of generators within their respective study group area and sub area. Full Deliverability generation units were modeled on line at full rated nameplate MW capacity. In general, as the aggregate generation MW output within a study group area and sub area were dispatched, generation in PG&E, SCE and SDG&E areas were reduced to balance loads and resources. Though a target dispatch to PG&E, SCE and SDG&E was on a traditional planning assumption split of 50%, 43% and 7%, respectively, not all base cases were able to achieve these target levels. The bulk power study considered two load conditions: 2013 heavy summer and 2013 Light Spring load conditions.

The interconnection customer requested Energy-Only for three projects in the East of Colorado River Sub Area. As a result, the Projects were modeled but not dispatched in the base cases as directed by the CAISO. However, the interconnection of the projects will result in the inability to utilize the existing series capacitor thereby adversely impacting existing WECC Path ratings (Path 46 and Path 49). The reason for such impact is due to the fact that the interconnection results in relatively short line segment distances that create significant protection coordination issues.

Such impact will have to be evaluated through the established WECC Regional Planning Forum, such as the WATS Committee which includes APS, SRP, LADWP, WAPA, IID, SDG&E, NPC, etc. Studies performed as part of these WECC Regional Planning Forums may identify the need for additional transmission upgrades that are attributed to these Energy-Only projects but that are not defined in this Phase 1 Study. Any such system upgrades will be categorized as reliability upgrades required to mitigate impacts on established WECC Path Ratings.

Heavy summer and localized light load study assumptions are provided below in Tables 6.1 and Table 6.2 respectively.

Table 6.1
Heavy Summer Load (MW) Assumptions

SUBSTATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Alamitos 220/66	194	191	191	191	192	192	190	191	192	192
Alberhill 500/115	0	0	0	251	259	264	280	289	300	310
Antelope 220/66	693	709	726	741	759	777	794	812	829	852
Auld 500/115	0	0	0	0	0	0	0	0	596	608
Bailey 220/66	143	153	164	175	187	199	211	223	234	249
Barre 220/66	796	797	793	796	801	812	815	822	828	839
Big Creek 220/220	11	11	11	11	11	11	11	11	11	11
Blythe (Walc) 161/33	60	60	61	62	62	63	64	65	66	67
Camino 220/66	2	2	2	2	2	2	2	2	2	2
Center 220/66	491	488	490	494	499	502	506	509	514	517
Chevmain 220/66	167	167	167	167	167	167	167	167	167	167
Chino 220/66	732	848	869	886	903	921	927	932	944	958
Cima 220/66	3	3	3	3	3	3	3	3	3	3
Del Amo 220/66	486	480	481	480	485	488	496	501	503	505
Devers 220/115	716	341	350	358	368	378	387	401	411	422
Eagle Mountain 220/66	2	2	2	2	2	2	2	2	2	2
Eagle Rock 220/66	218	222	226	230	236	246	253	257	260	266
El Casco 220/115	0	208	215	219	233	241	249	257	265	274
El Dorado 220/115	13	13	13	13	13	13	13	13	13	13
El Nido 220/66	423	427	436	436	439	437	439	442	443	446
Ellis 220/66	686	689	712	717	727	729	736	744	749	757
Etiwanda 'Ameron' 220/66	18	18	18	18	18	18	18	18	18	18
Etiwanda 220/66	743	751	757	788	809	829	845	873	887	908
Goleta 220/66	299	297	296	296	297	298	299	301	302	303
Goodrich 220/33 (City of Pasadena)	309	307	306	306	308	309	312	314	315	316
Gould 220/66	139	139	142	145	147	150	152	154	156	159
Hinson 220/66	481	476	473	472	472	474	474	476	477	479
Inyokern 220/115	30	31	32	37	38	39	40	41	42	44
Johanna 220/66	473	489	512	529	581	584	586	592	597	615
Kramer 220/115	191	194	197	200	204	207	209	212	215	219
La Cienega 220/66	521	522	525	526	529	533	535	538	541	545
La Fresa 220/66	711	703	699	698	699	705	706	709	713	713
Laguna Bell 220/66	479	477	478	481	485	490	494	500	505	509
Lewis 220/66 (City of Anaheim)	565	564	565	571	588	597	606	619	628	636
Lighthipe 220/66	492	489	489	489	491	494	496	498	501	502
Mesa 220/66	648	654	650	651	658	657	663	669	675	678
Mira Loma 220/66	699	604	614	625	638	647	666	687	703	718
Mirage 220/115	0	488	496	505	516	527	538	544	555	565
Moorpark 220/66	854	866	872	879	885	895	903	914	920	930
Olinda 220/66	388	387	389	394	396	401	407	416	424	430
Padua 220/66	690	686	684	683	686	696	704	713	720	724
Rector 220/66	770	785	793	810	836	849	482	494	505	515
Rio Hondo 220/66	739	738	738	739	742	748	750	757	762	765
San Bernardino 220/66	662	666	672	684	689	696	712	724	705	712
San Joaquin 220/66	0	0	0	0	0	0	424	435	444	453
Santa Clara 220/66	608	617	626	636	646	655	662	672	681	693
Santiago 220/66	796	851	876	897	920	945	963	685	695	703
Saugus 220/66	827	843	990	1011	1037	1057	1076	1099	1122	1142
Springville 220/66	299	298	307	307	308	323	328	334	339	345
Valley 500/115	1820	1864	1912	1712	1758	1806	1839	1886	1331	1360
Vestal 220/66	180	181	182	183	183	185	186	188	190	192
Victor 220/115	493	500	504	513	524	535	545	556	567	577
Viejo 220/66	382	388	390	393	397	402	406	672	679	685
Villa Park 220/66	763	768	763	766	728	734	736	735	739	739
Vista 220/115	362	248	260	252	256	264	267	271	278	282
Vista 220/66	728	732	736	538	549	562	574	587	630	648
Walnut 220/66	723	712	706	709	710	712	715	720	725	726
Wilderness 220/66 (City of Riverside)	0	0	0	296	296	298	298	300	301	301
TOTALS	**24718**	**25144**	**25560**	**25974**	**26372**	**26768**	**27160**	**27545**	**27921**	**28308**

Table 6.2
Localized Light Load (MW) Assumptions

SUBSTATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Alamitos 220/66	119	117	117	117	118	118	116	117	118	118
Alberhill 500/115	0	0	0	154	159	162	172	177	184	190
Antelope 220/66	425	434	445	454	465	476	487	498	508	522
Auld 500/115	0	0	0	0	0	0	0	0	365	373
Bailey 220/66	88	94	100	107	115	122	129	136	144	153
Barre 220/66	488	489	486	488	491	498	499	504	507	514
Big Creek 220/220	7	7	7	7	7	7	7	7	7	7
Blythe (Walc) 161/33	37	37	37	38	38	39	39	40	41	41
Camino 220/66	1	1	1	1	1	1	1	1	1	1
Center 220/66	301	299	300	303	306	308	310	312	315	317
Chevmain 220/66	109	109	109	109	109	109	109	109	109	109
Chino 220/66	448	519	532	543	554	564	568	571	579	587
Cima 220/66	2	2	2	2	2	2	2	2	2	2
Del Amo 220/66	298	295	295	294	297	299	304	307	308	309
Devers 220/115	439	209	214	220	225	231	237	246	252	258
Eagle Mountain 220/66	1	1	1	1	1	1	1	1	1	1
Eagle Rock 220/66	133	136	138	141	144	151	155	157	159	163
El Casco 220/115	0	128	132	134	143	148	153	158	162	168
El Dorado 220/115	8	8	8	8	8	8	8	8	8	8
El Nido 220/66	259	262	267	268	269	268	269	271	272	274
Ellis 220/66	420	422	437	440	446	447	451	456	459	464
Etiwanda 'Ameron' 220/66	12	12	12	12	12	12	12	12	12	12
Etiwanda 220/66	456	460	464	483	496	508	518	535	544	557
Goleta 220/66	183	182	181	182	182	183	183	185	185	186
Goodrich 220/33 (City of Pasadena)	189	188	187	188	188	190	191	192	193	194
Gould 220/66	85	85	87	89	90	92	93	95	96	97
Hinson 220/66	295	292	290	289	289	291	291	292	293	294
Inyokern 220/115	19	19	19	23	23	24	25	25	26	27
Johanna 220/66	290	300	314	324	356	358	359	363	366	377
Kramer 220/115	117	119	121	123	125	127	128	130	132	134
La Cienega 220/66	320	320	322	323	324	326	328	330	332	334
La Fresa 220/66	436	431	429	428	429	432	433	435	437	437
Laguna Bell 220/66	293	292	293	295	297	300	303	306	309	312
Lewis 220/66 (City of Anaheim)	346	345	346	350	360	366	371	379	385	390
Lighthipe 220/66	301	300	299	300	301	303	304	305	307	308
Mesa 220/66	397	401	398	399	403	402	406	410	413	416
Mira Loma 220/66	429	370	376	383	391	397	408	421	431	440
Mirage 220/115	0	299	304	310	316	323	330	334	340	346
Moorpark 220/66	524	531	535	539	543	549	553	560	564	570
Olinda 220/66	238	237	239	241	243	246	250	255	260	263
Padua 220/66	423	420	419	419	420	427	431	437	441	444
Rector 220/66	472	481	486	497	512	520	296	303	310	316
Rio Hondo 220/66	453	452	452	453	455	458	460	464	467	469
San Bernardino 220/66	406	408	412	419	422	427	436	444	432	436
San Joaquin 220/66	0	0	0	0	0	0	260	266	272	278
Santa Clara 220/66	0	0	0	0	0	0	0	0	0	0
Santiago 220/66	373	378	384	390	396	401	406	412	418	425
Saugus 220/66	488	522	537	550	564	579	590	420	426	431
Springville 220/66	507	516	607	620	636	648	660	673	688	700
Valley 500/115	183	182	188	188	189	198	201	204	208	211
Vestal 220/66	1116	1143	1172	1049	1078	1107	1127	1156	816	833
Victor 220/115	110	111	111	112	112	113	114	115	116	117
Viejo 220/66	302	306	309	315	321	328	334	341	347	354
Villa Park 220/66	234	238	239	241	244	247	249	412	416	420
Vista 220/115	468	471	468	470	446	450	451	450	453	453
Vista 220/66	222	152	159	155	157	162	164	166	170	173
Walnut 220/66	446	449	451	330	337	345	352	360	386	397
Wilderness 220/66 (City of Riverside)	443	437	433	434	435	436	438	441	444	445
TOTALS	**15157**	**15419**	**15673**	**15746**	**15990**	**16232**	**16472**	**16707**	**16937**	**17174**

Fourteen-(14) out of fifteen-(15) Transition Cluster Projects are solar projects. They do not produce the maximum output in the Light Load conditions. Therefore, the off-peak base case was not studied. The system impacts identified from the off-Peak conditions will be mitigated through the use of CAISO Market congestion management mechanisms.

Table 6.3 showed the existing generation capacity in the Eastern Bulk local area, which was dispatched in the pre-Transition Cluster base case:

Table 6.3
Eastern Bulk Existing Generation

Locations	Type	Size (MW)
Devers Area	Wind	873
East of Devers Area	N-Gas	520
Eastern Bulk	QF Capacity	472

Table 6.4 showed the Serial List project capacity in the Eastern Bulk system, which was dispatched in the pre-Transition Cluster base case:

Table 6.4
Eastern Bulk Serial List Projects

CAISO Queue	Type	Project Size (MW)
1	Wind	16.5
3	N-Gas	850
17	N-Gas	520
49	Wind	100.5
72	Hydro	500
136	N-Gas	300
138	Wind	150
146	Solar	150
147	Solar	400
219	N-Gas	50
	Total	**3,037**

7. Renewable Generation Assumptions

Due to relatively new and ever changing technologies associated with renewable generation, concerns over possible impacts on reliability performance have highlighted the need to accurately model these renewable generators in power flow, short circuit duty and dynamic stability studies.

The technical data provided by the developers within the Eastern Bulk System Cluster Window results in the use of multiple wind generation, solar generation, and gas-fired generation models. To maintain confidentiality, the information for each individual Transition Cluster generation project is provided in the individual Transition Cluster Phase I Interconnection Study Reports.

7.1 Generator Electric Grid Fault Ride-Through Capability and Power Factor Criteria

WECC has adopted a Generator Electrical Grid Fault Ride-Through Capability Criteria. SCE currently supports a Low Voltage Ride-Through Criteria to ensure continued reliable service. The Criteria is summarized as follows:

1. Generator is to remain in-service during system faults (three phase faults with normal clearing and single-line-to-ground with delayed clearing) unless clearing the fault effectively disconnects the generator from the system.

2. During the transient period, generator is required to remain in-service for the low voltage and frequency excursions specified in WECC Table W-1 (provided below) as applied to load bus constraint. These performance criteria are applied to the generator interconnection point, not the generator terminals.

3. Generators may be tripped after the fault period if this action is intended as part of a SPS.

4. This Standard will not apply to individual units or to a site where the sum of the installed capabilities of all machines is less than 10MVA, unless it can be proven that reliability concerns exist.

5. The performance criteria of this Standard may be satisfied with performance of the generators or by installing equipment to satisfy the performance criteria.

6. The performance criterion of this Standard applies to any generation independent of the interconnected voltage level.

7. No exemption from this Standard will be given because of minor impact to the interconnected system.

Existing generators that go through any refurbishments or any replacements are then required to meet this Standard.

7.2 Transmission Assumptions

Serial Group Network Upgrades and key transmission projects proposed from the following forums were included in the pre-TRANSITION CLUSTER base cases used to assess the Eastern Bulk System:

1. **From SCE Annual Expansion Plan**
   - West-of-Devers Upgrade Project (WOD Project)
     There are four-(4) 220 kV lines on the west side of the Devers 220 kV Substation:

     Devers – San Bernardino 220 kV line #1 and #2
     Devers – Vista 220 kV line #1 and #2

     Currently, these old lines do not have overloading capability. Therefore, the WOD Project was proposed to mitigate the identified overloads on the lines – Reconductor the lines with 2B-1033 ACSR conductor. The WOD Project has been approved by SCE Board. It is waiting for the CAISO Board approval.

   - Devers – Mirage Split Project
     SCE's Devers and Mirage 115 kV systems are operated in parallel with the local 220 kV systems. Such configuration caused peak time overloads on the 115 kV systems.

Reconfiguring the Devers 115 kV and Mirage 115 kV systems to be operated radial from the 220 kV system will mitigate the identified overloads and increase local reliability to serve load. The Project is in the CPCN application phase.

2. **From Serial Group Project Studies:**
   The Red Bluff 500/220 kV Substation
   - There were two-(2) solar projects in the Serial Group, totaling 550 MW, which proposed to interconnect in SCE/MWD's J. Hinds and Eagle Mountain area. This capacity will overload MWD's 220kV system and would cause costly system upgrades and interruption of the MWD's pump services during the construction of the system upgrades.

   - Based on the mutual agreement among CAISO, SCE, and affected Interconnection Customers (the ICs), the Red Bluff Substation was proposed to interconnect these projects directly into SCE's existing Palo Verde – Devers 500 kV line (PVDV Line) by loop-in the Red Bluff Substation 2 miles East of the CA series caps on the PVDV line. Currently, the Red Bluff Substation is in the Facility Study phase of the Serial Group projects.

7.3 Transmission Path Flow Assumptions

Below is a list of transmission flow assumptions used in this Phase I Interconnection Study.

A) General base case development assumptions that should be used to model flows on WECC-defined paths are as follows. When modeling new generation outside or on the border of the CAISO Controlled Grid, Planners shall model pre-and-post-project flows on WECC-defined paths within their respective non-simultaneous path ratings and any other regional path ratings or operational capabilities such as SCIT. To the extent available, flows modeled on WECC paths, which have a direct impact on study results, should be based on maximum historical flow levels. Keeping flows below their respective path ratings can be done by reducing the MW output of other generation in the local geographic area by roughly the same amount as the additional MW output of the new generator requesting the interconnection. Though the CAISO Deliverability Study will be based on the Deliverability Study methodology, the PTO Reliability Analyses should be based on Path Rating flow levels.

B) General base case development assumptions that should be used to model flows on critical paths are as follows. For generation requests connecting inside the CAISO Controlled Grid, Planners shall model fully stressed flows on key transmission facilities that are immediately downstream of the point of interconnection, including facilities that are part of WECC-defined paths. To correct excessively stressed conditions farther downstream or an imbalance between the load and generation, flows can be reduced on parallel paths and neighboring transmission group study areas and sub areas as needed.

C) Base cases were developed in accordance with the applicable PTO cluster groups. It is important to use the all source cluster groups since it may include WDAT LGIP generation projects, Rule 21 generation projects and major transmission projects in addition to LGIP-related projects. All non-LGIP related generation projects need to be added to the appropriate PTO cluster grouping based on the generation interconnection point. All major transmission projects, which had already been included in pre-GIPR planning studies, need to be added to the PTO cluster group based on the first public announcement date (e.g. PTO Expansion Planning Stakeholder meeting). Transmission projects that PTOs are working on, which have not been included in previous pre-GIPR studies, and have since received CAISO approval should be modeled in all base cases. However, any transmission projects that PTOs are working on, which have not been included in previous pre-GIPR studies, but have not received CAISO approval should be modeled as the

proposed mitigation plans not in the starting base cases. This will demonstrate the needs of these projects that can be used during the project approval.

The following table shows SCE Area assumptions and relevant path flows and area import totals in the pre-Transition Cluster base cases.

Power Flow Study Assumptions (MW)
(With the Inclusion of Reactive Devices to Mitigate Voltage Issues)

SCE Area Assumption (MW)	2013 Heavy Summer
Generation	18,102
Import	8738
Load	26,269
Losses	575

Path Flows (MW)	2013 Heavy Summer
Path 26	4,000
Path 46 (WOR)	6,955
Path 49 (EOR)	5,359

7.4 Existing Special Protection Systems

The Eastern Bulk System has several existing or planned Special Protection Systems (SPS) for single and double element outage conditions. The relevant SPS that (a) may be impacted by the addition of Transition Cluster queued generation and/or (b) whose operation may be required to mitigate reliability problems due to the addition of Transition Cluster queued generation.

A. West-of-Devers SPS

The SPS was designed temporarily to relieve operational overloads on the existing four-(4) 220 kV lines West of Devers Substation: Devers-San Bernardino 220 kV line #1 and #2; Devers-Vista 220 kV line #1 and #2. The details are:

The WOD SPS is a temporary solution until re-conducting of the West-of-Devers 220 kV lines be completed. After re-conducting is completed, the WOD SPS will be disabled.

Engineering studies have determined that any of the following outages, during certain conditions, could cause one (1) or more of the West-of-Devers 220 kV lines to become overloaded:

- Devers-Valley 500 kV Line, **or**
- Single West-of-Devers 220 kV line, **or**
- Multiple West-of-Devers 220 kV lines

The WOD SPS designed to prevent this overloading by monitoring the four (4) West-of-Devers 220 kV lines for thermal overloads in the *westbound direction only* and initiate if any one (1) line remains loaded above its thermal rating for 30 seconds:

Note: *Each of the four (4) lines has only a "continuous" rating.*

- Devers-San Bernardino No. 1 *(795 amps)*
- Devers-San Bernardino No. 2 *(1150 amps)*

- Devers-Vista No. 1 *(1150 amps)*
- Devers-Vista No. 2 *(1240 amps)*

The WOD SPS **does not** require a contingency or outage to initiate tripping action. An overload sustained for 30 seconds is all that is required. The WOD SPS need not coordinate with any other scheme or protection system.

The WOD SPS has two (2) different tripping scenarios depending upon the status of the West-of-Devers 220 kV lines prior to SPS initiation:

- If RAS initiation occurs when there are two (2) or more West-of-Devers 220 kV lines in service: After a 30 second time delay, the WOD SPS opens the 220 kV side of the Devers 1AA and 2AA Banks.
- If RAS initiation occurs when only one (1) West-of-Devers 220 kV line is in service: After a 30 second time delay, the WOD SPS opens the remaining West-of-Devers 220 kV line.

<u>Blythe-I SPS</u>
The SPS was developed from the Blythe-I generation interconnection study. The purpose of the SPS is to mitigate identified overloads in MWD 220 kV system due to the Project interconnection. The details of the SPS:

- Install a section Circuit Breaker (CB) between the SCE side of J. Hinds bus and MWD side of J. Hinds bus
- The Blythe-I generation will be ramped down, if the power flow crosses the Section CB at or over 340MW
- The Section CB will be opened, if the Blythe-I capacity cannot be ramped down enough to maintain the flow.
- For the loss of J. Hinds – Mirage 220 kV line, the SPS will trip one unit of the Blythe-I Project

8. Study Methodology

The power flow base cases(s) and dynamic stability data including the new WECC approved governor model were developed in General Electric PSLF 16.3_02 format. For all areas outside California, the network topology and loads reflect information provided to WECC by each respective owner area. This Phase I Interconnection Study was conducted by applying the SCE and CAISO Planning Standards. More specifically, the main criteria applicable to this study are as follows:

8.1 Power Flow Study Principles

The following principles were used in determining whether congestion management, special protection systems, or facility upgrades are required to mitigate base case, single contingency, or double contingency overloads:

- Congestion management, as a means to mitigate base case overloads, can be used if it is determined to be manageable and the CAISO concurs with the implementation

- Facility upgrades will be required if it is determined that the use of congestion management is unmanageable

- Special Protection Systems (SPS), in lieu of facility upgrades, will be recommended if the system is simple and effective, does not jeopardize system integrity, does not exceed the current CAISO

single and double contingency tripping limitations, does not adversely affect existing or proposed special protection systems in the area, and can be readily implemented

- Facility upgrades will be required if implementation of a special protection system is determined to be complex, ineffective, or the amount of tripping exceeds the current CAISO single and double contingency tripping limitations

- Facility upgrades will also be required if adverse impacts are identified on existing or currently proposed special protection systems

- Congestion management in preparation for the next contingency will be required, with CAISO concurrence, if no facility upgrades or special protection systems are implemented

8.2 Generation Reactive Support and Power Factor Correction

Transition Cluster generation projects requesting interconnection will be required to be able to meet specified voltage regulation and power factor correction requirements at the Point of Interconnection (POI). To simulate "nominal" power factor POI characteristics for generation projects, shunt capacitor banks were modeled internal to each project and were sized equivalent to each project's step-up transformer losses. In some cases with long generation ties where generation tie reactive losses are also significant, additional shunt compensation internal to the project was also modeled to compensate for those losses as well. On a case-by-case basis for those projects that in fact exhibited high generation tie reactive losses, sensitivity power factor analysis was performed to determine the potential reliability impacts of the projects attempting to meet the high end of the power factor POI requirements (i.e. 0.95 boost).

8.3 Power Flow Analysis Criteria and Contingency List

Power flow studies will be performed under normal, and single and double contingency conditions to ensure the Planning Standards are met.

Study Criteria:

A. Under normal conditions, bus voltages must be maintained between 0.95 p.u. and 1.05 p.u., unless specific minimum operating voltage requirements exist. All line and transformer loadings must be below normal continuous ratings.
B. SCE guidelines for VAR flow interchange with adjacent utilities would be maintained at a fixed, constant value. However, because a power system is dynamic, VAR flow can be controlled only within reasonable limits and may actually exceed the limits from time to time.
C. Study Criteria during Contingency Conditions
   - No transmission element will be loaded above its emergency rating as stated in the CAISO transmission register and indicated below.

Transmission Lines	Base Case	Limiting Component Normal Rating
	N-1	Limiting Component A-Rating
	N-2	Limiting Component B-Rating
500/220 kV Transformer Banks	Base Case	Normal Loading Limit
	Long-Term & Short-Term	As defined by SCE Operating Bulletin No.33

- Equipment emergency voltage limits (high or low) will not be exceeded.
- Bus voltage deviations from the base case voltage shall not exceed established planning limits
- No loss of load for single contingencies.

D. The base cases will be used to simulate the impact of the Transition Cluster queued generation projects during normal operating conditions, as well as single and selected multiple (CAISO Categories "B" and "C") outages. Both conditions immediately following contingencies and post-transient conditions will be studied. The outage list is posted on the CAISO web-site.

8.4 Short Circuit Duty Study Principles

To determine the impact on short-circuit duty within the SCE electrical system after inclusion of the Transition Cluster generation Projects, the study calculated the maximum symmetrical three-phase-to-ground and single-line-to-ground short-circuit duties. Generation and transformer data represented in the generator and transformer data sheets provided by the customer were utilized. Bus locations where short-circuit duty is increased with the proposed Transition Cluster generation projects, by at least 0.1 kA and the duty is in excess of 60% of the minimum breaker nameplate rating are flagged for further review. Upon completion of the detailed circuit breaker review, circuit breakers exposed to fault currents in excess of 100 percent of their interrupting capacities will need to be replaced or upgraded, whichever is appropriate.

8.5 Transient Stability Analysis Criteria

Transient stability studies will be performed to the extent that CAISO and SCE reasonably expect transient or voltage stability concerns for the electrical area under study. Because of potential stability related concerns in this Eastern Bulk System, a stability analysis was performed.

Study Criteria:

A. All machines in the system shall remain in synchronism as demonstrated by their relative rotor angles.
B. System stability is evaluated based on the damping of the relative rotor angles and the damping of the voltage magnitude swings.
C. The transient voltage dip should be maintained above 0.80 p.u. at Adelanto and Sylmar.
D. Other transient voltage dips and duration requirements must meet the criteria of the WECC/NERC Planning Standards as indicated below.

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WECC Disturbance-Performance Table of Allowable Effects on Other Systems (in addition to NERC requirements)

NERC and WECC Categories	Outage Frequency Associated with the Performance Category (Outage/Year)	Transient Voltage Dip Standard	Minimum Transient Frequency Standard	Post-Transient Voltage Deviation Standard (See Note 2)
A	Not Applicable	Nothing in Addition to NERC		
B	≥ 0.33	Not to exceed **25%** at load buses or **30%** at non-load buses. Not to exceed **20% for more than 20 cycles** at load buses.	Not below **59.6 Hz** for 6 cycles or more at a load bus	Not to exceed **5%** at any bus
C	0.033 – 0.33	Not to exceed 30% at any bus. Not to exceed **20% for more than 40 cycles** at load buses.	Not below **59.0 Hz** for 6 cycles or more at a load bus	Not to exceed **10%** at any bus
D	< 0.033	Nothing in Addition to NERC		

Note 2: As an example in applying the WECC Disturbance-Performance Table, Category B disturbance in one system shall not cause a transient voltage dip in another system that is greater than 20% for more than 20 cycles at load buses, or exceed 25% at load buses or 30% at non-load buses at any time other than during the fault.

Stability models provided by developers were used in the stability study. In general, the Transition Cluster includes a wide variety of renewable generation projects, and many of the models involved custom EPCL models for PSLF. These models, generally speaking, have not gone through model verification and validation testing by WECC to confirm that (a) the performance of the models accurately reflects the actual dynamic characteristics of the equipment being modeled, (b) the models are numerically stable for use in system studies, and (c) the models interact appropriately in combination with other models (both custom and standard) and with the GE PSLF software itself. In addition, there continues to be a significant effort at WECC to improve existing models to more accurately reflect actual system performance and dynamic characteristics (improved load models, SVC models, WTG "Types 1-4" models, and so on). It is important to recognize that generation developers will be required to adhere to all applicable WECC model validation and testing policies.

9. Deliverability Study

The CAISO performed an On-peak Deliverability Assessment based on the On-Peak Deliverability Assessment Methodology posted on the CAISO web-site.

A modified version of the power flow 2013 Summer Peak base case prepared by SCE for the reliability analysis was used to evaluate the deliverability of the proposed interconnection and the transmission system impacts of the Project. A description of the modifications follows.

9.1 Load Modeling

For the On-Peak Deliverability Study, a coincident 1-in-5-year heat wave, was modeled in the base case.

9.2 Generation Capacity (Pmax)

The Net Qualified Capacity (NQC) was used for generation capacity values. Capacity values for intermittent generation were modeled as described in the On-Peak Deliverability Assessment Methodology.

9.3 Generation Dispatch in the base cases

Please refer to the On-Peak Deliverability Assessment methodology document on the CAISO web-site.

9.4 Import Levels

The On-Peak Deliverability Study base case modeled the 2009 Maximum Import Capability for each branch group based on the methodology for Import Capability Assignment Process for resource adequacy (CAISO Tariff Section 40.4.6.2.1), were modeled as fully utilized in the base case. These import levels are listed below.

Table 9.1 On-Peak Deliverability Assessment Import Target

BG Name	BG Import Dir	Net Import (MW)	Import Unused ETC (MW)
Lugo_victrville_BG	N-S	1047	523
COI_BG	N-S	3770	548
BLYTHE_BG	E-W	106	0
CASCADE_BG	N-S	23	0
CFE_BG	S-N	-154	0
ELDORADO_BG	E-W	935	0
IID-SCE_BG	E-W	268	0
IID-SDGE_BG	E-W	-174	163
INYO_BG	E-W	0	0
LAUGHLIN_BG	E-W	0	0
MCCULLGH_BG	E-W	-15	316
MEAD_BG	E-W	539	516
MERCHANT_BG	E-W	425	0
N.GILABK4_BG	E-W	-170	168
NOB_BG	N-S	1449	0
PALOVRDE_BG	E-W	2984	233
PARKER_BG	E-W	66	52
SILVERPK_BG	E-W	9	0
SUMMIT_BG	E-W	-32	15
SYLMAR-AC_BG	E-W	-351	471
Total		**10,726**	**3,005**

9.5 Deliverability Assessment Results

The Deliverability Assessment results are given in the Attachment 2 to Appendix A.

10. Power Flow Study Findings

10.1 Pre-Transition Cluster, Serial Group Upgrades Only

The summer and spring base cases did not have any overloads prior to the addition of the generation in the Eastern system Transition Cluster group with the additions of the system upgrades proposed from the Serial List project studies.

10.2 Transition Cluster, Serial Group Upgrades Only

In order to assess the impacts of the generation in the Transition Cluster, the intertie path flow was re-adjusted to accommodate the Transition Cluster generation capacity delivery and to keep the normal delivery of SCE entitlements from out of state generation plants.

With implementing the transmission upgrades triggered by the higher queued generation interconnection requests and **the originally proposed POIs of the TRANSITION CLUSTER projects (See Figure 1-2)**, the addition of the Transition Cluster interconnection requests in the SCE Eastern Bulk system resulted in severe system impacts:

- Loop flow was shown between EOR and WOR systems. After scheduling Transition Cluster project capacity from the east of Devers area into SCE and/or Northern CA, amount of capacity flowed back to Palo Verde, through the AZ / NV 500 kV systems, and back into the SCE System.

- Overloads on the lines along the delivery path to and beyond the Serrano Substation

- Voltage collapse between Colorado River and Palo Verde areas under credible N-2 contingencies

- MWD 220 kV system showed base case and contingency overloads from 39% to 138 % of the line ratings. Low voltage caused local system voltage collapse under N-1 and N-2 contingencies. Such significant system impact was due to about 2,000 MW of Transition Cluster project capacity injected directly into the existing MWD 220 kV system which was not designed to accommodate large amounts of new generation.

- Overloads and low voltages occurred in Devers and Red Bluff area due to over 8000 MW of Transition Cluster project capacity being brought into Devers/ Red Bluff area from east and west of Colorado River areas. The overloads were identified from 40.7% to 116% of the line and transformer ratings see (Table 8.1). Severe low voltages caused voltage collapse under several N-2 contingencies.

  The Red Bluff 500 kV substation was looped-into the DPV1 and DPV2 500 kV lines to balance the flow. Under normal conditions, operation of the CA series capacitors may no longer be required.

- After transferring over 9,500 MW of Transition Cluster project capacity through Devers – Palo Verde Corridor into the SCE basin area, the system performance at the receiving end in Serrano, area were seriously impacted due to high overloads between 64.3% and 155.6% of line ratings. Local systems also showed severe low voltages under base case condition that caused local voltage collapse under the contingency conditions.

- There were a total of 3 Transition Cluster projects that applied to loop-into the existing Devers – Palo Verde 500kV line #1 in east of Colorado River area. These project additions significantly reduced the system reliability in the area. Under normal conditions, operation of the AZ series capacitors may no longer be required.

The interconnection customer requested Energy-Only for these Projects. As a result, the Projects were modeled but not dispatched in the base cases as directed by the CAISO. However, the interconnection of the projects will result in the inability to utilize the existing series capacitor thereby adversely impacting existing WECC Path ratings (Path 46 and Path 49). The reason for such impact is due to the fact that the interconnection results in relatively short line segment distances that create significant protection coordination issues.

Such impact will have to be evaluated through the established WECC Regional Planning Forum, such as the WATS Committee which includes APS, SRP, LADWP, WAPA, IID, SDG&E, NPC, etc. Studies performed as part of these WECC Regional Planning Forums may identify the need for additional transmission upgrades that are attributed to these Energy-Only projects but that are not defined in this Phase 1 Study. Any such system upgrades will be categorized as reliability upgrades required to mitigate impacts on established WECC Path Ratings. Under each N-1 and N-2 contingency condition in this local area, severe voltage collapse was identified.

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Table 10.1
Power Flow Result Summary
Peak Cases

Overload Facility	Rating	Heavy Summer	
		Pre	Post
1. Serrano – Alberhill 500 kV T/L #1 Base Case	3000 Amp (N) 3000 Amp (E)	1928.3	4666.5
2. Devers 500 kV / 220 kV Transformer #1 Base Case	1120 Amp (N) 1680 Amp (E)	456.3	1295.6
3. Devers 500 kV / 220 kV Transformer #2 Base Case	1120 Amp (N) 1680 Amp (E)	456.3	1295.6
4. Eagle Mtn. – Iron Mtn. 220 kV T/L #1 loss of Julian Hinds – Mirage 220 kV T/L #1	900 Amp (N) 990 Amp (E)	570.8	1635.4
5. Iron Mtn. – Camino 220 kV T/L #1 loss of Julian Hinds – Mirage 220 kV T/L #1	763 Amp (N) 763 Amp (E)	503.2	1557.9
6. Julian Hinds – Mirage 220 kV T/L #1 Base Case	896 Amp (N) 896 Amp (E)	650.3	1004.2
7. Julian Hinds – Eagle Mtn. 220 kV T/L #1 Base Case	900 Amp (N) 990 Amp (E)	408.5	1148.3
8. Devers - Mirage 220 kV T/L #1 loss of Devers Mirage 220kV T/L #2	1240 Amp (N) 1669 Amp (E)	655.5	1826.9
9. Devers - Mirage 220 kV T/L #2 loss of Devers Mirage 220kV T/L #1	1240 Amp (N) 1669 Amp (E)	655.9	1828.2

The following power flow diagrams illustrate the system performance under the Peak case conditions:

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Figure 10.1
2013 Peak Base Case -- Pre-Mitigation

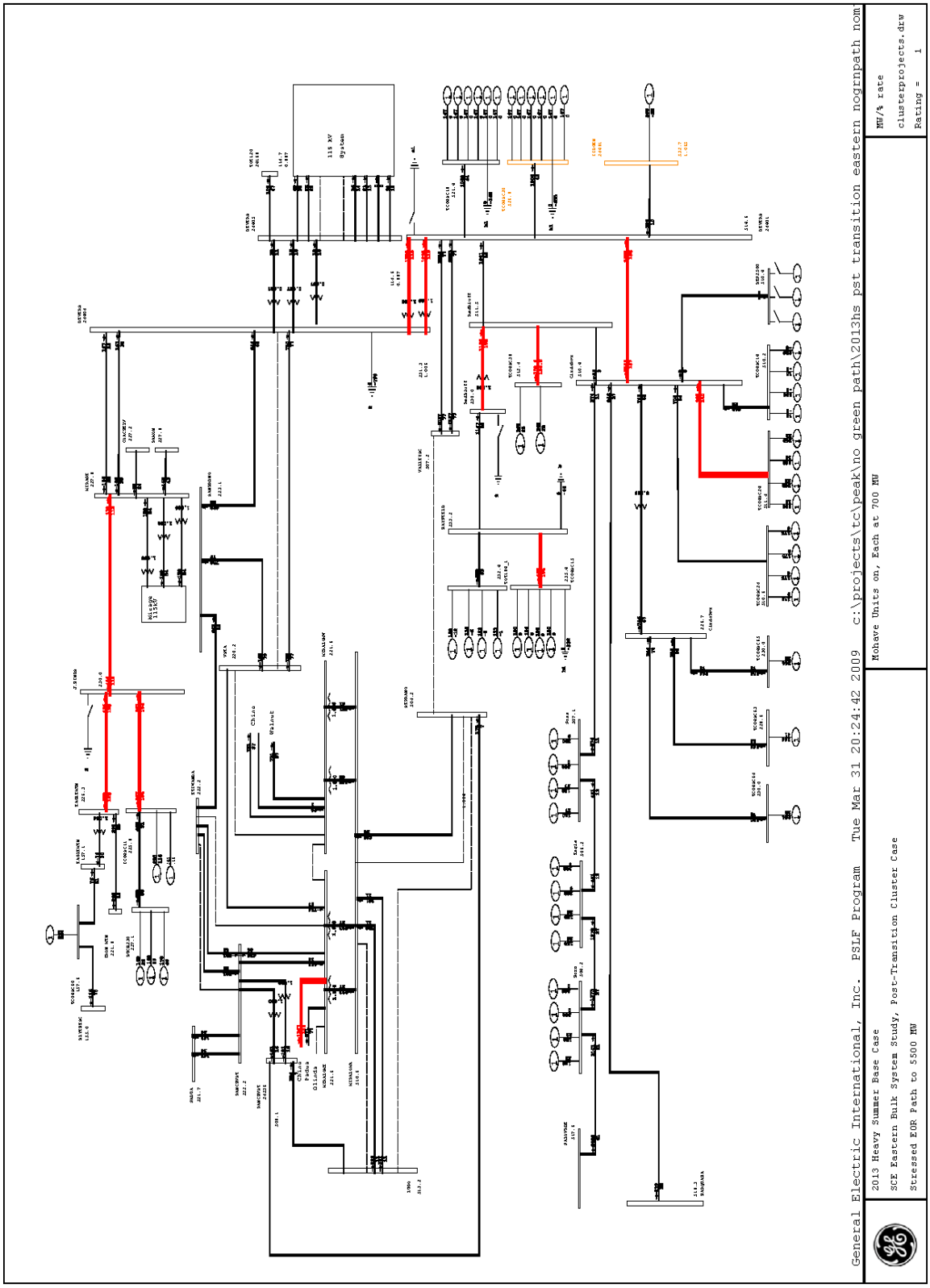
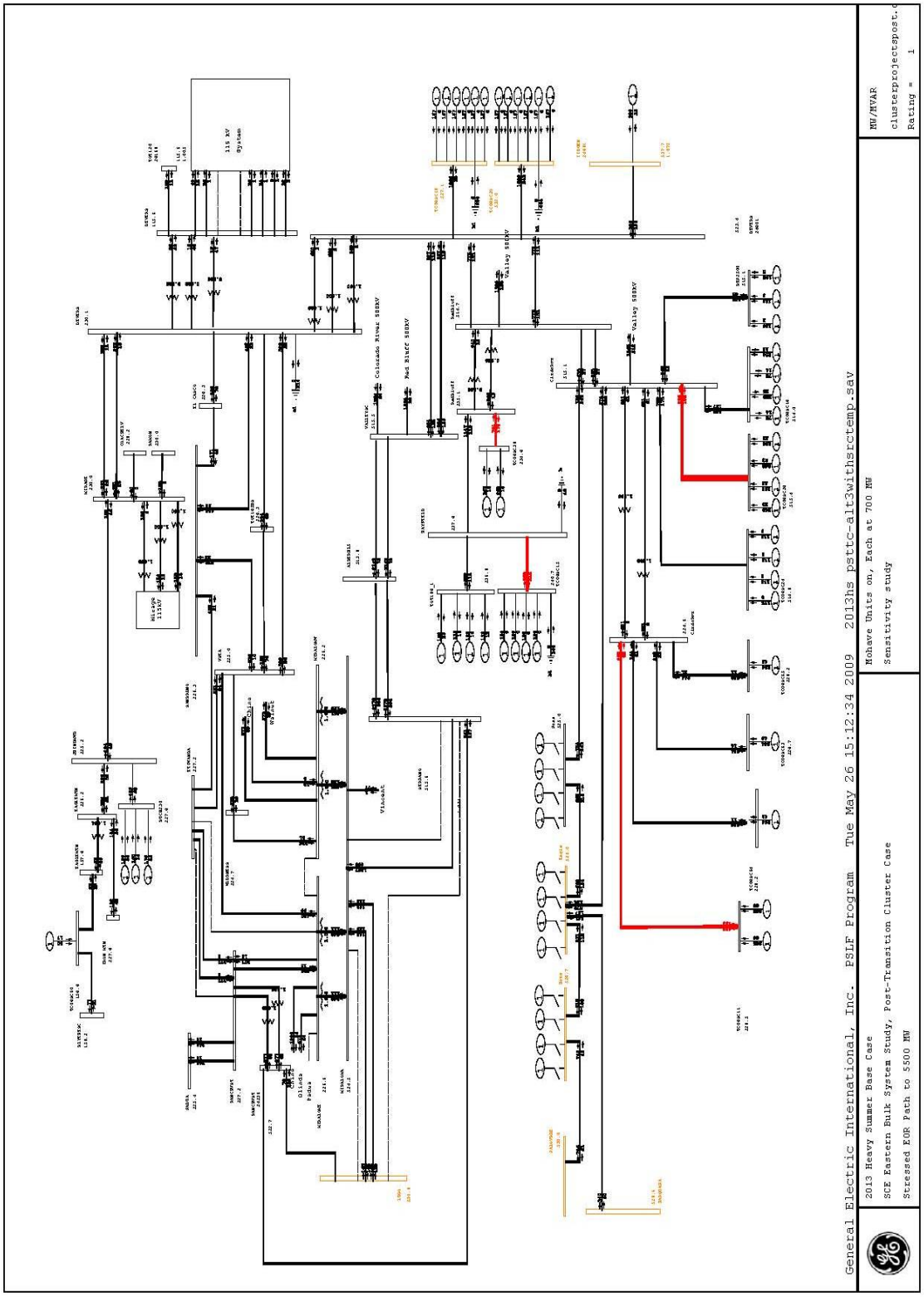


Figure10.1
2013 Peak Base Case – Post Mitigation



10.3. System Upgrades Triggered by Eastern Transition Cluster Projects

This study identifies the need for several required transmission upgrades to the Eastern System to reliably interconnect over 9,500 MW of Eastern TRANSITION CLUSTER projects and to deliver the portion of this generation requesting Full Capacity Deliverability Status, in addition to existing CAISO load serving entity entitlements.

The addition of the Eastern system Transition Cluster generation will require an increase in transmission capacity to be able to ensure the deliverability of the Eastern system Transition Cluster projects requesting Full Capacity Deliverability Status and SCE existing entitlements without any adverse impacts on the system.

Fourteen (14) out of fifteen (15) Transition Cluster projects in the Eastern Bulk system are solar projects. These projects are expected not to produce the maximum capacity under off-peak conditions. The worst system impact and the most system upgrades were identified in the summer peak cases as identified in the CAISO's Deliverability study. CAISO expects to manage any system impacts occurring during off-peak hours through the use of CAISO Market congestion management mechanisms.

The proposed system upgrades were based on the summer peak system studies. They were developed based on the following procedures:

- Developed the Transition Cluster base cases by modeling all Eastern system Transition Cluster project at full-delivery capacity
- Implemented all CAISO proposed mitigations that developed from the Deliverability Assessment (with and without the GRNP Project) in the post- Transition Cluster base cases
- Revised CAISO proposed mitigation to ensure feasibility.

The following system upgrades were proposed to ultimately mitigate the identified system impacts:

<u>1. Direct the Power Delivery away from MWD System</u>

To ultimately mitigate the severe system impact and avoid large costly system upgrades to the MWD system (purchasing new lands, building new transmission lines, building a new 220 kV substation, adding more reactive support devices, dealing with other utilities, etc..), a total of 1,100 MW of Transition Cluster generation originally proposed in J.Hinds / Eagle Mountain area were designed to be delivered directly into the Red Bluff / Devers area by changing the Point-of Interconnection (POI) of two (2) Transition Cluster Projects:

a. ISO Queue #210 Project --- changed its POI to Red Bluff 220 kV Substation
b. ISO Queue #193 Project --- changed its POI to the Colorado River 220 kV Sub

The following Transition Cluster project POI was also moved to the Red Bluff 220 kV Substation as the SCE collector station in the area.

c. ISO Queue #365 Project --- changed its POI to the Red Bluff 220 kV Substation

It was mutually agreed among SCE, CAISO, and affected ICs to make the POI changes.

By implementing the changes of the POIs , the Transition Cluster project capacity in J. Hinds / Eagle Mtn area will be delivered directly into the SCE bulk system to avoid significant system upgrades in the MWD system.

2. Devers Area Upgrades

Most of the 9,500 MW of Transition Cluster project capacity ended up going through Devers area and westbound into the LA basin resulting in thermal overloads, low voltages, and transient system impact. The following mitigation measures were proposed to relieve overloads on Devers 500/220 kV banks and Devers-Mirage 220 kV lines:

a. Design a SPS to trip 200 MW of Transition Cluster generation connected to the Devers Substation to mitigate the thermal overload due to a single contingency of another 500/220 kV transformer bank at the Devers Substation

b. Design a SPS to trip 950 MW of Transition Cluster Generation connected to the Devers Substation to mitigate the thermal overloads on each of the Devers – Mirage 220 kV line due to a single contingency of the other line.

3. Red Bluff Area Upgrades

The Red Bluff / Devers area was identified as bottleneck point that urgently needed new facilities to increase system transfer capability.

The purpose of the following mitigation measures is to relieve the reliability and deliverability impacts in this part of the Eastern Bulk System:

The following mitigations were proposed:

a. Add second 500 / 220 kV AA bank at the Red Bluff 500 kV Substation, with a single phase spare bank

b. SPS to trip 700 MW of generation at the Red Bluff Sub to mitigate bank overload due to a single contingency of another 500/220 kV transformer bank at the Red Bluff Substation

c. Loop the future DPV2 500 kV lines into the Red Bluff 500 kV Substation

d. Bypass the Series Caps of the CA side on the future DPV2 500kV line (The final need of the SRC will be determined from detail studies in the future with realistic new generation status information)

e. Build a single-circuit, about 125 miles long, Red Bluff – Valley 500 kV line, a single-tower construction, 2B-2156 ACSR conductor, in a separate ROW away from the DPV1 and DPV2 corridor, with 50% series compensation

By building the Red Bluff–Valley 500 kV line, a large amount of Transition Cluster project capacity was directed into SCE's Valley / Serrano area near SCE load centers. In addition, the new line successfully relieved the reliability impact to the SCE system and increased the capability to deliver the Transition Cluster project capacity.

4. Colorado River Area Upgrades

Seven-(7) TRANSITION CLUSTER generation projects are connecting to the 500kV or 220 kV side of the Colorado River Substation. Over 5,000 MW of generation capacity is delivered through the Colorado River Sub into the DPV1 and DPV2 lines. To mitigate adverse system impacts due to this large injection of power, the following mitigation plans were proposed:

a. Install two 500/220 kV transformer banks, each rated at 1120 MVA for the capacity delivery

b. Design an SPS to trip 500 MW of generation at the Colorado River Sub to mitigate the bank overload due to a single contingency of another 500/220 kV transformer bank at the Colorado River Substation

To balance the power flow between DPV1 and DPV2 500kV lines it was proposed:

c. Loop in both DPV1 and DPV2 500kV line into Eagle Substation.

Through the dynamic stability study, it was identified that the transient voltage showed unacceptable performance and was into voltage collapse under the worst N-2 contingency of Colorado River – Posa 500kV line and Colorado River – Eagle 500kV line. To mitigate the transient voltage violations, the following dynamic VAR support was proposed:

d. Install 500 MVAR SVC at the Colorado River Substation 220kV bus.

The Phase I Study modeled the originally proposed POI for the three Transition Cluster Projects looping in the existing DPV1 line in the east of Colorado River area. These are Energy –Only projects. Therefore, the Study modeled these generation projects as zero output in the Peak case. However, such system configuration significantly reduced the equipment reliabilities, increased operation and maintenance complexity, and unbalanced power flow between the two 500 kV lines in the corridor.

The interconnection customer requested Energy-Only for these Projects. As a result, the Projects were modeled but not dispatched in the base cases as directed by the CAISO. However, the interconnection of the projects will result in the inability to utilize the existing series capacitor thereby adversely impacting existing WECC Path ratings (Path 46 and Path 49). The reason for such impact is due to the fact that the interconnection results in relatively short line segment distances that create significant protection coordination issues.

Such impact will have to be evaluated through the established WECC Regional Planning Forum, such as the WATS Committee which includes APS, SRP, LADWP, WAPA, IID, SDG&E, NPC, etc. Studies performed as part of these WECC Regional Planning Forums may identify the need for additional transmission upgrades that are attributed to these Energy-Only projects but that are not defined in this Phase 1 Study. Any such system upgrades will be categorized as reliability upgrades required to mitigate impacts on established WECC Path Ratings.

5. Serrano Area Upgrades

With the proposed new 500kV line into Valley / Serrano area, the local area received large amount of Transition Cluster project capacity. Severe overloads and low voltages were identified among Serrano area. Rebuilding the local system became critical to reliably serving the local loads. However, the GIS facilities in Serrano and Valley substations critically limited the feasibility for any minor facility upgrades. Therefore, the following mitigations were proposed to ultimately solve the identified system impact:

Build the 2nd circuit of Serrano – AlberHill – Valley 550 kV line, 90 miles long, 2B-2156, ACSR Conductor, a single-tower construction, in an expanded ROW of the Serrano – AlberHill – Valley 500 kV line #1 line

6. Local 220 kV Shunt Caps

Together with all proposed mitigations, an acceptable amount of shunt caps were proposed to meet system voltage performance criteria under base case conditions:

- 150 Mvar at El Casco 220 kV Substation
- 150 Mvar at Red Bluff 220 kV Substation
- 150 Mvar at Devers 220 kV Substation'
- 150 Mvar at Serrano 220 kV Substation

These proposed system upgrades successfully mitigated the identified system impact. CAISO has agreed to the system upgrades listed above.

The system impacts identified from the Off-Peak conditions will be mitigated based on the use of congestion management under CAISO Market Redesign Technology Upgrade (MRTU) resources.

8. Single-Line Diagram

The following Single-Line diagram illustrates the Transition Cluster Project interconnections and mitigations in the Eastern Bulk system.

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SCE Eastern Bulk Transition Cluster System Configuration Serial Projects not shown

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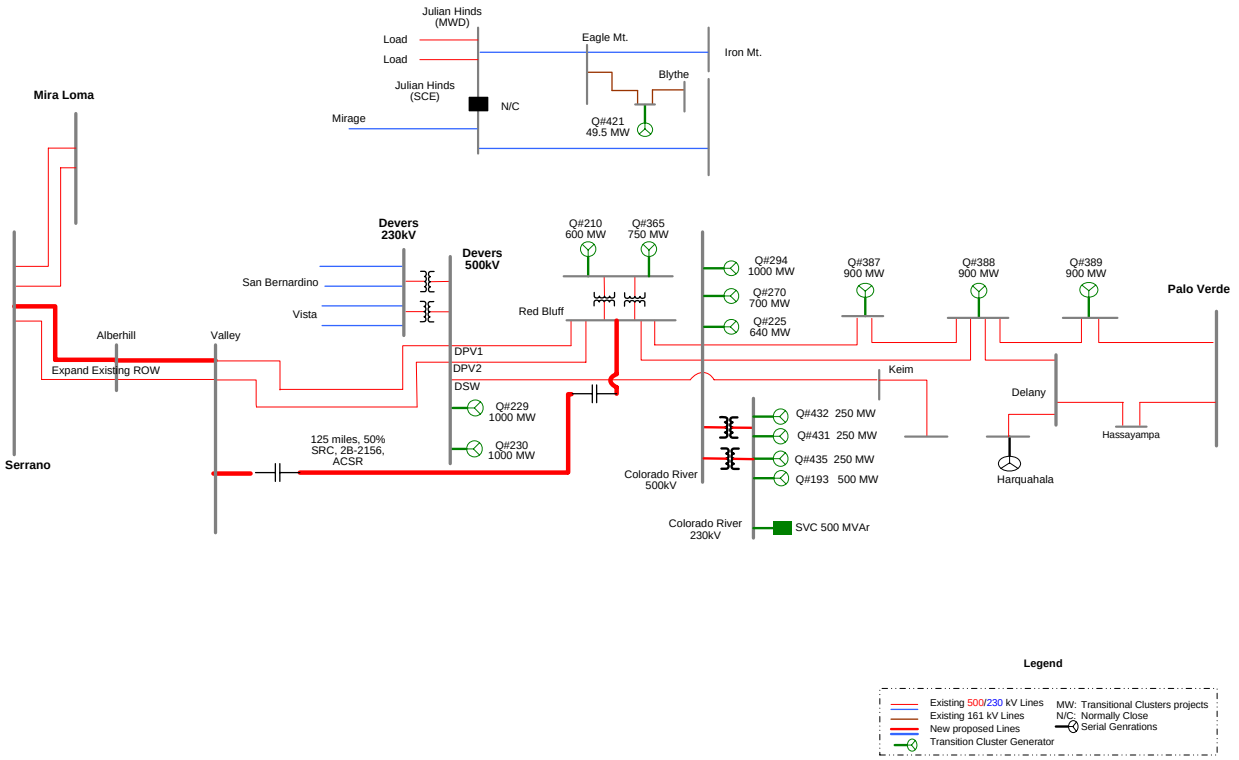

Legend

- Existing 500/230 kV Lines
- Existing 161 kV Lines
- New proposed Lines
- Transition Cluster Generator
- MW: Transitional Clusters projects
- N/C: Normally Close
- Serial Genrations

		SCE Eastern Bulk – Ultimate Plan (GIPR TC Phase-I Study)
ENGINEER	DATE	SOUTHERN CALIFORNIA EDISON
Ayman Samaan Ying He	**05/11/2009**	

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11. Dynamic Stability Study Findings

Fourteen (14) out of fifteen (15) Transition Cluster projects proposed in the Eastern Bulk System are solar projects. They do not provide dynamic reactive support to the system. Without adequate system upgrades, the transient stability performance showed fatal voltage collapse under credible N-2 contingencies.

Among all the stability contingency studies, the worst double contingency outage was the loss of Colorado River-Posa and Colorado River - Eagle 500 kV lines.

To mitigate such severe system impact with the least cost, it was proposed to:

a. Install 500 MVAr SVC at the Colorado River 220 kV Sub

b. Design an SPS to trip 1,300 MW Transition Cluster generation (700 MW at Colorado River Sub and 600 MW at the Red Bluff Sub)

Together with proposed new shunt caps, such severe system impact were successfully mitigated to meet the overall transient system performance and Reliability Criteria.

The detailed stability plots will be provided upon request .

No system impact was identified in post-transient studies with modeling all proposed mitigations.

12. Short Circuit Duty Study Findings

A. Study Results

The starting point for developing the SCD base case for transition cluster studies was the existing SCE transmission network and all associated generation. The short circuit model extends beyond SCE's area to include projects that have a significant impact on the short circuit duties at SCE busses. Equivalents are used to model the system beyond these areas. The existing Serial Group projects and associated transmission upgrades identified in each interconnection system impact study were then added to this model to form the pre-Transition Cluster base case model.

Short circuit duties at each SCE bus were then determined after adding the Transition Cluster generation and associated transmission upgrades to the pre-Transition Cluster base case model to form the Transition Cluster base case model. These short circuit duty results were evaluated to identify over stressed circuit breakers.

Results of the short-circuit duty studies are shown below.

Table 12.1
Three Phase (3PH)
Short Circuit Duty Study Results

		Pre-Project		Post-Project		DELTA
Bus Name	Bus KV	X/R	kA	X/R	kA	kA
Mira Loma	500	25.5	41.9	25.7	53.4	11.5
Mira Loma A	220	20.1	55.4	20.8	59.0	3.6
Mira Loma B	220	24.1	70.3	25.2	75.5	5.2
Serrano	500	25.9	36.0	26.2	42.5	6.5
Serrano	220	25.8	60.2	27.0	63.9	3.7
Devers	220	24.8	49.4	27.7	50.9	1.5
Vista	220	20.2	49.7	20.3	50.8	1.1
Redondo	220	24.2	47.6	24.4	48.4	0.8

Table 12.2
Single Line to Ground (SLG)
Short Circuit Duty Study Results

		Pre-Project		Post-Project		DELTA
Bus Name	Bus KV	X/R	kA	X/R	kA	kA
Mira Loma	500	10.2	37.2	9.7	45.8	8.6
Mira Loma A	220	11.1	56.3	11.2	59.6	3.3
Mira Loma B	220	12.4	67.2	12.3	71.5	4.3
Serrano	500	12.8	30.9	11.6	35.8	4.9
Serrano	220	18.2	61.7	18.4	65.2	3.5
Devers	220	24.1	54.3	24.9	56.5	2.2
Vista	220	16.4	45.1	16.4	45.7	0.6
Redondo	220	30.6	42.4	30.9	42.8	0.4

B. Discussion of Short Circuit Duty Study Results

There are four specific issues that need to be discussed based on the results of the SCD study findings presented above.

SCD Mitigation Measures at Mira Loma and Serrano Substations

The significant number of requests to interconnect generating facilities to the SCE grid has proved challenging with regard to Short Circuit Duty. The Phase I studies depict several areas of the SCE system with extremely high Short Circuit Duty, and various methods of mitigation are being evaluated. However, at this time SCE does not have a proposed recommendation to alleviate this issue at two separate locations.

Specifically, SCE's Mira Loma Substation shows a post project three-phase Short Circuit Duty of 75.5 kA at the 220 kV bus. Given the high X/R ratio and close proximity of the calculated short circuit duties to the next higher circuit breaker rating (80 kA), SCE would likely need to upgrade the the 220 kV bus to 100 kA . The 100 kA Short Duty Requirement presents a number of technical issues (i.e., circuit breaker availability, substation design, and personal grounding) that would need to be worked out before a reasonably

accurate cost estimate could be developed. As an example, SCE's current personal grounding technology is limited to 70 kA.

A new grounding technology would need to be developed to meet the expected short circuit duty requirements. Therefore, cost estimates have not been provided for this element of work. Additionally, SCE's Serrano Substation is shown with a post project three-phase Short Circuit Duty of 63.9 kA at the 220 kV bus, however, existing SCE equipment is rated at 63 kA. The Serrano Substation is critical to the operation of the SCE System, and it is physically located in a congested metropolitan area. Acceptable and viable methods of mitigation will require solving very complex engineering challenges with potentially long lead times.

Detailed engineering analysis is required to propose feasible solutions at these substations. The Phase I Study process does not allow time to address these types of complex planning and engineering challenges. SCE will further evaluate the impacts of the Short Circuit Duty at these stations, and investigate mitigations during the Phase II Study.

13. Recommended Distribution Network Upgrades

To reliably deliver the aggregate generation output of all generation projects that have requested interconnection to this Eastern Bulk System, over 9,500 MW, the following facilities and procedures will be needed as part of the overall the POS. Some elements of the POS may need further analysis and definition during the Phase II Interconnection Study or other independent design studies as needed to address any impacts to Affected Systems.

1. ***Short Circuit Duty (SCD) Mitigation***
   - Replace 12 - 220 kV circuit breakers at Vista 220 kV Substation.
2. ***Substation Light and Power Source***
   - Provide primary and back-up external 33 kV and 12 kV power to Desert Center solar Substation via the SCE Distribution system.

14. Recommended Reliability Network Upgrades

To reliably deliver the aggregate over 9,500 MW generation output of all generation projects that have requested interconnection to this Eastern Bulk System, the following facilities and procedures will be needed as part of the overall the POS. Some elements of the POS may need further analysis and definition during the Phase II Interconnection Study or other independent design studies as needed to address any impacts to Affected Systems.

1. **Short Circuit Duty (SCD) Mitigation**
   Replace and upgrade circuit breakers at four SCE Substations, and upgrade the switchyard at one SCE Substation.

   - Replace 4 - 500 kV Circuit Breakers at Mira Loma Substation
   - Upgrade 6 - 500 kV Circuit Breakers at Mira Loma Substation
   - Replace 18 - 220 kV Circuit Breakers at Devers Substation
   - Upgrade Switchyard at Devers Substation
   - Upgrade 4 220 kV Circuit Breakers at Redondo Substation

2. **Devers Special Protection System (SPS)**
   - SPS to trip 200 MW generation at Devers Sub to mitigate T-1 overloads at Devers 500/220 kV transformer banks

3. **Devers-Mirage Special Protection System (SPS)**
   - SPS to trip 950 MW generation at Devers Sub to mitigate N-1 overloads on Devers-Mirage 220 kV lines

4. **East of Colorado River Special Protection System (SPS)**
   - SPS to trip 1300 MW generation at Colorado River Sub and the Red Bluff Sub area to mitigate thermal and transient system impact by loss of Colorado River – Posa and Colorado River – Eagle 500 kV lines

5. **East of Colorado River Loop-in**
   - Loop-in the future DPV 500kV line #2 into the Eagle Substation

6. **Colorado River Substation**
   - Install 1-one 500/220 kV transformer bank.

7. **Plan-of-Service Network Upgrades**

   Colorado River 500/220kV Substation – 500kV Switchyard

   Extend the existing 500kV Switchyard and install new Line Positions to terminate three 500kV Generation tie Lines.

   500kV Switchyard Expansion Required:
   - Extend the North and South 500kV buses four positions to the east to span new Positions 9 through 12.
   - Equip existing vacant Position 8 as a Double Breaker line position to terminate the TC08SC18 500kV generation tie line.
   - Leave new Position 9 vacant to connect the future No.3AA 500/220kV Transformer Bank.
   - Equip new Position 10 as a Double Breaker line position to terminate the TC08SC24 500kV generation tie line.
   - Equip new Position 11 as a Double Breaker line position to terminate the TC08SC28 500kV generation tie line.
   - Leave new Position 12 vacant for future use.
   - The expansion addressed above requires an approximate extension of the original 2000 Ft. by 1000 Ft. area to an approximate 2000 Ft. by 1000 Ft. by expanding the station 1000Ft. to the east.
   - The 1000 Ft. expansion addressed above area requires grading and site preparation and also the extension of the original grounding grid, interior driveways and control cable trenches.

   <u>Telecommunication Items</u>
   - Install approximately 284 miles of new fiber optic cable from each one of the ten Generating Facilities to the corresponding SCE Substation to meet the diverse routing requirements for generation tie line protection and SPS Relays.
   - Install all required light-wave, channel and related terminal equipment at each end of the ten lines and installation of microwave antenna structures at the new Posa, Eagle and Horn Substations.
   - Install all required light-wave, channel and related terminal equipment at each end of the new Colorado River – Valley, Red Bluff – Valley, Alberhill – Serrano No.2 and Alberhill – Valley No.2 500kV T/L's.

Also, SCE reserves the right to develop and implement an SPS, which may differ with what was modeled in this Study, as long as it can be demonstrated that the performance is as good as or better than the results presented in this report.

15. Recommended Delivery Network Upgrades

To adequately deliver the aggregate MW generation output of all generation projects that have requested interconnection to this Eastern Bulk System, the following facilities and procedures will be needed as part of the overall the POS. Some elements of the POS may need further analysis and definition during the Phase II Interconnection Study or other independent design studies as needed to address any impacts to Affected Systems.

1. **West of Devers 220kV Upgrades**
   - Reconducting four 220 kV lines West of Devers.
   - Install 150 MVAr Shunt Capacitors at El Casco 220 kV Sub
   - Install 150 MVAr Shunt Capacitors at Devers 220 kV Sub

2. **Colorado River Substation**
   - Install 1-one 500/220 kV transformers with 1-phase spare at the Colorado River Sub
   - SPS to trip 500 MW generation at Colorado River Sub to mitigate T-1 overloads on the 500/220kV transformer banks

3. **Serrano-Valley Upgrade**
   - Build a 90 miles long, 2nd circuit Serrano – Valley 500 kV line #2, 2B-2156, ACSR conductor, single-circuit tower construction, on an expanded or separated ROW from the existing Serrano – Valley 500 kV line
   - Install 150 MVAr Shunt Capacitors at Serrano 220 kV Sub

4. **West of Colorado River Upgrades**
   - Loop-in the Red Bluff Sub into the DPV2 500 kV lines
   - Build a new 125 mile long, 2B-2156 ACSR conductor, Red Bluff – Valley 500 kV line, single-circuit tower construction, with 50% series compensation, on a separate ROW from the existing Palo Verde – Devers and Devers – Valley 500 kV lines
   - Install 150 MVAr Shunt Capacitors at Red Bluff 220 kV Sub
   - Install 500MVAr SVC at 220 kV bus

5. **Redbluff Collector Station**
   - Install second 500/220 kV transformers with 1-phase spare at the Red Bluff Sub
   - SPS to trip 700 MW gens at Red Bluff

Dynamic VAr place holder based on common methodology

16. Network Facilities Analysis Report

A. <u>Summary of Network Facilities Analysis Scope</u>

In accordance with Section IV of this Appendix A, per unit costs based on "SCE Generation Interconnection Unit Cost Guide" as shown in Attachment 1, were used to estimate the costs of Reliability and Delivery Network Upgrades identified under previous Sections XI and XII of this Appendix A. Also included in the scope is the estimated time to complete the required facilities and upgrades.

B. Key High Level Assumptions

The Network Facilities Analysis was based on the POS identified under Sections XI and XII of this Appendix A and upon the following assumptions:

1) Interconnection Customers requested Commercial Operation Dates were not a factor in this Appendix A.
2) The technical data supplied by the Interconnection Customers for their respective project are accurate and complete.
3) The maximum interconnection capacities requested by Interconnection Customers are net of auxiliary loads.
4) Interconnection Customers will install, own, operate and maintain all CAISO metering equipment. The CAISO metering equipment will be located on each Interconnection Customer's side of the Point of Interconnection.
5) Interconnection Customer shall design their respective project to maintain a composite power delivery at continuous rated power output at the terminals of the Electric Generating Unit at a power factor within the range of 0.95 leading to 0.90 lagging, unless the CAISO has established different requirements that apply to all generators in the Control Area on a comparable basis.
6) The Network Facilities Analysis results will reflect the CAISO Tariff, rules and protocols and SCE's Interconnection Handbook in effect at the time SCE provides the Phase I Report to the Interconnection Customer.

C. Plan of Service Details

The following is the Plan of Service for the Distribution and Network Upgrades required to support the interconnection of the following fifteen Transitional Queue Projects within the Eastern Bulk System Transmission Cluster into the CAISO System.

The upgrades are numbered respective to the Distribution, Reliability (R) and Deliverability (D) Network Upgrades as listed previously.

For the Cost Allocation Tables, please refer to the attached documentation.

17. Overall Network Facilities Development Cost Estimate

The overall cost estimate shown below and in Attachment 2 identifies the cost of all Network Facilities that were listed under Sections XI and XII of this Appendix A that are required by all projects grouped within the Eastern Bulk System. The costs indicated in the tables are shown in 2009 Dollars.

TOTAL EASTERN BULK SYSTEM NETWORK COST ESTIMATE: $2,600,408,000

Please Note:

The West-of Devers Upgrade (WOD) Project, which is to upgrade the four-(4) 230 kV lines west side of Devers 230 kV Sub to 2B-1033 ACSR conductor, was a SCE proposed TPP Project. The WOD Project obtained SCE's Board approval and is waiting for CAISO's approval. Therefore, the WOD Project has been modeled in the Pre-TRANSITION CLUSTER base case.

From CAISO's Deliverability Study, CAISO chose to allocate the WOD Project cost among Transition Cluster projects.

18. Short Circuit Duty Cost Allocation Methodology

For the most part, each Transition Cluster Group is isolated due to the radial electrical branch design of the SCE electrical system resulting in limiting short circuit duty contributions to facilities within the particular radial electrical branch group. Accordingly, costs of replacing and/or upgrading circuit breakers located within a Transition Cluster Group were allocated among all generation projects located within that Group. Costs of replacing and/or upgrading circuit breakers not located within a particular Transition Cluster Group were allocated over the entire Transition Cluster. Costs were allocated pro rata on the basis of the maximum megawatt electrical output of each proposed new Large Generating Facility or the amount of megawatt increase in the generating capacity of each existing Generating Facility.

<u>Transition Cluster Group Cost Allocation Algorithm</u>

$$\text{Project 1 Breaker Cost} = \frac{G_1\ (\text{MW})}{G_1 + G_2 + \cdots G_{C\ (\text{projects in cluster group})}\ (\text{MW})} \times \text{CB Costs}$$

<u>Entire Transition Cluster Cost Allocation Algorithm</u>

$$\text{Project 1 Breaker Cost} = \frac{G_1\ (\text{MW})}{G_1 + G_2 + \cdots G_{S\ (\text{all projects})}} \times \text{CB Costs}$$

19. Network Facilities Project Development Schedule

The estimated time to construct the required PTO's Interconnection Facilities, any Distribution Upgrades, Reliability Network Upgrades, and Delivery Network Upgrades will be provided in the Phase II Study. Given the magnitude of the Network Upgrades required to interconnect the generation, as requested in the Transition Cluster, the non-binding estimated date the PTO's interconnection facilities, network upgrades, and distribution upgrades will be completed as identified in the Phase I Study could take as long as 96 months from execution of an LGIA to engineer, license, procure, and construct. This timeframe is subject to the availability of resources.

Eastern Cost Allocation Tables

	Project	Point of Interconnection	MW	Comments
1.	T225	Colorado River 500kV Bus	640	500kV Generation tie
2.	T294	Colorado River 500kV Bus	1000	500kV Generation tie
3.	T270	Colorado River 500kV Bus	700	500kV Generation tie
4.	T435	Colorado River 220kV Bus	250	220kV Generation tie
5.	T431	Colorado River 220kV Bus	250	220kV Generation tie
6.	T432	Colorado River 220kV Bus	250	220kV Generation tie
7.	T193	Colorado River 220kV Bus	500	220kV Generation tie
8.	T365	Red Bluff 220kV Bus	750	220kV Generation tie
9.	T210	Red Bluff 220kV Bus	600	220kV Generation tie
10.	T387	Devers – Palo Verde 500kV T/L	900	New Posa Substation
11.	T388	Devers – Palo Verde 500kV T/L	900	New Eagle Substation
12.	T389	Devers – Palo Verde 500kV T/L	900	New Horn Substation
13.	T421	Blythe – Eagle Mountain 161kV T/L	50	New Desert Center Sub.
14.	T229	Devers 500kV Bus	1000	500kV Generation tie
15.	T230	Devers 500kV Bus	1000	500kV Generation tie

Distribution Upgrades:

Distribution -1:

Short Circuit Duty Mitigation					
Needed For					
Circuit Breaker upgrades due to Short Circuit Duty increases as a result of generation added to the SCE System.					
Elements					
1	**Vista Substation:** • Upgrade 12 - 220 kV Circuit Breakers (Non-CAISO)				
Non-CAISO Vista Cost Allocation Factor					
Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
T193	500	1.1 kA	5.2%	$1,478,000	$76,000
	600		6.2%		$92,000
	49.5		0.5%		$8,000
	250		2.6%		$38,000
	640		6.6%		$98,000
	700		7.2%		$107,000
	1000		10.3%		$153,000

	750		7.7%		$114,000
	250		2.6%		$38,000
	900		9.3%		$137,000
	900		9.3%		$137,000
	900		9.3%		$137,000
	250		2.6%		$38,000
	1000		10.3%		$153,000
	1000		10.3%		$153,000
				TOTAL	**$1,478,000**

Distribution-2:

Substation Light and Power (SL&P) primary and back-up circuits for new circuits					
Needed For					
33 kV and 12 kV external service to the SCE substation					
Elements					
1	**DC Blythe Substation:** **Primary 33 kV Circuit** • Build 6 miles of new underground line **Secondary 12 kV Circuit** • Build 16 miles of new underground line				
Cost Allocation Factor					
	Queue #	Cost Share	Upgrades	Total Cost of Upgrade	Cost per Generator
1		100%	New SL&P at DC Blythe	$ 28,600,000	$ 28,600,000
				TOTAL	**$ 28,600,000**

Reliability Upgrades:

R-1: Short Circuit Duty Mitigation:

Short Circuit Duty Mitigation	
Reliability Needed For	
Circuit Breaker Replacements due to Short Circuit Duty increases as a result of generation added to the SCE System.	
Elements	
1	**Mira Loma Substation:** • Replace 4 - 500 kV Circuit Breakers

	• Upgrade 6 - 500 kV Circuit Breakers
2	**Devers Substation:** • Replace 18 - 220 kV Circuit Breakers • Upgrade Switchyard
3	**Redondo Substation:** • Upgrade 4 - 220 kV Circuit Breakers

Mira Loma Cost Allocation Factor					
Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
T193	500	11.5 kA	1.9%	$11,642,000	$221,000
	600		2.3%		$268,000
	49.5		0.2%		$23,000
	250		1.0%		$116,000
	640		2.4%		$279,000
	700		2.7%		$314,000
	1000		3.8%		$442,000
	750		2.9%		$338,000
	250		1.0%		$116,000
	900		3.4%		$396,000
	900		3.4%		$396,000
	900		3.4%		$396,000
	250		1.0%		$116,000
	1000		3.8%		$442,000
	1000		3.8%		$442,000
				TOTAL	**$4,30,000**

Devers Cost Allocation Factor					
Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
T193	500	1.5 kA	5.2%	$30,988,000	$1,611,000
	600		6.2%		$1,921,000
	49.5		0.5%		$155,000
	250		2.6%		$806,000
	640		6.6%		$2,045,000
	700		7.2%		$2,231,000
	1000		10.3%		$3,192,000
	750		7.7%		$2,386,000
	250		2.6%		$806,000
	900		9.3%		$2,882,000
	900		9.3%		$2,882,000

	900		9.3%		$2,882,000
	250		2.6%		$806,000
	1000		10.3%		$3,192,000
	1000		10.3%		$3,192,000
				TOTAL	**$30,989,000**
Redondo Cost Allocation Factor					
Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
T193	500	0.8 kA	1.9%	$684,000	$13,000
	600		2.3%		$16,000
	49.5		0.2%		$1,000
	250		1.0%		$7,000
	640		2.4%		$17,000
	700		2.7%		$18,000
	1000		3.8%		$26,000
	750		2.9%		$20,000
	250		1.0%		$7,000
	900		3.4%		$24,000
	900		3.4%		$24,000
	900		3.4%		$24,000
	250		1.0%		$7,000
	1000		3.8%		$26,000
	1000		3.8%		$26,000
				TOTAL	**$256,000**

Eastern R-2:

Devers SPS					
Reliability Needed For					
Protect Devers AA Bank under T-1 contingency					
Elements					
1	Trip 200 MW generation connecting to Devers substation				
2	**Devers Substation:** - Install two (2) sets of SPS Relays.				
Cost Allocation Factor					
Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
	1000	2000	50%	$ 391,741	$ 196,000
	1000		50%		$ 196,000
				TOTAL	**$ 392,000**

Eastern R-3:

Devers -Mirage SPS					
Reliability Needed For					
To mitigate the N-1 contingency overload under the N-1 contingency of either of these two (2) lines of Devers - Mirage 230kV					
Elements					
1	Trip 950 MW Generation connecting to Devers substation				
2	**Devers Substation:** · Install two (2) sets of SPS Relays.				
3	**Mirage Substation:** · Install two (2) sets of SPS Relays.				
Cost Allocation Factor					
Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
	1000	2000	50%	$ 783,483	$ 392,000
	1000		50%		$ 392,000
				TOTAL	**$ 784,000**

Eastern R-4:

East of Colorado River SPS	
Reliability Needed For	
To prevent the system from transient unstable following N-2 contingencies at east of Colorado River	
Elements	
1	Tripping 1300MW generation at East of Red Bluff under N-2 contingencies at east of Colorado River
2	**Delaney – Palo Verde Transmission Line:** · Replace one (1) of the existing OHGW's with OPGW on the 15-Mile segment from Delaney Substation to the Palo Verde Gen. Station
3	**Colorado River Substation:** · Install seven (7) sets of SPS Relays.
4	**Posa Substation:** · Install one (1) set of SPS Relays.
5	**Eagle Substation:** · Install one (1) set of SPS Relays.
6	**Horn Substation:** · Install one (1) set of SPS Relays.

Cost Allocation Factor

Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
T193	500	9690	5.16%	$ 7,959,212	$ 411,000
	600		6.19%		$ 493,000
	640		6.60%		$ 526,000
	1000		10.32%		$ 821,000
	1000		10.32%		$ 821,000
	700		7.22%		$ 575,000
	1000		10.32%		$ 821,000
	750		7.74%		$ 616,000
	900		9.29%		$ 739,000
	900		9.29%		$ 739,000
	900		9.29%		$ 739,000
	49.5		0.51%		$ 41,000
	250		2.58%		$ 205,000
	250		2.58%		$ 205,000
	250		2.58%		$ 205,000
				TOTAL	**$ 7,960,000**

Eastern R-5:

East of Colorado River Loop-in					
Reliability Needed For					
To balance power flow on DPV 1 and DPV 2 lines					
Elements					
1	Loop in the Colorado River – Delaney 500kV T/L into the new Eagle Substation.				
2	**Colorado River – Delaney 500kV Transmission Line:** · Loop the existing line into to the new Eagle Substation.				
3	**Eagle Substation:** · Equip two (2) existing vacant positions as Double Breaker Positions to terminate the Colorado River and Delaney 500kV T/L's.				
Cost Allocation Factor					
Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
	900	2700	33%	$ 24,638,692	$ 8,213,000
	900		33%		$ 8,213,000
	900		33%		$ 8,213,000
				TOTAL	**$ 24,639,000**

Eastern R-6:

Colorado River Substation **1. Install one (1) 500/220 kV AA transformer**	
Needed For	
Extend Colorado River 500kV switchyard to 500/220kV substation and to mitigate T-1 overload (One bank being installed under Reliability and one under Deliverability, cost divided between the two allocations.)	
Elements	
1	Install one (1) 500/220kV Transformer Bank and a new 220kV Switchyard to allow the installation of the additional facilities required to support four (4) new Transitional Queue Interconnections to the 220kV Bus
2	**Colorado River 500/220kV Substation – Additional Facilities** • Install a third Circuit Breaker at the existing Double Breaker 500kV Line Position 3 to connect the new 1120MVA 500/220kV No.1AA Transformer Bank • Equip existing vacant 500kV Position 5 as a Double Breaker Bank Position to connect the new 1120MVA 500/220kV No.2AA Transformer Bank.

	• Install new 1120MVA 500/220kV No.1AA Transformer Bank consisting of four 373MVA Single Phase Units (Includes one Spare Unit) and 13.8kV Tertiary Buses. • Install new North and South 220kV Buses to span Positions 5 through 8. • Equip new 220kV Position 5 as Double Breaker Bank Position to connect the new 1120MVA 500/No.1AA Transformer Bank. • Leave 220kV Positions 6 and 8 vacant for future 220kV Gen Tie Lines • Equip new 220kV Position 8 as Double Breaker Bank Position to connect the new 1120MVA 500/No.1AA Transformer Bank. • Install four (4) sets of SPS Relays
3	**Power System Control** Expand the existing RTU at Colorado River Substation to install additional points required for all new substation elements

Cost Allocation Factor					
Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
T193	500	1250	40%	48,625,000	$ 19,450,000
	250		20%		$ 9,725,000
	250		20%		$ 9,725,000
	250		20%		$ 9,725,000
				TOTAL	**$48,625,000**

Eastern Plans of Service R-7:

Plan of Service Upgrades	
Elements	
1	

2	**T193, - Interconnections to the Colorado River Substation 220kV Bus Colorado River 500/220kV Substation – 220kV Switchyard** · Install a third Circuit Breaker at the existing Double Breaker Bank Position 8 to terminate the T193 220kV gen Tie Line.
3	

4	
5	

6	

Cost Allocation Factor				
Queue #	Cost Share	Upgrades	Total Cost of Upgrade	Cost per Generator
	27%	Interconnection to the Colorado River Substation 500kV Bus	$ 62,211,449	$ 17,015,000
	43%			$ 26,586,000
	30%			$ 18,610,000
			TOTAL	**$ 62,200,000**
T193	40%	Interconnections to the Colorado River Substation 220kV Bus	$ 87,276,963	$ 34,911,000
	20%			$ 17,455,000
	20%			$ 17,455,000
	20%			$ 17,455,000
			TOTAL	**$ 87,277,000**
	50%	Interconnections to the Red Bluff Substation 220kV Bus	$ 9,850,132	$ 4,925,000
	50%			$ 4,925,000
			TOTAL	**$ 9,850,000**
	50%	Colorado River 500/220kV Substation – 500kV Switchyard	$ 26,113,624	$ 13,057,000
	50%			$ 13,057,000
			TOTAL	**$ 26,114,000**
	33%	Interconnections to the Devers-Palo Verde 500kV Transmission Line	$ 207,939,560	$ 69,313,000
	33%			$ 69,313,000
	33%			$ 69,313,000
			TOTAL	**$ 207,939,000**
	100%	Interconnection to the Blythe-Eagle Mountain 161kV Transmission Line	$ 47,426,664	$ 47,427,000
			TOTAL	**$ 47,427,000**
			TOTAL	**$ 440,807,000**

Delivery Upgrades:

Eastern D-1:

West of Devers 230kV Upgrades **1. Reconductoring four 230kV lines of West of Devers.** **2. 150 MVAR at El Casco 230 kV Sub** **3. 150 MVAR at Devers 230 kV Sub**	
Needed For	
To mitigate base case and contingency overload after model transition cluster generation. The existing WOD SPS of opening Devers AA banks will cause voltage collapse so that has to be removed.	
Elements	
1	**Transmission Lines – Substations and all related elements** · Devers – Vista No.1 220kV T/L · Devers – Vista No.1 220kV T/L · Devers – San Bernardino No.1 220kV T/L · Devers – San Bernardino No.1 220kV T/L · Upgrade approximately 176 Circuit Miles of existing four 220kV T/L's by replacing existing conductors with new 2-1033KCMIL ACSR, installing all new insulators and hardware assemblies and replace or modify structures as required. · Replace all terminal equipment at Devers, San Bernardino and Vista Substations as required to upgrade all corresponding Line Positions to 3,000A Ratings to support the line upgrades described above. · Perform various modifications on existing sub-transmission lines. · Perform all Corporate Real Estate and Permitting and Licensing activities required to modify and/or expand existing Right of Way. · Install all telecommunications facilities to support the upgraded 220kV Line Protection Schemes.
2	**El Casco Substation:** · Install a new 150MVAR 220kV Capacitor Bank.
3	**Devers Substation:** · Install a new 150MVAR 220kV Capacitor Bank. *NOTE: This installation requires 220kV Bus Extensions beyond the existing substation perimeter fence and associated site preparation, extension of grounding grid and relocation of station access road*

Cost Allocation Factor

Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
	19.56	260.42	7.51%	$ 217,594,644	$16,341,000
	2.12		0.81%		$1,763,000
T193	15.05		5.78%		$12,577,000
	50.88		19.54%		$42,518,000
	26.79		10.29%		$22,390,000

	21.43		8.23%		$17,908,000
	50.88		19.54%		$42,518,000
	7.52		2.89%		$6,288,000
	7.52		2.89%		$6,288,000
	21.06		8.09%		$17,603,000
	7.52		2.89%		$6,288,000
	30.09		11.55%		$25,132,000
				TOTAL	**$ 217,614,000**

Eastern D-2:

Colorado River Substation **1. Install one (1) 500/220 kV AA transformer** **2. SPS to trip 500 MW gens at Colorado River Sub** **3. Install 500 MVAR of Service at 220 kV Bus**	
Needed For	
Extend Colorado River 500kV switchyard to 500/220kV substation and to mitigate T-1 overload	
Elements	
1	Install one (1) 500/220kV Transformer Banks and a new 220kV Switchyard to allow the installation of the additional facilities required to support four (4) new Transitional Queue Interconnections to the 220kV Bus
2	**Colorado River 500/220kV Substation – Additional Facilities** • Install a third Circuit Breaker at the existing Double Breaker 500kV Line Position 3 to connect the new 1120MVA 500/220kV No.1AA Transformer Bank • Equip existing vacant 500kV Position 5 as a Double Breaker Bank Position to connect the new 1120MVA 500/220kV No.2AA Transformer Bank. • Install new 1120MVA 500/220kV No.1AA and No.2AA Transformer Banks consisting of seven 373MVA Single Phase Units (Includes one Spare Unit) and 13.8kV Tertiary Buses. • Install new North and South 220kV Buses to span Positions 5 through 8. • Equip new 220kV Position 5 as Double Breaker Bank Position to connect the new 1120MVA 500/No.1AA Transformer Bank. • Leave 220kV Positions 6 and 8 vacant for future 220kV Gen Tie Lines • Equip new 220kV Position 8 as Double Breaker Bank Position to connect the new 1120MVA 500/No.1AA Transformer Bank. • Install four (4) sets of SPS Relays
3	**Power System Control** Expand the existing RTU at Colorado River Substation to install additional points required for all new substation elements

Cost Allocation Factor

Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
T193	500	1250	40%	$ 49,504,217	$ 19,801,000

	250		20%		$ 9,901,000
	250		20%		$ 9,901,000
	250		20%		$ 9,901,000
				TOTAL	**$49,504,000**

Eastern D-3:

RedBluff Collector Station **1. Add 2nd 500 / 230 kV AA bank at the Red Bluff 500 kV Substation** **2. SPS to trip 700 MW gens at RedBluff Sub**	
Needed For	
To mitigate normal overload and T-1 overload	
Elements	
1	Install a new Bank Position at the existing 220kV Switchyard to connect the new 500/220kV Transformer Bank.
2	**Red Bluff 500/220kV Substation – Additional Facilities** • Equip existing vacant 500kV Position 5 as a Double Breaker Bank Position to connect the new 1120MVA 500/220kV No.2AA Transformer Bank. • Install new 1120MVA 500/220kV No.2AA Transformer Bank consisting of three (3) 373MVA Single Phase Units and 13.8kV Tertiary Bus. • Equip existing vacant 220kV Position 8 as a Double Breaker Bank Position to connect the new 1120MVA 500/220kV No.2AA Transformer Bank. • Install two (2) sets of SPS Relays.
3	**Power System Control** Expand the existing RTU at Red Bluff Substation to install additional points required for all new substation elements.

Cost Allocation Factor

Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
	600	1350	44%	$ 49,366,324	$ 21,941,000
	750		56%		$ 27,426,000
				TOTAL	**$ 49,367,000.00**

Eastern D-4

Serrano - Valley upgrade **1. Build the 2nd circuit of Serrano-Valley 500 kV line in different right of way or expand the right of way.** **2. 150MVAR at Serrano 230kV Sub**	
Needed For	
To mitigate basecase overload and N-1 overload on the existing Serrano-Valley 500kV line	
Elements	
1	Install a new Serrano – Valley No.2 500kV Transmission Line and a new 70MVAR 220kV Shunt Capacitor Bank at Serrano Substation. *NOTE: SCE is planning the installation of a new 500/115kV Alberhill Substation which will be connected to the 500kV System by looping the existing Serrano Valley into the new station and forming the two new Alberhill – Serrano and Alberhill – Valley 500kV T/L's.* *The Alberhill Substation 500kV Switchyard is being designed to allow the looping of the future Serrano – Valley No.2 500kV T/L*
2	**Alberhill – Valley No.2 500kV T/L** Install 15 Miles of new Single Circuit Line equipped with two (2) 2156KCMIL ACSR Conductors, one (1) ½-In Steel OHGW and one (1) OPGW
3	**Alberhill – Serrano No.2 500kV T/L** Install 26 Miles of new Single Circuit Line equipped with (2) 2156KCMIL ACSR Conductors, one (1) ½-In Steel OHGW and one (1) OPGW
4	**Alberhill Substation** Install two (2) new 500kV Line Positions to terminate the new Serrano No.2 and Valley No.2 500kV T/L's on the existing vacant GIS 500kV Positions 1 and 4. **Each position will be equipped as follows:** • One (1) 60 Ft. High by 90 Ft. Wide 500kV Line Dead End Structure. • Three (3) Line Drops equipped with 2-2156KCMIL ACSR Conductors. • Two (2) 500kV Wave Traps. • Three (3) 500kV CCVT's mounted on individual steel pedestals. • Three (3) 500kV Surge Arresters mounted on individual steel pedestals. • Three (3) 500kV Gas to Air Bushings. • One (1) additional GIS Circuit Breaker and associated Disconnect Switches to be installed at the center location of the corresponding 500kV GIS Position.
5	**Serrano Substation** Install one (1)new 500kV Line Position 4 to terminate the new Alberhill No.2 500kV T/L. **The following work is required:** • Extend the existing 500kV GIS Buses one (1) position to the south to install a new GIS 500kV Position 4. • Equip the new GIS Position 4 as a Double Breaker Line Position to terminate the new Alberhill No.2 500kV T/L and leave additional space for a future Center Breaker and associated Disconnect Switches. • The 500kV installation addressed above requires the extension of the existing 500kV GIS Building approximately 50 Ft. to the south.

	• Install a new 150MVAR 220kV Shunt Capacitor Bank. • The 220kV installation addressed above requires substantial modifications to the existing 220kV GIS Switchgear and the corresponding building.
6	**Valley Substation** Install a third Circuit Breaker at the existing Double Breaker Line 500kV Position 8X-S to terminate the new Alberhill No.2 50kV T/L.
7	**Telecommunications** Install all required light-wave, channel and related terminal equipment at each end of the new Alberhill – Serrano No.2 and Alberhill – Valley No.2 500kV T/L's
8	**Power System Control** Expand existing RTU's at Alberhill, Valley and Serrano Substations to install additional points required for all new substation elements.

Cost Allocation Factor					
Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
	84.53	976	8.66%	$ 750,379,772	$64,982,000
	142.97		14.65%		$109,907,000
	142.97		14.65%		$109,907,000
	83.25		8.53%		$63,998,000
	89.66		9.19%		$68,926,000
	128.08		13.12%		$98,461,000
	105.67		10.83%		$81,233,000
	32.02		3.28%		$24,615,000
	32.02		3.28%		$24,615,000
	32.02		3.28%		$24,615,000
T193	64.04		6.56%		$49,230,000
	12.62		1.29%		$9,702,000
	10.03		1.03%		$7,711,000
	8.39		0.86%		$6,450,000
	7.84		0.80%		$6,027,000
				TOTAL	**$ 750,379,000**

Eastern D-5:

West of Colorado River upgrade: **1. Colorado River - Devers loop-in to RedBluff** **2. New RedBluff - Valley 500kV line with 50% compensation on single circuit tower in a different right of way of Devers - Valley 500 kV line.** **3. 150 MVAR at Red Bluff 230 kV Sub** **4. 300MVAR of Service**
Needed For
To mitigate base case overload
Elements

1	Install a new Red Bluff – Valley Transmission Line equipped with two (2) Line Series Capacitor Banks, a new 150MVAR 220kV Shunt Capacitor Bank at Red Bluff Substation and a new 500MVAR 220kV SVC at Colorado River Substation and loop the Colorado River – Devers No.2 500kV T/L into Red Bluff Substation.
2	**Colorado River – Devers No.2 500kV T/L** Loop the line into Red Bluff Substation
3	**Red Bluff – Valley 500kV T/L** • Install 103 Miles of new Single Circuit Line equipped with (2) 2156KCMIL ACSR Conductors and OPGW • The line will be equipped with two (2) 500kV Line Series Capacitor Banks described on Item 9.c below. **500kV Line Series Capacitors** • Install two (2) 800MVAR 500kV Line Series Capacitors Banks on the new Red Bluff – Valley 500kV Transmission Lines. **Each Capacitor Bank will be equipped as follows:** • Two (2) 110 Ft. High by 90 Ft. Wide 500kV Line Dead End Structure. • Six (6) Line Drops equipped with 2-2156KCMIL ACSR Conductors. • Two (2) Horizontal Mounted – Group Operated Disconnect Switches • One (1) Pantograph Type – Group Operated Capacitor By-Pass 500kV Disconnect Switch. • One (1) Mechanical-Electrical Equipment Room (MEER). • The installation addressed above requires an approximate area of 350 Ft. by 250 Ft. • The new area requires grading and site preparation and also a new grounding grid, interior driveways and control cable trenches.
4	**Red Bluff Substation** Extend the existing Configuration of the 500kV Switchyard to allow the installation of the additional facilities required to loop the Colorado River – Devers No.2 500kV T/L and terminate the new Valley 500kV T/L. **500kV Switchyard Expansion Required:** • Install a third Circuit Breaker at the existing Double Breaker 500kV Bank Position 3 to terminate the Devers No.2 500kV T/L. • Equip existing vacant 500kV Position 6 as a Double Breaker Bank Position to terminate the Colorado River No.2 500kV T/L. • Extend the North and South 500kV buses two positions to the west to span new Positions 1 and 2. • Leave new Position 1 vacant for future use. • Equip new Position 2 as a Double Breaker Line Position to terminate the Valley 500kV T/L.
5	**Valley Substation** • Install a 500kV Line Position to terminate the new Red Bluff 500kV T/L on the existing vacant 500kV Position 9X-S. **The position will be equipped as follows:** • One (1) new 60 ft. High by 90 Ft. Wide 500kV Line Dead End Structure. • Three (3) Line Drops equipped with 2-2156KCMIL ACSR Conductors. • Two (2) 500kV Wave Traps • Three (3) 500kV CCVT's mounted on individual steel pedestals • Three (3) 500kV Surge Arresters mounted on individual steel pedestals

	• Three 1,000 Ft. of Single Phase 500kV Gas Insulated Line (GIL) from each dead End Structure to the existing Switchyard Position. • Six (6) 500kV Gas to Air Bushings (One at each end of the GIL) • One (1) additional Circuit Breaker and associated Disconnect Switches to be installed at the existing Switchyard Position. • The installation addressed above requires an approximate 250 Ft. by 100 Ft. expansion of the south / west corner of the station. • The expansion addressed above area requires grading and site preparation and also the extension of the original grounding grid and installation of control cable underground conduits.
6	**Colorado River Substation** • Install a new 500MVAR 220kV SVC. • This installation requires the equipping of the vacant 220kV Position 12 as a Double Breaker Position to connect the SVC to both the North and South 220kV Buses.
7	**Telecommunications** • Install all required light-wave, channel and related terminal equipment at each end of the new Red Bluff – Valley 500kV T/L and the two (2) new 500kV Line Series Capacitors locations.
8	**Power System Control** • Install new RTU's at each Capacitor Bank location and expand existing RTU's at Colorado River, Red Bluff and Valley Substations to install additional points required for all new substation elements.

Cost Allocation Factor

Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
	36.06	859.38	4.20%	$ 882,422,213	$37,027,000
	144.24		16.78%		$148,107,000
	173.38		20.18%		$178,029,000
	93.76		10.91%		$96,274,000
	100.97		11.75%		$103,677,000
	36.06		4.20%		$37,027,000
T193	72.12		8.39%		$74,054,000
	138.70		16.14%		$142,419,000
	36.06		4.20%		$37,027,000
	1.91		0.22%		$1,961,000
	12.52		1.46%		$12,856,000
	4.88		0.57%		$5,011,000
	4.90		0.57%		$5,031,000
	3.82		0.44%		$3,922,000
				TOTAL	**$ 882,422,000**

Delivery upgrades on other areas:

Pisgah - Rancho Vista 500 kV AC line
Needed For

Multiple overloads under N-1 and N-2 contingencies	
Elements	
1	**Pisgah – Rancho Vista 500kV T/L:** Install 97 Miles of new Single Circuit Line equipped with two (2) 2156KCMIL ACSR Conductors, one (1) OHGW and one (1) OPGW.
2	**Crucero – Pisgah 500kV T/L (Formerly Eldorado – Pisgah):** · Relocate the line termination at Pisgah Substation from Position 1 to Position 3.
3	**Lugo – Pisgah No.2 500kV T/L:** · Relocate the line termination at Pisgah Substation from Position 3 to Position 10..
4	**Pisgah 500/220kV Substation:** · Reconfigure the proposed 500kV Switchyard to allow the installation of the additional facilities required to relocate the 500kV T/L's addressed above and terminate the new Rancho Vista 500kV T/L. **New Positions Required:** · Equip vacant 500kV Position 3 as a Double Breaker Line Position to terminate the relocated Crucero 500kV T/L. · Install a third Circuit Breaker at the proposed 500kV Double Breaker Bank Position 10 to terminate the relocated Lugo No.2 500kV T/L.
5	**Rancho Vista 500/220kV Substation:** · Install all required outdoor 500kV T/L Termination Equipment and one (1) additional 500kV GIS Circuit Breaker and associated Disconnect Switches to an existing GIS Double Breaker Line Position to terminate the Pisgah 500kV T/L.
6	**Telecommunications:** · Install all required light-wave, channel and related terminal equipment at each end of the new Pisgah Rancho Vista 500kV T/L.
7	**Power System Control:** · Expand existing RTU's at Pisgah and Rancho Vista Substations to install additional points required for all new substation elements.

Cost Allocation Factor

Queue #	MW Size	Total Impact	Cost Share	Total Cost of Upgrade	Cost per Generator
	22	428	5%	$ 1,016,198,488	$51,838,000
	1		0%		$3,137,000
T193	2		1%		$5,507,000
	2		0%		$3,737,000
	1		0%		$2,157,000
	26		6%		$62,253,000
	16		4%		$37,989,000
	1		0%		$2,359,000
	89		21%		$211,779,000
	118		28%		$281,123,000
	1		0%		$3,370,000
	57		13%		$134,124,000
	1		0%		$2,528,000
	16		4%		$37,352,000

	50		12%		$118,331,000
	1		0%		$2,451,000
	0		0%		$843,000
	0		0%		$843,000
	0		0%		$843,000
	1		0%		$1,225,000
	17		4%		$39,743,000
	5		1%		$12,667,000
				TOTAL	**$ 1,016,200,000**

Attachment 2 to Appendix A -- Deliverability Assessment Results of Eastern Bulk System

The following three tables provide the summary of the Eastern Bulk System deliverability assessment results.

Table A.2.1 provides a summary of the contingency analysis results from the deliverability study. It shows the overloaded or overstressed facilities or paths that were identified along with the worst contingency causing the problem.

Table A.2.1: Transition Cluster Deliverability Study – Eastern Bulk System Contingency Analysis Summary

Overloaded Facility	Worst Contingency	Category
WestOfDevers	Base Case	A
J.Hinds-Mirage	Base Case	A
J.Hinds-EagleMtn	Base Case	A
Devers - RedBluff	Base Case	A
Valley-AlberHill-Serrano	Base Case	A
Devers-ColoradoRiver	Devers - RedBluff N-1	B
Devers-ValleySC	Devers-ValleySC N-1	B
Voltage Collapse	J.Hinds-Mirage N-1	B
Voltage collapse	Colorado River – Eagle N-2	C
Voltage collapse	Devers – ValleySC N-2	C

Table A.2.2 provides a summary of the preliminary delivery network upgrades required to provide full capacity deliverability status for the generation projects identified by queue # in the generation groups listed. This table shows the delivery network upgrades under the column labeled “Upgrades”, and the generation projects responsible for the cost of that upgrade in the column labeled “Group” with subheading “Queue #”. Then it shows the percentage cost responsibility for each generation project in that group in the column labeled “Cost Allocation” with subheading “Cost Share”. This cost share is based on the MW flow impact of the each generation project on the delivery network upgrade. This flow impact is calculated using the distribution factor or DFAX calculated as described in the deliverability assessment methodology documents.

Table A.2.2: Mitigation Plan and Cost Allocation of Delivery Network Upgrade Cost in Eastern Bulk System

Upgrades	Type	Needed For	Group		Cost Allocation Factor	
			Queue #	Flow Impact on Network Upgrade (MW)	Total Flow Impact	Cost Share
West of Devers 230kV upgrades 1. Reconductoring four 230kV lines of West of Devers. 2. 150 MVAR at El Casco 230 kV Sub 3. 150 MVAR at Devers 230 kV Sub	Delivery	To mitigate basecase and contingency overload after model transition cluster generation. The existing WOD SPS of opening Devers AA banks will cause voltage collapse so that has to be removed.		19.56	260	7.51%
				2.12		0.81%
			T193	15.05		5.78%
				50.88		19.54%
				26.79		10.29%
				21.43		8.23%
				50.88		19.54%
				7.52		2.89%
				7.52		2.89%
				21.06		8.09%
				7.52		2.89%
				30.09		11.55%
Colorado River Substation 1. Install 2nd 500/230 kV AA transformer 2. SPS to trip 500 MW gens at Colorado River SubSub	Delivery	Extend Colorado River 500kV switchyard to 500/230kV substation and to mitigate T-1 overload	T193	500.00	1250	40.00%
				250.00		20.00%
				250.00		20.00%
				250.00		20.00%
RedBluff Collector Station 1. Add 2nd 500 / 230 kV AA bank at the Red Bluff 500 kV Substation 2. SPS to trip 700 MW gens at RedBluff Sub	Delivery	To mitigate normal overload and T-1 overload		600.00	1350	44.44%
				750.00		55.56%
Serrano - Valley upgrade 1. Build the 2nd circuit of Serrano-Valley 500 kV line in different right of way or expand the right of way. 2. 70 MVAR at Serrano 230kV Sub	Delivery	To mitigate basecase overload and N-1 overload on the existing Serrano-Valley 500kV line		84.53	976	8.66%
				142.97		14.65%
				142.97		14.65%
				83.25		8.53%
				89.66		9.19%
				128.08		13.12%
				105.67		10.83%
				32.02		3.28%
				32.02		3.28%

				32.02		3.28%
			T193	64.04		6.56%
				12.62		1.29%
				10.03		1.03%
				8.39		0.86%
				7.84		0.80%
West of Colorado River upgrade: 1. Colorado River - Devers loop-in to RedBluff 2. New RedBluff - Valley 500kV line with 50% compensation on single circuit tower in a different right of way of Devers - Valley 500 kV line. 3. 150 MVAR at Red Bluff 230 kV Sub 4. 500 MVAR SVC at Colorado River 230 kV bus	Delivery	To mitigate basecase overload and maintain system stable under N-2 contingencies		36.06	859	4.20%
				144.24		16.78%
				173.38		20.18%
				93.76		10.91%
				100.97		11.75%
				36.06		4.20%
			T193	72.12		8.39%
				138.70		16.14%
				36.06		4.20%
				1.91		0.22%
				12.52		1.46%
				4.88		0.57%
				4.90		0.57%
				3.82		0.44%

Table A.2.3 provides the results of a sensitivity study performed to determine the MW amount of generation in the group that would be deliverable if the upgrade component described in the column labeled “Component” were removed from the preliminary delivery network upgrade plan.

Table A.2.3: Sensitivity of Removing Highest Cost Delivery Network Upgrade Component in Eastern Bulk Area Groups

Upgrades	Group	Cost Allocation Factor		Deliverable MW w/o the Highest Cost Component		
	Queue #	Total Flow Impact	Cost Share	Component	On Peak Deliverable MW and % of NQC	Off Peak Deliverable MW and % of NQC
West of Devers 230kV upgrades 1. Reconductoring four 230kV lines of West of Devers. 2. 150 MVAR at El Casco 230 kV Sub 3. 150 MVAR at Devers 230 kV Sub	T225	260	7.51%	West of Dever 230 kV lines upgrade	2940 MW 45.3%	N/A
	T421		0.81%			
	T193		5.78%			
	T229		19.54%			
	T365		10.29%			
	T210		8.23%			
	T230		19.54%			
	T431		2.89%			
	T432		2.89%			
	T270		8.09%			
	T435		2.89%			
	T294		11.55%			
Colorado River	T193	1250	40.00%	Remove one	1150	N/A

Substation 1. Install 2nd 500/230 kV AA transformer 2. SPS to trip 500 MW gens at Colorado River SubSub	T431		20.00%	AA bank (Only impact T193, T431, T432 and T435)	92.0%	
	T432		20.00%			
	T435		20.00%			
RedBluff Collector Station 1. Add 2nd 500 / 230 kV AA bank at the Red Bluff 500 kV Substation 2. SPS to trip 700 MW gens at RedBluff Sub	T210	1350	44.44%	Remove one AA bank (Only impact T210 and T365)	600 44%	N/A
	T365		55.56%			
Serrano - Valley upgrade 1. Build the 2nd circuit of Serrano-Valley 500 kV line in different right of way or expand the right of way. 2. 70 MVAR at Serrano 230kV Sub	T210	976	8.66%	Remove 2nd Serrano -Valley 500 kV line	4740 73.0%	N/A
	T229		14.65%			
	T230		14.65%			
	T225		8.53%			
	T270		9.19%			
	T294		13.12%			
	T365		10.83%			
	T435		3.28%			
	T432		3.28%			
	T431		3.28%			
	T193		6.56%			
	T468		1.29%			
	T178B		1.03%			
	T209		0.86%			
	T429		0.80%			
West of Colorado River upgrade: 1. Colorado River - Devers loop-in to RedBluff 2. New RedBluff - Valley 500kV line with 50% compensation on single circuit tower in a different right of way of Devers - Valley 500 kV line. 3. 150 MVAR at Red Bluff 230 kV Sub 4. 500 MVAR SVC at Colorado River 230 kV bus	T431	859	4.20%	Remove Redbluff - Valley 500 kV line	4740 73.0%	N/A
	T294		16.78%			
	T365		20.18%			
	T225		10.91%			
	T270		11.75%			
	T435		4.20%			
	T193		8.39%			
	T210		16.14%			
	T432		4.20%			
	T442		0.22%			
	T468		1.46%			
	T178B		0.57%			
	T209		0.57%			
	T429		0.44%			

STATE OF CALIFORNIA ARNOLD SCHWARZENEGGER, *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

F I L E D
09-28-09
04:22 PM

September 28, 2009

Agenda ID #8880
Ratesetting

TO PARTIES OF RECORD IN APPLICATION 05-04-015

This is the proposed decision of Administrative Law Judge (ALJ) Kolakowski. It will not appear on the Commission's agenda sooner than 30 days from the date it is mailed. The Commission may act then, or it may postpone action until later.

When the Commission acts on the proposed decision, it may adopt all or part of it as written, amend or modify it, or set it aside and prepare its own decision. Only when the Commission acts does the decision become binding on the parties.

Parties to the proceeding may file comments on the proposed decision as provided in Article 14 of the Commission's Rules of Practice and Procedure (Rules), accessible on the Commission's website at www.cpuc.ca.gov. Pursuant to Rule 14.3, opening comments shall not exceed 15 pages.

Comments must be filed either electronically pursuant to Resolution ALJ-188 or with the Commission's Docket Office. Comments should be served on parties to this proceeding in accordance with Rules 1.9 and 1.10. Electronic and hard copies of comments should be sent to ALJ Kolakowski at vsk@cpuc.ca.gov and the assigned Commissioner. The current service list for this proceeding is available on the Commission's website at www.cpuc.ca.gov.

/s/ KAREN V. CLOPTON
Karen V. Clopton, Chief
Administrative Law Judge

KVC:eap

Attachment

Decision **PROPOSED DECISION OF ALJ KOLAKOWSKI** (Mailed 9/28/09)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of Southern California Edison Company (U-338-E) for a Certificate of Public Convenience and Necessity Concerning the Devers-Palo Verde No. 2 Transmission Line Project.	Application 05-04-015 (Filed April 11, 2005)

DECISION MODIFYING DECISION 07-01-040 GRANTING A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

On May 14, 2008, Southern California Edison Company (SCE) filed a petition for modification (Petition) of Decision (D.) 07-01-040 in Application (A.) 05-04-015. D.07-01-040 grants a certificate of public convenience and necessity to SCE to construct the Devers-Palo Verde No. 2 Transmission Line Project (Project). Most significantly, SCE seeks modifications to the Decision that will permit SCE to construct only the California portion of the Project. This decision grants the requested relief, as adjusted herein, and modifies D.07-01-040 as set forth in Attachment 1.

1. Background

The Commission granted an application for a certificate of public convenience and necessity (CPCN) for the Project in D.07-01-040 (the Decision) dated January 25, 2007. The Commission granted the CPCN on the basis that the Project would generate significant economic benefits to California ratepayers.

The Project approved in the Decision was originally comprised of two major transmission lines, one of which is intrastate, and one of which is interstate. Together, the elements of the Project were intended to increase the transfer capability between load centers in southern California and electrical resources in Arizona by 1,200 megawatts (MW). This would allow southern California ratepayers to access competitively priced electrical resources in Arizona, as well as reduce congestion on existing transmission lines, thus providing significant ratepayer benefits in the form of lower energy prices and reduced congestion charges. These ratepayer savings were estimated to be well in excess of the annual ratepayer costs of the Project.[1] As a result of these findings, the Decision conditioned construction of the California portion of the Project upon approval for construction of the Arizona portion of the Project.[2]

The intrastate portion of the Project is a 41.6 mile transmission line known as the "Devers-Valley No. 2" transmission line, a second 500 kV transmission line between SCE's Devers substation in North Palm Springs, Riverside County, and SCE's Valley substation in the unincorporated portion of Riverside County. The interstate line is an approximately 230 mile 500 kV line known as "Devers-

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[1] Decision at 104, Findings of Fact 2-4, and 6.

[2] The Decision states that approval is conditioned upon construction according to the approved route, which encompassed the entire Project. Approval for the Arizona portion would have to be obtained from another agency, which would either be the Arizona Corporation Commission (ACC) or the Federal Energy Regulatory Commission (FERC).

Harquahala" transmission line, which would connect Devers substation in California to a location in Arizona near the Palo Verde nuclear generating plant.[3]

On June 6, 2007, the Arizona Corporation Commission (ACC) denied SCE's application to construct the Project in Arizona.[4]

On May 14, 2008, SCE filed the Petition requesting modifications to the Decision to allow SCE to construct the Project in phases. Specifically, SCE sought authority to construct all of the California portions of the Project, up to and including the proposed Midpoint Substation east of Blythe, about 15 miles west of the California/Arizona border. SCE sought to access "potential new renewable and conventional gas-fired generation in the Blythe, California area" and the Petition stated that "[s]uch authorization will help enable California to meet its renewable energy goals."[5] The Petition stated that "SCE is committed to constructing the DPV2 facilities in Arizona" notwithstanding ACC denial, and claimed that phasing the construction "does not change the cost-effectiveness of the DPV2 project. … DPV2 will still provide net benefits."[6]

The Commission's Division of Ratepayer Advocates (DRA) and The Utility Reform Network (TURN) filed separate responses to the Petition on June 13,

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[3] The exact location of the Arizona terminus of the Devers-Harquahala transmission line was subject to on-going negotiations at the time of the Decision. The environmental document certified in the Decision studied three routing alternatives with different termination points for the Project. The Decision concluded that SCE should seek to terminate the Project at a new Harquahala Junction, subject to ACC approval and any other needed authorizations. Decision at 65-67.

[4] Arizona Corporation Commission Decision No. 69638 (June 6, 2007), docket No. L-00000A-06-0295-00130.

[5] Petition at 1.

[6] Petition at 4-6.

2008. TURN filed in support of SCE, arguing that it had resolved any environmental concerns with SCE. DRA raised objections to SCE's proposal, arguing that a new cost-effectiveness study was necessary and that without the Arizona portion of the Project, the California portion might be unnecessary.

In response to the concerns raised by DRA, assigned Commissioner Dian Grueneich and ALJ Timothy J. Sullivan issued a joint ruling on July 17, 2008 (Joint Ruling). The Joint Ruling found that SCE had not provided sufficient information to allow the Commission to grant the Petition. It found:

> SCE's Petition fails to provide facts to demonstrate that ratepayer benefits accrue: (1) if only the California portion of DPV2 is construction, or (2) if construction of the Arizona portion of DPV2 is constructed far beyond the time frame estimated in the original CPCN decision.

Consequently, the Joint Ruling ordered SCE to amend the Petition "to provide this missing information and therefore demonstrate that construction of the California portion of DPV2 will serve the public interest."[7]

ALJ Victoria S. Kolakowski was co-assigned to the proceeding on August 14, 2008.

In response to the Joint Ruling, SCE filed an amendment to the Petition (Amendment) on September 2, 2008 and a supplement on September 12, 2008. The Amendment included additional information regarding the renewable resources in the Blythe area, as well as updated information regarding the costs and benefits of the Project. No party filed comments on the Amendment or the supplement.

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[7] Joint Ruling at 2.

More than eight months later, on May 15, 2009, SCE filed an *ex parte* notice with two attachments. The first attachment was a copy of a letter to the Commissioners, dated May 15, 2009, informing them that SCE intended to discontinue pursuit of ACC approval for the Arizona portion of the Project and stating SCE's intention to pursue the California portion of the Project. The second attachment was a copy of a letter to the ACC dated May 15, 2009, stating that SCE had updated its economic analysis and that the benefits of the Project are "significantly lower as a result of recent developments." The letter stated that SCE would not be refiling with the ACC for authorization of the Arizona portion of the Project. Consistent with these notices, SCE withdrew its May 16, 2008 pre-filing request to initiate Federal Energy Regulatory Commission (FERC) preemption of the ACC denial in Docket No. PT08-1-000 in a May 18, 2009 letter to FERC. SCE had submitted the request as an initial step in obtaining a FERC permit for the Arizona portion of the Project pursuant to Section 216 of the Federal Power Act.

In response to the May 15, 2009 *ex parte* notice, ALJ Kolakowski issued a ruling on June 3, 2009, directing SCE to supplement the record for what had become a California-only Project.[8] The ruling directed that SCE supplement the Petition regarding four matters: (1) the current status of the California-only Project, including any changes to cost estimates, applications before other agencies and the California Independent System Operator Corporation (CAISO),

[8] "California-only Project" is used herein to describe a modified version of the original Project wherein only the California segments west of and including the Midpoint Substation are constructed, and the segments east of Midpoint Substation are not constructed.

power purchase agreements between SCE and generation developers served by the Project, projections of renewable energy resources identified by the Renewable Energy Transmission Initiative (RETI),[9] and any other relevant information; (2) information regarding the status of the CAISO's approval of the California-only Project; and (3) information regarding the status of the Blythe Energy Project Phase I and II generation facilities.

SCE filed its supplemental information on June 26, 2009 (Supplemental Filing). Notably, the Supplemental Filing provides as Attachment I a June 19, 2009 letter from the CAISO to the ALJ setting forth the conditions for CAISO approval of a California-only Project (CAISO Letter).[10] The CAISO Letter explains that, given a California-only Project, "the economic justification for the project … is no longer applicable."[11] However, the CAISO Letter suggests that "that California portion of the project continues to provide operational and reliability benefits, and the ISO has identified the anticipated need for the project as a generation interconnection facility, which provides the basis for the ISO's agreement to the construction of the California portion of the project, should the

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[9] RETI is a collaborative study effort among California stakeholders seeking to develop renewable generation and associated transmission. The RETI effort is overseen by a Coordinating Committee composed of the Commission, the California Energy Commission, the CAISO, the Southern California Public Power Authority, the Northern California Power Agency, and the Sacramento Municipal Utility District. The Stakeholder Steering Committee is comprised of investor-owned utilities, publicly owned utilities, renewable developers, federal land use agencies, environmental organizations, consumer organizations, local government organizations, and others. Additional information about RETI is available at http://www.energy.ca.gov/reti.

[10] The letter was also delivered to the ALJ on June 19, 2009, and the CAISO filed a concurrent *ex parte* notice with the letter attached.

[11] Supplemental Filing, Attachment I, CAISO Letter at 2.

requirements below be met."[12] The CAISO Letter provides a summary of the status of generator interconnection requests in the Blythe area, where the California-only Project would terminate, and states that "[t]he ISO anticipates that the California portion of the project will be an important facility in furtherance of state goals regarding the long-term acquisition of power from renewable energy resources." In summary, the CAISO Letter explains that the CAISO's approval of the California-only Project is contingent upon the execution of a sufficient number of Large Generator Interconnection Agreements for interconnection to the California-only Project.[13] SCE estimates CAISO approval of the California-only Project by as early as December 2009 or as late as January 2011, depending upon the successful execution of large generator interconnection agreements in the near term, or a determination of need based upon certain clusters of interconnection requests.[14]

In response to the Supplemental Filing, DRA filed a response on July 6, 2009 (DRA Response) arguing that "[t]here is nothing in the record that demonstrates that the California portion of this transmission project is needed; no such determination has yet been made by the CAISO, and any determination is at least six months away."[15] DRA seeks denial of the Petition, without prejudice to a later SCE filing.

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[12] Supplemental Filing, Attachment I, CAISO Letter at 2.

[13] Supplemental Filing, Attachment I, CAISO Letter at 2.

[14] Supplement Filing at 15.

[15] DRA Response at 4.

2. Procedural Requirement Under Rule 16.4

Rule 16.4 governs the process for the filing and consideration of Petitions for Modification (PFM). Rule 16.4(b) requires that a PFM concisely state the justification for the proposed relief and to propose specific wording for all requested modifications. SCE's Petition and Amendment contain concise but thorough statements of justification for the proposed modifications. SCE's Petition and Amendment proposes specific wording for all requested modifications. Hence, this requirement has been fulfilled.

Rule 16.4(d) states that if more than one year has elapsed since the effective date of the decision, then the petitions must explain why they could not have been presented within one year of the effective date of the decision. SCE's Petition did not expressly address this issue. However, it is clear from the sum of the discussion throughout the record that the Petition was necessitated by the ACC's denial of SCE's permit to construct the Arizona portion of the Project, SCE's subsequent appeal of that decision, and SCE's inability to remedy this situation in the months that followed. Attachment B to the Supplemental Filing provides a procedural background for the Petition and explains that SCE filed the Petition "in anticipation of obtaining the approvals it needed to construct the Arizona portion of DPV2, and to position itself and the State of California to take advantage of potential generation sources (most of which are renewable) near Blythe, California."[16] We find that this is a reasonable justification for the delay.

Hence, we conclude that SCE's Petition and Amendment complies with the requirements of Rule 16.4.

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[16] Supplemental Filing, Attachment B, 2nd paragraph.

3. Need For The California-Only Project

3.1. The Prior Economic Need For The Project Doest Not Apply To A California-Only Project

As described above, this Commission approved the Project contingent upon construction of both the California and Arizona portions because the Arizona portion of the Project was critical to delivering the economic benefits that justified approval of the line. Nevertheless, SCE's Petition provided insufficient information to confirm that the Arizona portion would ever be approved by the ACC and constructed. Consequently, pressed by the Joint Ruling ordered SCE to provide an updated economic analysis to explain the economic benefits of a California-only Project. SCE provided limited economic analysis in its Amendment and stated that it would complete a more detailed analysis by the end of the year to accompany an application to construct with either FERC or the ACC, and that analysis would be presented to the Commission. SCE argued in its Amendment that a new economic analysis was unnecessary because the Project was approved in D.07-01-040.[17] This argument has been rendered moot by SCE's subsequent decision to perform an economic analysis.

The issue of the economic benefits of the Project has been rendered moot by SCE's subsequent admission in the Supplemental Filing that the economic benefits of the Project have been reduced and that it will no longer be pursuing construction of the Arizona portion of the Project.[18] The Supplemental Filing

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[17] Amendment at 13.

[18] Supplemental Filing at 3-4.

points to SCE's May 15, 2009 letter to the ACC to explain that the economic benefits of the Project from Arizona to California have diminished since Commission approval:

> [T]here has been a narrowing of the economic spread between the costs of California and Arizona generating resources, and a reduced load forecast due to changed economic conditions and the expansion and success of energy efficiency. As a result, the benefits to California consumers of SCE pursuing the Arizona portion have been reduced from the level forecast at the time of SCE's initial filing in [sic] with the ACC.[19]

On this basis, SCE informed the ACC that it would no longer pursue authorization to construct the Arizona portion of the Project.

SCE's decision to pursue a California-only Project changes the nature of the Project approved by this Commission.

SCE does not seek to justify a California-only Project on purely economic grounds. Rather, SCE now seeks to justify the California-only Project as "needed to interconnect significant amounts of new generation."[20] Consequently, we analyze here that showing and whether it may be relied upon to justify construction of a California-only Project.

3.2. Interconnection Requests and Other Indicia of the Need for Transmission in the Blythe Area

SCE's Petition sought Commission approval to accelerate SCE's construction of the California portion of the Project on the basis that SCE had "received a large number of interconnection requests for new generation in the

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[19] Supplemental Filing at 3.

[20] Supplemental Filing at 4 citing SCE's May 15, 2009 letter to ACC at 2.

Blythe area."[21] SCE stated that "[d]evelopment of these projects requires construction of the California portion of the DPV2 project if the power from these projects is to reach markets in Southern California."[22]

The size and number of interconnection requests associated with the Blythe area have changed during the pendency of SCE's Petition, and are likely to change again on December 1, 2009 when additional deposits will be required from certain generators in the CAISO interconnection queue. In the May 14, 2008 Petition SCE reported 5128 MW of renewable generation interconnection requests in the Blythe Area (including the Midpoint and Julian Hinds-Eagle Mountain Areas) and 1210 MW of conventional gas-fired generation for a total of 6338 MW seeking interconnection. SCE's more recent June 26, 2009 Supplemental Filing reports eleven interconnection requests comprised of 4900 MW of renewable generation and the same 1210 MW of conventional gas-fired generation for a total of 6110 MW.[23] Thus, while the interconnection request numbers have changed slightly over time, due in part to CASIO interconnection queue reform, they have not changed dramatically and generator interest in the Blythe area appears to remain constant and significant.

We do not approve construction of transmission lines based solely on the evidence of generator interconnection requests, which have most recently reflected a certain amount of speculation, rather than firm commitments to development. Consequently, SCE was compelled to provide additional information in support of its Petition.

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[21] Petition at 5.

[22] Petition at 5.

In support of its claim that the California-only Project is needed to interconnect renewable generation, SCE points to the U.S. Department of Interior, Bureau of Land Management (BLM) "Solar Energy Applications list" to demonstrate that over 10,000 MW of solar projects are proposed to be located along the corridor of a California-only Project:

> [A]s of August 7, 2008, [the Solar Energy Applications list] indicated that 10,850 MW of solar projects have requested rights-of-way through the California Desert District BLM office at Palm Springs, the office that oversees projects in the Blythe area. These 10,850 MW have proposed locations that are physically located along the DPV 2 Corridor. [Footnote omitted] Out of the 10,850 MW of proposed solar project locations, 3,700 are expected to be solar thermal and 7,150 are solar photovoltaic and together they account for roughly 22% of all solar energy projects that have requested for [sic] rights-of-way with California's BLM offices. This shows that the Blythe area is an important area for California if solar resources are [sic] which could be used to serve California electric customers.[24]

SCE also provided a "snapshot" of a BLM map showing the locations of the Blythe-area solar projects along the Project corridor. SCE concludes that "[t]hese projects' proximity to the DPV2 corridor demonstrates that the California portion of DPV2, along with the Midpoint switchyard, is the most logical transmission line to be developed to help interconnect solar energy onto the California system."[25] SCE concludes:

> A close examination of the CAISO interconnection queue and the BLM right-of-way requests suggests that the total solar resources

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[23] Supplemental Filing at 13 (emphasis added).

[24] Amendment at 5.

[25] Amendment at 7.

> being planned and developed in the Blythe area may actually be greater than either of the queue sizes because some projects in the CAISO interconnection queue are being developed on privately-owned land and therefore do not require BLM application [sic] and some of the projects on the BLM list have not yet submitted CAISO interconnection requests. Thus, the total amount of solar energy being planned in the Blythe area exceeds 10,800 MW.[26]

SCE's Supplemental Filing points to RETI findings to justify the California-only Project as needed to interconnect renewable generation. Specifically, SCE cites to the RETI Phase 1B Final Report (RETI 1B Report) and the RETI Phase 2A Draft Report (RETI 2A Draft Report).[27] Both of these RETI Reports are public documents of which we take official notice.

The RETI 1B Report analyzed potential Competitive Renewable Energy Zones (CREZs) to determine how they ranked in terms of economic and environmental factors. The CREZs accessible to the Project are labeled Riverside East-A and Riverside East-B. The RETI 1B Report indicates that these two CREZs have the potential for 7,800 MW of large-scale solar projects.[28] The RETI 1B Report identifies the Riverside East-A CREZ, with 1,000 MW of large-scale solar potential, as one of the most highly rated CREZs in the state in economic terms.[29]

SCE explains that the RETI 2A Draft Report (which has subsequently been modified and adopted as a final report) identifies a Conceptual Transmission

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[26] Amendment at 8.

[27] Supplemental Filing at 8-11. All of these RETI reports are available at: http://www.energy.ca.gov/reti/documents/index.html

[28] RETI 1B Report, Economic Analysis of CREZ, Table 4-9 at 4-16.

[29] *See* RETI 1B Report at 5-13.

Plan for California "which includes major transmission lines and other facilities likely to be required not only to deliver renewable energy, but also provide important additional benefits to the grid."[30] SCE goes on to explain that "[t]he California portion of the DPV2 is included as a component of this Conceptual Transmission plan. This project has the advantage of being before the Commission and can be completed in a timely fashion, provided the Commission acts quickly."[31]

The Supplemental Filing also includes the CAISO Letter at Attachment I which states that: "[t]he ISO's studies have determined that the interconnection of 1030 MW of new full capacity generating facilities to the Devers-Palo Verde No. 1 line in the Blythe area near the Colorado River would trigger the need for construction of the new Midpoint to Valley transmission line in order for the generation from those facilities to be fully deliverable."[32]

3.3. Commission Standards for Determining Need

Historically, under California Pub. Util. Code § 1001, need for a transmission project is established based upon a project's contribution to reliability or the ratepayer savings it will produce. Further, the Commission does not approve a new transmission line unless it is required for the "present or future public convenience and necessity."

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[30] Supplemental Filing at 8.

[31] Supplemental Filing at 8.

[32] CAISO Letter at 3.

More recently, with the advent of California's Renewable Portfolio Standard (RPS) and the adoption of Pub. Util. Code § 399.2.5,[33] the Commission has recognized the necessity of approving new transmission projects in anticipation of future renewable energy projects to meet RPS goals. However, and significantly, SCE has not expressly asserted that the California-only Project is necessary to meet California's RPS and SCE has not requested approval of the California-only Project pursuant to Section 399.2.5.[34] Rather, SCE has claimed that the California-only Project is needed to interconnect both renewable and conventional generation resources proposed to be located in the Blythe area. Nevertheless, because of the extensive renewable potential of the Blythe area, and the RETI 2A Draft Report's identification of the California-only Project as needed to deliver those resources to Southern California load centers, we will consider the § 399.2.5 need analysis applied in previous renewable transmission CPCN cases to determine the need for the California-only Project.

In D.07-03-012 and D.07-03-045 we considered the need for Segments 1, 2, and 3 of what has become known as the Tehachapi Renewable Transmission Plan (TRTP) to build transmission to the wind rich Tehachapi Wind Resource Area. In those decisions we established a three part test for determining need under Pub. Util. Code § 399.25,[35] requiring that a project proponent demonstrate: (1) that a project would bring to the grid renewable generation that would

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[33] Formerly Pub. Util. Code § 399.25.

[34] *See, e.g.* Amendment at 20 ("… SCE is not requesting in this petition that the Commission authorize cost-recovery under Pub. Util. Code Section 399.25. However, SCE is not waiving its statutory right to seek such recovery in the future.")

[35] The relevant provisions of Pub. Util. Code § 399.25 were not modified when the statute was recodified as § 399.2.5.

otherwise remain unavailable; (2) that the area within the line's reach would play a critical role in meeting the RPS goals; and (3) that the cost of the line is appropriately balanced against the certainty of the line's contribution to economically rational RPS compliance.

SCE has provided uncontested information that the California-only Project will be an essential component to delivering renewable generation in the Blythe area to California load centers. The RETI analysis assumes the existence of the California-only Project in its base case, and it finds that the generation in the Blythe area (the East Riverside CREZs) constitute some of the most promising renewable resources in California, taking both economic and environmental considerations into account.

Notwithstanding this unchallenged showing, SCE has failed to take the information to the next stage and make an argument of need for the California-only Project under the three part test established in D.07-03-012 and D.07-03-045. Instead, SCE asserts that the line is needed to respond to interconnection requests – requests that have not been formalized into Interconnection Agreements, and could be withdrawn at any time.

This Commission does not approve transmission lines based solely on interconnection requests, and we decline to do so here. Nevertheless, as set forth below, we find special circumstances here for approving SCE's request to authorize construction of the California-only Project.

3.4. Prudent Decision Analysis Weighing All Factors

As described above, SCE's showing in support of the need for the California-only Project is deficient. Nevertheless, the cumulative weight of the uncontested facts and the unique circumstances surrounding this transmission

line lead us to conclude that construction of the California-only Project is required to meet future public convenience and necessity.

The California-only Project will allow access to significant potential renewable resources, particularly large-scale solar projects in the Riverside East-A and Riverside East-B CREZs. While these resources remain speculative, and may not be needed to meet the current 20% RPS mandates, those located in the Riverside East-A CREZ appear to be economically desirable for reaching the 33% by 2020 levels set forth in California policy.[36]

Two other factors unique to this Petition clearly weigh in favor of a California-only Project. First, the transmission lines would be built within existing high-voltage transmission rights-of-way containing towers similar to those proposed, thus significantly minimizing the environmental impact of the line. The 500 kilovolt (kV) towers for the California-only Project would be placed adjacent to the existing Devers-Palo Verde 1 line, which is also comprised of 500 kV towers. Second, almost all of the planning and environmental siting review has been completed. The Commission has already certified the Final Environmental Impact Report (Final EIR) for the Project. The final engineering and economic evaluations are underway.

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[36] The Energy Action Plan, adopted by the Commission and the California Energy Commission in May 2003, accelerated the completion date to 2010. SB 107, passed in 2006, codified that policy. The Governor's Executive Order S-14-08 (issued on November 17, 2008) promotes the 33% renewable goal and identifies adequate transmission for renewable energy an issue of critical importance. More recently, the Governor's Executive Order S-21-09 (signed on September 15, 2009) orders the California Air Resources Board to adopt regulations implementing a 33% renewable resources by 2020 RPS program.

No other transmission project could access the Riverside East CREZs without significant time delays in terms of environmental review and significant cost. Given RETI's assumption of the California-only Project segments in its base case, it would be difficult for California to achieve a goal of 33% renewable resources by 2020 without being able to access these CREZs. In addition, in order to reach the 33% goal, California will likely need to construct significant new transmission resources in SCE's service territory, and delay could make it more difficult for both SCE and the Commission to pursue development of these projects simultaneously. Further, and significantly, there is no environmental opposition to this line. Hence, there is a definite benefit to completing a project, like this one, that faces no environmental challenges and for which construction can begin imminently.

This is clearly a unique and unprecedented opportunity to construct a previously studied transmission line project to support RETI-identified economically and environmentally desirable CREZs. We should not pass up this opportunity to quickly and efficiently, with little environmental damage, expand the transmission grid to support these CREZs.

Given the potential for renewable resources in the Riverside East CREZs, the substantial work and study already completed on the Project including certification of the Final EIR, the constrained environmental impacts of building in an existing corridor, the lack of environmental opposition, and the uncertainty in terms of delay and cost in considering an alternative project to access these CREZs, we find that it is necessary, reasonable, and prudent to construct the California-only Project.

However, because construction of the Arizona portion of the Project would potentially reduce the California-only Project's ability to transmit energy from

the Riverside East CREZs, we require SCE to seek Commission approval prior to resuming pursuit of the Arizona portion of the Project in the future.

4. Environmental Impact

SCE's Petition raises two issues which led us to question the need for additional environmental review under the California Environmental Quality Act (CEQA)[37] and the National Environmental Policy Act (NEPA).[38] The first issue is the construction of the Midpoint Substation, which was not authorized in the Decision, and the second issue is the possibility that development of renewable resources in Blythe may constitute a connected action that would require a supplemental Environmental Impact Report (EIR)/Environmental Impact Statement (EIS). Both issues are addressed in this section.

The Midpoint Substation was studied in the environmental review process as a possible element of the Project but was not authorized in the Decision. The environmental impacts of two alternative substation locations were fully evaluated in the Final EIR/EIS, the Midpoint-Desert Southwest Substation (Midpoint-DSW Substation) and SCE's originally proposed location (Midpoint Substation). The Final EIR/EIS concluded that either location was "equally environmentally superior/preferable.[39]" Hence, SCE may chose to pursue either of the studied locations for purposes of CEQA/NEPA, and our approval of construction of the Midpoint Substation does not trigger the need for additional environmental review.

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[37] California Public Resources Code § 21000, *et seq*.

[38] 42 USC § 4321, *et seq.*

[39] Final EIR/EIS, Vol. 2, Section E.2.1.3, at E-12.

The issue of whether development of renewable resources in Blythe constitutes a "connected action" within the CEQA/NEPA framework is more complicated. CEQA § 21166 states three conditions that may require the issuance of a subsequent or supplemental EIR (SEIR):

a) Substantial changes are proposed in the project which will require major revisions of the environmental impact report.

b) Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the environmental impact report.

c) New information, which was not known and could not have been known at the time the environmental impact report was certified as complete, becomes available.

SCE argues that nothing in the Petition or Amendment rises to the level of requiring an SEIR, as the Project will be constructed in the same manner as studied in the Final EIR/EIS, and any renewable resources anticipated to be constructed in the Blythe area are too speculative to allow for a detailed environmental review.[40] In addition, SCE argues that requiring environmental review for what is essentially "mere 'interconnection requests'" would create an extraordinarily burdensome standard for the Commission, which would hamper development of renewable resources system-wide and would extend the scope of the project description to include future actions overseen by other state agencies.[41]

SCE's arguments are compelling. Nevertheless, in order to be prudent, Energy Division staff (Staff) directed the environmental consultant to develop an

[40] Amendment at 20-33.

Addendum to the Final EIR/EIS based upon the new information presented by the Petition, Amendment, and Supplemental Filing. The Addendum is attached hereto as Attachment 2. The Addendum explores the environmental impacts of renewable development in the Riverside East CREZs and concludes, and therefore we find, that the Blythe area renewable resources are too speculative to require an SEIR, in agreement with SCE's contention. We conclude that undertaking an SEIR is unnecessary here.

However, one important matter remains regarding the environmental impacts and the Decision, that of the Decision's statement of overriding considerations. The Decision recognized that significant and unavoidable impacts would result from construction of the Project, and made a finding pursuant to CEQA § 15093 that overriding considerations merited construction of the Project notwithstanding those impacts.[42] Those considerations included the economic benefits originally contemplated by the Project's interconnection to Arizona and access to inexpensive generation resources. Those benefits will not be obtained from a California-only Project.

Nevertheless, the valuable role of the California-only Project in meeting the state's RPS goals provides benefits which outweigh the unavoidable adverse environmental effects. Hence, we find that these benefits of the California-only Project constitute an overriding consideration warranting approval of the California-only Project.

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[41] Amendment at 21 and 31.

[42] Decision at 99.

5. CAISO Board Approval and Cost Recovery Issues

Similar to the Commission's own decision, CAISO Board approval of the Project was based upon construction of the entire Project and the economic analysis assuming access to low-cost energy in Arizona. The CAISO Letter[43] reflects that the CAISO intends to consider the California-only Project separately and approve construction in order for SCE to recover costs through FERC's ordinary transmission charges. While CAISO approval for the California-only Project is not necessary for the Commission to issue this decision on SCE's Petition, CAISO approval will be a determinative factor in whether construction costs are recovered from transmission users in FERC-administered rates.[44]

The CAISO Letter sets forth the conditions for CAISO approval of the California-only Project, based upon the CAISO's tariff at FERC.[45] In response to the CAISO Letter, DRA protested that the Commission should deny the Petition because the record does not demonstrate the need for the California-only Project and need has not yet been determined by the CAISO. DRA proposes that SCE re-file the Petition after the CAISO has determined the need for the California-only Project.[46]

We disagree with DRA's contention that the Petition should be denied. Withholding Commission approval for CAISO Board approval, and then

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[43] Supplemental Filing, Attachment I.

[44] SCE is not seeking backstop cost recovery under Pub. Util. Code § 399.2.5.

[45] Supplemental Filing, Appendix I at 3.

[46] Response of the [sic] Division of Ratepayer Advocates to Southern California Edison Company's Supplemental Information on Petition for Modification of D.07-01-040, July 6, 2009.

reconsidering the need for the California-only Project, will only serve to delay construction of this important transmission resource.

However, we recognize that CAISO Board approval is necessary to FERC rate-recovery, and thus beneficial to SCE ratepayers. Thus, our approval here is contingent upon CAISO Board approval of the California-only Project. As CAISO approval will be conditioned upon executed interconnection agreements, among other things, this condition will prevent construction of the line if no interconnection requests materialize into actual projects.

Further, we recognize that the status of the CAISO's interconnection queue and executed interconnection agreements are critical to CAISO approval and the ultimate use of the California-only Project. Consequently, we require SCE to provide notice to the Director of the Commission's Energy Division on the status of the interconnection queue and interconnection agreements as they relate to the California-only Project every six months. Such notices shall include information on both renewable interconnection requests and agreements, as well as information on conventional generation seeking interconnection to the California-only Project.

6. Maximum Reasonable and Prudent Cost

The Decision established a maximum reasonable and prudent cost (maximum cost) for the Project pursuant to Pub. Util. Code § 1005.5(a) of $545,285,000 in 2005 including pension and benefits, and administrative and general overheads, but excluding Allowance for Funds Used During Construction (AFUDC). The Decision provided for increases and decreases to

the maximum cost dependent upon various routing options that SCE might pursue for the Arizona portion of the Project.[47]

The Decision recognized that SCE's cost estimate for the Project would be more accurate once SCE developed a final detailed engineering design-based construction estimate, particularly given the fact that certain routing options remained under consideration. Consequently, it required SCE to file an advice letter within 30 days of the availability of such an estimate so that the Commission could reconsider the appropriate maximum cost for the project.[48]

SCE requests that in lieu of modifying the maximum cost at this time that we retain the advice letter process set forth in the Decision.

We grant SCE's request on this point. However, we note that SCE's current showing of the costs for the California-only Project raise several concerns which we expect SCE to fully address in its advice letter filing. SCE now estimates that the California-only Project will cost $686 million in 2009 dollars. As an initial matter, it is troubling that SCE's cost estimate for the California-only Project is over $100 million more than the maximum cost set for the entire Project – including the Arizona portion – with only 4 years of cost escalation. SCE does not explain how it calculated the escalation of 2005 dollars to 2009 dollars. SCE's advice letter filing should provide the most current cost estimates available, and if any escalators are used, they should be explained and justified. Additionally, if SCE's method for escalating 2005 dollars to 2009 dollars results in a different amount compared to using a Bureau of Labor Statistics escalation/inflation

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[47] Decision at Ordering Paragraph 10.

[48] Decision at Ordering Paragraphs 11 and 12.

calculator, SCE should fully explain the difference and why SCE's chosen method is more appropriate. The cost differences between the Project we approved in the Decision and the California-only Project should be clearly explained.

SCE should also carefully review its assumptions and arithmetic in future filings, as there appear to be several errors in SCE's current filing. For example, SCE estimates AFUDC of $135 million. This represents 25.6% of the cost of the California-only Project, which is significantly higher than AFUDC costs on other SCE transmission projects. This may be an error. SCE's advice letter filing should update the amount of AFUDC projected for the California-only Project, explain how it was calculated, including the rate used to calculate AFUDC (i.e., 90 day commercial paper rate). Additionally, SCE states in the Supplemental Filing that "Attachment K shows that construction of the DPV2 would include an estimated $113 million for DPV2, $333 million for Devers to the California border, and $235 million for the California border to Harquahala for an estimated total of $686 million in $2009."[49] However, if we add up these numbers - 113 + 333 + 235 – they equal $681 million, not $686 million. Further, Attachment K reflects $112 million for DPV2, not the $113 million cited in the Supplemental Filing. While these errors or omissions are not significant given the scope of the project at issue here, we note that this listing is not exhaustive. Repeated errors and omissions of this type reflect a concerning lack of attention to detail which we expect to be corrected in future filings.

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[49] Supplemental Filing at 19.

7. Conclusion

The Petition, Amendment and Supplemental Filing have been found to be procedurally sufficient to support a Petition for Modification. Based upon the information contained in the Petition, the Amendment, the Supplemental Filing, and the CPUC-prepared Addendum, we conclude that SCE's proposed modifications should be adopted, as adjusted herein. We modify D.07-01-040 as set forth in Attachment 1.

8. Comments on Proposed Decision

The proposed decision of the ALJ in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed by ___ on _____, and reply comments were filed by ___ on _____.

9. Assignment of Proceeding

Dian M. Grueneich is the assigned Commissioner and Victoria S. Kolakowski and Timothy J. Sullivan are the assigned Administrative Law Judges in this proceeding.

Findings of Fact

1. The Commission approved SCE's A.05-04-015 for a CPCN for the Devers-Palo Verde No. 2 Transmission Line Project in D.07-01-040 on January 25, 2007.
2. The approved Project required construction in both Arizona and California.
3. The California-only Project would be constructed almost entirely within the existing high voltage transmission rights-of-way occupied by the 500 kV Devers-Palo Verde 1 transmission line.
4. D.07-01-040 certified a Final EIR for the Project.

5. SCE filed a Petition for Modification of D.07-01-040 on May 14, 2008. SCE filed an Amendment to the Petition on September 2, 2008 in accordance with a joint Commissioner-ALJ Ruling issued on July 17, 2008. Due to a number of changed circumstances, SCE made a supplemental filing on June 26, 2009.

6. The Petition was filed as a consequence of the Arizona Corporation Commission's June 6, 2007 decision to deny SCE a permit to construct the Arizona portion of the Project and various SCE efforts after that time to resolve this issue, and therefore the delay in filing the Petition was reasonable.

7. SCE did not present cost-effectiveness information sufficient to demonstrate need for a California-only Project on economic grounds.

8. There is no guarantee that the Arizona portion of the Project will ever be completed, and SCE's letter to the ACC dated May 15, 2009 indicates that SCE does not intend to file a new application for approval of the Arizona portion of the Project in the near future.

9. SCE asserts that it has received a large number of interconnection requests for new generation in the Blythe, California area, which would be served by a California-only Project.

10. SCE asserts that the California-only Project is necessary for the power from this new generation in the Blythe area to reach markets in Southern California.

11. SCE's Supplemental Filing identified interconnection requests totaling 6,110 MW that would access the California-only Project, including 2,950 MW of renewable generation at the Midpoint Substation, 1,950 MW of renewable generation in the Julian Hinds-Eagle Mountain area, and 1,210 MW of conventional generation at the Midpoint Substation.

12. SCE cites BLM data stating that as of August 7, 2008, BLM had identified 10,850 MW of solar projects requesting rights-of-way along the Project corridor. These projects are proposed to be physically located along the corridor of the California-only Project.

13. SCE relies upon this data to conclude that the total resources being planned and developed in the Blythe area may actually be greater than evidenced by the CAISO interconnection queue or the BLM data because the lists do not overlap. Thus, the total amount of solar energy being planned in the Blythe area may exceed 10,800 MW.

14. The RETI 1B Report identified a potential of 7,800 MW of large-scale solar generation capacity for the Riverside East-A and Riverside East-B CREZs, which would be served by a California-only Project. RETI found the 1,000 MW Riverside East-A CREZ to be an economically desirable CREZ.

15. The RETI 2A Draft Report presents a Conceptual Transmission Plan which includes the California-only Project as delivering the resources in the Riverside East CREZs to load.

16. The CAISO represents that it has studied the impacts on the transmission system of interconnecting new renewable resources in the Blythe area of the Riverside East CREZs and has determined that interconnection of 1,030 MW or more of new generation will trigger the need for construction of a Midpoint to Valley transmission line.

17. No party has challenged any of these facts.

18. Given the potential for renewable resources in the Riverside East CREZs, the substantial work and study already completed on the Project including certification of the Final EIR, the limited environmental impacts of building in an existing high voltage transmission corridor next to an existing 500 kV line, the

lack of environmental opposition, and the uncertainty in terms of delay and cost in considering an alternative project to access these CREZs, it is necessary, reasonable and prudent to construct the California-only Project, subject to approval by the CAISO's board of directors.

19. Construction of the Arizona portion of the Project would potentially reduce the Project's ability to access the Riverside East CREZs.

20. The California-only Project provides substantial benefits, including access to renewable resources in Riverside County, which outweigh the unavoidable adverse environmental effects of the Project as set forth in D.07-01-040. Hence, these benefits of the California-only Project constitute an overriding consideration warranting approval of the California-only Project.

21. Energy Division staff developed an Addendum to the Final EIR, and that Addendum is appended to this decision as Attachment 2.

22. The renewable resources in the Blythe area are too speculative to require the completion of a subsequent or supplemental EIR under CEQA.

23. The CAISO has not approved a California-only Project, and such approval is necessary to recover construction costs in FERC-administered transmission rates.

24. The modifications necessary for D.07-01-040 are in Attachment 1.

25. A.05-04-015 should be closed.

Conclusions of Law

1. SCE's Amended Petition, as supplemented, satisfies the requirements of Rule 16.4.

2. SCE has not demonstrated that the costs and economic benefits of a California-only Project justify its construction on a purely economic basis.

3. SCE has not demonstrated that construction of a California-only Project is required to meet the state's RPS.

4. SCE has not demonstrated that the California-only Project meets the requirements set forth in California Pub. Util. Code § 399.2.5.

5. It is appropriate to take official notice of RETI Phase 1B Final Report and the RETI Phase 2A Draft Report.

6. The record demonstrates that the cumulative impact of the potential for renewable resources in the Riverside East CREZs, the substantial work and study already completed on the Project including certification of the Final EIR, the limited environmental impacts of building in an existing high voltage transmission corridor next to an existing 500 kV line, the lack of environmental opposition, and the uncertainty in terms of delay and cost in considering an alternative project to access these CREZs, make construction of the California-only Project necessary, reasonable and prudent, subject to approval by the CAISO's board of directors.

7. Because construction of the Arizona portion of the Project would potentially reduce the Project's ability to access resources in the Riverside East CREZs, SCE should seek Commission approval prior to pursuing the Arizona portion of the Project in the future.

8. Because the status of the CAISO's interconnection queue and executed interconnection agreements are critical to CAISO approval and the ultimate use of the California-only Project, we should require SCE to provide notice to the Director of the Commission's Energy Division on the status of the interconnection queue and interconnection agreements as they relate to the California-only Project every six months. Such notices should include information on both renewable interconnection requests and agreements, as well

as information on conventional generation seeking interconnection to the California-only Project.

9. A Supplemental EIR is unnecessary for approval of the proposed modifications.

10. The benefits of the California-only Project constitute an overriding consideration warranting approval of the California-only Project.

11. The Addendum designated as Attachment 2 should be incorporated in the record of this proceeding.

12. To protect California ratepayers the Commission should direct SCE not to begin construction of the California-only Project until the CAISO Board approves the California-only Project.

13. A.05-04-015 should be closed.

14. This order should be effective immediately.

O R D E R

IT IS ORDERED that:

1. Decision (D.) 07-01-040 is modified as shown in Attachment 1. All other language in D.07-01-040 shall be read and understood to conform to those modifications.

2. The Addendum to the Final Environmental Impact Report designated as Attachment 2 is hereby incorporated into the record of this proceeding.

3. Southern California Edison Company shall seek Commission approval before resuming pursuit of the Arizona portion of the Devers-Palo Verde No. 2 Transmission Line Project.

4. Southern California Edison shall not begin construction of the California-only Project until the California Independent System Operator Corporation's board of directors approves construction of the California-only Project.

5. Application 05-04-015 is closed.

This order is effective today.

Dated _____, at San Francisco, California.

INFORMATION REGARDING SERVICE

I have provided notification of filing to the electronic mail addresses on the attached service list.

Upon confirmation of this document's acceptance for filing, I will cause a Notice of Availability of the filed document to be served upon the service list to this proceeding by U.S. mail. The service list I will use to serve the Notice of Availability of the filed document is current as of today's date.

Dated September 28, 2009, at San Francisco, California.

/s/ ERLINDA PULMANO
Erlinda Pulmano

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Last Updated on 28-SEP-2009 by: JVG
A0504015 LIST

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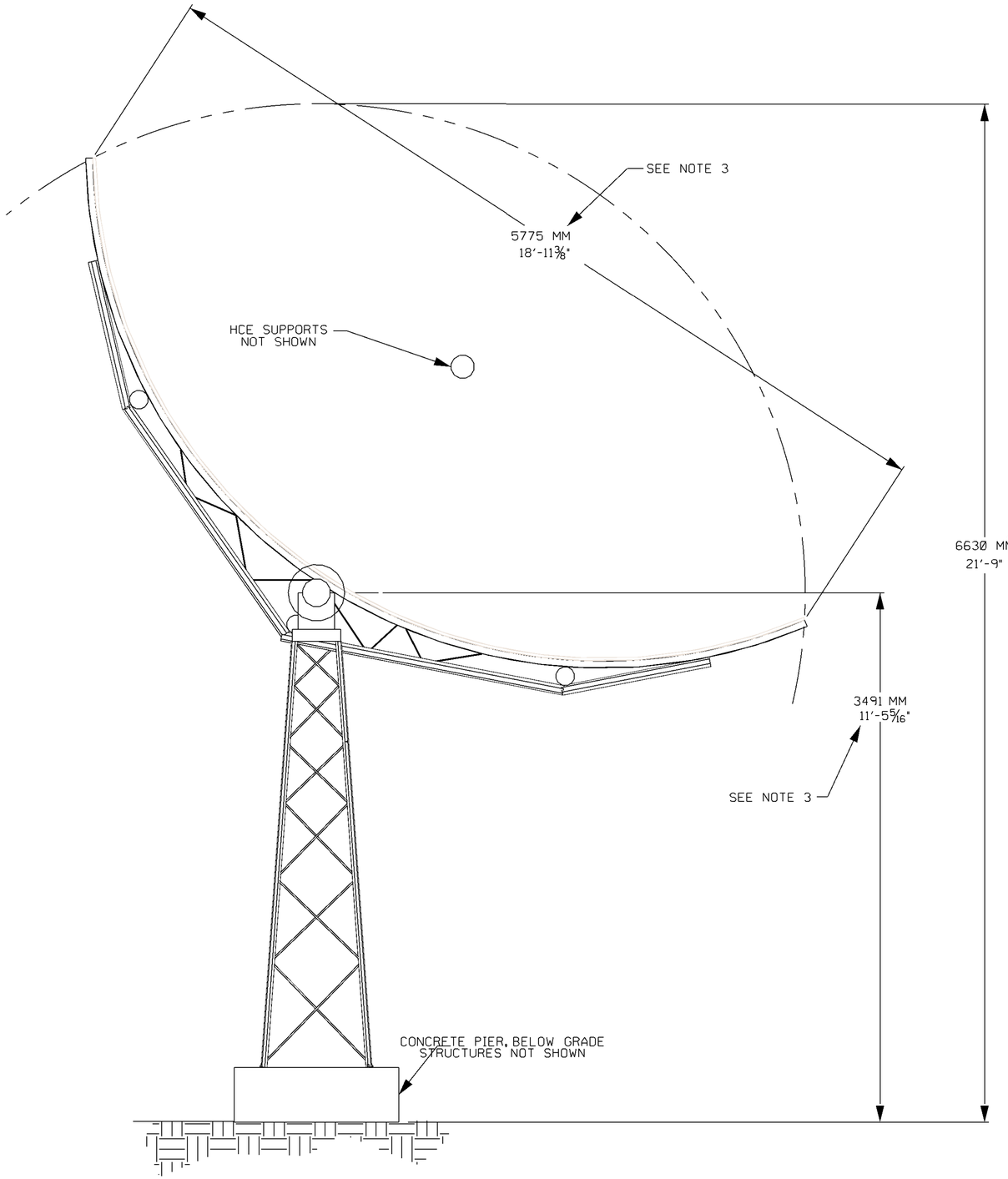
Table 4.4-1: TRANSMISSION LINE SAFETY AND NUISANCE (TLSN) Laws, Ordinances, Regulations and Standards (LORS)

Applicable LORS	Description
Aviation Safety	
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR),"Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1 G, " Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/460-1 G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
Interference with Radio Frequency Communication	
Federal	
Title 47, CFR, Section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
State	
California Public Utilities Commission (CPUC) General Order 52 (G0-52)	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
Audible Noise	
Local	
IEEE 1127-1998 IEEE Guide for the Design, Construction, and Operation of Electric Power Substations for Community Acceptance and Environmental Compatibility	Specifies standards for minimizing audible noise emitted from substations and switchyards through recommended design practices
Riverside County General Plan, Noise Element	References the County's Ordinance Code for noise limits.
Hazardous and Nuisance Shocks	
State	
CPUC GO-95, "Rules for Overhead Electric Line Construction"	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.

Applicable LORS	**Description**
Title 8, California Code of Regulations (CCR) Section 2700 et seq. "High Voltage Safety Orders"	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.
Industry Standards	
National Electrical Safety Code	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
Institute of Electrical and Electronics Engineers (IEEE) 1119, "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations"	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
Electric and Magnetic Fields	
State	
GO-131-D, CPUC "Rules for Planning and Construction of Electric Generation Line and Substation Facilities in California"	Specifies application and noticing requirements for new line construction including EMF reduction.
CPUC Decision 93-11-013	Specifies CPUC requirements for reducing power frequency electric and magnetic fields.
Industry Standards	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
Fire Hazards	
State	
General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction” General Order 128 (GO-128)	Specifies tree-trimming criteria to minimize the potential for power line-related fires. Defines underground practices for utilities.
14 CCR Sections 1250-1258, "Fire Prevention Standards for Electric Utilities"	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

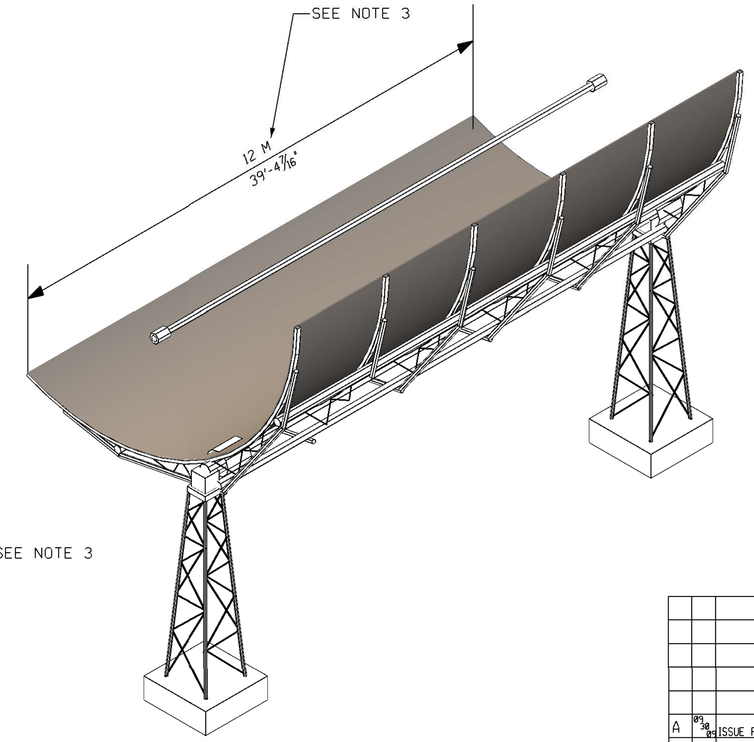
4.5 REFERNCES

Riverside County General Plan (RCIP), Chapter 6 Safety Element, 2008



ELEVATION

N.T.S.



NOTES:

1. NOT FOR CONSTRUCTION.
2. DRAWING IS AN ENGINEERING REPRESENTATION AND MAY CHANGE DURING DETAIL DESIGN.
3. PHYSICAL DIMENSION REPRESENTATED MAY CHANGE DURING DETAIL DESIGN.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH. SPEC.	LEAD DISCIP. ENGINEER	PROJ. ENGR. MANAGER	PROJECT MANAGER
A	09 30 09	ISSUE FOR REVIEW	RWG	JF	RWG	JF	JF	JF	CN

PRELIMINARY STATUS — DATE — LDE — REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.

APPROVED STATUS — DATE — LDE — REPRESENTS REVIEWED AND APPROVED DESIGN; ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.

ORIGINATING PERSONNEL

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PROFESSIONAL ENGINEER'S SEAL

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LIC. NO.: ____ DATE: ____

WorleyParsons — resources & energy

CLIENT/PROJECT TITLE

GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

SOLAR COLLECTOR
MODULE CONCEPTUAL
ARRANGEMENT

SCALE: NONE
DRAWING SIZE:
WORLEYPARSONS DWG. NO.: GENI-0-SK-111-002-005
REV: A

$$DESIGN-FILE-NAME$$
$$DATE$$ $$$$TIME$$$$

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Cooling Tower Plume Modeling Analysis for the Genesis Solar Energy Project

Prepared For

Prepared By

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October 2009

Introduction

The project will include the use of two seven (7) linear cell wet mechanical draft cooling towers, one for each power block in order to adequately address the need to reject increased heat to the atmosphere from the proposed project. The air leaving the cooling towers is usually saturated with moisture and warmer than the ambient air, causing a wet exhaust plume to be created. The saturated exhaust plume may be visible or not depending on the specific meteorological conditions. This plume will also vary in size depending on meteorological conditions and operational factors.

Potential issues associated with cooling tower plumes include the presence of visual plumes and the occurrence of ground level fogging and/or icing episodes that involve the ground contact of visible plumes. In order to evaluate the effects on the local and regional environment, a modeling analysis was conducted to simulate the cooling tower plumes from the proposed project using three (3) years of meteorological data, collected at Daggett, California.

Modeling Techniques

The Seasonal/Annual Cooling Tower Impact Program (SACTIP, Version 11-01-90) was used to assess potential impacts from the cooling tower. SACTIP was developed by Argonne National Laboratory[1] for the Electric Power Research Institute (EPRI) to address the following potential adverse impacts of cooling towers:

- Plume visibility
- Deposition of cooling tower drift
- Ground-level fogging and icing
- Shadowing by the plume & reduction of solar energy

SACTIP contains algorithms for both natural and mechanical draft cooling towers arranged singly or in clusters. Plume merging and associated enhanced plume rise are treated by the routines contained in the model. While the SACTIP model does not have any official regulatory endorsement, this model has been applied for a large number of projects where cooling tower impact assessments were required. The characteristics of the tower and the preparation of the meteorological data set are discussed below.

The characteristics of the proposed cooling tower are listed in Table 1. These input parameters were obtained from the project's engineering consultant and is based on preliminary design data for the facility.

[1] Argonne National Laboratory, 1984. User's Manual: Cooling-Tower -Plume Prediction Code. Prepared for Electric Power Research Institute, 3412 Hillview Avenue, Palo Alto, CA 9404, EPRI CS-3403-CCM, April, 1984.

A three (3) year meteorological data set was constructed using hourly surface observations from the Daggett Airport meteorological station, located near the proposed project location, for the years 1988 through 1990. As discussed below, nighttime hours were removed from the meteorological data set as well as daytime hours where weather or other visibility-obscuring phenomenon would impair visibility. Figure 1 displays a wind rose constructed from all hours of the data. The average wind speed is 2.02 m/s and high winds greater than 8.8 m/s are infrequent (one percent for the data set). Wind speeds either missing or less than the threshold of the anemometer at Daggett occur for approximately five percent of the time period.

Given the length of time of the data used in the SACTIP analysis, the data used are considered representative of the climatic conditions of the area where plume formation can occur. Even with this representative data set, short-term variability in conditions can affect the prediction of cooling tower plume impacts. Therefore, the results of the analysis are considered an indicator of likely occurrence and not an absolute predictor of events.

Modeling Results

Cooling Tower

SACTIP was applied to simulate plumes from the proposed cooling towers using the three (3) year meteorological data set and tower design characteristics described previously. Default options were assumed for the input variables controlling the model's operation. The three (3) year data set was input into SACTIP to produce a three (3) year average frequency distributions for condensed plume length, condensed plume height, plume shadowing, and ground level fogging. Although the model provides information on plume shadowing and drift deposition, the focus of our analysis and the discussion that follows is on visible plume dimensions and ground based fogging.

Table 1. Cooling Tower Input Parameters

Parameter	Value
Type	Linear mechanical draft 2 towers, 7 cells
Heat Dissipation Rate (MW)	234 (maximum summer)
Circulation Rate (gpm)	94,623
Total Tower Air Flow (kg/s)	7999 – 8028
Max Drift Rate (%)	0.0005
Salt Concentration (mg/l)	9,969
Orientation	Two banks of 7 in-line cells aligned east to west

Height (m)	13.82
Equivalent Total Cell Diameter (m)	22.6
Exit Velocity & Temperature	Variable, calculated by the model assuming saturation conditions

Conditions favoring a long condensed plume occur more frequently in the fall and winter seasons, as atmospheric conditions, such as air temperature and relative humidity, are more favorable during these periods for plume formation. Also, plume formation tends to occur more frequently during nighttime hours and during adverse weather conditions. Since the applicant has committed to a lighting plan that minimizes illumination, these cooling tower plumes would not be visible at night. Unless illuminated by on-site sources, these cooling tower plumes would not be visible. The SACTIP meteorological data set was modified by removing the nocturnal hours, which accounted for 50 percent of all the hours in the three-year (3) data set. In addition, daytime observations with fog, precipitation, visibility less than three (3) miles, or ceiling heights less than 500 feet were excluded from the meteorological data set as under these conditions, a visible plume from the cooling tower would be obscured by these local weather phenomena. For the Daggett meteorological data set, these adverse weather conditions account for less than one percent of the total valid (daylight hours) observations. Table 2 summarizes these statistics.

Table 2	**Total hours**	**Day hours**	**Night Hours Removed from Analysis**	**Limited Visibility Hours Removed from Analysis**	**Total Hours Modeled With SACTIP**
Year					
1988	8784	4404	4380	74	4330
1989	8760	4394	4366	52	4342
1990	8760	4394	4366	60	4334

Thus, the three (3) year meteorological data set was modified by removing both nighttime hours and hours with weather obscuring phenomena. In total, these conditions accounted for 51 percent of all the hours (day, night, and obscuring weather) in the data set. The SACTIP was then applied to the remaining data set to assess the cooling tower plumes under daytime conditions when a condensed plume would most likely also be a visible plume. Of particular interest was the analysis of visible plume formation during the months when such formation is most likely, namely the fall and winter seasons. The occurrence of low temperatures coupled with high relative humidity occurs with a greater frequency during these seasons. Plume formation is favored during these types of low temperature/high humidity conditions since the ability of the atmosphere to absorb water vapor is greatly reduced because the air mass is at or near saturation.

The results of the cooling tower analysis are summarized in the SACTIP modeling outputs for the annual and seasonal periods. The attachments present the frequency distributions of the primary model output variables, namely plume length and height, which are listed by downwind sector and radial distance from the center of the cooling tower array.

Cooling Tower Plume Formation –

The SACTIP results for all seasons are summarized in Table 3 below. Impacts are consistent between the seasons. This can be accounted for by the limited variation in seasonal tower characteristics and the lack of extreme seasonal meteorological ranges. The annual values indicate that the majority of visible plume lengths will be less than 50 meters (164 feet). Modeling results indicate that plume formation will occur 99 percent of the time during valid visible hours but only at locations immediately adjacent to the cooling tower and always within the facility boundary. Larger downwind visible plume lengths are possible, but the downwind visible plume length will be less than 200 meters for 95 percent of all the hours where a visible plume will form. This results in a plume length exceeding 200 meters for only five percent of the time during all four seasons. When translated into total hours for the season, on average, 217 hours per year will have plume lengths up to but not exceeding 200 meters. SACTIP also predicts that the probability that a visible plume height will exceed 20 meters is eight percent. The average heights are 20 meters with a median plume radius of 20 meters.

TABLE 3 Seasonal Plume Characteristics from SACTIP

Season	*Annual*	*Winter*	*Spring*	*Summer*	*Fall*
Plume Characteristics (meters)					
Median Length	50	50	100	50	50
Median Height	20	30	20	20	20
Median Radius	20	20	20	20	20

Ground level fogging and icing conditions

A primary focus of the current study is to assess the potential for ground-level fogging on nearby areas. The potential for fogging was assessed with SACTIP. Potential fogging conditions can occur when atmospheric conditions allow the cooling tower plume to generate a cloud that contacts the ground. This can occur under periods of high humidity and favorable temperatures and stabilities with the fog being nucleated or generated by the cooling tower plume. Should fog be generated across a highway or other thoroughfare, it may become a potential hazard and mitigation measures such as signs and traffic assistance may be needed. In order for fogging to affect roadway operations, the cooling tower plume must touchdown on the road surface and be condensed. This requires high winds (low plume rise), the right wind direction, low dew-point depression, and low temperatures.

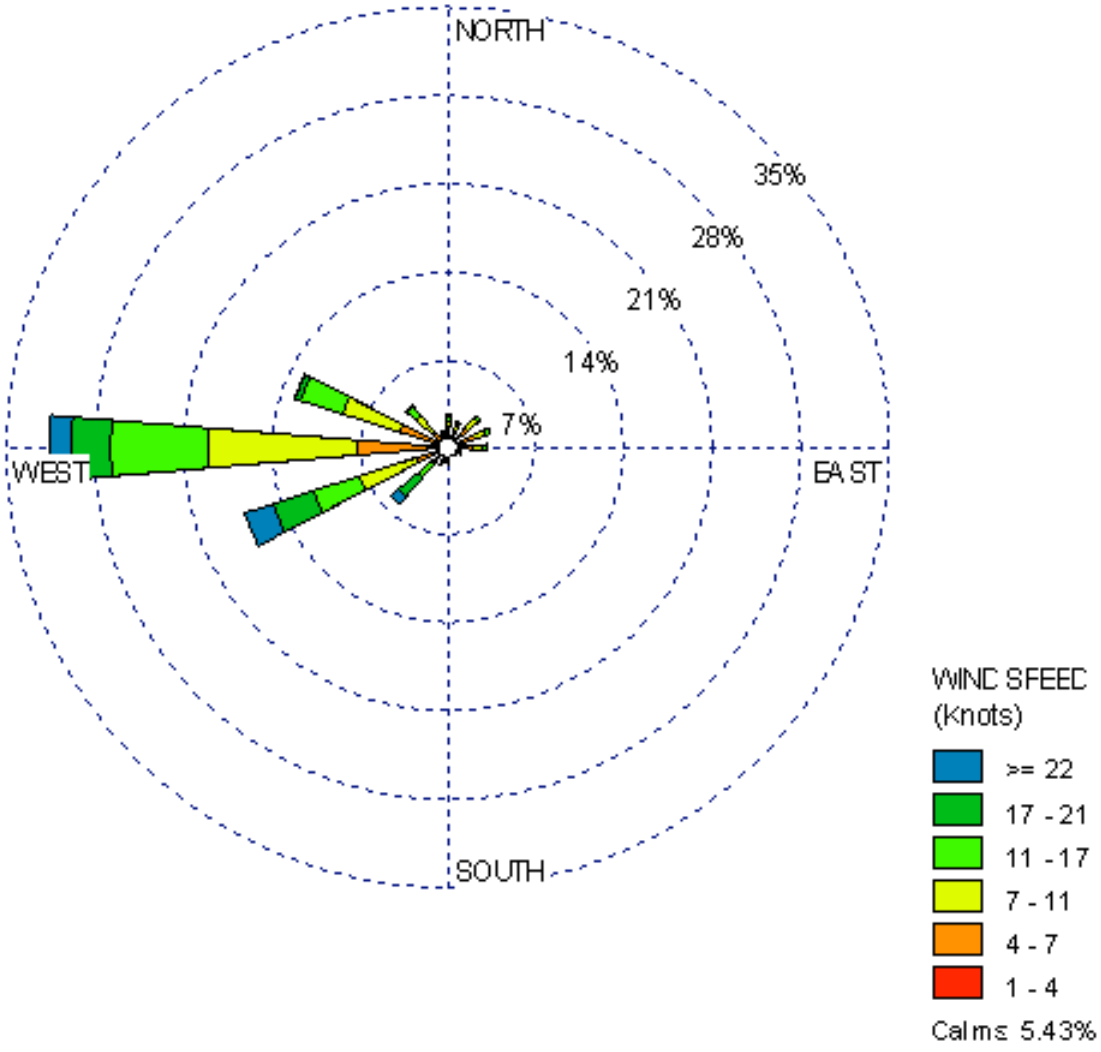
SACTIP was run with all hours of the three- year data-base, including nighttime and low-visibility hours. There were only two hours a year of occurrences of predicted fogging from the cooling tower, considering all wind directions. Results for rime icing show that no impacts are expected to occur.

Summary

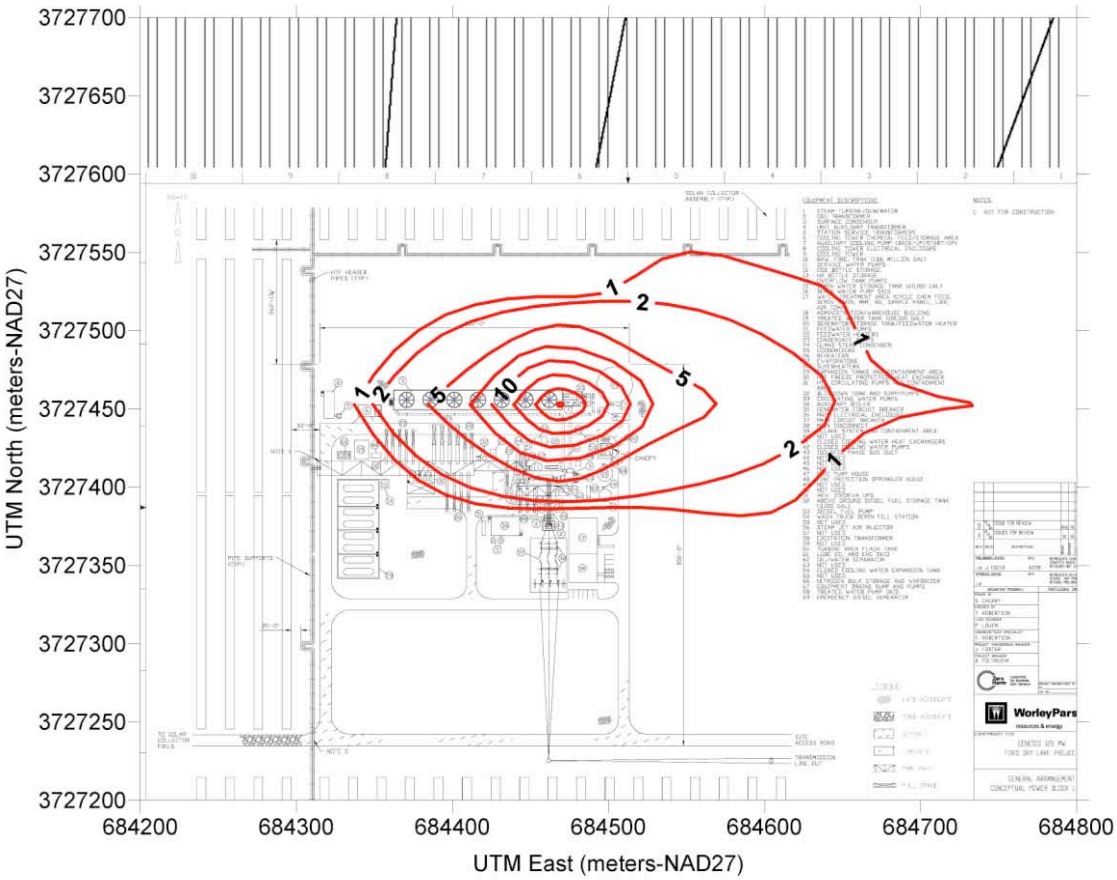
A cooling tower modeling analysis was conducted using SACTIP and three years of Daggett, CA meteorological data. Model simulations indicate that visible plumes will occur, but will be moderate in size (height and length). The probability of formation of long visible plumes in

excess of 200 meters is about five percent. No plume fogging or rime icing is predicted to occur in the general vicinity of the project site.

Figure 1
Annual Wind Rose (1988-1990)
Daggett, CA Airport

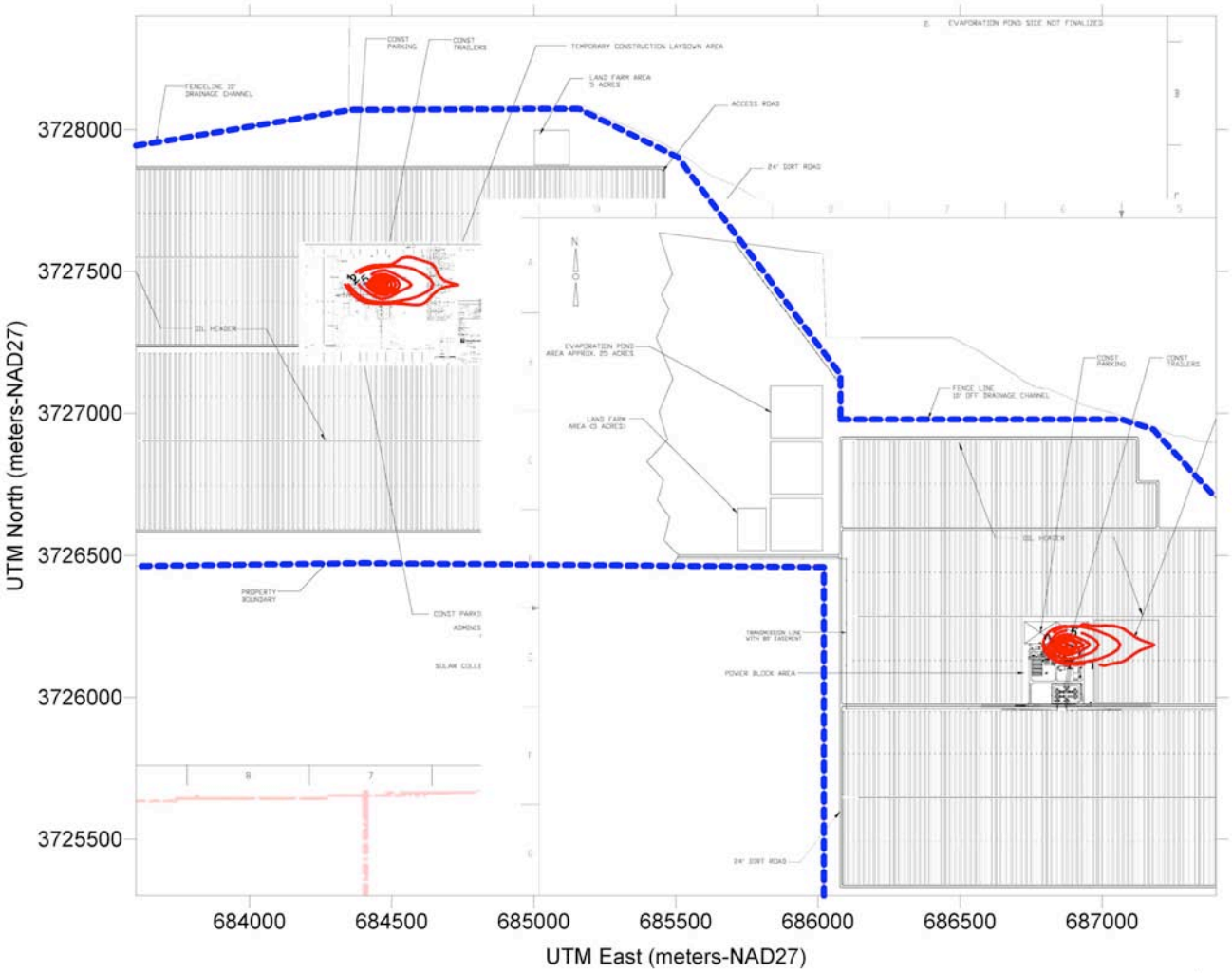


Genesis Cooling Tower Modeling
% Hours/Year of Visual Plume



Source: DRG files for Eagle Mountain
and Blythe 1:100k USGS Metric Maps

Genesis Cooling Tower Modeling
% Hours/Year of Visual Plume



Source: DRG files for Eagle Mountain and Blythe 1:100k USGS Metric Maps

0 m 1200 m 2400 m

Figure I – 1.4

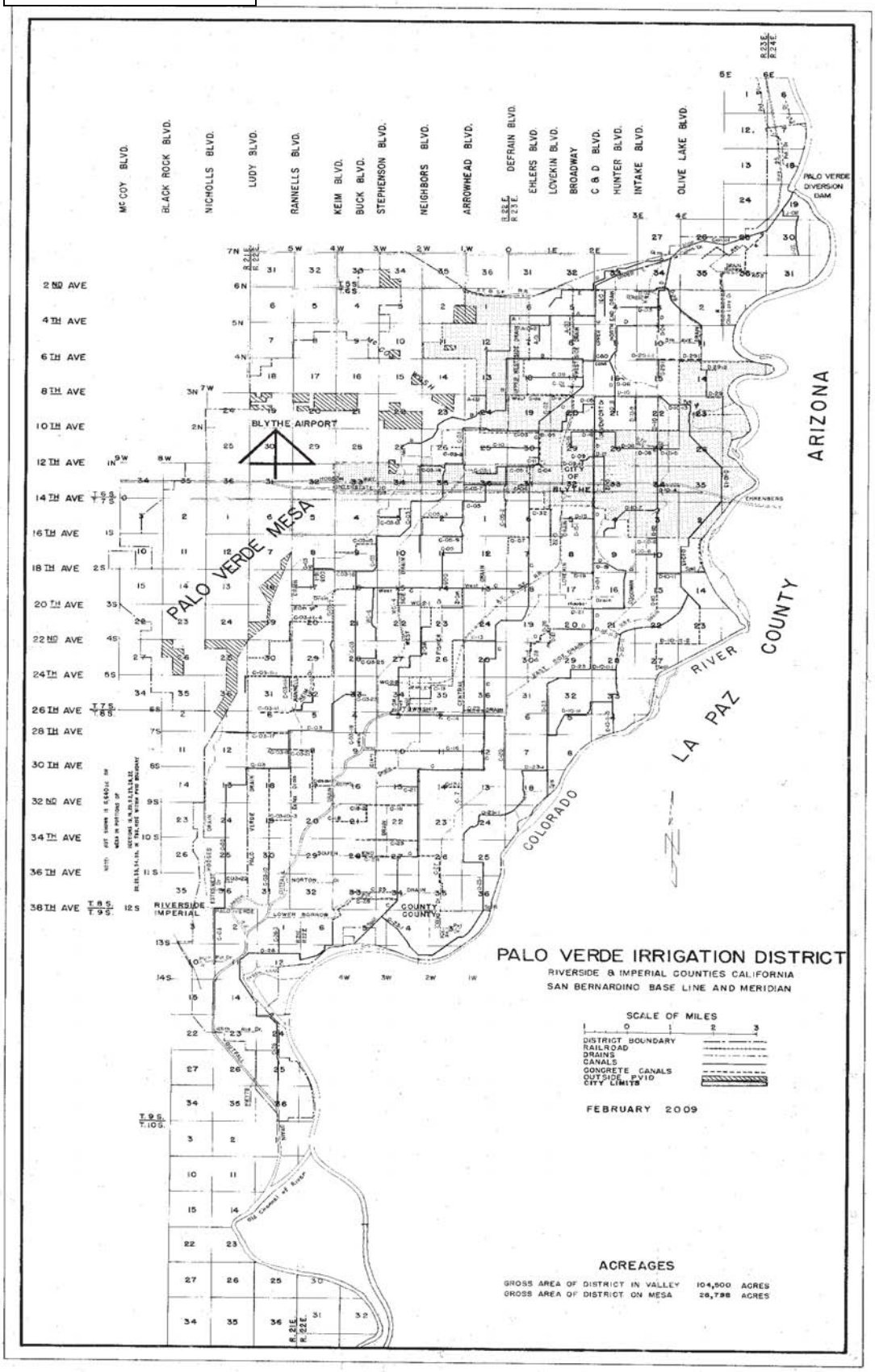
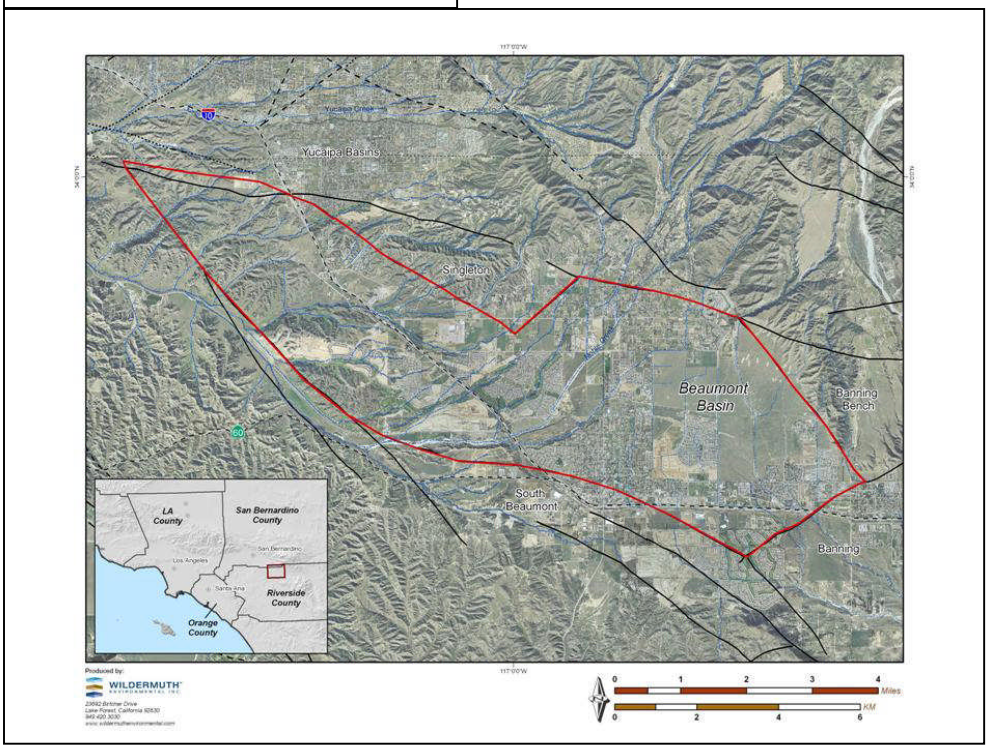

PALO VERDE IRRIGATION DISTRICT
RIVERSIDE & IMPERIAL COUNTIES CALIFORNIA
SAN BERNARDINO BASE LINE AND MERIDIAN
SCALE OF MILES
DISTRICT BOUNDARY
RAILROAD
DRAINS
CANALS
CONCRETE CANALS
OUTSIDE PVID
CITY LIMITS
FEBRUARY 2009
ACREAGES
GROSS AREA OF DISTRICT IN VALLEY 104,500 ACRES
GROSS AREA OF DISTRICT ON MESA 28,798 ACRES
PALO VERDE MESA
BLYTHE AIRPORT
CITY OF BLYTHE
ARIZONA
LA PAZ COUNTY
COLORADO RIVER
RIVERSIDE COUNTY
IMPERIAL COUNTY
PALO VERDE DIVERSION DAM
MC COY BLVD.
BLACK ROCK BLVD.
NICHOLLS BLVD.
LUDY BLVD.
RANNELLS BLVD.
KEIM BLVD.
BUCK BLVD.
STEPHENSON BLVD.
NEIGHBORS BLVD.
ARROWHEAD BLVD.
DEFRAIN BLVD.
EHLERS BLVD.
LOVEKIN BLVD.
BROADWAY
C & D BLVD.
HUNTER BLVD.
INTAKE BLVD.
OLIVE LAKE BLVD.
2ND AVE
4TH AVE
6TH AVE
8TH AVE
10TH AVE
12TH AVE
14TH AVE
16TH AVE
18TH AVE
20TH AVE
22ND AVE
24TH AVE
26TH AVE
28TH AVE
30TH AVE
32ND AVE
34TH AVE
36TH AVE
38TH AVE

Figure I – 1.3 Adjudicated Basin Maps

Beaumont Groundwater Basin



Santa Margarita Groundwater Basin

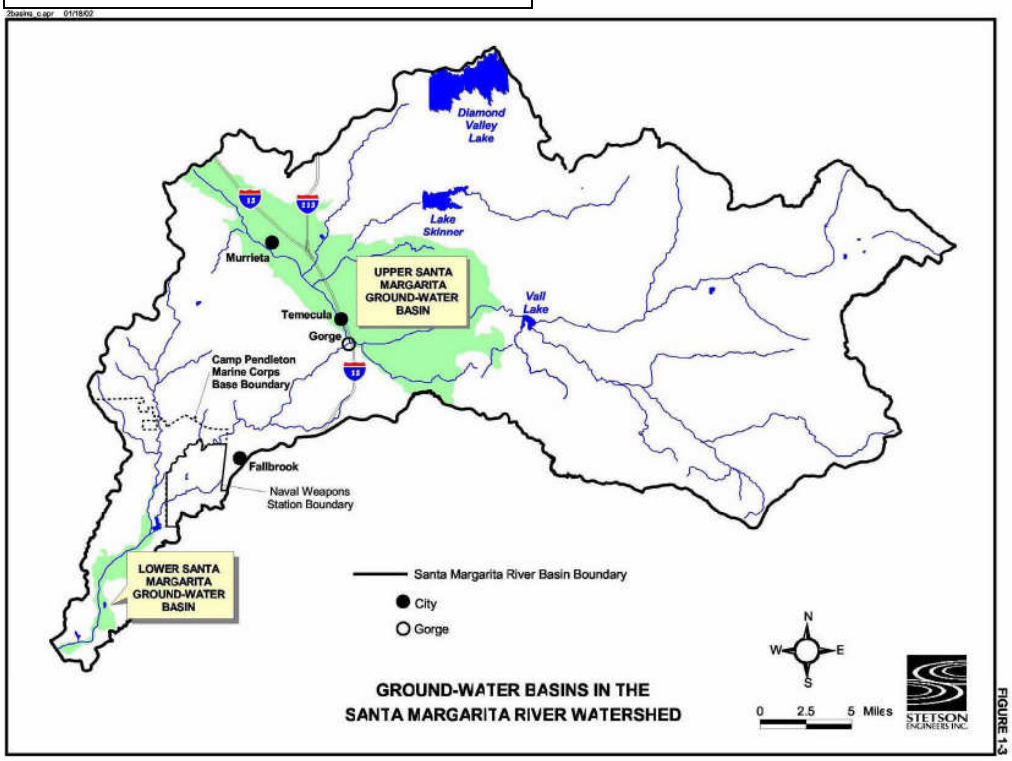


Figure I - 1.2

Adjudicated Basins and Watermasters in California

Court Name	Final Decision	Watermaster	Location
Beaumont Basin	2004	Beaumont Basin Watermaster	Riverside County
Brite Basin	--	Tehachapi-Cummings County Water District	Kern County
Central Basin	1965	Dept. of Water Resources -- Southern District	Los Angeles County
Chino Basin	1978	Nine-member board	San Bernardino County
Cucamonga Basin	--	None appointed; operated as part of Chino Basin	San Bernardino County
Cummings Basin	1972	Tehachapi-Cummings County Water District	Kern County
Goleta Basin	--	Goleta Water District	Santa Barbara County
Main San Gabriel Basin	1973	Nine-member board nominated by water purveyors and water districts, appointed by Superior Court.	Los Angeles County
Mojave Basin Area	1996	Mojave Water Agency	San Bernardino County
Puente Basin	1986	Puente Basin Watermaster, three-person appointed board	Los Angeles County
Puente Narrows	--	Two consultants	Los Angeles County
Raymond Basin	1944	Raymond Basin Management Board	Los Angeles County
San Gregorio Creek Stream System	1992	One-person watermaster	San Mateo County
Santa Margarita River Watershed	1966	U.S. District Court appointee	San Diego and Riverside

			Counties
Santa Paula Basin	1996	Three-person Technical Advisory Committee from United Water CD, City of Ventura, and Santa Paula Basin Pumpers Association	Ventura County
Scott River Stream System	1980	Two local irrigation districts	Siskiyou County
Six Basins	1999	Nine-member board	Los Angeles and San Bernardino Counties
Tehachapi Basin	1972	Tehachapi-Cummings County Water District	Kern County
Upper Los Angeles River Area	1979	An individual hydrologist appointed by the Superior Court	Los Angeles County
Warren Valley Basin	1977	Hi-Desert Water District	San Bernardino County
West Coast Basin	1961	Dept. of Water Resources -- Southern District	Los Angeles County
Western San Bernardino	1971	Western Municipal Water District	San Bernardino and Riverside Counties

Source: Calif. Dept. of Water Resources, Aug. 2004.

Adjudication

In some groundwater basins in California, land owners or other parties have turned to the courts to settle disputes over how much groundwater can rightfully be extracted. The courts have then determined an equitable distribution of water that will be available for extraction each year. In these adjudicated groundwater basins, the courts typically appoint a Watermaster to administer the court judgment.

Figure I – 1.1

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May 12, 2009

VIA EMAIL & FACSIMILE

Joshua Escoto, Esq.
Board Certified Real Estate Lawyer
NextEra Energy Resources, LLC
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Re: Water Rights for Project Genesis Solar

Dear Mr. Escoto:

You have retained us to evaluate the water rights associated with certain parcels of property located in Riverside County leased from the Bureau of Land Management pursuant to a right-of-way grant ("Property"). In connection with this letter, we have been furnished with and examined the following document supplied to us: a Township Range Map delineating the future project site.

In setting forth the statement of facts in this letter and in rendering the preliminary opinions hereinafter expressed, we have relied upon our examination of the foregoing document and upon representations made to us by representatives of NextEra Energy Resources LLP ("NextEra"), but we have not independently verified the factual matters set forth in said document and representations.

I.
STATEMENT OF FACTS

The Property is located in Riverside County, California. We understand that the United States Bureau of Land Management ("BLM") has or will enter a lease and right-of-way agreement authorizing NextEra to use the Property for the construction and operation of a proposed 250 MW solar trough. The Property, and future site of the solar facility, is near the City of Blythe. Blythe is a Colorado River Valley community, adjacent to the California/Arizona border where Interstate 10 crosses the Colorado River. Based on your

representations to us, it is our understanding that the water you will be pumping for the Project is percolating groundwater from the Chuckwalla Valley.

II.
RELEVANT PRINCIPLES OF CALIFORNIA GROUNDWATER LAW

California water law recognizes several kinds of water rights, including riparian, appropriative, overlying, and prescriptive rights. The nature, extent, and permanent exercise of a water right depends in large part on the source of the water and the location and purpose of its use. In 1914, the California Legislature adopted the Water Commission Act, which provides the statutory procedure for the allocation of rights to unappropriated surface waters but specifically excludes percolating groundwater from its provisions. With certain exceptions, no statewide system of statutory regulation yet exists in California to allocate rights to the use or management of percolating groundwater. Rather, the development of the law of percolating groundwater has been left to the courts. In general, no discretionary permit is required to pump percolating groundwater, even in overdrafted basins. A landowner may simply obtain a county well permit, drill a well, and pump the water.

California recognizes several legal classifications of groundwater (depending on its occurrence in various geologic formations), which govern the application of water rights laws. For legal purposes, underground waters are divided into three categories: (1) the underflow of a surface stream; (2) a definite underground stream; and (3) percolating waters. (See A. Littleworth & E. Garner, CALIFORNIA WATER (1995) Water Rights in California, p. 48.) All underground waters other than underflow or underground streams are considered percolating waters. Percolating waters include water in underground water basins and groundwaters that have escaped from streams. (*Montecito Valley Water Co. v. Santa Barbara* (1904) 144 Cal. 578, 584; Wat. Code §§ 1200, 2500.)

A. Surface Water Rights

The Water Code defines surface water as including water flowing on the surface and "subterranean streams flowing through known and defined channels." (Wat. Code § 1200.) There is a presumption that all water below the surface of the ground is percolating groundwater unless it is shown that it is contained within a subterranean stream flowing in known and definite channels. (*City of Los Angeles v. Pomeroy* (1899) 124 Cal. 597, 628, *reiterated in In the Matter of Application 29664 of Garrapata Water Company: Extraction of Water by Garrapata Water Company from the Alluvium of the Valley of Garrapata Creek in Monterey County*, Dec. No. 1639 at 2 (1999); *Arroyo Ditch and Water Company v. Bowen* (1909) 155 Cal. 280, 284.) The State Water Resources Control Board ("State Board") has jurisdiction over groundwater that is flowing within known and defined channels and a permit is required for its use.

If water below ground surface is part of the body or subsurface flow of a stream, it is considered surface water. (*Vineland Irrigation Distr. v. Azusa Irrigation Co.* (1899) 126

Cal. 486, 494.) The determination of whether water below ground surface is to be classified as surface water (a subterranean stream flowing in a known and definite channel) is based upon the following factors: (1) the water must be flowing in a subsurface channel; (2) the channel must have relatively impermeable bed and banks; and (3) the course of the channel must be known or capable of being determined by reasonable inference. (*Pomeroy, supra*, at 632; *Vineland, supra*, at 494; *Garrapata, supra*, at 2.)[1] Thus, if water for the Project was connected to the Colorado River, surface water law would apply. Based on your representation, it is not.

B. Groundwater Rights

The basic principles of the law of percolating waters were set forth in the early case of *Katz v. Walkinshaw* (1903) 141 Cal. 116. In *Katz*, the California Supreme Court rejected the English common law doctrine of absolute ownership of underground waters and adopted the doctrine of correlative rights and reasonable use.[2] The correlative rights doctrine recognizes the common right of all overlying landowners to the reasonable beneficial use of water on their overlying land. Disputes between overlying landowners, in cases where the supply is insufficient for all, are to be settled by giving each a fair and just proportion of water. (*Id.* at 136.) If an overlying landowner makes no use of the water on his own land, he is not allowed, in the absence of actual damage, to enjoin its use by another, although he may have a right to a declaratory relief action protecting his prospective uses. (*Tulare Irrigation District v. Lindsay-Strathmore Irrigation District* (1935) 3 Cal. 2d 489, 529-530.)

The rights of overlying users are paramount to the rights of those who take water for use outside the basin or watershed (who are appropriators), but the overlying right extends only to the quantity of water that is necessary for reasonable and beneficial use on the overlying land and an appropriator may take any surplus. (*Katz v. Walkinshaw*, *supra*, at 135-136.) As between appropriators of percolating groundwater — that is, those who use the water for non-overlying purposes — the first in time of use has priority over those that use the water later, but all appropriators are limited to water which is surplus beyond that which is needed for use on the overlying lands. (*Pasadena v. Alhambra*, *supra*, at 926.) An appropriator may be enjoined from use by an overlying owner if there is no surplus water. (*Corona Foothill Lemon Company v. Lillibridge* (1937) 8 Cal. 2d 522, 531.)

The right to divert or extract water under an overlying right is obtained by the acquisition of real property that abuts, adjoins, or overlies a natural watercourse or a groundwater basin. (*City of Barstow v. Mojave Water Agency* (2000) 23 Cal. 4th 1224, 1251.) The overlying rights are vested property rights which are annexed to the soil and are "part and parcel" of the

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[1] It is important to note that the State Board has taken an increasingly expansive view of the definition of surface water.

[2] All types of water rights, diversions, and uses of water in California are governed by principles contained in Article 10, Section 2 of the California Constitution which requires that all uses of water be put to beneficial and reasonable use, and that waste or unreasonable use or unreasonable method of use of water be prevented.

overlying land. (*Los Angeles County Flood Control District v. Abbot* (1938) 24 Cal. App. 2d 728, 733.) Water rights are appurtenant to the land and remain with the land unless divested by prescription or severance. (*City of Pasadena v. City of Alhambra* (1949) 33 Cal. 2d 908, 925; *Wright v. Best* (1942) 19 Cal. 2d 368.)

Overlying water rights can be limited if a groundwater basin is in overdraft. Overdraft is when extractions from the groundwater basin exceed the safe yield of the basin. (Los Angeles v. San Fernando (1975) 14 Cal. 3d 199, 278). Safe yield is the maximum quantity of water which can be withdrawn annually without causing and undesirable result (Id. At 277-282).

III.

WATER RIGHTS FOR PROJECT GENESIS

You have represented to us that the Property overlies the Chuckwalla Valley Groundwater Basin.[3] This basin underlies the Palen Valley and the Chuckwalla Valley in eastern Riverside County. The California Department of Water Resources ("DWR") regularly compiles and publishes information on groundwater basins. According to DWR, there are no perennial streams in Chuckwalla Valley. Although DWR has not published any recent data on the Chuckwalla Valley Groundwater Basin, the data available states that groundwater levels for the basin are stable.[4] Additionally, well yields range from a maximum of 3,900 gallons per minute to an average of 1,800 gallons per minute, which are the highest for any Basin in the area.[5] The availability of water should be verified by current engineering data, but based on the DWR information it appears that the Basin is not in overdraft.

The Chuckwalla Valley Groundwater Basin is an unadjudicated groundwater basin,[6] and thus, the owners of the Property have the right to pump percolating groundwater from the basin for reasonable and beneficial use, provided that the water rights were never severed or reserved. Given that the Property is owned by BLM, an agency of the United States Government, and likely has since California became a state, it is highly unlikely, but not impossible, that the Property's water rights have been reserved or severed.

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[3] We assume that the water underlying the Property is not "underflow," more commonly referred to as subterranean streams. Underground water that constitutes a subterranean stream falls under the jurisdiction of the State Water Resources Control Board, whereas percolating groundwater does not. As explained supra, underground water is generally presumed to be percolating water. An individual or entity claiming that the water is part of a subterranean stream bears the burden of proof.

[4] See DWR Bulletin 118, Update 2003. Data provided by DWR regarding groundwater stability is from 1963.

[5] See DWR Bulletin 118, Update 2003. Data provided by DWR regarding well yields is from 1975.

[6] A form of groundwater management in California is through court adjudication. In basins where a lawsuit is brought to adjudicate the basin, the groundwater rights of all the overliers and appropriators are determined by the court.

Because the Property is owned by BLM, a federal agency, water rights generally follow local customs or laws. (*California Oregon Power Company v. Beaver Portland Cement Company* (1935) 295 U.S. 142.) Accordingly, California water law governs the water rights of the Property. Providing that the lease and right-of-way grant obtained from BLM for the Property did not place any restrictions or reservations on the water rights, NextEra appears to have the right to pump percolating groundwater for the reasonable and beneficial use of the Project.[7] If the Basin is or becomes overdrafted, other overlying users from the Chuckwalla Basin may successfully seek to correlatively reduce pumping for the Project. Additionally, if there is surplus water in the Basin, NextEra may pump groundwater for use off the property.

The U.S. Department of the Interior, Bureau of Reclamation ("Bureau") has proposed a rule intended to regulate unlawful use of lower Colorado River water. (See 73 Fed. Reg. 40,916 (July 16, 2008).) The proposed rule provides a framework for identifying unlawful use, which includes a "River Aquifer/Accounting Surface" methodology used by the Bureau to identify groundwater wells that pump water replaced with water drawn from the lower Colorado River. (*Id.*) Such wells may require an entitlement to divert Colorado River water. (*Id.*) The study area includes the valley adjacent to the lower Colorado River and parts of some adjacent valleys in Arizona, California, Nevada, and Utah and extends from the east end of Lake Mead south to the southerly international boundary with Mexico. Your hydrogeologist indicated that the Property may be within the study area. As of the date of this letter, the Bureau has not finalized its draft rule, although the Bureau may promulgate a final rule in the future. At that point, groundwater pumping from wells on the Property may be subject to regulation and limitation, but since the proposed rule has not been finalized, it is difficult to speculate on what these limitations may be.

A. <u>Criteria for Determining Lawful Use of Lower Colorado River Water</u>

The Bureau's proposed rule would establish Part 415 of Title 43 of the Code of Federal Regulations ("CFR"), setting forth regulations governing the use of lower Colorado River water without an entitlement. Pursuant to proposed Part 415, Title 43 of the CFR, "a person or entity may lawfully use water from the lower Colorado River only under an entitlement.[8]" (Proposed 43 C.F.R. § 415.3.") The proposed rule, and its implementing regulations, will apply to a well that uses mainstream water because: (1) the well is located in the Colorado River's floodplain and draws water directly from the mainstream, or (2) the well is located outside the floodplain

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[7] When the United States reserves public land for uses such as Indian reservations, military reservations, national parks or forests, it also implicitly reserves sufficient water to satisfy the purposes for which the reservation was created (the basis for the so-called federal reserved water rights doctrine). This Property is subject to a right-of-way grant, which authorizes a specific piece of public land for a certain project subject to certain rights and privileges for a specific use of the land for a specific period of time.

[8] An entitlement means an authorization to use water from the lower Colorado River water as described in: (1) the Consolidated Decree entered by the United States Supreme Court in *Arizona v. California*, 547 U.S. 150 (2006), in March 2006; (2) a water delivery contract with the Bureau; or (3) a reservation of water by the Bureau. (Proposed 43 C.F.R. § 415.3.)

and pumps water replaced by water drawn from the lower Colorado River as determined by the River Aquifer/Accounting Surface method, and is deemed to be using mainstream water.[9] (Proposed 43 C.F.R. § 415.4.) Of the two scenarios, the second scenario would likely apply to any well on the Property, although this is a determination to be made by your hydrogeologist using the criteria set forth in the paragraph that follows.

Generally, a well located outside the floodplain but within the accounting surface portion of the river aquifer will be considered to pump water that is replaced by water drawn from the lower Colorado River if "the static water elevation[10] in the well is less than or cannot be distinguished from the elevation of the accounting surface[11] at the well site." (Proposed 43 C.F.R. § 415.11.) The accounting surface is "the elevation at which underground water would be expected to occur in a particular area of the river aquifer if the lower Colorado River was the only source of groundwater in the area. (*Id.*) Therefore, water pumped below or from an elevation indistinguishable from the elevation of the accounting surface in the location of the well will be replaced by water drawn from the lower Colorado River. (*Id.*) The static water elevation in your well is then compared by the Bureau to the elevation of the accounting surface at your well site. (*Id.*) "If the static water elevation in your well is indistinguishable from or lower than the elevation of the accounting surface where your well is located, you are pumping water that is replaced by water drawn from the mainstream of the lower Colorado River," and you must obtain an entitlement or stop using water from the lower Colorado River. (*Id.*)

B. <u>Potential Risks of Pumping Groundwater from Chuckwalla Valley Basin</u>

Summarized below are the risks, as set forth in greater detail above, that may attach to groundwater pumped from a well on your Property;

1. If your well(s) is pumping percolating groundwater from the Chuckwalla Valley Basin and the Basin becomes overdrafted, a neighboring landowner may challenge your right to pump water pursuant to the overlying rights doctrine on the basis that the amount being extracted is unreasonable. A court could then impose limitations on the amount of groundwater extracted by NextEra.

2. The Bureau may finalize its draft rule and implement Part 415, Title 43 of the Code of Federal Regulations. If your hydrogeologist confirms that your well(s) is located

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[9] The mainstream of the lower Colorado River includes all water in the river channel and all water in any reservoir on the lower Colorado River. (Proposed 43 C.F.R. § 415.4.)

[10] "Static water elevation" means "the non-pumping elevation of the water in a well, measured as the elevation of the ground, or other appropriate elevation reference, less the depth to water in the well with the pump turned off and the water elevation in the well recovered to the non-pumping elevation." (Proposed 43 C.F.R. § 415.2.)

[11] "Accounting surface" means "the elevation and slope of the unconfined static water table in the river aquifer outside the floodplain and the reservoirs of the lower Colorado River that would exist if the lower Colorado River were the only source of water to the river aquifer." (Proposed 43 C.F.R. § 415.2.)

outside the floodplain but within the accounting surface of the river aquifer, then, based on the elevation of the accounting surface at the well site relative to the static water elevation in the well, the Bureau may find that your well is pumping "water that is replaced by water drawn from the mainstream of the lower Colorado River." Accordingly, proposed Part 415, Title 43 would require that you limit your pumping or obtain an entitlement from the Bureau before you could lawfully resume pumping from the Basin. Alternatively, or in addition to the Bureau's involvement, a Colorado River water entitlement holder may challenge your use of lower Colorado River water as interfering with their water rights.

Sincerely,

Eric L. Garner
of BEST BEST & KRIEGER LLP

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