

**RIDGECREST SOLAR POWER PROJECT (09-AFC-9)
DATA ADEQUACY SUPPLEMENT**

Technical Area: Transmission System Design

Response Date: October 26, 2009

Following are additional information and/or clarifications in response to the specific issues raised in the CEC staff Data Adequacy review. For each specific area where the questions were raised by CEC staff, the applicable section of the CEC Siting Regulations is identified, followed by the "Information Required to Make AFC Conform with Regulations," followed by the supplemental/clarifying information.

DA-TSD-1. Appendix B (h) (2) (B)

Information Required:

Provide a physical layout drawing showing distinctly the route of the proposed 0.5-mile 230 kV overhead generator tie line in and out of the plant site between the proposed Ridgecrest Solar Power Project (RSPP) 230 kV switchyard and proposed new SCE 230 kV substation including Right of Way (ROW) widths. Describe whether the ROW would be through private and/or public lands. Also include in the diagram the existing and relocated routes of 1.4-mile transmission lines in the project site.

Response:

Please refer to the new Figure 2-12 depicting the route of the proposed 0.5 mile 230 kV overhead transmission line connecting the power block 230 kV switchyard to the new SCE's Millennium 230 kV substation (as a note for clarification, the substation is referred to as the switchyard in the Ridgecrest AFC, but in this and in subsequent responses, it will be referred to as the substation). The figure also depicts the generator tie line in and out of the Millennium substation to the existing SCE 230 kV transmission line, located to the west. The proposed transmission line route between the power block and the new substation, the proposed transmission line route between the new substation and the existing transmission lines, and the relocated existing 115 kV and 230 kV lines are all entirely within the proposed Project ROW, all within federal lands managed by the BLM. No private lands are affected.

DA-TSD-2. Appendix B (b) (2) (C)

Information Required:

- (a) Submit a Pole design diagram for dead-end structures of the generator overhead 230 kV tie lines showing configuration of insulators and conductors (with sizes, type and ampere rating) with their respective position measurements on the pole.
- (b) Submit a complete electrical one-line diagram (or resubmit Figure 2.8 with missing elements or sizes/ratings) of the proposed RSPP 230 kV switchyard showing all equipment for all new generators' interconnection with the switchyard along with their respective sizes and/or ratings as follows:
 - i) Any bus duct connectors or overhead conductors or cables, 18 kV switchgear, buses, breakers & disconnect switches on the low side of each Generator step-up transformer (GSU).
 - ii) The GSU and short overhead conductors and/or cables from the GSU to the switchyard with the configuration for the switchyard buses, breakers, disconnect switches on the 230 kV side, along with the proposed tie line transmission outlet from the switchyard.

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- (c) Provide a one-line electrical diagram (or resubmit Figure 2.9 with missing elements) showing the proposed new SCE 230 kV substation with the proposed 230 kV generator tie line interconnection facilities for buses, breakers and disconnect switches and their respective sizes and/or ratings.
- (d) Provide a physical layout drawing of the proposed new SCE substation showing all major equipment and transmission outlets.

Response:

- (a) Please see Figure 2-13 provided at the end of this section. The new 230 kV circuit line from the power block switchyard to the new SCE Millennium substation will be constructed using a steel monopole made of weathered or galvanized steel. The structures will be bolted or slip-fit design. The structures will be 75 to 120 feet tall, with the phases arranged in a delta configuration. The structures for typical tangent and dead-end applications are shown on Figure 2-13. The base of the pole at ground will be 48 inches for a tangent structure, and slightly larger for dead-end structures depending on span and height of the pole.

The conductors will be single-bundled aluminum conductors, steel-reinforced ("ACSR") 715.5 KCMIL ("Redwing" type 1.081 inches in diameter) on a typical phase spacing of 17 feet and structure-to-conductor distance of 12 feet. Located at the top of the transmission structure will be a lightning OPGW shield wire.

To provide dual communication paths from power block switchyard to the new Millennium substation, a fiber optic line will be embedded in the overhead shield wires and a microwave tower and dish will be installed.

The minimum mid-span line-to-ground clearance will be calculated at an ambient temperature of 130 degrees Fahrenheit under maximum load conditions and typically will be 31 feet. All dimensions will comply with applicable CPUC General Order 95 rules.

- (b) The current Figure 2-8 in the AFC illustrates the elements of the RSPP power block switchyard. The revised Figure 2-9, provided at the end of this section, contains the one-line drawing for the new SCE Millennium substation, including all CEC requested items.
- (c) Please refer to the revised Figure 2-9 provided at the end of this section. The SCE 230 kV transmission line from the existing Kramer Substation to the existing Inyokern Substation runs on the east side of the power plant. A new 230 kV substation will be constructed at the power plant site. This new substation will bisect this existing 230 kV transmission line creating three new line segments: Kramer to Millennium, Millennium to Inyokern and the Ridgecrest Solar Power Project to Millennium.
- (d) Please refer to the new Figure 2-14, provided at the end of this section, which depicts the physical layout of the new SCE Millennium substation. The new substation will be designed as a circuit breaker-and-a-half design. It will be a two bay station. The new substation will have five circuit breakers, three take-off structures, two 4000 Ampere bus sections and a control house. The one line is laid out in a preliminary physical arrangement.

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DA-TSD-3. Appendix B (b) (2) (D)

Information Required:

Submit a drawing showing the alternate routes of the proposed 230 kV generator tie lines and describe how the preferred route is selected by comparing to alternate routes and their environmental effects.

Response:

As described in Section 4.7 of Section 2.0 of the AFC, Project Description, an alternative that was explored was to interconnect at Inyokern Substation, which is located five miles northwest from the Project site. Please refer to Figure 2-15, provided at the end of this section, which depicts the alternative generator tie lines. This route, which was identified in the CAISO Phase I Study as the only “competitive” alternative, is rejected, because it would require the construction of five additional miles of new transmission line. Such a new line would have to be constructed either in the existing ROW for the SCE 230 kV line or a new ROW would have to be obtained. The existing ROW is occupied by a 115 kV transmission line in addition to the SCE 230 kV line. It is uncertain if this ROW could support an additional new 230 kV transmission line. Constructing a new 230 kV transmission outside of the existing ROW would be extraordinarily difficult if not infeasible since it likely would require obtaining the permission of dozens of private landowners.

The preferred route has the generator tie line connecting less than 0.1 mile from the existing SCE 230 kV to the new SCE Millennium Substation within the Project ROW. This route was selected because it was the shortest route and most suitable location to interconnect to the SCE 230 kV line while minimizing environmental impacts and costs. The route, identified as “viable” in the CAISO Phase I Study, causes the least disturbance to the site area and surrounding environment.

DA-TSD-4. Appendix B (i) (1) (A)

Information Required:

Provide a list of federal, state, regional or local laws, ordinances, regulations and standards applicable for transmission and describe in short their applicability/purpose during planning, construction and operation of the proposed RSPP.

Response:

Table 5.14-1 of the Transmission Safety and Nuisance Line section of the AFC presents LORS applicable to transmission safety and nuisance. Table TSD-4 below provides additional applicable federal, state and local LORS for the transmission line.

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Table TSD-4: Summary of Applicable Transmission LORS

LORS	Applicability
Federal	
National Electric Safety Code (NESC)	NESC is the industry-accepted safety standard for overhead and underground electric utility and communications utility installations. NESC covers electric supply and communication lines, equipment, and work practices employed by both public and private electric utility installations. NESC requires specific distances between utility facilities, such as overhead lines. The RSPP will comply with NESC.
National Electric Code (NEC)	The NEC covers the installation of electrical conductors, equipment, and raceways; and signaling and communications conductors, equipment, and raceways for (1) Public and private premises, including buildings, structures, mobile homes, recreational vehicles, and floating buildings (2) Yards, lots, parking lots, carnivals, and industrial substations (3) Installations of conductors and equipment that connect to the supply of electricity (4) Installations used by the electric utility, such as office buildings, warehouses, garages, machine shops, and recreational buildings, that are not an integral part of a generating plant, substation, or control center. The RSPP will comply with NEC.
State	
California Public Utilities Commission (CPUC) General Order (G.O.) 95	CPUC G.O. 95 rules are applicable to overhead and underground electric line construction. Section VI addresses detailed construction requirements for tower lines and extra high voltage lines. Section X addresses supply and communication lines in line crossings or conflicts rule. Section XI addressed supply lines or communication lines crossing over railroads. The RSPP will comply with the applicable portions of CPUC G.O. 95.
Local	
Kern County Zoning Ordinance	The Kern County Zoning Ordinance provisions do not apply to the construction, installation, operation, and maintenance of public utility distribution and transmission lines or supporting towers, and poles and underground facilities for providing gas, water, electricity, or telephone and telegraph services by public utility companies or other company under the jurisdiction of the California Public Utilities Commission. Additionally, the provisions do not apply to privately constructed, operated, or maintained electrical transmission lines and towers, provided that the lines are constructed, maintained, and operated in accordance with, and subject to, the requirements of the California Public Utilities Commission and that the transmission lines are tied into a public utility grid system. Thus, no approvals pertaining to the transmission line would be required from Kern County.

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DA-TSD-5. Appendix B (i) (1) (B)

Information Required:

Provide a list of agencies, other than the Energy Commission, in a Table who will provide necessary permits, leases and approvals to enforce the identified laws, regulations, standards and for land use or other plans for transmission.

Response:

Table TSD-5 below provides a list of the one agency, other than the Energy Commission, in addition to those mentioned in Section 5.14 Transmission Line Safety and Nuisance of the AFC, who will issue approvals and studies for the transmission line.

Table TSD-5: Agencies and Agency Contacts		
Agency	Contact/Phone/E-mail	Permit/Issue
California ISO (CAISO)	Linda Wright, Project Specialist P.O. Box 639014 Folsom, CA 95763-9014 (916) 351-4470 lwright@caiso.com	CAISO conducted the Phase I cluster study and is preparing the Phase II study to determine potential impacts to the capacity of the system to accommodate loads generated by RSPP.

DA-TSD-6. Appendix B (i) (2)

Information Required:

Provide the names, phone number, address and email address of the official contact person for each agency.

Response:

Please see the table in the response DA-TDS-6 above.

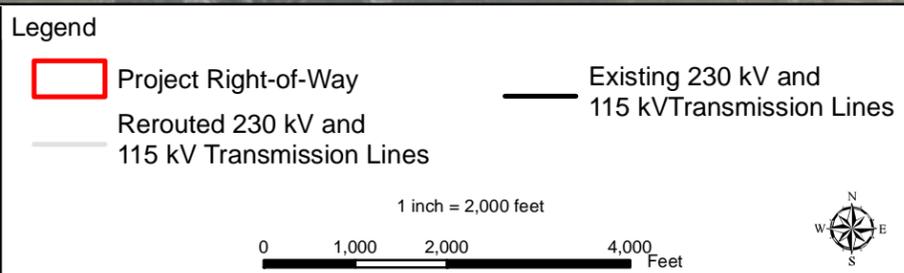
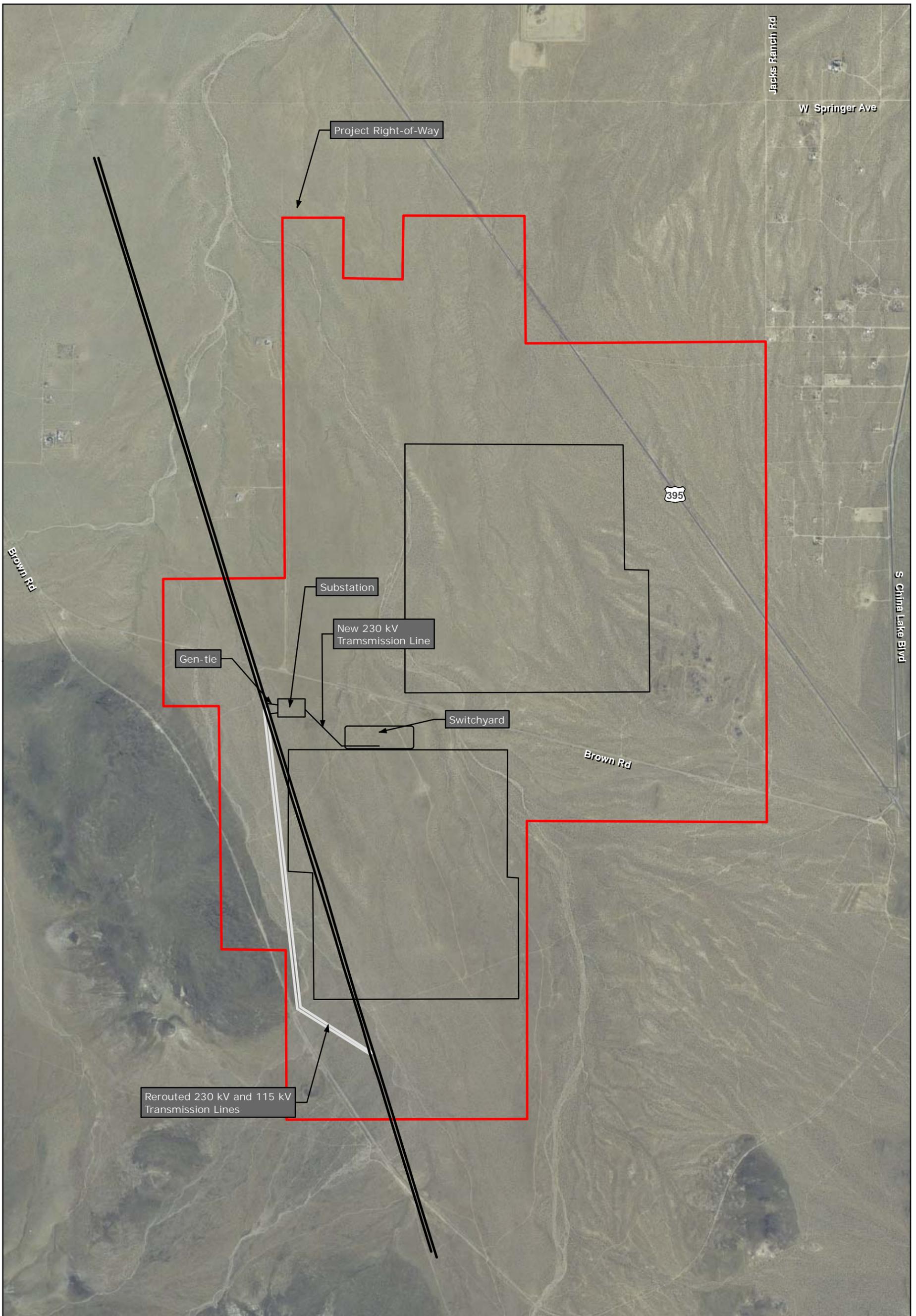
DA-TSD-7. Appendix B (i) (3)

Information Required:

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

Response:

Transmission related permits and study reports include the Cluster Study now underway. The Phase II Study will take 330 days from initiation on November 30, 2009, giving an estimated date for completion of October 30, 2010. The Applicant will be seeking an accelerated review, which could be 150-180 days. There are no further permits required for RSPP anticipated.

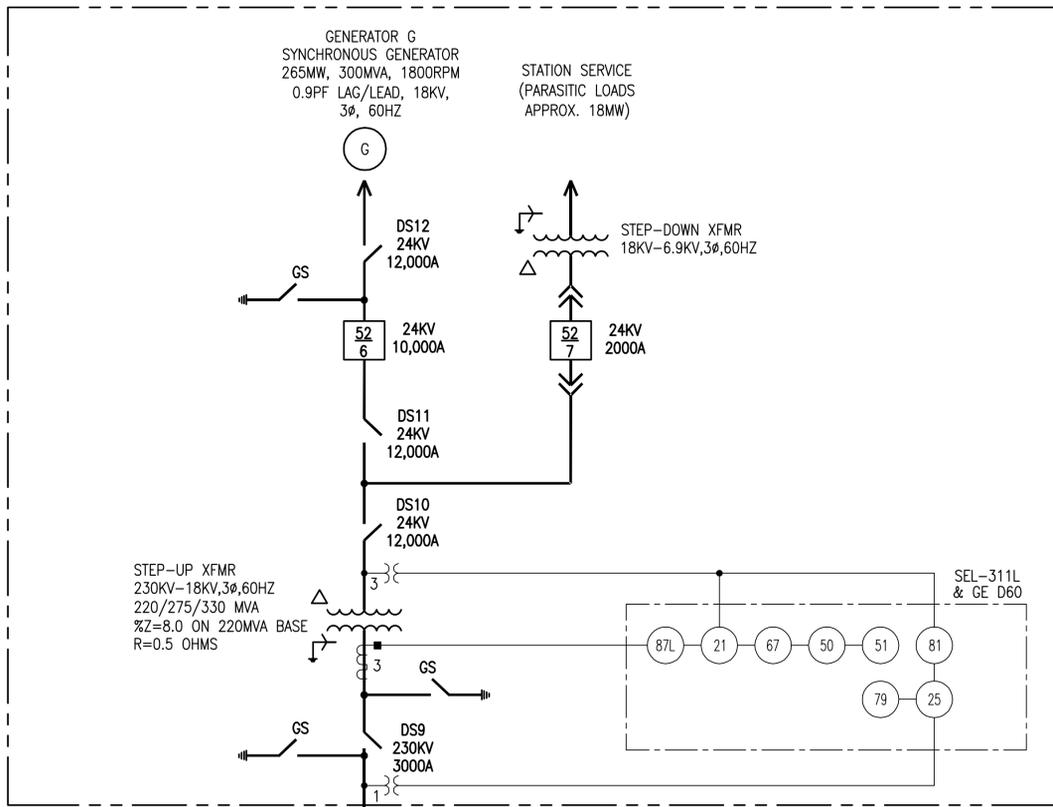


Ridgecrest Solar Power Project

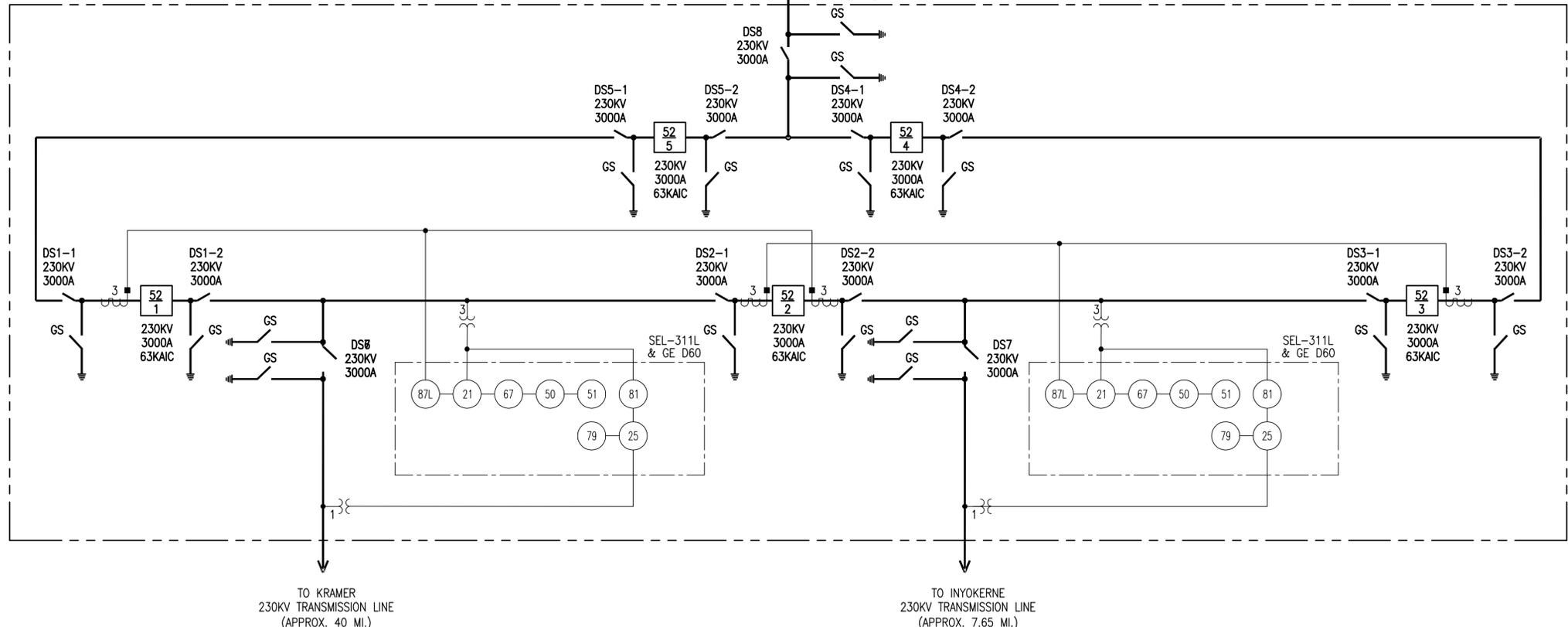
Figure 2-12
Transmission Line
Facilities and Routes

Date: October 2009

RIDGECREST POWER BLOCK SWITCHYARD



NEW MILLENNIUM SUBSTATION



ABBREVIATIONS:

- A AMPERES
- APPROX. APPROXIMATELY
- DS DISCONNECT SWITCH
- FT. FEET
- G GENERATOR
- GS GROUND SWITCH
- HZ HERTZ
- IC INTERRUPTING CURRENT
- KA KILO AMPERES
- KV KILOVOLTS
- KVA KILO VOLTAMPERE
- LA LIGHTNING ARRESTER
- MI MILES
- MVA MEGA VOLTAMPERE
- MW MEGA WATTS
- NEUT,N NEUTRAL
- PF POWER FACTOR
- RES RESISTOR
- V VOLTS
- XFMR TRANSFORMER

NOTE: ABBREVIATION MAY OR MAY NOT INCLUDE PERIOD/S, OR LETTER S FOR PLURAL FORM.

SYMBOLS

- | SYMBOLS | DESCRIPTION |
|---------|---|
| | CIRCUIT BREAKER X |
| | POWER TRANSFORMER |
| | STEAM TURBINE GENERATOR
SYNCHRONOUS GENERATOR
265MW, 300MVA, 1800RPM
0.9PF LAG/LEAD, 18KV,
3Ø, 60HZ |
| | DISCONNECT SWITCH
THREE POLE GANG OPERATED |
| | GROUND SWITCH |
| | CURRENT DIFFERENTIAL |
| | DISTANCE |
| | DIFFERENTIAL OVERCURRENT |
| | INSTANTANEOUS OVERCURRENT |
| | TIME OVERCURRENT |
| | OVER/UNDER FREQUENCY |
| | AUTO-RECLCING |
| | SYNCHRONISM CHECK |
| | LINE CURRENT DIFFERENTIAL
PROTECTION AND AUTOMATION SYSTEMS |
| | LINE DISTANCE PROTECTION SYSTEM |

NOT FOR CONSTRUCTION

Prepared for:



AECOM USA, Inc. AECOM

440 STEVENS AVENUE
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REVISIONS				
NO.	DATE	DESCRIPTION	BY	APPD.

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RIDGECREST SOLAR POWER PROJECT
KERN COUNTY, CALIFORNIA

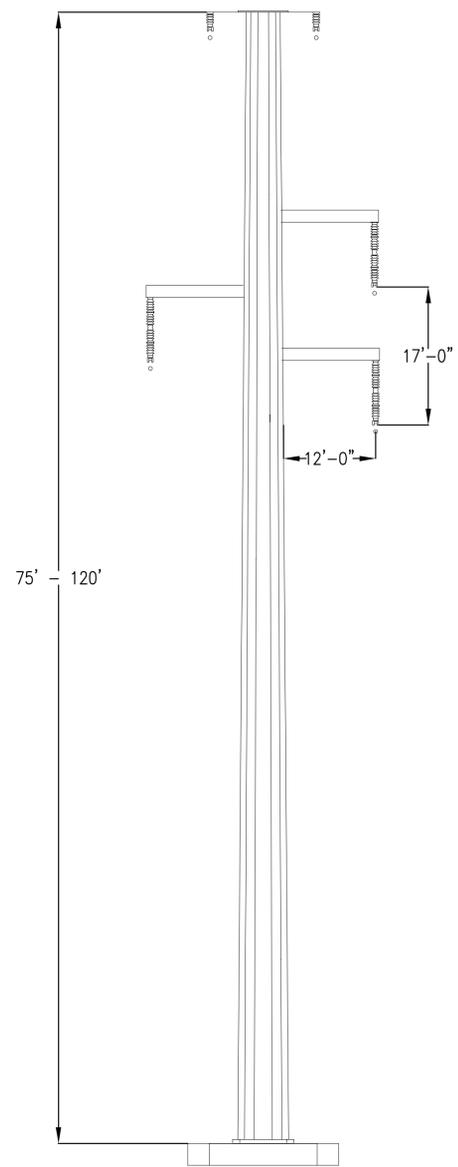
FIGURE 2-9

ELECTRICAL

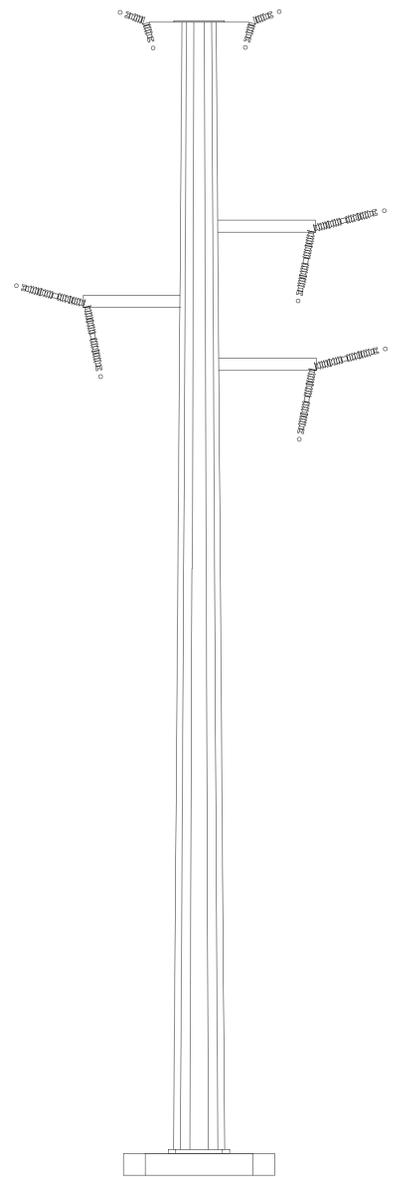
ONE LINE DIAGRAM

PROJECT MANAGER:	R. ARDOLINO	SCALE:	NTS
DESIGNED BY:	R.SCHUGMANN	DATE:	OCT. 08 2009
DRAWN BY:	R.SCHUGMANN	AECOM PROJECT NO.:	60100008
CHECKED BY:			
FILE LOCATION:			
DRAWING NO.:			

E-301



TANGENT TRANSMISSION TOWER
NOT TO SCALE

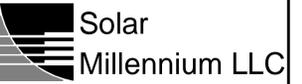


DEAD END TRANSMISSION TOWER
NOT TO SCALE

TYPICAL 230KV STRUCTURE
SINGLE BUNDLE 715.5KCMIL "REDWING"

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RIDGECREST SOLAR POWER PROJECT
KERN COUNTY, CALIFORNIA

FIGURE 2-13

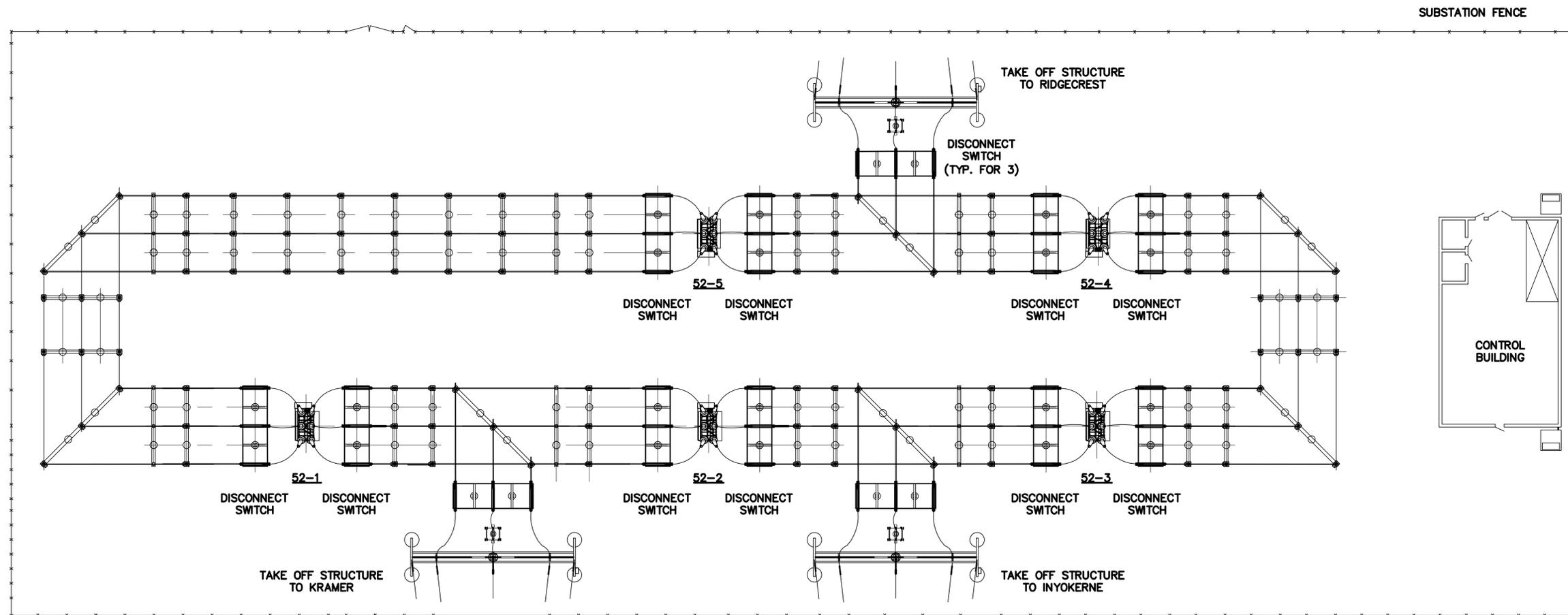
ELECTRICAL

TRANSMISSION TOWER
DETAIL

PROJECT MANAGER:	R. ARDOLINO	SCALE:	NTS
DESIGNED BY:	R. ALVIO	DATE:	OCT. 08 2009
DRAWN BY:	R.SCHUGMANN	AECOM PROJECT NO.:	60100008
CHECKED BY:			

FILE LOCATION:
DRAWING NO.

E-R-TWR



Prepared for:



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RIDGECREST SOLAR POWER PROJECT
KERN COUNTY, CALIFORNIA

FIGURE 2-14

ELECTRICAL

MILLENNIUM SUBSTATION
PLAN VIEW

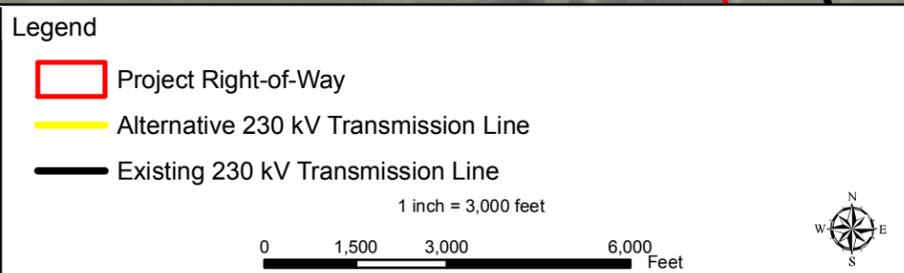
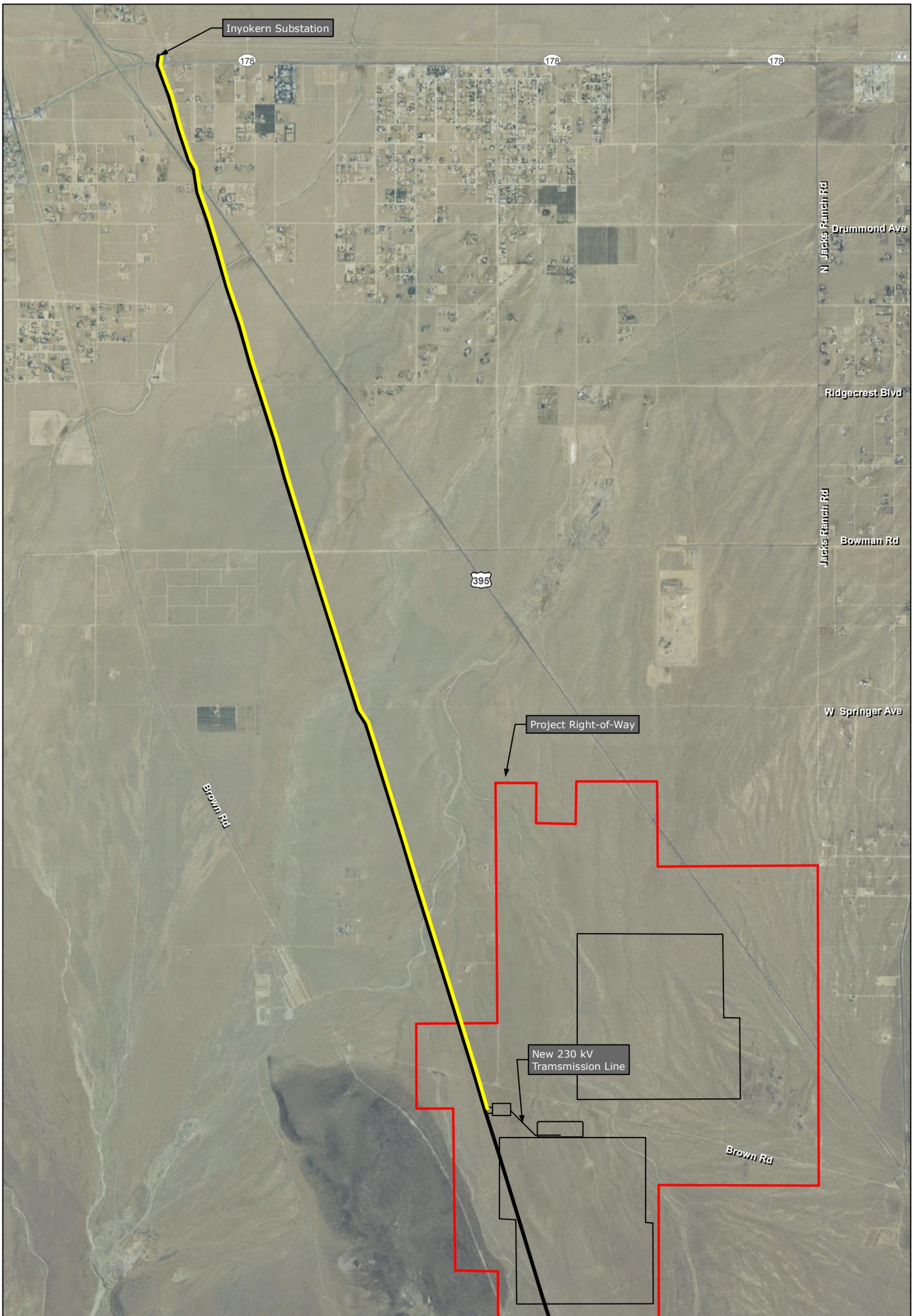
PROJECT MANAGER:	R. ARDOLINO	SCALE:	NTS
DESIGNED BY:	R.SCHUGMANN	DATE:	OCT. 12 2009
DRAWN BY:	R.SCHUGMANN	AECOM PROJECT NO.:	60100008
CHECKED BY:			

FILE LOCATION:
DRAWING NO.

E-401

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**Figure 2-15
RSPP**

**Alternative Transmission Line
to Inyokern Substation**




Date: October 2009