ABENGOA MOJAVE SOLAR

DOCKET
09-AFC-5
DATE
REC'D JUN 30 2010

Supplemental Staff Assessment - Part C

CALIFORNIA
ENERGY COMMISSION
Arnold Schwarzenegger, Governor

JUNE 2010
CEC-700-2010-003 - SUPC

DOCKET NUMBER 09-AFC-5

PROOF OF SERVICE (REVISED 06/08/10) FILED WITH
CD COPIES MAILED FROM SACRAMENTO ON 06/30/10
AA

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ABENGOA MOJAVE SOLAR (AMS)
(09-AFC-5)
SUPPLEMENTAL STAFF ASSESSMENT PART C

EXECUTIVE SUMMARY

Testimony of Craig Hoffman

INTRODUCTION

The California Energy Commission staff has the responsibility to complete an independent assessment of the Abengoa Mojave Solar project (AMS) Application for Certification (09-AFC-5). This analysis includes a review of the engineering design and any potential impacts to the environment, the public's health and safety, and a determination of whether the project conforms to all applicable laws, ordinances, regulations and standards (LORS). Energy Commission staff prepares a Staff Assessment (SA) that identifies any potentially significant environmental impacts and includes recommended mitigation measures in the form of conditions of certification for construction, operation and eventual closure of the project.

The SA contains analyses similar to those normally contained in an Environmental Impact Report (EIR) required by the California Environmental Quality Act (CEQA). The Energy Commission review and licensing process is a functional equivalent of an EIR. When issuing a license, the Energy Commission is the lead state agency under CEQA, and its process is functionally equivalent to the preparation of an EIR.

The President and Congress have underscored the need for accelerated development of renewable energy projects in California with the passing of the American Recovery and Reinvestment Act (ARRA) of 2009. The Act specifically directs economic stimulus funding to qualified projects that begin construction by December 1, 2010. The AMS project is requesting ARRA funding which has required an accelerated project schedule and the preparation of a single Staff Assessment (SA) as opposed to a Preliminary Staff Assessment and Final Staff Assessment. The SA presents for the applicant, interveners, agencies, other interested parties, and members of the public, the staff's final analysis, conclusions, and recommendations.

When necessary, staff provides a comment period to resolve issues between the parties and to narrow the scope of disputed issues presented at evidentiary hearings. During the comment period that normally follows the publication of the SA, staff will conduct one or more workshops to discuss its findings, proposed mitigation, and proposed compliance-monitoring requirements. Based on the workshops and written comments, staff may refine its analysis, correct errors, and finalize conditions of certification to reflect areas where agreements have been reached with the parties and will then publish a Supplemental Staff Assessment (SSA). The SSA will be a limited document representing revisions and additions rather than a document including each technical section.

BACKGROUND

Energy Commission staff published a SA for the AMS project on March 15, 2010. That document included staff's independent analysis, conclusions, and recommendations for the proposed project. Staff publically noticed the SA for a 30-day comment period that lasted from Tuesday March 16, 2010 to Thursday, April 15, 2010.

During this comment period, public workshops were held on Tuesday, April 6, 2010 in Sacramento at the Energy Commission and on Wednesday, April 7, 2010 at the Barstow City Hall to discuss staff's findings, proposed mitigation, and proposed conditions of certification and compliance-monitoring requirements.

The Supplemental Staff Assessment (SSA) has been prepared based upon discussions at the SA workshops, written comments and new information provided by the applicant, agencies and public. This SSA is a limited document representing revisions and additions to various technical sections that were commented upon. Technical sections included with the SSA supersede the section in the SA. This document does not include each technical section. Executive Summary Table 1 identifies where the final sections are located for each technical section. For a complete project description please see SSA Part B. Final technical sections are located in the SA, SSA Part A, SSA Part B and SSA Part C. The SSA only includes sections that were revised or had public comments.

The AMS SSA was published in three parts. SSA Part A was published on May 12, 2010 and contained the Energy Commission staff's final environmental and engineering evaluation of the project in the following technical sections: Hazardous Materials, Noise and Vibration, Public Health, Traffic and Transportation, Visual Resources, Waste Management and Worker Safety and Fire Protection and will serve as staff's testimony during evidentiary hearings.

SSA Part B was published on May 25, 2010 and contained the Energy Commission staff's final environmental and engineering evaluation of the project in the following technical sections: Air Quality, Biological Resources, Cultural Resources, Land Use, Soils and Water Resources and Transmission System Engineering and will serve as staff's testimony during evidentiary hearings.

SSA Part C contains Transmission System Engineering and Transmission System Engineering - Appendix A that is an environmental review of downstream transmission and telecommunication facilities. These are facilities that are past the first point of interconnection, the Lockhart substation, and are required for the AMS project to connect to Southern California Edison Company's (SCE) Kramer-Cool Water 230-kV transmission line.

Staff's testimony that will be provided at the Energy Commission's Evidentiary Hearings on the AMS project will encompass the technical sections not modified in the SA and revisions to sections included in SSA Part A, SSA Part B and SSA Part C.

ENERGY COMMISSION'S "IN LIEU" PERMITTING PROCESS

Staff has implemented an objective of the Renewable Energy Action Team (REAT), as identified in the Governor's Executive Order S-14-08, to create a consolidated process for permitting renewable energy generation facilities under California law. This permit streamlining process is being implemented according to the Energy Commission's "in lieu permit" authority established under the Warren-Alquist Act. Accordingly, staff coordinated its environmental review with other agencies such as the U.S. Fish and Wildlife Service, California Department of Fish and Game, Lahontan Regional Water

Quality Control Board, Mojave Desert Air Quality Management District and San Bernardino County to ensure that substantive requirements of these agencies were incorporated into the process and document.

The requirements of state and local permits that would ordinarily be issued but for the Energy Commission's exclusive jurisdiction, will be incorporated into the Commission's certificate if the project is approved. By implementing this cooperative approach, staff was able to reduce the overall permit processing time otherwise necessary to issue an Incidental Take Permit, Streambed Alteration Agreement and Waste Discharge Requirements.

CEQA PROCESS

The Energy Commission's siting regulations require Energy Commission staff to independently review the AFC and assess whether the list of environmental impacts contained is complete and whether additional or more effective mitigation measures are necessary, feasible, and available (Cal. Code Regs., tit. 20, §§ 1742 and 1742.5(a)).

In addition, Energy Commission staff must assess the completeness and adequacy of the measures proposed by the applicant to ensure compliance with health and safety standards and the reliability of power plant operations (Cal. Code Regs., tit. 20, § 1743(b)). Energy Commission staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable laws, ordinances, regulations, and standards are met (Cal. Code Regs., title 20, § 1744(b)).

Energy Commission staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act (CEQA). No additional Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the California Natural Resources Agency as meeting all requirements of a certified regulatory program (Pub. Resources Code, § 21080.5 and Cal. Code Regs., title 14, § 15251 (j)).

Energy Commission staff's impact assessment, including the recommended conditions of certification, is only one piece of evidence that the Committee assigned to oversee the AMS AFC will consider in reaching a decision on the proposed project and making its recommendation to the full Energy Commission. At the public evidentiary hearings, all parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties, thereby creating a hearing record on which a decision on the project can be based. The hearings before the assigned Committee also allows all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Member's Proposed Decision (PMPD). Following its publication, the PMPD is circulated in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision.

PROJECT LOCATION AND DESCRIPTION

The proposed AMS project is a solar electric generating facility to be located on approximately 1,765 acres. The proposed project site is located approximately nine miles northwest of the Town of Hinkley in unincorporated San Bernardino County, approximately halfway between the City of Barstow and Kramer Junction (Highway 395 / Highway 58 junction). Project access is provided by Harper Lake Road, which is located approximately twenty miles west of Barstow along the Highway 58 corridor. The project site is approximately six miles north of where Harper Lake Road intersects with Highway 58. The existing Solar Electric Generating Stations VIII and IX facilities, owned by NextEra™ Energy Resources, are located immediately northwest of the project site.

The project site is comprised of private property that was historically used as the Lockhart Ranch complex. The property has served as an agricultural and cattle center for over sixty years and, in that capacity, has utilized water from ground wells; farming activities have included flood irrigation and ultimately the pivot system of irrigation of quarter section areas. Currently there are no ranching or residential activities on the property, and there is only one active pivot irrigation field in production on the site.

The project would utilize solar parabolic trough technology to activate a heat transfer fluid. The proposed collector fields of parabolic trough solar collectors are modular in nature and comprise many parallel rows of solar collectors, aligned on a north-south axis. Each solar collector has a linear, parabolic-shaped reflector that focuses the sun's radiation on a linear receiver known as a heat collection element located at the focus of the parabola.

As heat transfer fluid is circulated through the solar field, light from the sun reflects off the solar collector's parabolic troughs and is concentrated on the heat collection elements located at the focal point of the parabola. This heat transfer fluid provides a high-temperature energy source which is used to generate steam in steam generators. As this steam expands through the steam turbine generators, electrical power is generated.

The project will have a combined nominal electrical output of 250 megawatts (MW) from twin, independently-operable solar fields, each feeding a 125-MW power island. The plant sites, identified as Alpha (the northwest portion of the Project area) and Beta (the southeast portion of the project area), will be 884 acres and 800 acres respectively and joined at an on-site transmission line interconnection substation to form one full-output transmission interconnection. This proposed substation, located at the southwest corner of the Beta solar field, is referred to as the "Lockhart" substation. An additional 81 acres shared between the plant sites will be utilized for receiving and discharging offsite stormwater drainage.

The applicant has a power purchase agreement with Pacific Gas and Electric Company.

PUBLIC AND AGENCY COORDINATION

Mojave Solar LLC (Applicant), a wholly owned subsidiary of Abengoa Solar Inc., filed an Application for Certification with the California Energy Commission (Energy Commission) on August 10, 2008.

On August 27, 2008, the Energy Commission staff issued a notification of receipt of the Application for Certification (AFC), together with a project description, to property owners within 1,000 feet of the proposed project and those located within 500 feet of the linear facilities. Staff sent a similar notification and a copy of the AFC to a comprehensive list of agencies and libraries. Staff's notification letters requested public and agency review and comment on the AFC, and invited continued participation in the Energy Commission's review and permitting process. Staff followed up this notification on October 21, 2009 with a notice of receipt of a Supplement to the AFC to those interested parties listed above.

The Energy Commission's Public Advisor's Office (PAO) reviewed public outreach information available from the applicant and others and then conducted its own extensive efforts to identify certain local officials, as well as interested entities within a six-mile radius around the proposed site for the AMS project.

The PAO sent a cover letter and a two-sided bilingual notice in English and Spanish announcing the Informational Hearing, Environmental Scoping Meeting and Site Visit for the project, held on December 9, 2009, in the City of Barstow. This notice was sent to local Barstow and San Bernardino County elected officials; commissions and boards; eighteen local Native American Tribes and registered members (provided by the Native American Heritage Commission); public and private schools; places of worship; local non-profit groups (community, environmental, ethnic organizations), mobile home parks; emergency services; museums and libraries. There were no identified Native American tribal lands within a six-mile radius of the project.

In addition, the PAO arranged for advertisements in English in the December 5, 2009 issue of the *Victorville Daily Press* and Spanish in *Rumores News* and also requested public service announcements in English and Spanish at television and radio stations broadcasting in the project area.

In addition to the outreach efforts of the PAO, staff has continued to solicit comments on the AFC from local, state and federal agencies that have an interest in the project including San Bernardino County Planning Department and Public Works Department, Mojave Desert Air Quality Management District, Cal-Trans, Lahontan Regional Water Quality Control Board, U.S. Fish and Wildlife Service, and California Department of Fish and Game. Staff has also considered the comments of interveners, community groups, and individual members of the public.

PUBLIC WORKSHOPS

On December 8, 2009, staff conducted a publicly noticed Data Response and Issue Resolution workshop at the Energy Commission in Sacramento and discussed the applicant's data responses on the topics of Air Quality, Alternatives, Biology, Land Use, Soils and Water Resources and Waste Management. The purpose of the

workshop was to provide members of the community and governmental agencies opportunity to obtain project information, and to offer comments they may have had regarding any aspect of the proposed project.

On December 9, 2009, the Energy Commission Committee assigned to oversee the proceeding conducted a publicly noticed Site Visit, Informational Hearing and Environmental Scoping Meeting at the City of Barstow council chambers. This Scoping Meeting and Informational Hearing provided an opportunity for members of the community in the project vicinity to obtain information and offer comments and concerns about the proposed project as well as identify potential environmental impacts for consideration during the Energy Commission's review of the proposal. The applicant explained plans for developing the project and the related facilities and Energy Commission staff explained the administrative licensing process and Staff's role in reviewing the AFC.

On January 15, 2010, staff conducted a second publicly noticed Data Response and Issue Resolution workshop at the Energy Commission and discussed the topics of Air Quality, Biology, Cultural Resources, Land Use, Soils and Water Resources and Waste Management. This meeting was continued to January 20, 2010 to extend discussions on Air Quality, Soils and Water Resources and Waste Management. The purpose of these workshops was to provide members of the community and governmental agencies the opportunity to obtain project information, and to offer comments they may have had regarding any aspect of the proposed project.

On March 15, 2010 the Energy Commission published the AMS Staff Assessment SA. This document was publically noticed for comments from March 16, 2010 to April 15, 2010. The Energy Commission held public workshops on the SA on April 6th in the City of Sacramento and April 7th in the City of Barstow. At these workshops, discussions on the project were held, and written comments were provided by the applicant, agencies and the public. The SSA has been prepared to respond to those comments and information and analysis not provided in the SA.

LIBRARIES

On August 27, 2008, the Energy Commission staff sent the AMS Application for Certification, and on October 21, 2009 followed up with the AMS Supplement to the Application for Certification, to various libraries located in Kern County and San Bernardino County (Barstow Branch Library, Victorville City Library, Apple Valley Newton T. Bass Branch Library, Adelanto Branch Library, Kern County Library - Mojave Branch, Barstow Community College Library and Victor Valley College) and to libraries in Eureka, Fresno, Los Angeles, Sacramento, San Diego, and San Francisco.

A Notice of Availability was sent to these libraries for the Staff Assessment on March 16, 2010. A Notice of Availability for the Supplemental Staff Assessment Part A was sent on May 19, 2010. A Notice of Availability for the Supplemental Staff Assessment Part B was sent on May 27, 2010. A Notice of Availability for the Supplemental Staff Assessment Part C will be sent out when the document is published.

ENVIRONMENTAL JUSTICE

California law defines environmental justice as "the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies" (Government Code Section 65040.12 and Public Resources Code Section 72000).

All Departments, Boards, Commissions, Conservancies and Special Programs of the Resources Agency must consider environmental justice in their decision-making process if their actions have an impact on the environment, environmental laws, or policies. Such actions that require environmental justice consideration may include:

- Adopting regulations;
- Enforcing environmental laws or regulations;
- Making discretionary decisions or taking actions that affect the environment;
- Providing funding for activities affecting the environment; and
- Interacting with the public on environmental issues.

In considering environmental justice in energy facility siting cases, staff uses a demographic screening analysis to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. The demographic screening is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality, December, 1997) and *Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses* (U.S. Environmental Protection Agency, April, 1998). The screening process relies on Year 2000 U.S. Census data to determine the presence of minority and below-poverty-level populations.

Environmental Justice: Guidance Under the National Environmental Policy Act, defines minority individuals as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population is identified when the minority population of the potentially affected area is (1) greater than 50%; or (2) or when one or more U.S. Census blocks in the potentially affected area have a minority population of greater than 50%.

In addition to the demographic screening analysis, staff follows the steps recommended by the U.S. EPA's guidance documents which are: outreach and involvement; and if warranted, a detailed examination of the distribution of impacts on segments of the population.

Staff has followed each of the above steps for the following 11 sections in the SA: Air Quality, Hazardous Materials, Land Use, Noise, Public Health, Socioeconomics, Soils and Water, Traffic and Transportation, Transmission Line Safety/Nuisance, Visual Resources, and Waste Management. Over the course of the analysis for each of the 11 areas, staff considered potential impacts and mitigation measures and whether there would be a significant impact on an environmental justice population.

As a result of staff's analysis, staff determined there are no environmental justice issues for the proposed AMS project. Staff identified the following economic benefits from the project: capital costs; construction and operation payroll; sales taxes; and school impact fees.

PROJECT'S COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Staff believes that with the Commission's adoption of staff's proposed mitigation measures and the proposed conditions of certification, the AMS project would comply with all applicable laws, ordinances, regulations, and standards (LORS).

PROJECT'S ENVIRONMENTAL IMPACTS

Based upon the information provided to date and the analysis completed to date for each technical section, staff has concluded that with implementation of staff's recommended mitigation measures described in the conditions of certification, all potential environmental impacts will be mitigated to a less than significant level and the AMS project would not cause significant adverse impacts.

The project analysis complies with the requirements of the California Environmental Quality Act (CEQA). The conclusions of each technical area are summarized in the table on the following page. For a detailed review of potentially significant impacts and the related mitigation measures, please refer to the various chapters of the SA, SSA Part A, SSA Part B and SSA Part C.

Executive Summary Table 1
Summary of Impacts to Each Technical Area

Technical Area	Document Location	Complies with LORS	Impacts Mitigated
Air Quality	SSA Part B	Yes	Yes
Alternatives	SA	Not Applicable	Not Applicable
Biological Resources	SSA Part B	Yes	Yes
Cultural Resources	SSA Part B	Yes	Yes
Cumulative	SA	Yes	Yes
Efficiency	SA	Not Applicable	Not Applicable
Facility Design	SA	Yes	Yes
Geology and Paleontology	SA	Yes	Yes
Hazardous Materials		Yes	Yes
Land Use	SSA Part B	Yes	Yes
Noise and Vibration	SSA Part A	Yes	Yes
Public Health	SSA Part A	Yes	Yes
Reliability	SA	Not Applicable	Not Applicable
Socioeconomic Resources	SA	Yes	Yes
Soil and Water Resources	SSA Part B	Yes	Yes
Traffic and Transportation	SSA Part A	Yes	Yes
Transmission Line Safety/Nuisance	SA	Yes	Yes
Transmission System Engineering	SSA Part C	Yes	Yes
Transmission System Engineering – Appendix A	SSA Part C	Yes	Yes
Visual Resources	SSA Part A	Yes	Yes
Waste Management	SSA Part A	Yes	Yes
Worker Safety and Fire Protection	SSA Part A	Yes	Yes

NOTEWORTHY PUBLIC BENEFITS

AMS offers the benefit of providing 100% of its power generation from the sun. The daylight operating hours generally coincide with the hours when peaking capacity and

energy is needed to support the California ISO electric power transmission grid. In addition, staff has identified the following significant and environmentally important public benefits:

- AMS would contribute to meeting goals under California's Renewable Portfolio Standard Program (Senate Bill (SB) 1078; as amended by SB 107), which establishes that 20% of the total electricity sold to retail customers in California by December 31, 2010 must consist of renewable energy;
- AMS would contribute to meeting the Governor's Executive Order #S-14-08 which establishes that renewable energy must contribute 33% of the supply for meeting total state energy demands by 2020;
- AMS would contribute to the state accomplishing its goals for reducing global carbon emissions in accordance with the California Global Warming Solutions Act of 2006 (Assembly Bill 32); and
- AMS would generate both short term construction-related and long term operational-related increases in local expenditures and payrolls, as well as sales tax revenues.

SUPPORT FOR PROPOSED PROJECT

The Federal government and the State of California have established the need for the nation and State to increase the development and use of renewable energy in order to enhance the nation's energy independence, meet environmental goals, and create new economic and employment growth opportunities. AMS would help meet these needs by:

- Assisting California in meeting its Renewable Portfolio Standard goals of 20 percent of retail electric power sales by 2010 under existing law (Senate Bill 1078 – Chapter 516, Statutes of 2002)..
- Supporting U.S. Secretary of the Interior Salazar's Orders 3283 and 3285 making the production, development and delivery of renewable energy top priorities for the United States;
- Supporting Governor Schwarzenegger's Executive Order S-14-08 to streamline California's renewable energy project approval process and to increase the State's Renewable Energy Standard to 33 percent renewable power by 2020;
- Supporting the greenhouse gas reduction goals of Assembly Bill 832 (California Global Warming Solutions Act of 2006); and
- Sustaining and stimulating the economy of Southern California by helping to ensure an adequate supply of renewable electrical energy, while creating additional construction and operations employment and increased expenditures in many local businesses.

STAFF ASSESSMENT COMMENTS

The following persons and agencies commented on the Staff Assessment. Responses to comments are provided in the technical sections.

County of San Bernardino / C Hyke (TN 56176), Comments on agriculture mitigation consistency with San Bernardino County.

County of San Bernardino / C Hyke (TN 56264), Comments on biological mitigation, impacts to county services and agricultural mitigation.

Defenders of Wildlife / J Aardahl (TN 56245), Commented on water conservation opportunities and impacts on surrounding protected biological resources.

Department of Conservation / D. Otis (TN 56177), Comments on agriculture mitigation.

Department of Conservation / M. Meraz (TN 56512), Comments on agriculture mitigation and LESA model.

Ellison, Schneider and Harris / C. Ellison (TN 56350). Applicant's Comments on Staff Assessment.

Glenn Maclean (TN 56215), Commented on the historical and cultural value of the Lockhart General Store.

Joe Ramirez (TN 56231), Commented on existing road and traffic conditions, change in view and quality of life, illumination of the night sky, the evaporation ponds as a draw for insects and emergency services.

Southern California Edison / H. Arshadi (TN 56289), Commented on the project description and need for environmental review on interconnection facilities.

Transition Habitat Conservancy / J. Bays (TN 56241), Commented on the agricultural mitigation requirement.

ENGINEERING ASSESSMENT

TRANSMISSION SYSTEM ENGINEERING

Testimony of Ajoy Guha, P. E. and Mark Hesters

SUMMARY OF CONCLUSIONS

The proposed interconnection facilities for the Abengoa Mojave Solar project (AMS) including the proposed new Alpha and Beta 230 kV switchyards, the generator 230 kV tie lines to the proposed new Southern California Edison (SCE) Lockhart 230 kV substation and their terminations would be adequate in accordance with industry standards and good utility practices, and are acceptable to staff according to engineering Laws, Ordinances, Regulations and Standards (LORS).

The Interconnection Facilities Study/Technical Assessment Study demonstrate that the addition of the AMS would cause new normal (N-0) and single contingency (N-1) overloads on the Kramer-Lugo No. 1 & No. 2 230 kV lines during 2013 summer peak and light spring system conditions. The study also identified transient stability violation for loss of the Lugo-Cool Water 230 kV line. The current mitigation plan responsibility for the AMS includes two alternatives. The alternative 1 mitigation plan involves building a new 59-mile Cool Water-Lugo 230 kV line, and installation of a new Special Protection System (SPS) for curtailment of the AMS generation under certain outage and other conditions. The alternative 2 mitigation plan includes congestion management, installation of a new SPS for curtailment of the AMS generation output and participation in the existing Kramer Remedial Acton Scheme (RAS) for associated curtailments in lieu of installation of the proposed Cool Water-Lugo 230 kV line.

The applicant has chosen the alternative 2 mitigation plan as above which staff finds acceptable. The plan involves installation of a telecommunication system using multi-stranded fiber optic cables and other communication equipment, which would be installed in the following routes:

- Lockhart substation to Alpha & Beta switchyards-about 3 miles.
- Lockhart substation to Kramer substation-about 18 miles.
- Lockhart substation to Tortilla substation-about 31 miles.
- Tortilla substation to Cool Water substation-about 12 miles.

  (This telecommunications line is needed for the overall Southern California Edison power grid and responsibility for the improvement and environmental impacts have been assigned to the Daggett Ridge Wind Energy Project. The Daggett Ridge Wind Energy Project and associated linear downstream facilities is being fully analyzed and permitted in a separate environmental review process by the County of San Bernardino and Bureau of Land Management. This line segment is listed within the Transmission System Engineering (TSE) section, however it is not analyzed within the TSE Appendix A. Responsibility for the Tortilla substation to Cool Water substation fiber optic line improvement and environmental impacts have not been assigned to the AMS project and staff concurs.)
- Kramer substation to Victor substation-about 36 miles.

The new fiber optic cables for a total length of approximately 100 miles of the combined routes would be installed partly on the existing overhead transmission (115 kV) and distribution (33 kV) wood and steel poles, partly on new wood poles, and partly through new and existing underground conduits. The installation of the proposed fiber optic cables is considered a downstream project impact. A general environmental analysis of the telecommunication system upgrades with the fiber optic cables will be provided as Appendix A to this Transmission System Engineering (TSE) section on or before June 30, 2010 in the Supplemental Staff Assessment Part C.

The AMS would meet the requirements and standards of all applicable LORS upon compliance with the recommended Conditions of Certification.

The applicant has signed a power purchase agreement with Pacific Gas and Electric for renewable power supply. The AMS as a solar generation would provide clean renewable energy towards meeting state mandate and goals.

INTRODUCTION

The Transmission System Engineering (TSE) analysis examines whether or not the facilities associated with the proposed interconnection conforms to all applicable LORS required for safe and reliable electric power transmission. Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant. Additionally, under the CEQA, the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (California Code of Regulations, title 14, §15378). Therefore, the Energy Commission must identify the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that are required for interconnection and represent the "whole of the action." The downstream network upgrade mitigation measures that will be required to maintain system reliability for the addition of the power plant, are used to identify the requirement for any additional CEQA analysis.

Energy Commission staff relies on the interconnecting authority for the analysis of impacts on the transmission grid as well as the identification and approval of required new or modified facilities downstream from the proposed interconnection that would be required as mitigation measures. The proposed AMS would interconnect to the SCE transmission network and requires analysis by SCE and approval of the California ISO.

SCE'S ROLE

SCE is responsible for ensuring electric system reliability in the SCE system for addition of the proposed generating plant. SCE will provide the analysis and reports in their System Impact and Facilities studies, and their approval for the facilities and changes required in the SCE system for addition of the proposed transmission modifications.

CALIFORNIA ISO'S ROLE

The California ISO is responsible for ensuring electric system reliability for all participating transmission owners and is also responsible for developing the standards necessary to achieve system reliability. The California ISO is responsible for completing

the studies of the SCE system to ensure adequacy of the proposed transmission interconnection. The California ISO will determine the reliability impacts of the proposed transmission modifications on the SCE transmission system in accordance with all applicable reliability criteria. According to the California ISO Tariffs, the California ISO will determine the "Need" for transmission additions or upgrades downstream from the interconnection point to insure reliability of the transmission grid. The California ISO will, therefore, review the System Impact Study (SIS) performed by SCE and/or any third party, provide their analysis, conclusions and recommendations. On satisfactory completion of the SCE Interconnection Facility Study (IFS)/Technical Assessment Study (TAS) and in accordance with the LGIP as in the California ISO Tariff, the California ISO instead of issuing a final approval letter, would proceed to execute the LGIA between the California ISO and the project owner and subsequently perform an Operational study examining the impacts of the project on the grid based on the expected June, 2012 COD or current COD. The California ISO may also provide written and verbal testimony on their findings at the Energy Commission hearings, if necessary.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance and operation or use of overhead electric lines and to the public in general.
- California Public Utilities Commission (CPUC) General Order 128 (GO-128), "Rules for Construction of Underground Electric Supply and Communications Systems," formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.
- The National Electric Safety Code, 1999 provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.
- NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of the standards, "NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table" and on Section I.D, "NERC and

WECC Standards for Voltage Support and Reactive Power". These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WECC 2006).

- North American Reliability Council (NERC) Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC Standards are either more stringent or more specific than the NERC Standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).
- California ISO Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the California ISO transmission grid facilities. The California ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to the NERC/WECC or NERC Reliability Planning Standards for Transmission System Contingency Performance. However, the California ISO Standards also provide some additional requirements that are not found in the WECC/NERC or NERC Standards. The California ISO Standards apply to all participating transmission owners interconnecting to the California ISO controlled grid. They also apply when there are any impacts to the California ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the California ISO (California ISO 2002a).
- California ISO/FERC Electric Tariff provides guidelines for construction of all transmission additions/upgrades (projects) within the California ISO controlled grid. The California ISO determines the "Need" for the proposed project where it will promote economic efficiency or maintain system reliability. The California ISO also determines the Cost Responsibility of the proposed project and provides an Operational Review of all facilities that are to be connected to the California ISO grid (California ISO 2007a).

PROJECT DESCRIPTION

The AMS, a solar thermal generating plant, would be located in a 1,765-acre site in the Mojave Desert in San Bernardino County immediate southwest of Harper Dry Lake and about 9 miles northwest of Lockhart. The project would have two independent solar

fields, Alpha and Beta, each feeding a 125 MW power island with a solar steam generator to operate a steam turbine generator (STG). The AMS would have a total 250 MW nominal output with two 125 MW STG units. Each STG unit rated 165 MVA, 13.8 kV would be connected through an 8,000-ampere segregated bus duct to the low voltage terminal of a dedicated 148/175 MVA, 13.8/230 kV generator step-up (GSU) transformer with an impedance of 9 percent @148 MVA (AS 2009a, AFC, sections 1 & 2; AS 2009b, DA supplemental AFC).

SWITCHYARDS AND INTERCONNECTION FACILITIES

The new Alpha and Beta 230 kV switchyards would have a 1,200-ampere single bus arrangement. The 230 kV high voltage terminals of each GSU transformer at the Alpha and Beta solar fields would be connected to its switchyard 230 kV bus by short 700-ampere overhead conductors through a 1,200-ampere, 230 kV circuit breaker and two disconnect switches.

The Alpha and Beta switchyards would be interconnected to the SCE Kramer-Cool Water No. 1 230 kV line by building a new SCE Lockhart 230 kV substation located at the southern fence line of Beta solar field and looping the existing Kramer-Cool Water No. 1 230 kV line into the new substation (ESH 2010b, Page 3). The Alpha switchyard would be interconnected to Lockhart substation by building a new 2.17-mile long single circuit 230 kV overhead line with 477 kcmil steel-reinforced aluminum conductors (ACSR) on 80 to 110-foot steel poles within the plant boundary. The Beta switchyard would be interconnected to Lockhart substation by building a new 0.84-mile long single circuit 230 kV overhead line with 477 kcmil ACSR conductors on 80 to 110-foot steel poles within the plant property. The generator tie lines would be connected to their respective Alpha and Beta 230 kV switchyard bus through a 1,200-ampere disconnect switch. The applicant would build, own and operate the AMS Alpha and Beta switchyards and the generator tie lines.

The new SCE Lockhart 230 kV substation is proposed as a 2,000-ampere double bus arrangement. For two switch bays there would a double breaker configuration at this time for connecting generator tie lines from Alpha and Beta switchyards and also another switch bay would be built with a breaker and a half configuration for connecting two circuits for looping the SCE Kramer-Cool Water #1 230 kV line. Each of the generator tie lines from Alpha and Beta switchyard would be connected to a Lockhart substation switch bay through a 1,200-ampere disconnect switch. The switch bays would be built with seven 2,000-ampere circuit breakers and fourteen associated 2,000-ampere disconnect switches. SCE would build, own and operate the new Lockhart substation, the interconnection facilities within the substation fence line, and all transmission outlets (AS 2009a, AFC, sections 1 & 2; AS 2009b, DA supplemental AFC).

The configuration of the AMS Alpha and Beta 230 kV switchyards, the generator 230 kV overhead tie lines and their terminations at the proposed new Lockhart 230 kV substation would be adequate in accordance with industry standards and good utility practices, and is acceptable to staff. Proposed Conditions of Certification TSE 1 to TSE 8 insure that the proposed facilities are designed, built and operated in accordance with good utility practices and applicable LORS.

TRANSMISSION SYSTEM IMPACT ANALYSIS

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility and the control area operator are responsible for ensuring grid reliability. For the AMS, SCE and California ISO are responsible for ensuring grid reliability. In accordance with the FERC/California ISO/Utility Tariffs, System Impact and Interconnection Facilities Studies are conducted to determine the preferred and alternate interconnection methods to the grid, the downstream transmission system impacts and the mitigation measures needed to ensure system conformance with performance levels required by the utility reliability criteria, NERC planning standards, WECC reliability criteria, and California ISO reliability criteria. Staff relies on the studies and any review conducted by the responsible agencies to determine the effect of the project on the transmission grid and to identify any necessary downstream facilities or project impacts required to bring the transmission network into compliance with applicable reliability standards (NERC2006, WECC 2006, California ISO 2002a and 2007a).

The System Impact and Interconnection Facilities Studies/Technical Assessment Study analyze the grid with and without the proposed project under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds by which grid reliability is determined. The studies must analyze the impact of the project for the proposed first year of operation and thus are based on a forecast of loads, generation and transmission. Load forecasts are developed by the interconnected utility, which would be SCE in this case. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages), and short circuit duties. SCE completed the System Impact Study in June 2008 and the Interconnection Facilities Study in October 2009.

The applicant has also provided the Harper Lake Solar Power Plant Interconnection Optional Study Report which forecasts the curtailment of the AMS if congestion management is chosen as a means to mitigate overloads identified in the Interconnection Facilities Study.

If the studies show that the interconnection of the project causes the grid to be out of compliance with reliability standards, the study will then identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. If the interconnecting utility determines that the only feasible mitigation includes transmission modifications or additions which require CEQA review as part of the “whole of the action,” the Energy Commission must analyze those modifications or additions according to CEQA requirements.

SCOPE OF SYSTEM IMPACT STUDY (SIS)/ INTERCONNECTION FACILITIES STUDY

The June 27, 2008 SIS was prepared by the California ISO in coordination with SCE to evaluate the impact of the proposed AMS on the SCE transmission system and was supplanted by the IFS which included the TAS completed on December 12, 2008 (ESH 2010b, page 3). The TAS updated the generation interconnection queue, removing

many generators that dropped out or moved to lower queue positions. The updated generation interconnection queue used in the TAS provides a more accurate forecast of the impacts of the AMS interconnection. The SIS and IFS/TAS were prepared with and without the AMS 250 MW generation output with the following base cases based on the most expected critical loading condition for the transmission system in SCE's service area:

- A 2013 summer peak base case derived from the current SCE's California ISO annual transmission expansion study base cases and has 1-in -10 year extreme weather load level for SCE's service area.
- A 2013 light spring peak base case at 65 percent of the summer peak load level.

In each of the studies southern California generation and critical seasonal power flows in WECC Paths were maintained within limits. The base cases included planned California ISO approved transmission upgrades that would be operational by 2013. The pre-project base cases also included all queue generation projects with higher positions than the AMS, for the SIS this was 5,846 MW, in the IFS/TAS only 1,460 MW were left in the interconnection queue ahead of AMS (ESH 2010b, TAS page 9).

In addition, the study evaluated conditions with dispatch of generation inside and outside SCE territory that maximized loadings in the north of Lugo area. This included adjusting the West-of-River (Path 46) flow and modeling all pertinent queue generation in the vicinity of the AMS.

The study included analyses for power flow, short circuit, substation evaluation, transient stability, and post-transient voltage. The study also provided preliminary scope of work and cost estimates for the upgrades in the proposed Lockhart substation including downstream network reliability upgrades in the SCE system, assuming SCE would engineer, construct, own and maintain the new Lockhart substation and downstream network upgrades (AS 2009a, AFC, Appendix N: SIS report).

Power Flow Study Results and Mitigation

The IFS/TAS found that the addition of the AMS would cause new normal (N-0) and single contingency (N-1) overloads on the Kramer-Lugo No. 1 & No. 2 230 kV lines during 2013 summer peak and light spring system conditions. The Power Flow study results are shown in Tables 2.1 & 2.4, and section IV.A of the SIS (AS 2009a, AFC; Appendix N, SIS, pages 23-38).

Below is a summary of the results of the California ISO's power flow analysis for the AMS with the base cases (ESH 2010b).

- Under 2013 summer peak and light spring system conditions the study identified new normal (N-0) overloads on the Kramer-Lugo No. 1 & No. 2 230 kV lines (119% of their normal ratings) due to the addition of the AMS:

  Mitigation

  Staff considers mitigation alternative 1 or alternative 2 acceptable.

Alternative 1

a. Construction of a new Cool Water-Lugo 230 kV line and installation of a new SPS designed to curtail AMS generation under certain system conditions. This line would be designed. Built and operated by SCE and the CPUC would be the lead agency for permitting. The new about 59-mile long 230 kV line would be built using 500 kV structures for 16 miles with bundled 2156 Kcmil ACSR conductors and 230 kV structures for 43 miles with 2-1590 Kcmil ACSR conductors. Additional facilities to provide fiber optic channels may be required to remedy situations for withdrawal of application by higher queue interconnections projects.

Alternative 2

a. Use congestion management and install a new SPS to mitigate overloads through curtailment of the AMS generation, and participation in the existing Kramer RAS. A telecommunication system using multi-stranded fiber optic cables and other communication equipment would be required in order to implement the SPS, as well as providing monitoring and remote operation capabilities at the Lockhart substation. The All Dielectric Self Supporting Fiber (ADSS) Optic cables would be installed in the following routes:

   i. Lockhart to Alpha and Beta Switchyards, approximately 3 miles.

   ii. Lockhart substation-Kramer substation, approximately 18 miles in an existing transmission corridor.

   iii. Lockhart Substation-Cool Water Substation via Tortilla substation, approximately 43 miles in an existing corridor.

   (This telecommunications line is needed for the overall Southern California Edison power grid and responsibility for the improvement and environmental impacts have been assigned to the Daggett Ridge Wind Energy Project. The Daggett Ridge Wind Energy Project and associated linear downstream facilities is being fully analyzed and permitted in a separate environmental review process by the County of San Bernardino and Bureau of Land Management. This line segment is listed within the Transmission System Engineering (TSE) section, however it is not analyzed within the TSE Appendix A. Responsibility for the Tortilla substation to Cool Water substation fiber optic line improvement and environmental impacts have not been assigned to the AMS project and staff concurs.)

   iv. Kramer Substation-Victor Substation, approximately 36 miles in an existing corridor.

- Under 2013 summer peak and light spring system conditions the study identified the that the AMS aggravated pro-project overloads of the Kramer-Lugo No. 1 & No. 2 230 kV lines under single (N-1) contingency conditions:

Mitigation

With the additional upgrades in place for the new normal (N-0) overloads as stated above, the study determined that installation of a special protection system (SPS) for both the above lines under the single contingency conditions would be required to mitigate thermal and transient stability problems by tripping off the AMS. Staff considers the mitigation measure acceptable under the study assumptions.

- With the additional upgrades identified to mitigate new overloads caused by the addition of AMS, the study does not identify any double (N-2) contingency overloads in the local area.

The applicant has chosen alternative 2, congestion management and SPS, as the mitigation for overloads identified in the power flow studies. Based on the current studies, congestion management and SPS are acceptable mitigation for the identified overloads.

Short Circuit Study Results A and Substation Evaluation

Three line-to-ground (3 LG) and single line-to-ground (SLG) faults were simulated with and without the AMS to determine if there are any overstressed circuit breakers in SCE substations in the project vicinity caused by the addition of the project. The short circuit duty analysis included all queue projects and the related transmission upgrades.

The short circuit results shown in Tables 2-5 and 2-6 in section D of the SIS present the impact for the addition of the AMS only, while the results shown in the Tables 2-7 and 2-8 present the incremental impacts for the addition of upgrades required for the AMS (AS 2009a, Appendix N, SIS, Section IV. D, Pages 39-42). The Interconnection Facilities Study found that the AMS does not trigger the need for circuit breaker replacement but does aggravate pre-project conditions that could require the upgrade/replacement of fifty-two circuit breakers at eight different locations in case of withdrawal of application by higher queue interconnection projects (EHS 2010b, page 4).

The replacement of circuit breakers usually occurs within the fence line of existing facilities and does not require further CEQA review. If CEQA review is required the CPUC would be the lead agency for required permits.

Transient Stability Study Results and Mitigation

Transient stability analysis is performed to determine whether the transmission system would remain stable with the addition of the AMS. The analysis was performed with the 2013 summer peak and light spring base cases with simulated faults under selected critical single and double contingencies. Transient stability plots for summer and spring load conditions are provided in Appendices A and B of the SIS report (AS 2009a, Appendix N, SIS, section IV.B, pages 38-39).

The IFS/TAS found one transient stability violation caused by the AMS. The SPS identified for the mitigation of the N-1 overload above would also mitigate the transient stability violation (EHS 2010b, page 5).

Post-transient Voltage Analysis Results

The power flow study revealed that without facility upgrades identified under the pre-project base case conditions, the AMS aggravates previous low voltage conditions, including case non-convergence, which are indicative of voltage collapse conditions. These voltage problems would be mitigated with implementation of pre-project transmission upgrades for higher queue projects (AS 2009a, Appendix N, SIS, section IV.C, page 39).

Interconnection Option Study Results

The Interconnection Optional Study analyzed the potential curtailment for the AMS if congestion management and the SPS (Alternative 2, above) were used to mitigate transmission overloads identified in the TAS. The study looked at the historical loading of the transmission lines affected by the AMS and found that the likely maximum annual curtailment for the AMS would be 5% under the congestion management and SPS mitigation alternative (AS 2010d).

CALIFORNIA ISO REVIEW

In accordance with the provisions of LGIP, the June 27, 2008 SIS was prepared by the California ISO in coordination with SCE and evaluated the impact of the proposed 250 MW generation output from the AMS to a new Lockhart 230 kV substation with the loop-in of the existing Kramer-Cool Water 230 kV line. The IFS/TAS identified mitigation plan to eliminate the adverse impacts of the AMS would be adequate. The California ISO may also provide written and verbal testimony on their findings at the Energy Commission hearings, if necessary.

Execution of the LGIA would ensure system reliability in the California ISO grid and compliance with WECC/NERC and California ISO Planning standards (WECC 2006, NERC 2006, California ISO 2002a and 2007a). Condition of Certification TSE-5 requires the submittal of the LGIA to the Energy Commission at least 30-days prior to the construction of transmission interconnection facilities.

DOWNSTREAM FACILITIES

Besides the proposed interconnection facilities for the proposed AMS including Alpha & Beta switchyards, generator tie lines and construction of a new SCE Lockhart substation, accommodating the interconnection of the AMS new generation output to the SCE system would involve the installation of several optic communications cables on new wood poles in existing transmission corridors. The installation of the new cables is considered a reasonably foreseeable consequence of the proposed AMS project and requires CEQA analysis.

CUMULATIVE IMPACTS

Since the AMS is being connected to the north of Lugo SCE area which requires several major transmission upgrades for the reliable interconnection of both the AMS and generators with higher queue positions, staff believes that the AMS would create some cumulative effects in the SCE local network under certain conditions until all the identified transmission facilities are in place.

However, the cumulative impacts due to the AMS, as identified in the SIS or IFS which includes higher queue projects, would be mitigated. Staff also believes that there would be some positive impacts because the project, as local solar generation, would provide clean renewable energy, meet the increasing load demand in the SCE network, provide additional reactive power and voltage support, and enhance reliability in the SCE local network.

ALTERNATIVE TRANSMISSION ROUTES

The AMS site has access to two major transmission lines abutting its southern boundary, the Mead-Adelanto 500 kV line in the Los Angeles Department of Water and Power (LADWP) system and the SCE Kramer-Cool Water No. 1 230 kV line. The applicant did not choose to interconnect to the LADWP line with multiple owners, as the interconnection would increase costs, uncertainty, complexity and would be harder to ensure delivery of the project to the California ISO grid. The interconnection to the SCE system would ensure earlier interconnection and power delivery to the California ISO grid.

The generator overhead tie lines from the proposed AMS Alpha and Beta switchyards to the SCE Kramer-Cool Water 230 kV line through the proposed SCE Lockhart substation would also follow the shortest, least expensive routes within the AMS site with least environmental impacts (GWF2008a, AFC, section 4.5).

CONFORMANCE WITH LORS AND CEQA REVIEW

The configuration of the AMS Alpha and Beta switchyards, the generator interconnection overhead tie lines and their terminations at the proposed new Lockhart 230 kV substation would be adequate in accordance with industry standards and good utility practices, and is acceptable to staff.

The IFS/TAS demonstrate that there would be some adverse impacts on the SCE system for the addition of the AMS. The mitigation plan would be adequate and would eliminate the adverse impacts of the AMS.

SCE would be responsible for designing, building and operating the new 230 kV Cool Water – Lugo line. Sixteen miles of the new line would replace the existing Lugo – Pisgay 230 kV line as it heads east from the Lugo substation. SCE has not identified a route for the new 37-miles of the line as it heads north to the Cool Water substation.. The final routing and permitting of the 230 kV line would not occur until the LGIA is signed and CPUC permitting for the line could take twelve-months or more. Until a route for the line is chosen by SCE or through the permitting process any environmental analysis would require speculation on that final route. Without a specific route staff and the applicant are unable to provide an environmental analysis of these project impacts.

The AMS would meet the requirements and standards of all applicable LORS with the applicant’s submission of all required information as stated above and upon satisfactory compliance of the Conditions of Certifications.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff received comments from SCE in a letter dated April 15, 2010 indicating that the Staff Assessment did not include a complete environmental analysis of the interconnection facilities at the Lockhart substation and that staff's description of the Lockhart substation facilities was not accurate. Staff has reviewed SCE's general environmental analysis report in the Draft, "Lockhart Substation Project Description for Abengoa Solar Inc." of March 15, 2010. The SCE report includes environmental impacts and mitigation measures for design and construction of the proposed Lockhart 230 kV substation, Kramer-Cool Water #1 230 kV transmission line loops into the new Lockhart substation , generator tie line connections, 12 kV distribution lines for station power and light and fiber optic telecommunication cables. The report does not discuss the relocation of 50 kV lines in or around the Lockhart Substation. Staff at this stage has no further information about any other new or existing facilities near the project site which would need to meet CEQA requirements (SCE 201b). The project description has been updated in this Staff Assessment and now indicates that the proposed Lockhart 230 kV substation would have 3 switch bays and seven circuit breakers along with associated disconnect switches.

CONCLUSIONS AND RECOMMENDATIONS

1. The configuration of the AMS Alpha and Beta switchyards, the generator interconnection overhead tie lines and their terminations at the proposed new Lockhart 230 kV substation would be adequate in accordance with industry standards and good utility practices, and is acceptable to staff according to engineering LORS.

2. The IFS/TAS demonstrates that the addition of the AMS would cause new normal (N-0) and single contingency (N-1) overloads on the Kramer-Lugo No. 1 & No. 2 230 kV lines during 2013 summer peak and light spring system conditions. The study also identified transient stability violation for loss of the Lugo-Cool Water 230 kV line. The current mitigation plan responsibility for the AMS includes building a new 59-mile Cool Water-Lugo 230 kV line, and installation of a new SPS to curtail the AMS generation under certain contingency and other conditions OR congestion management and installation of a new SPS and participation in the existing Kramer RAS.

3. The applicant has chosen the congestion management and the SPS mitigation alternative which staff finds acceptable. A telecommunication system using multi-stranded fiber optic cables and other communication equipment would be required in order to provide transmission line protection, SPS, monitoring and remote operation capabilities at the Lockhart substation. The fiber optic cables would be installed in the following routes:

    - Lockhart substation to Alpha & Beta switchyards-about 3 miles.
    - Lockhart substation to Kramer substation-about 18 miles.
    - Lockhart substation to Tortilla substation-about 31 miles.
    - Tortilla substation to Cool Water substation-about 12 miles.

(This telecommunications line is needed for the overall Southern California Edison power grid and responsibility for the improvement and environmental impacts have been assigned to the Daggett Ridge Wind Energy Project. The Daggett Ridge Wind Energy Project and associated linear downstream facilities is being fully analyzed and permitted in a separate environmental review process by the County of San Bernardino and Bureau of Land Management. This line segment is listed within the Transmission System Engineering (TSE) section, however it is not analyzed within the TSE Appendix A. Responsibility for the Tortilla substation to Cool Water substation fiber optic line improvement and environmental impacts have not been assigned to the AMS project and staff concurs.)

- Kramer substation to Victor substation-about 36 miles.

The new fiber optic cables for a total length of approximately 100 miles of the combined routes would be installed partly on the existing overhead transmission (115 kV) and distribution (33 kV) wood and steel poles, partly on new wood poles, and partly through new and existing underground conduits. The installation of the proposed fiber optic cables is a reasonably foreseeable consequence of the MEP.

4. A general environmental analysis of the telecommunication system upgrades with the fiber optic cables will included in the Appendix A to this Transmission System Engineering (TSE) section by June 30, 2010 as in the Supplemental Staff Assessment Part C.

5. The AMS would meet the requirements and standards of all applicable LORS upon compliance with the recommended Conditions of Certification.

6. The applicant has signed a power purchase agreement with Pacific Gas and Electric for renewable power supply. The AMS as a solar generation would provide clean renewable energy towards meeting state mandate and goals.

RECOMMENDATIONS

If the Energy Commission approves the project, staff recommends the following Conditions of Certification to ensure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATIONS FOR TSE

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed

submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects and Wave-traps
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Insulators and Conductors
Grounding System

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project:

A. A civil engineer;

B. A geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering;

C. A design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or

D. A mechanical engineer.

(Business and Professions Code Sections 6704 et seq., require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action (1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required to obtain the CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes

and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

A. Receipt or delay of major electrical equipment;

B. Testing or energization of major electrical equipment; and

C. The number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations to the CBO as determined by the CBO.

A. The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", California ISO standards, National Electric Code (NEC) and related industry standards.

B. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to accommodate full output from the project and to comply with a short-circuit analysis.

C. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.

D. The project conductors shall be sized to accommodate the full output from the project.

E. Termination facilities shall comply with applicable SCE interconnection standards.

F. The project owner shall provide to the CPM:

i. The Special Protection System (SPS) sequencing and timing if applicable,

ii. A letter stating the mitigation measures or projects selected by the transmission owners for each reliability criteria violation are acceptable,

iii. An Operational study report based on the expected or current COD from the California ISO and/or SCE, and

iv. A copy of the executed LGIA signed by the California ISO and the project owner.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agree to by the project owner and CBO), the project owner shall submit to the CBO for approval:

A. Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

B. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", NEC, applicable interconnection standards, and related industry standards.

C. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.

D. The Special Protection System (SPS) sequencing and timing if applicable shall be provided concurrently to the CPM.

E. A letter stating the mitigation measures or projects selected by the transmission owners for each reliability criteria violation are acceptable,

F. An Operational study report based on the expected or current COD from the California ISO and/or SCE, and

G. A copy of the executed LGIA signed by the California ISO and the project owner.

[1] Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes that may not conform to requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

Verification: At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes that` may not conform to requirements of **TSE-5** and request approval to implement such changes.

TSE-7 The project owner shall provide the following Notice to the California Independent System Operator (California ISO) prior to synchronizing the facility with the California Transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the California ISO a letter stating the proposed date of synchronization; and

2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. The project owner shall contact the California ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

A. “As built” engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, “High Voltage Electric

Safety Orders", and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.

B. An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

C. A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

REFERENCES

California ISO (California Independent System Operator) 1998a. California ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

California ISO (California Independent System Operator) 1998b. California ISO Dispatch Protocol posted April 1998.

California ISO (California Independent System Operator) 2002a. California ISO Planning Standards, February 7, 2002.

California ISO (California Independent System Operator) 2007a. California ISO, FERC Electric Tariff, First Replacement Vol. No. 1, March, 2007.

California ISO (California Independent System Operator) 2009a, Large Generator Interconnection Procedures, dated.

AS 2009a: Abengoa Solar Inc. Application for Certification (AFC) for the AMS, dated 7-2-09. Appendix N: Interconnection System Impact Study report. Submitted on 8-10-2009.

AS 2009b: Abengoa Solar Inc. Data Adequacy Supplement dated 9-4-09. Submitted on 9-24-2009.

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AS 2010b: Abengoa Solar Inc. / E. Garcia (TN 55215). Abengoa Mojave - Facility Transmission System Upgrade, dated 2/5/2010. Submitted to CEC on 2/8/2010.

ESH 2009c. Ellison. C. Response to Data Request set no 1. Submitted on 11-24-09.

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CEC 2009m: CEC Data Request set 1A (1-93) dated 10-22-09. Submitted on 10-22-09.

NERC (North American Electric Reliability Council) 2006. Reliability Standards for the Bulk Electric Systems of North America, May 2 2006.

SCE 2010b: SCE letter of April 15, 2010, comments on staff assessments. Submitted to CEC on 4-19-10.

WECC (Western Electricity Coordinating Council) 2006. NERC/WECC Planning Standards, August 2006.

DEFINITION OF TERMS

ACSR	Aluminum cable steel reinforced.
AAC	All Aluminum conductor.
ACSS	Aluminum conductor steel-supported.
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere	The unit of current flowing in a conductor.
Kiloampere (kA)	1,000 Amperes
Bundled	Two wires, 18 inches apart.
Bus	Conductors that serve as a common connection for two or more circuits.
Conductor	The part of the transmission line (the wire) that carries the current.
Congestion Management	Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports) would not violate criteria.
Emergency Overload	See Single Contingency. This is also called an L-1.
Hertz	The unit for System Frequency.

Kcmil or KCM	Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.
Kilovolt (kV)	A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground. 1,000 Volts.
Loop	An electrical cul de sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.
MVAR or Megavars	Megavolt Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.
Megavolt Ampere (MVA)	A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.
Megawatt (MW)	A unit of power equivalent to 1,341 horsepower.
Normal Operation/ Normal Overload	When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.
N-1 Condition	See Single Contingency.
Outlet	Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.
Power Flow Analysis	A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.
Reactive Power	Reactive power is generally associated with the reactive nature of inductive loads like motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.
Remedial Action Scheme (RAS)	A remedial action scheme is an automatic control provision, which, for instance, would trip a selected generating unit upon a circuit overload.
SSAC	Steel Supported Aluminum Conductor.
SF6	Sulfur hexafluoride is an insulating medium.

Single Contingency	Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.
Solid Dielectric Cable	Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.
SVC	Static VAR Compensator: An equipment made of Capacitors and Reactors with electronic controls for producing and controlling Reactive Power in the Power System.
Switchyard	A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.
Thermal rating	See ampacity.
TSE	Transmission System Engineering.
TRV	Transient Recovery Voltage
Tap	A transmission configuration creating an interconnection through a sort single circuit to a small or medium sized load or a generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.
Undercrossing	A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.
Underbuild	A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.
VAR	Voltage Ampere Reactive, a measure for Reactive power in the power system.

APPENDIX A

TRANSMISSION SYSTEM ENGINEERING
DOWNSTREAM UPGRADES
CONGESTION MANAGEMENT/TELECOMMUNICATION
SYSTEM IMPACT ANALYSIS

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Testimony of Heather Blair

1.0 INTRODUCTION AND PURPOSE

This Transmission System Engineering Appendix to the Supplemental Staff Assessment (SSA) for the Abengoa Mojave Solar (AMS) project has been prepared by Energy Commission staff to examine the potential downstream impacts of future congestion management / telecommunication system upgrades that may be required as a result of interconnecting the 250 megawatt (MW) AMS project to Southern California Edison's (SCE) existing Coolwater–Kramer No.1 220-kilovolt (kV) transmission line. The upgrades are considered "downstream" because they occur after the first point of interconnection. The objective of this analysis is to assess whether construction and/or operation of the downstream upgrades would result in significant environmental impacts and recommend mitigation measures that would reduce potential impacts to less than significant levels. The downstream upgrade elements are collectively referred to as the anticipated downstream upgrades.

The Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 MW or larger and associated facilities. The Energy Commission also has the licensing authority up to the first point of interconnection for transmission facilities. Under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission. Therefore, the Energy Commission must identify the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that are required for interconnection and represent the "whole of the action."

The off-site downstream facilities would be designed, built, and operated by SCE. The California Public Utilities Commission (CPUC) would be the CEQA lead agency and either the Bureau of Land Management (BLM) or U.S. Department of Energy (DOE) would be National Environmental Policy Act (NEPA) lead agencies, for permitting and licensing of these facilities. SCE's project description for the Lockhart Substation and associated facilities is a planning-level description only (SCE 2010c); site-specific engineering and design documents will be prepared at a later date. Therefore, this appendix is intended as a screening-level analysis that may support further environmental review, which will be conducted by the CPUC and/or BLM or DOE as the appropriate permitting agencies. The analysis of downstream impacts and identification of impact avoidance, minimization, and mitigation measures presented in this appendix are intended to inform the Energy Commission and the general public of the potential environmental and public health effects caused by interconnection of the AMS project to the SCE transmission system.

Abengoa Solar Inc. (Abengoa) applied to the California Independent System Operator (CAISO) for interconnection of the 250 MW AMS project. Abengoa requested and paid

for Interconnection Studies in accordance with the CAISO Large Generation Interconnect Procedures Tariff and was assigned Queue Position 125. All applicable interconnection studies have been completed for the AMS, and Abengoa is currently negotiating the execution of the Large Generator Interconnection Agreement under an "Energy Only" service arrangement with the implementation of special protection system (SPS). Such service arrangement could result in the need to implement congestion management protocols which could result in the curtailment of generation resources in the area during times when total generation production in the area exceeds the total area transmission capability.

Telecommunication / congestion management system upgrades beyond the first point of AMS interconnection would be required in order to provide transmission line protection, special protection systems, monitoring, and remote operation capabilities of the electrical equipment at Lockhart Substation. To this end, fiber optic communication cables, associated poles, conduits, and other telecommunication facilities would be installed to provide diverse path routing of communications required for the AMS interconnection, and to provide communications redundancy at the two AMS power blocks. This work would include installing communication paths between the Tortilla, Lockhart, Kramer, and Victor substations, as described in Section 2.0, below.

2.0 DESCRIPTION OF THE PROPOSED DOWNSTREAM UPGRADES PROJECT

This section describes the anticipated downstream upgrades required to accommodate interconnection of the 250 MW AMS project to SCE's existing Coolwater–Kramer No.1 220-kV transmission line. In addition, this section includes a general description of the construction processes for the anticipated downstream upgrades.

2.1 PROJECT OVERVIEW

The anticipated downstream upgrades are summarized below and described in detail in Section 2.3 based on information provided by SCE (SCE 2010c) and Abengoa (AS 2010k):

Lockhart Substation: A new 220-kV substation would be constructed to loop-in the existing Coolwater–Kramer No. 1 220-kV transmission line and provide two 220-kV line positions to terminate two new 220-kV generation tie lines (gen-ties) owned by AMS.

Transmission Lines: The existing Coolwater–Kramer No. 1 220-kV transmission line would be looped into the new Lockhart Substation. The transmission loop would require construction of approximately 3,000 feet of new transmission line (composed of two segments of approximately 1,500 feet each) creating the new Lockhart–Kramer and Coolwater–Lockhart 220-kV transmission lines. This may require removal, modification, or replacement of at least one existing transmission support structure.

Generation Tie Line (gen-tie) Connections: The two AMS-built gen-ties would be connected into the SCE-owned Lockhart Substation. This work involves construction of two single spans of conductors between the Lockhart switchrack and the last

AMS-owned tower(s). The AMS gen-ties, which are under the licensing jurisdiction of the Energy Commission, are analyzed in the SSA, whereas the loop-in connections are analyzed in this appendix.

Distribution Line for Station Light and Power: The existing Hutt 12-kV distribution circuit out of the Hutt Poletop Substation would be connected to the Lockhart Substation. This would involve removing two existing poles and constructing a new pole approximately 40 feet north of the Lockhart Substation. A range of approximately 200-400 feet of underground conduit would be installed from the replaced pole to the substation to provide a path for one of the two required sources of station light and power.

Telecommunications Facilities: Fiber optic communication cables, associated poles, conduits, and other telecommunication facilities would be installed to provide diverse path routing of communications required for the AMS interconnection, and to provide communications redundancy at the AMS alpha and beta power blocks. This work would include installing communication paths between the Tortilla, Lockhart, Kramer, and Victor substations.

2.2 PROJECT LOCATION

The proposed Lockhart Substation, transmission lines to loop the Coolwater–Kramer 220-kV transmission line into the Lockhart Substation, gen-tie connections, and distribution interconnection, would be located within or adjacent to the limits of the AMS project, which is on private land located approximately 5.5 miles northeast of the intersection of State Route (SR) 58 and Harper Lake Road in the county of San Bernardino. Figures 1 and 2 depict the location of the Lockhart Substation and appurtenant facilities in relation to the proposed AMS project. Figure 3 identifies the location of electrical lines associated with the Lockhart Substation.

As illustrated in Figure 4, the proposed telecommunication lines would extend south of the proposed Lockhart Substation to the existing Tortilla substation to the southeast and the existing Kramer and Victor substations to the west and south, respectively, within San Bernardino County. Additional detail regarding the location of the proposed fiber optic lines is provided below and illustrated in Figures 5 through 7.

- The proposed **Lockhart to Tortilla Substation fiber optic line** extends west, then south of the Lockhart Substation before turning due east immediately south of SR 58. The route roughly parallels SR 58 for approximately 10 miles, turns southeast to the city of Barstow, and terminates at the Tortilla Substation. Refer to Figure 5.
- The proposed **Lockhart to Kramer Substation fiber optic line** extends from the Lockhart Substation within the AMS project site to the Kramer Substation, which is approximately 13 miles due west, immediately south of SR 58. This segment would be located within existing utility easements. Refer to Figure 6.
- The proposed **Kramer to Victor Substation fiber optic line** extends directly south-southeast parallel to the west side of Highway 395 between its intersection with SR 58 and Palmdale Road. This route is primarily within unincorporated San Bernardino County and partially within the city limits of Adelanto at the southern portion of the route. Refer to Figure 7.

2.3 PROJECT CHARACTERISTICS

Lockhart Substation and Interconnection

The proposed Lockhart Substation would be a 220-kV switching station measuring approximately 450 feet by 550 feet and considered to be an “unattended” collector station (i.e., no power transformation). The substation would be located within the boundary of the AMS project and would be surrounded by a wall or chain-link fence with two gates. The substation would be constructed with a six-bay 220-kV switchrack; one bay would be used to loop in the SCE Coolwater–Kramer No. 1 220-kV transmission line, two bays would be used to terminate the two AMS gen-ties, and the three remaining bays would be available for future use. The Lockhart Substation would be initially equipped with two overhead 220-kV buses, seven 220-kV circuit breakers, 220-kV disconnect switches, one mechanical electrical equipment room (MEER), light and power transformers, station lighting, and a back-up generator. To accommodate the proposed Lockhart Substation within the AMS property and to allow for future access to the substation, a SCE transmission right-of-way corridor would be established between the southern boundary of the AMS and the existing SCE Coolwater–Kramer 220-kV corridor.

The proposed Lockhart Substation would be connected to the Coolwater–Kramer No. 1 220-kV transmission line via loop-in transmission segments. The two loop-in line segments would create two new transmission lines: the Coolwater–Lockhart 220-kV transmission line and the Kramer–Lockhart 220-kV transmission line. Each transmission line segment into the Lockhart Substation would be approximately 1,500 feet long. The proposed loop-in of the existing Coolwater–Kramer No. 1 220-kV transmission line to the Lockhart Substation would require approximately four double-circuit transmission support structures (refer to Figure 3). These transmission support structures would be tubular steel poles and/or lattice steel towers. Two of the structures would be placed just outside of the substation fence or wall but within the AMS boundary. The other two structures would be used to re-route the Coolwater–Kramer No. 1, 220-kV transmission line into Lockhart Substation and would be located adjacent to the southern boundary of the AMS project within the existing SCE right-of-way. The section of line connecting the existing Coolwater–Kramer No. 1 220-kV transmission line to the first structure outside of Lockhart Substation may require a new right-of-way between SCE’s existing right-of-way and the new Lockhart Substation facilities. Since preliminary design information is unavailable at this time, including engineered maps with right-of-way limits, it is assumed that existing utility rights-of-way would be used. To support the loop-in, one existing double-circuit transmission structure may need to be removed. The exact location of new and replaced towers will be determined during detailed engineering.

The proposed Lockhart Substation design would also require a connection between the gen-ties from the AMS dead-end structures to the appropriate 220-kV position inside the Lockhart Substation. The span needed for this connection is estimated to be up to 300 feet, depending on the location of the transmission line tower relative to the Lockhart Substation.

To provide light and ancillary power to the substation, a distribution circuit out of the existing Hutt Poletop Substation located to the northwest would be routed to the Lockhart Substation. Two existing poles in the approximate location of the proposed substation would be removed and a new distribution riser pole would be installed approximately 40 feet north of the proposed substation's northern fence. From this pole, a 12-kV distribution riser would be installed and approximately 200 feet of two 5-inch conduits would be installed and connected to a new 12-kV station light and power rack location within the Lockhart Substation adjacent to the MEER. Portions of these facilities are also proposed to be used for installation of the required fiber optic cables into Lockhart Substation. These new overhead poles for light and power would be located within the limits of the AMS project.

The disturbance area for the Lockhart Substation and other facilities within the AMS Project boundary have been analyzed in the AMS Staff Assessment and Supplemental Staff Assessment because they are within the footprint of the AMS Project.

Telecommunication System

A telecommunication system would be required in order to provide transmission line protection, SPS, monitoring, and remote operation capabilities of the electrical equipment at Lockhart Substation.

To provide transmission line protection, the telecommunications system would extend diverse communication paths utilizing fiber-optic cables to connect Lockhart Substation to the SCE telecommunication network via the existing SCE Kramer Substation, the existing SCE Tortilla Substation, and also to the AMS alpha and beta power blocks (refer to Figures 2, 5, and 6).

To provide for the required SPS, a fiber optic cable would be installed between SCE's existing Kramer Substation and SCE's existing Victor Substation (refer to Figure 7). In addition, new fiber optic multiplex equipment and channel equipment would be installed at SCE's Kramer, Tortilla, Coolwater, Roadway, Lugo substations to support the communication requirements for the Lockhart Substation.

It is anticipated that the total distance of the combined telecommunication routes would be approximately 85 miles. As described in the following subsections, certain portions of the fiber optic cable would be constructed on existing overhead distribution and transmission wood and light duty steel poles, while other portions of the cable would be constructed on new overhead structures and within newly constructed underground conduit systems. The characteristics of the proposed telecommunications system are summarized in Table 1 and the ground disturbance that would result from construction of the Victor Substation to Kramer Substation fiber optic line is detailed in Table 2.

Table 1 - Summary of Proposed Fiber Optic Lines

	Kramer to Lockhart	Lockhart to Tortilla	Victor to Kramer
Total fiber optic cable length	92,000 ft (18 miles)	164,000 ft (31 miles)	189,000 ft (36 miles)
Total underground (UG) length	3,100 ft	1,900 ft	2,300 ft
- Existing UG conduits	2,000 ft	500 ft	700 ft
- New UG conduits	1,100 ft	1,400 ft	1,600 ft
Total overhead (OH) length	88,000 ft	162,000 ft	182,700 ft
- OH length (existing poles)	82,000 ft	150,000 ft	182,700 ft
- OH length (new poles)	6,000 ft	12,000 ft	0 ft
- Existing poles	250	600	226
- New poles	30	55	30
Ground disturbance	7,500 sq ft	13,700 sq ft	226,500 sq ft
Time to construct (4 men per crew)	38 crew days	64 crew days	154 crew days
Total man days	152 man days	256 man days	755 man days

Note: These figures are desktop estimates and may change based upon final engineering.

Table 2 - Estimated Ground Disturbance Victor-Kramer Fiber Optic Cable

Project Feature	Site Quantity	Disturbed Acreage Calculation (L X W)	Acres Disturbed During Construction	Acres to be Restored	Acres of Permanent Disturbance
Construct New Steel Pole	30	75' X 75'	3.9	2.4	1.5
Fiber Optic Setup Area - Tensioner[1]	18	40' X 60'	1.0	1.0	0.0
Fiber Optic Splicing Setup Areas[1]	18	20' X 30'	0.2	0.2	0.0
New Access Roads[2]	0.1	Linear miles X 14' wide	0.1	0.0	0.1
Total[3]			**5.2**[4]	**3.6**	**1.6**

1 Includes structure assembly and erection, conductor and fiber optic cable installation. Area to be restored after construction. Portion of right of way within 25 feet of the tubular steel pole (TSP) and within 10 feet of light-weight steel pole (LWS) and H-frame to remain cleared of vegetation. Permanently disturbed areas for TSP=0.06 acre, LWS=0.05 acre, and H-Frame=0.06 acre.

2 Based on 9,000 feet conductor reel lengths, number of circuits, and route design.

3 The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described project feature, the width of the existing right-of-way, or the width of the proposed right-of-way and, they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the project by SCE's Construction Manager and/or Contractor awarded project.

4 5.2 acres equals 226,500 sq ft.

The environmental analysis presented in Section 3.0 assumes the following characteristics for the fiber optic lines:

- New poles would be located within existing utility rights-of-way
- New poles would be between 18 and 24 feet in height and would consist of either wood or light-duty steel
- Footprints for new pole construction would affect approximately 2 square feet for permanent impacts and 34 square feet for temporary construction impacts
- New underground trenching would necessitate a maximum construction footprint of 20 feet in width
- Stringing activities and construction equipment would be located within existing utility rights-of-way

Lockhart Substation to Tortilla Substation Fiber Optic Line

The DU project includes approximately 31 miles of new fiber optic cable to be installed between the proposed Lockhart Substation and the existing Tortilla Substation (see Figure 5). Approximately 1,000 feet of cable would be installed in an underground conduit within the limits of the Lockhart Substation/AMS project site, transitioning to new overhead poles near the edge of the SCE transmission corridor to the south. The cable would require the construction of approximately 55 new poles between the Lockhart Substation and Harper Lake Road to the east. These poles would be constructed within the existing SCE transmission corridor. At the intersection with Harper Lake Road, the overhead fiber optic line would transition underground for approximately 400 feet and head south on the west side of Harper Lake Road. The new underground trench would be located within a disturbed road right-of-way.

From this point, the underground cable would transition back to the overhead line via a riser and would be strung on existing overhead transmission line poles that parallel Harper Lake Road for approximately 5 miles, continuing south. The cable would be strung on existing transmission line structures beginning at the intersection of Harper Lake Road and SR 58, east along SR 58, south on Summerset Road, east on Community Boulevard, and south on Lenwood Road and Sun Valley Drive until intersecting with the existing Poco 33-kV transmission line located approximately one-third mile south of Main Street in Barstow.

The cable then would be strung on the existing 33-kV transmission line structures for approximately 4.7 miles and would continue to be strung on existing transmission line structures south along I Street and east for 740 feet along Bonanza Road until intersecting with the existing SCE Kramer–Tortilla 115-kV transmission line. The fiber optic cable would be strung on those existing structures until about 500 feet west of the existing Tortilla Substation, at which point it would transition to an existing underground conduit via a riser and terminate at the existing Tortilla Substation.

Lockhart Substation to Kramer Substation Fiber Optic Line

The DU project includes approximately 18 miles of new fiber optic cable to be installed between the proposed Lockhart Substation and the existing Kramer Substation (see

Figure 6). Approximately 1,000 feet of new underground conduit would extend north from the Lockhart Substation to the poles for the proposed distribution line for Lockhart Substation light and power. The fiber optic line would be co-located with the proposed distribution line on approximately 30 poles within the AMS property between the Lockhart Substation and Lockhart Road to the north. From Lockhart Road, the fiber optic cable would be strung on existing overhead transmission line structures for approximately 1.5 miles to the west until the intersection with Harper Lake Road. Here, the fiber optic cable would turn due south and would be strung on existing overhead transmission line structures along the west side of Harper Lake Road until it intersects with the existing SCE transmission line corridor for the Lockhart 33-kV and Coolwater–Kramer 220-kV transmission lines. From this point, the cable would be strung on existing transmission support structures within the utility corridor until just east of Highway 395. The cable would continue to be strung on existing overhead structures for another one-third mile south until the line intersects with the existing Kramer Substation. The overhead cable would transition to an existing underground conduit via a riser for approximately 2,000 feet until the conduit reaches the MEER within the substation.

Kramer Substation to Victor Substation Fiber Optic Line

The DU project includes approximately 36 miles of new fiber optic cable to be installed between the existing Kramer Substation and the existing Victor Substation (see Figure 7). Fiber optic cable connecting these existing substations would commence at the MEER within the Victor Substation by installing cable in a new underground conduit until it reaches the southern border of the substation where it would transition to a new riser on an existing Kramer-Victor 115-kV overhead transmission support structure.

From this new riser, approximately 2.8 miles of new overhead fiber optic cable would be installed on the existing Kramer-Victor 115-kV overhead structures, which generally parallel Highway 395 in proximity of the Kramer Substation. A new riser drop down, approximately 500 feet of new underground conduit, and a new line riser would be required to cross under 287-kV transmission lines owned by the Los Angeles Department of Water and Power. From this point, the new fiber optic cable would be installed on the existing Kramer-Victor 115-kV overhead structures for approximately 0.8 mile. A new riser drop down, approximately 500 feet of new underground conduit, and a new line riser would be required to cross under the existing SCE Kramer-Lugo 220 kV transmission lines. From this point, the new fiber optic cable would again be installed on the existing Kramer-Victor 115-kV overhead structures for approximately 1.2 miles where it would then be routed in and out of the existing SCE Roadway Substation.

To enter the Roadway Substation MEER, a new riser drop down and approximately 350 feet of new underground conduit would be required. To exit the Roadway Substation MEER, approximately 575 feet of new cable would be installed within existing underground conduit, approximately 600 feet of new cable would be installed on new underground conduit, and a new line riser would be required. From this point, approximately 570 feet of new overhead cable would be installed back to the Kramer-Victor 115-kV line where it would then head north for approximately 29 miles towards the Kramer Substation. A new riser drop down would be required on the last Kramer-Victor 115-kV pole just outside the Kramer Substation and approximately 1,000 feet of

new underground conduit towards the Kramer Substation MEER would complete the fiber optic communications path between the existing Victor Substation and Kramer Substation. Approximately 30 new wood or lightweight steel poles would be installed in specific areas within existing transmission line right-of-way to support ground clearance requirements. The number and exact location, as well as type of poles would be determined during final engineering.

Implementation of SCE's proposed SPS would also require installation of an optical repeater site at the existing Roadway Substation, which is along the Kramer Substation to Victor Substation fiber optic route, approximately 5 miles north of the Victor Substation.

2.4 CONSTRUCTION METHODS

The following sections summarize the general construction methods that would be employed for the Lockhart Substation and interconnection as well as the proposed fiber optic lines. Refer to SCE's Project Description for a detailed description (SCE 2010c).

Lockhart Substation and Interconnection

Because the proposed Lockhart Substation would be located within the boundaries of the AMS project, grading for the substation site would be included within Abengoa's overall grading design. Land disturbance areas and earth-moving quantities at the substation location were included in the AMS Application for Certification (AFC) and impacts from land disturbance were analyzed in the Energy Commission's Staff Assessment (SA) and Supplemental Staff Assessment (SSA) for the AMS project.

During construction and operation, the proposed substation site would be accessed through the AMS internal road network from the main AMS access point on Harper Lake Road. This internal road network would be both paved and unpaved. A temporary, 1.5-acre staging yard would be established within the AMS project site for substation construction and interconnection.

Construction of the Lockhart Substation and interconnection facilities would occur within the boundaries of the AMS project site or within the existing SCE 220-kV transmission line corridor. Construction of the new transmission support structures may require a temporary concrete batch plant within the boundaries of the AMS project.

Detailed estimates of the labor force and equipment required for each type of activity associated with construction of the proposed Lockhart Substation and the AMS interconnection facilities (i.e., 220-kV transmission line loop-in, existing transmission line structure modification/ replacement, and 220-kV gen-tie connection) as well as the proposed distribution line for station light and power are provided in SCE's Project Description (SCE 2010c, Tables 2 and 4 through 7) and are typical of substation construction and interconnection.

Fiber Optic Lines

SCE would utilize its existing Victor, Roadway, Kramer, Tortilla, and Coolwater substations as well as its Barstow Service Center and the proposed Lockhart Substation

as marshalling yards to support the installation of the telecommunications facilities required for the DU project. SCE or contractor crews would use standard construction methods to construct the fiber optic cables and would comply with all laws, ordinances, regulations, and standards (LORS) during the construction phase.

Portions of the fiber optic cable would be constructed on existing overhead distribution and transmission wood and light-duty steel poles. In addition, portions of the cable would be constructed on new overhead structures and within newly constructed underground conduit systems, subject to determination through further engineering design. Generally, no hazardous material would be used in installing the fiber-optic cables and there would generally be no need for local services or utilities (e.g., water). SCE's Project Description (SCE 2010k, Tables 9 and 10) presents an estimate of the labor force and equipment required for each type of activity associated with construction of the proposed fiber optic lines. Total labor force and crew days are shown in Table 1 for each fiber optic line segment.

2.5 APPLICANT-PROPOSED MEASURES

Conditions of Certification included in the SA and SSA for the AMS project are applicable to the Lockhart Substation and interconnection facilities within the boundary of the permitted AMS project site, and are hereby incorporated by reference.

Improvements proposed outside of the AMS project site, including interconnection facilities and the proposed fiber optic telecommunication lines would be licensed by the CPUC and potentially the BLM or DOE. Additional measures beyond those identified in the following sections may be required by these or other permitting agencies, pending further environmental analysis conducted by other agencies pursuant to CEQA and NEPA.

SCE will be the proposed builder of these facilities and operates under the following standard best management practices (BMPs), which are incorporated into the project description for the anticipated downstream upgrades (SCE 2010c).

Air Quality

AIR-1 The construction activities would be in compliance with Air Quality Management District (AQMD) requirements, as applicable to the project

Aesthetics and Visual Resources

AES-1 Lattice steel towers and tubular steel poles would be galvanized steel with a dulled grey finish that minimizes reflected light.

AES-2 Insulators that minimize reflection of light would be utilized.

AES-3 Substation equipment would have materials that minimize reflective light.

AES-4 If chain link fence is used, it would have a dulled-finish.

AES-5 The substation lighting would be designed to be manually operated for non-routine nighttime work.

Biological Resources

BIO-1 Preconstruction biological clearance surveys would be conducted to identify special-status plants and wildlife.

BIO-2 SCE would prepare a Worker Environmental Awareness Program (WEAP). All construction crews and contractors would be required to participate in WEAP training prior to starting work on the project.

BIO-3 All transmission and subtransmission towers and poles would be designed to be avian-safe in accordance with the suggested practices for Avian Protection on Power Lines: the State of the Art in 2006 (Avian Power Line Interaction Committee 2006).

Cultural Resources

CR-1 A cultural resource inventory of the project area would be conducted for cultural resources prior to any disturbance. All surveys would be conducted and documented as per applicable laws, regulations, and guidelines.

CR-2 To the extent feasible, all ground-disturbing activities shall be sited to avoid or minimize impacts to cultural resources listed as, or potentially-eligible, for listing as, unique archaeological sites, historical resources, or historic properties.

CR-3 A protective buffer zone would be established and maintained around each recorded archaeological site within or immediately adjacent to the right-of-way.

Paleontology Resources

PALEO-1 A paleontologist would conduct a pre-construction field survey of the project area.

PALEO-2 Prior to construction, a certified paleontologist would supervise monitoring of construction excavations.

Geology and Soils

GEO-1 Prior to final design, investigations would be conducted to identify site-specific geologic conditions and potential geologic hazards in sufficient detail to support sound engineering practices.

GEO-2 For new substation construction, specific requirements for seismic design would be followed based on the Institute of Electrical and Electronic Engineers' 693 "Recommended Practices for Seismic Design of Substations."

GEO-3 New access roads, where required, would be designed to minimize ground disturbance during grading.

GEO-4 Cut and fill slopes would be minimized by a combination of benching and following natural topography where feasible.

GEO-5 Any disturbed areas associated with temporary construction would be returned to preconstruction conditions (to the extent feasible) after the completion of project construction.

Hazards and Hazardous Waste

HAZ-1 A Phase I Environmental Site Assessment would be performed at each new or expanded substation location and along newly acquired transmission and sub-transmission line rights-of-way.

HAZ-2 SCE would implement standard fire prevention and response practices for the construction activities.

HAZ-3 As applicable, SCE would follow fire codes per Cal Fire Power Line Fire Prevention Fire Guide requirements for vegetation clearance during construction of the project to reduce the fire hazard potential.

HAZ-4 Hazardous materials and waste handling would be managed in accordance with the following SCE plans and programs:

- *Spill Prevention, Countermeasure, and Control Plan (SPCC Plan).* In accordance with Title 40 of the CFR, Part 112, SCE would prepare a SPCC for proposed and/or expanded substations, as applicable.
- *Hazardous Materials Business Plans (HMBPs).* Prior to operation of new or expanded substations, SCE would prepare or update and submit, in accordance with Chapter 6.95 of the CHSD, and Title 22 CCR, an HMBP, as applicable.
- *Storm Water Pollution Prevention Plan (SWPPP):* A project-specific construction SWPPP would be prepared and implemented prior to the start of construction of the transmission line and substation.
- *Health and Safety Program:* SCE would prepare and implement a health and safety program to address site-specific health and safety issues.
- *Hazardous Materials and Hazardous Waste Handling:* A project specific hazardous materials management and hazardous waste management program would be developed prior to initiation of the project. Material Safety Data Sheets would be made available to all Project workers
- *Emergency Release Response Procedures:* An Emergency Response Plan detailing responses to releases of hazardous materials would be developed prior to construction activities. All construction personnel, including environmental monitors, would be aware of state and federal emergency response reporting guidelines.

HAZ-5 Hazardous materials would be used or stored and disposed of in accordance with Federal, State, and Local regulations.

HAZ-6 The substation would be grounded to limit electric shock and surges that could ignite fires.

HAZ-7 All construction and demolition waste would be removed and transported to an appropriately permitted disposal facility.

Hydrology and Water Quality

HYDRO-1 Construction equipment would be kept out of flowing stream channels as feasible.

HYDRO-2 Towers would be located to avoid active drainage channels, especially downstream of steep hill slope areas, to minimize the potential for damage.

Land Use

LAND USE-1 SCE shall provide 14 days of advance notice of the start of construction to property owners located within 300 feet of construction-related activities.

Noise

NOISE-1 SCE would comply with local noise ordinances.

Transportation and Traffic

TRANS-1 Traffic control services would be used for equipment, supply delivery, and conductor stringing, as applicable.

TRANS-2 Construction traffic would be scheduled for off-peak hours to the extent feasible and would not block emergency equipment routes.

TRANS-3 If work requires modifications or activities within local roadway and railroad rights-of-way, appropriate permits would be obtained prior to the commencement of construction activities.

3.0 ANALYSIS OF TRANSMISSION AND TELECOMMUNICATIONS SYSTEM FACILITIES

This section examines the potential environmental impacts of the construction and operation of proposed downstream upgrades that may be required as a result of interconnection of the AMS project to the SCE transmission system.

The proposed downstream upgrades would be constructed by SCE and will be fully evaluated pursuant to CEQA and NEPA in a future environmental document prepared by the CPUC and BLM or DOE. SCE has filed applications (SF299 - Application for Transportation and Utility Systems and Facilities on Federal Lands) with BLM to modify existing utility right of ways to include the proposed fiber optic lines. Applications have been filed for each proposed route including, Victor Substation to Kramer Substation, Kramer Substation to Lockhart Substation and Lockhart Substation to Tortilla Substation. In reviewing the applications, BLM will complete an environmental review pursuant to NEPA and their implementing regulations. This screening-level impact analysis for the AMS anticipated downstream upgrades is based on available planning-level information and may be used by BLM in the future to inform their environmental review.

Several of the areas normally studied in a Staff Assessment (Facility Design, Power Plant Efficiency, Power Plant Reliability, Transmission System Engineering, and Transmission Line Safety and Nuisance) are not applicable to the CEQA analysis of downstream actions and are not included in this appendix.

3.1 AIR QUALITY

Environmental Setting

The air quality setting for the proposed project can be described regionally and locally. The proposed project is located within the western portion of San Bernardino County, within the Mojave Desert Air Basin (MDAB). MDAB is an assemblage of mountain ranges interspersed with long broad valleys, with a dry-hot desert climate. Air quality regulations in the MDAB are provided by the Mojave Desert Air Quality Management District (MDAQMD). The MDAQMD also provides an analysis of compliance with LORS.

Local air quality is based on proximity of sensitive air quality receptors to local air pollution sources (e.g., traffic-congested roadways and intersections). Sensitive air quality receptors include structures that house children, the elderly, and persons with preexisting respiratory or cardiovascular illness (i.e., schools, hospitals, and nursing homes).

Lockhart Substation and Interconnection

The proposed substation site is located in a remote area approximately 5.5 miles northeast of the intersection of SR 58 and Harper Lake Road in the county of San Bernardino. There are no sensitive air quality receptors located in proximity to the proposed substation and interconnection area. As described in the **Air Quality** section of the SSA, the nearest sensitive receptor is Hinkley Elementary School, which is approximately 10 miles southeast of the proposed Lockhart Substation and interconnection area.

Lockhart Substation to Tortilla Substation Fiber Optic Line

The Lockhart to Tortilla line is located partially within the AMS boundary and within existing transmission line corridors all the way to the existing Tortilla Substation in the city of Barstow. In the developed areas within and surrounding Barstow, there are residential areas adjacent to this route, an elementary school 0.33 mile south of the route, and a convalescent hospital approximately 0.6 mile west of the route; however, no sensitive air quality receptors are identified directly on or adjacent to the proposed route.

Lockhart Substation to Kramer Substation Fiber Optic Line

The Lockhart to Kramer line is located partially within the AMS property, as well as within existing transmission line corridors all the way to Kramer Substation. Most of this utility corridor is in a remote desert area of San Bernardino County, with the exception of the far west end, which is located near sparse retail, commercial, and industrial uses in the community of Kramer Junction. No sensitive air quality receptors are located in proximity to this proposed route; the nearest sensitive receptor is the Boron Elementary School, which is located approximately 8.5 miles west of the proposed route.

Kramer Substation to Victor Substation Fiber Optic Line

The Kramer to Lockhart line is located along Highway 395, partially within an undeveloped portion of San Bernardino County. There are residential areas adjacent to this route, primarily in the southern one-third of the alignment as the corridor nears Adelanto and the Victor Substation. The proposed route is within 0.25 mile of the St. Mary Medical Center; this is the only potentially sensitive receptor proximate to the proposed route.

Potential Impacts of Proposed Downstream Upgrades

The potential air pollutant emissions that would be generated by the project have been assessed qualitatively; the anticipated impacts of emissions have been identified and general measures to reduce potential impacts are recommended. Subsequent environmental review pursuant to CEQA and NEPA will require a quantitative analysis and specific mitigation measures would be identified accordingly.

The proposed project components (i.e., substation, interconnection, and fiber optic lines) would generate air pollutant emissions, primarily from facilities construction and, to a much lesser degree, from the operation and maintenance of the constructed facilities. Construction activities would generate temporary (short-term) emissions as fugitive dust emissions (particulate matter) from earth-moving activities and as exhaust emissions from the operation of construction equipment and vehicles. Exhaust emissions may include carbon monoxide (CO); ozone (O_3) precursors; nitrogen dioxide (NO_2); sulfur dioxide (SO_2); lead (Pb); and particulate matter, which is subdivided into two classes based on particle size: fine particles ($PM_{2.5}$) and inhalable particles (PM_{10}). Operation of the proposed DU project would generate minor stationary and mobile exhaust emissions from operation and maintenance of the proposed facilities (i.e., substation and fiber optic lines).

The construction emissions are not anticipated to be substantial or to exceed MDAQMD CEQA significance thresholds. Project operational emissions are anticipated to be negligible, as the emissions from the constructed substation and installed fiber optic lines would be limited to emergency generators and occasional maintenance.

In addition to regional impacts, localized air quality impacts of CO and toxic air contaminants (TACs) were also considered. Signalized intersections of unacceptable levels of service (LOS) are considered for localized CO impacts, where project traffic contributes to the unacceptable LOS condition. Impacts could occur if human receptors are located proximate to these intersections. Project-generated traffic would primarily be temporary (short-term) construction traffic; traffic from project operations would be negligible since the substation would be un-staffed and the interconnection and fiber optic cables would only require periodic maintenance. Project traffic is not anticipated to be substantial enough to result in increasing delays at intersections.

The AMS is projected to generate substantially more construction traffic than these downstream facilities, and its traffic impacts were found to be less than significant. Therefore, the proposed DU project would not have the potential to result in localized CO impacts. As stated in the AMS AFC, TACs of concern include diesel exhaust PM

(diesel PM), asbestos, and lead. The principal TAC of concern for the proposed project is diesel PM, which would result from diesel construction equipment and vehicles. The primary concern for diesel PM is sensitive receptors in proximity to high concentrations of diesel vehicle operation, such as construction sites, interstate highways, distribution centers, bus stations, or port facilities. The linear project construction areas (e.g., fiber optic line corridors) cover an extensive corridor area along roadways. A substantial use of diesel equipment and vehicles is not anticipated along the proposed fiber optic alignments.

For the most part, the nonlinear project facilities (e.g., Lockhart Substation) would be located away from sensitive air quality receptors. As described above, there are several residential areas and one sensitive receptor (i.e., St. Mary Medical Center) adjacent to the proposed alignments. However, fiber optic line installation would be temporary and short-term (approximately 1 to 2 days in any particular location). Overall, the diesel PM emissions generated from proposed DU project construction equipment and mobile sources are not anticipated to subject sensitive receptors to adverse levels of diesel PM or other emissions.

The following describes the type of activities and emissions associated with each DU project element and provide the basis for the conclusions presented above.

Lockhart Substation and Interconnection

The proposed Lockhart Substation and associated facilities would be located within the boundary of the AMS, or immediately adjacent. Air quality impacts for the AMS project site are included in Section 5.1 of the SSA, and were generally found to be less than significant with implementation of mitigation.

The substation and interconnection would generate air pollutant emissions primarily from facility site construction (i.e., substation and transmission lines) and linear facilities installation (i.e., fiber optic line); minor emissions would be generated from the post-construction operation and maintenance of the constructed substation. Construction activities would include site grading, facility installation, paving, and landscaping. Project emissions from the substation and interconnection are not anticipated to be substantial, and anticipated to be less than applicable MDAQMD CEQA significance thresholds, as identified in Table 5.2-8 in the AMS AFC.

Construction of new 220-kV transmission structures to replace the existing 220-kV transmission structures may require the installation and operation of a temporary concrete batch plant within the boundaries of the AMS for purposes of footings for the new transmission structures. The installation and removal of a temporary batch plant would generate temporary, short-term construction emissions of fugitive dust and exhaust from construction equipment and vehicles. Operation of the plant would generate temporary, short-term exhaust emissions from the operation of the plant's gas-powered mechanical equipment for the generation of concrete for the footings.

Lockhart to Tortilla Substation Fiber Optic Line

The Lockhart to Tortilla line includes approximately 31 miles of new fiber optic cable to be installed above ground on existing and new poles, except for approximately 1,900 feet of cable that would be installed in an underground conduit. Since the line would be located in existing utility rights-of-way along existing roadways, off-road construction vehicle travel is anticipated to be minor. Ground-disturbing activities from trenching for underground cable and excavation for the footings of new poles would generate minor levels of fugitive dust as well as construction equipment and vehicle exhaust.

Lockhart to Kramer Substation Fiber Optic Line

The Lockhart to Kramer line includes approximately 18 miles of new fiber optic cable to be installed above ground on existing and new poles, except for approximately 3,100 feet of cable that would be installed in an underground conduit. Since the line would be located in existing utility rights-of-way along existing roadways, off-road construction vehicle travel is anticipated to be minor. Ground-disturbing activities from trenching for underground cable and excavation for the footings of new poles would generate minor levels of fugitive dust, and construction equipment and vehicle exhaust.

Kramer to Victor Substation Fiber Optic Line

The Kramer to Victor line includes approximately 36 miles of new fiber optic cable to be installed above ground on existing and new poles, except for approximately 2,300 feet of cable that would be installed in underground conduit. Since the line would be located in existing utility rights-of-way along existing roadways, off-road construction vehicle travel is anticipated to be minor. Ground-disturbing activities from trenching for underground cable and excavation for the footings of new poles would generate minor levels of fugitive dust, and construction equipment and vehicle exhaust.

Impact Minimization Measures

The DU project would be required to comply with all MDAQMD rules, including portable equipment rules, which would dictate how the equipment could be operated. Mitigation measures would be implemented in compliance with the MDAQMD Ozone State Implementation Plan to reduce the emissions generated during project construction and operation.

Construction-related activities and emissions at the project site are consistent with activities and emissions encountered at any construction site. Compliance with the provisions of the following necessary construction permits generally results in minimal site emissions: 1) grading permit; 2) SWPPP requirements (construction site provisions); 3) use permit; 4) building permits; and 5) MDAQMD Authority to Construct permit, which requires compliance with the provisions of all applicable fugitive dust rules that pertain to the site construction phase.

Construction phase emissions are generally short-term in duration. Effective and comprehensive control measures would be needed to reduce equipment and fugitive dust emissions to the extent feasible. Staff recommends that the following measures be implemented during construction to mitigate potential impacts to air quality:

- Retain an on-site construction mitigation manager who would be responsible for the implementation and compliance of the construction mitigation program.
- Document the ongoing implementation and compliance with the construction mitigation program in a monthly construction compliance report.
- Implement fugitive dust control requirements, including paving the main access road to the main power block before construction begins on that part of the site, using durable non-toxic soil stabilizers on unpaved roads as soon as they are constructed, watering active construction areas, implementing trackout controls, and applying other activity-specific control measures to reduce fugitive dust emissions during construction.
- Limit the potential offsite impacts from visible dust emissions, by responding to situations when the fugitive dust control measures are not working effectively to control fugitive dust from leaving the construction area.
- Mitigate the PM and NO_x emissions from large diesel-fueled construction equipment by using newer cleaner engines and other various control measures such as idle time restrictions, engine maintenance, etc.

With effective and comprehensive control measures such as those recommended in this section, dust and equipment exhaust impacts would be reduced and would be less than significant.

Conclusions

The anticipated downstream upgrades would be required to comply with all MDAQMD rules, including portable equipment rules, which would dictate how the equipment could be operated. Mitigation measures would be implemented in compliance with the MDAQMD Ozone State Implementation Plan to reduce the emissions generated during project construction and operation. With effective and comprehensive control measures such as those recommended in this section and Section 2.3, dust and equipment exhaust impacts would be reduced to a less than significant level.

3.2 BIOLOGICAL RESOURCES

The biological resources analysis of the telecommunication/congestion management system is based on applicant-provided biological resource information for the Lockhart Substation Interconnection & Communication Facilities Environmental Analysis (AS 2010k) as well as the Draft Biological Assessment for the AMS project (AECOM 2010d). The anticipated downstream upgrades and their potentially resultant impacts to biological resources will undergo an independent analysis pursuant to CEQA and NEPA by the CPUC and BLM or DOE, respectively.

Environmental Setting

Regional Setting

The proposed project is located in the western Mojave Desert, within the county of San Bernardino, and within the cities of Barstow and Adelanto, California. The project area spans approximately 85 miles and would occur primarily within existing road and utility corridors. The region encompassing the proposed project is characterized by open space and areas of active and fallow agriculture, scattered with residences and urban areas. In addition, portions of the project area are surrounded by sensitive land uses such as Mohave ground squirrel (MGS) conservation area, desert wildlife management areas (DWMA), and desert tortoise critical habitat.

Existing Vegetation and Wildlife

The applicant conducted a reconnaissance-level survey of the anticipated downstream upgrades area by driving along access roads on April 4 and 5, 2010 (AS 2010k). As of this preliminary analysis, this is the only biological resources field survey effort conducted for the proposed telecommunication/congestion management system. Comprehensive biological surveys, including protocol surveys for desert tortoise, were conducted for the Lockhart substation footprint, as part of the AMS project. A wetland delineation has not been conducted outside the AMS project footprint; however, several drainages and the Mojave River traverse the proposed telecommunication/congestion management system area.

The following sections describe the vegetation communities observed and a preliminary assessment of the potential for special-status species to occur within the telecommunication/congestion management system area.

Vegetation Communities

Vegetation communities and land-use types (i.e., residential or developed) were mapped for each segment during the windshield survey. Although a weed survey was not conducted outside of the AMS project area, observations during the windshield survey identified tamarisk (*Tamarix ramosissima*), Russian thistle (*Salsola tragus*), and Saharan mustard (*Brassica tournefortii*) as the most abundant invasive weeds within the proposed telecommunication/congestion management system area. **Table 3** lists dominant vegetation communities and acreages for each project segment. Excluding the Lockhart substation, the project segments listed below refer to linear segments within a 100-feet-wide existing corridor. The vegetation communities for each project segment are described in further detail following **Table 3.**

Table 3 -Vegetation Communities and Acreage Occurring within the Project Area

Vegetation Communities and Cover Types	Lockhart Substation and Interconnection (acres)	Lockhart Substation to Tortilla Substation (acres)	Lockhart Substation to Kramer Substation (acres)	Kramer Substation to Victor Substation (acres)
Desert Saltbush Scrub	0	311.98	198.76	61.41
Mojave Creosote Bush Scrub	0	0	0	8.26
Mojave Creosote Bush Scrub	0	97.7	90.85	518.80
Mojave Creosote Bush-Atriplex Scrub	0	0	48.99	0
Tamarisk Scrub	0	8.55	0	0
Active Agriculture	0	39.18	9.17	0
Fallow Agriculture-Ruderal (weedy)	9.04	45.25	59.23	
Developed	0	0	15.73	45.08
Disturbed	0	0	0	22.75
Joshua Tree Woodland	0	0	0	1
Mojave Desert Wash – sandy areas	0	11.3	0	0
Mojave River	0	3.07	0	0

Source: AS 2010k

Lockhart Substation and Interconnection

The proposed Lockhart Substation and Interconnection would occur within and adjacent to the proposed AMS site footprint. Fallow agriculture-ruderal vegetation, dominated by Russian thistle, Saharan mustard, and Mediterranean grass (*Schismus arabicus*) occurs within the footprint and is interspersed with patches of disturbed saltbush scrub and tamarisk windbreaks. Disturbed desert saltbush scrub in this area is dominated by allscale (*Atriplex polycarpa*) and spinescale (*Atriplex spinifera*) with a non-native herbaceous understory. The windshield survey west along Lockhart Road and south along Harper Lake Road identified that ruderal habitat is the dominant vegetation community along this segment and it is interspersed with disturbed desert saltbush scrub and developed land.

Lockhart Substation to Tortilla Substation Fiber Optic Line

The proposed route for the 31-mile fiber optic line within this segment would originate at the proposed Lockhart Substation within the AMS project boundary and head west, following the existing Kramer-Coolwater 220-kV utility corridor south of the AMS project.

The Kramer-Coolwater utility corridor runs adjacent to disturbed desert salt bush scrub to the north and native Mojave creosote bush scrub characterized by creosote bush and white bursage (*Ambrosia dumosa*) habitat to the south. Sign of desert tortoise was observed during the windshield survey within this segment. The proposed alignment would intersect Harper Lake Road and head south. The dominant vegetation type proximate to Harper Lake Road is relatively undisturbed native saltbush scrub habitat. This cover type is characterized by Atriplex species including shadescale (*Atriplex confertifolia*), allscale, spinescale, winter fat (*Krascheninnikovia lanata*), horsebush (*Tetradymia canescens*), and creosote bush. Disturbed habitat occurs immediately adjacent to the road.

The fiber optic alignment then trends east for approximately 10 miles along SR 58 at its junction with Harper Lake Road. The primary vegetation occurring within this area is undisturbed desert saltbush scrub along the north side of existing tortoise-proof fencing. Other vegetation types along this SR 58 corridor include disturbed desert saltbush scrub and developed habitat. The alignment then turns south at Summerset Road and continues adjacent to agricultural fields. The alignment trends east along Community Road, which is dominated by fallow and active agriculture, for approximately 1.75 miles at which point sand dunes are present for the remaining 0.25 mile. The alignment then turns south to follow Lenwood Road and is adjacent to sand dunes, tamarisk, Russian thistle, disturbed desert saltbush scrub, and the Mojave River. Following the alignment north, the dominant habitat becomes disturbed creosote bush scrub in addition to commercial and residential development. Disturbed creosote bush scrub and residential development primarily occur where the alignment follows Sun Valley Drive. This portion of the proposed alignment would be located within an urban area dominated by residential development and disturbed creosote bush scrub. The remaining section of the alignment, between Bonanza Road and the Tortilla Substation, is dominated by disturbed creosote bush scrub, with frequent off-highway vehicle use and garbage dumping.

Lockhart Substation to Kramer Substation Fiber Optic Line

The 36-mile Lockhart to Kramer Substation segment is characterized by disturbed desert saltbush scrub and a residential property. Desert saltbush scrub occurs at lower elevations. This community is characterized by shadescale, allscale, spinescale, winter fat, horsebush, and creosote bush. At relatively higher elevations, Mojave creosote bush scrub occurs, characterized by cheesebush (*Hymenoclea solsola*), Anderson's boxthorn (*Lycium andersonii*), and peachthorn (*Lycium cooperi*). Joshua trees are present near the western end of the alignment near Highway 395.

Kramer Substation to Victor Substation Fiber Optic Line

The portion of the 36-mile Kramer to Victor Substation segment nearest to the existing Kramer Substation is dominated by undisturbed Mojave creosote bush scrub and white bursage, interspersed with patches of desert saltbush scrub and Joshua tree woodlands. This segment traverses primarily undisturbed vegetation communities, except where access roads enter west from Highway 395. The alignment enters a residential area at Bartlett Avenue, 19 miles south of Kramer Junction. South of Bartlett Avenue the alignment is dominated by mixed residential and commercial development

with interspersed disturbed vegetation. Further south, disturbed desert creosote scrub occurs, which is interspersed with creosote bush and white bursage.

Special-Status Species

Special-status species include those listed as threatened or endangered under the federal or state endangered species acts, species proposed for listing, California species of concern, and other species that have been identified by the U.S. Fish and Wildlife Service (USFWS), and/or California Department of Fish and Game (CDFG) as unique or rare, as well as species included on the California Native Plant Society's (CNPS) list of rare, threatened, or endangered plants in California. **Table 4** identifies the special-status species that could potentially occur within the telecommunication/ congestion management system area based on a review of existing databases (i.e., California Natural Diversity Database (CNDDB) (CDFG 2010), CNPS online rare plant inventory (CNPS 2010), and web-based National Wetlands Inventory (USFWS 2010)). Special-status species for the Lockhart substation element are also included in the Biological Resources section of the SA and SSA. With exception of the Lockhart substation, protocol-level special-status biological surveys have not been conducted for the DU project area; therefore, special-status wildlife and plant presence is unknown. The results for potential occurrence have been provided by the applicant (AS 2010k). It is likely that additional species will be considered as further telecommunication/ congestion management system design is prepared and a CEQA-level analysis is conducted.

Table 4 - Special-Status Species Potentially Occurring in the Project Area

Scientific Name	Common Name	Status*	Potential for Occurrence+
Plants			
Abronia villosa var. *aurita*	Chaparral sand-verbena	CNPS List 1B.1	Low
Canbya candida	White pygmy-poppy	CNPS List 4.2	Low
Cymopterus deserticola	Desert cymopterus	CNPS List 1B.2	Moderate to High
Delphinium recurvatum	Recurved larkspur	CNPS List 1B.2	Low
Eriophyllum mohavense	Barstow woolly sunflower	CNPS List 1B.2	Moderate to High
Loefingia squarrosa var. *artemisiarum*	Sagebrush loeflingia	CNPS List 2.2	Low
Mimulus mohavensis	Mojave monkeyflower	CNPS List 1B.2	Low
Sclerocactus polyancistrus	Mojave fish-hook cactus	CNPS List 4.2	Moderate to High
Salicornia (*Sarcocornia*) *utahensis*	Utah glasswort	CNPS List 2.2	Low
Chorizanthe spinosa	Mojave spineflower	CNPS List 4.2	Moderate to High
Reptiles			
Gopherus agassizii	Desert tortoise	FT/ST	Moderate to High
Birds			
Circus cyaneus	Northern harrier	CSC	Moderate to High
Buteo swainsoni	Swainson's hawk	ST	Moderate to High
Falco mexicanus	Prairie falcon	WL	Moderate to High
Athene cunicularia	Western burrowing owl	CSC	Moderate to High
Eremophila alpestris actia	California horned lark	CSC	Moderate to High
Toxostoma lecontei	Le Conte's thrasher	CSC	Moderate to High
Lanius ludovicianus	Loggerhead shrike	CSC	Moderate to High
Mammals			
Vulpes macrotis	Desert kit fox	CCR	Moderate to High
Spermophilus mohavensis	Mohave ground squirrel	ST	Moderate to High
Taxidea taxus	American badger	CSC	Moderate to High

***Status Legend** (Federal/State/California Native Plant Society (CNPS) lists, CNPS list is for plants only): **FT** = Federally listed Threatened; **ST** = State listed Threatened; **CSC** = California Species of Concern; **CCR** = Protected under CDFG Code Title 14, CCR §460; **WL** = State Watch List; **List 1B** = Rare or Endangered in California and elsewhere; **List 2** = Rare, threatened, or endangered in California but more common elsewhere; **List 4** = Limited distribution – a watch list; **.1** = Seriously threatened in California (high degree/immediacy of threat); **.2** = Fairly threatened in California (moderate degree/immediacy of threat) (Sources: CDFG 2010; CNPS 2010; AS 2010k)

+Definitions Regarding Potential Occurrence:
High: Species or sign not observed on the site, but reasonably certain to occur onsite
Moderate: Species or sign not observed on the site, but conditions suitable for occurrence
Low: Species or sign not observed on the site, conditions marginal for occurrence

Potential Impacts of Proposed Downstream Upgrades

Potential Impacts to Special-Status Plant Species

There is moderate to high potential for desert cymopterus, Barstow woolly sunflower, Mojave fish-hook cactus, Mojave spineflower, and potentially other sensitive plants to occur in the proposed DU project area. Rare plant surveys during the appropriate blooming period would be required to identify the distribution of potentially affected special-status plants.

Temporary impacts to the abovementioned vegetation communities would occur within the DU project area due to construction activities associated with cable stringing. Permanent impacts would occur to vegetation communities from grading and trenching required for the addition of 115 new transmission poles and underground fiber optic installation. Direct impacts to plants could occur during trenching and grading, or if plants are crushed or otherwise damaged by construction equipment and vehicle or foot traffic. If special-status plants are found to occur within the project area and cannot be avoided, then consultation with the appropriate agency (i.e., CDFG and/or USFWS) would identify appropriate mitigation measures. Ground-disturbing activities have the potential to indirectly affect adjacent vegetation communities by facilitating the transport and dispersal of invasive weed propagules, thereby potentially introducing new weeds and exacerbating invasions already present in the project vicinity.

Potential Impacts to Special-Status Wildlife Species

It is unknown at this time whether special-status wildlife occurs within the project area; however, it is likely that desert tortoise, Mohave ground squirrel, burrowing owl, and several other wildlife species listed in **Table 3** breed and/or forage within portions of the project area. In addition, breeding birds protected under the Migratory Bird Treaty Act are likely present within the proposed project area. Protocol-level or other focused surveys must be completed to identify the distribution of potentially affected special-status wildlife.

Potential impacts to special-status wildlife include direct mortality from encounters with construction equipment, burrow/nest destruction during equipment staging, entombing adults, eggs, or young, and disruption or harassment. In addition, short and long-term habitat loss, modification, and fragmentation, as well as the potential spread of noxious weeds could decrease local and regional wildlife habitat values.

Temporary impacts to special-status aquatic species inhabiting the Mojave River could occur from degradation of water quality from erosion or sedimentation during project construction activities.

Consultation with resource agencies (e.g., USFWS and CDFG) would be required to identify appropriate impact avoidance, minimization, and mitigation measures and ensure compliance with the federal and California endangered species acts.

Impacts to Sensitive Habitat

Direct impacts to potentially jurisdictional waters (e.g., drainages, Mojave River) could occur from trenching and the concomitant erosion and sedimentation from soil

disturbance. The Mojave River and drainages that occur within the project area are regulated by the CDFG under Fish and Game Code section 1600, the Lahontan Regional Water Quality Control Board, and potentially the U.S. Army Corps of Engineers (USACE) and the state and federal clean water acts, respectively. A formal wetland delineation would provide information to further assess potential impacts to jurisdictional wetlands and waters. If warranted, acquisition of a Lake and Streambed Alteration Agreement (section 1602 permit), Water Quality Certification (section 401 permit), and USACE section 404 permit and implementation of the measures therein would ensure that potential impacts to sensitive habitats are mitigated and compliance with applicable LORS is achieved.

Impact Minimization Measures

Agency consultation would identify appropriate measures to avoid minimize and mitigate potential impacts to species listed under the federal and/or California endangered species acts (e.g., desert tortoise, Mohave ground squirrel) and sensitive habitats (e.g., jurisdictional waters), as described above. If special-status species or sensitive habitats are identified within the project area, limited construction periods, no-disturbance buffers, passive relocation, translocation, artificial burrow construction, revegetation plans, and habitat compensation may be required to avoid, minimize, or mitigate impacts to special-status species and sensitive habitats.

To minimize impacts to nesting birds, pre-construction surveys would be conducted and no-disturbance buffers established if project activities occur during the nesting season (typically February 1 through August 30). At all times of the year, noise generating activities should be limited during early morning and evening to avoid impacts to birds protected under the Migratory Bird Treaty Act.

In addition, standard measures and best management practices recommended to minimize impacts to biological resources include but are not limited to:

- Designate a lead biologist to be on-site during construction activities to supervise, conduct and coordinate mitigation, monitoring and other biological resource compliance efforts.
- Develop and implement a Worker Environmental Awareness Program to inform and educate workers prior to site mobilization about sensitive biological resources associated with the project.
- Limit disturbance area by erecting temporary exclusion fencing to keep workers out of sensitive habitat and within designated work areas.
- Minimize traffic collisions with wildlife.
- Monitor during construction.
- Avoid use of toxic substances.
- Minimize lighting impacts.
- Avoid wildlife pitfalls by covering trenches, bores, and other excavations at the end of the work day.
- Avoid entrapment of wildlife.

- Report wildlife injury and mortality.
- Minimize standing water.
- Minimize spills of hazardous materials.
- Establish worker guidelines including trash containment, disposal, and removal.
- Avoid spread of noxious weeds and reestablish native vegetation quickly in temporarily disturbed areas.
- Implement erosion control measures.

Conclusion

Sensitive biological resources, including special-status species and jurisdictional waters, potentially occur within and adjacent to the anticipated downstream upgrades area. Additional surveys, including protocol surveys and a wetland delineation, may be required to determine the occurrence and distribution of these potentially affected biological resources. Potential direct and indirect to biological resources could be avoided, minimized, or mitigated, as necessary with implementation of standard and project-specific measures. Consultation with USFWS, CDFG, and USACE would likely be necessary to identify appropriate measures. In addition, permits may be required from these agencies to demonstrate compliance with the federal and state endangered species acts as well as the federal Clean Water Act. If compliance with all applicable LORS is achieved and impact avoidance, minimization, and mitigation measures are implemented as recommended by the resource agencies, the construction and operation of the proposed telecommunication/congestion management system would not result in significant, unmitigated impacts to biological resources.

3.3 CULTURAL RESOURCES

Environmental Setting

A records search was conducted by AECOM between April 5 and April 12, 2010 at the San Bernardino Archaeological Information Center (SBAIC). The records search included a 1.0-mile buffer around the proposed Lockhart Substation and Interconnection, Lockhart Substation to Tortilla Substation fiber optic line, Lockhart Substation to Kramer Substation fiber optic line, and the Kramer Substation to Victor Substation fiber optic line. The total percentage of the rights-of-way for the various facilities subject to previous cultural resources inventory is presently uncalculated. In addition to resources filed at California Historic Resources Information System (CHRIS), a number of sites recently identified by AECOM were found during field survey for the AMS project but have not yet been filed at CHRIS (AS 2010k, p. 30). Synthesis of these sources indicates that 730 cultural resources and isolates have been identified in the research area. For the purpose of impact analysis, resources within the boundary of the Lockhart Substation and a 300-feet wide corridor centered along the proposed fiber optic alignments were considered. The majority of the documented resources consist of historic sites related to homesteading and agricultural activities, such as structures or remnants of structures, homesteading sites, roads, trails, refuse dumps, wells, and water conveyance systems. Other historic sites included existing transmission and telecom lines, Highway 395, and the Atchison, Topeka and Santa Fe Railroad.

Prehistoric resources, consisting of lithic scatters, quarries, and isolates, as well as sites containing both prehistoric and historic components, are also present.

There are 140 resources and isolates that fall within the Lockhart Substation and a 150-feet wide corridor centered along the proposed fiber optic alignments (300 feet wide total).

- **Lockhart Substation and Interconnection Area.** The two sites falling within the Lockhart Substation and interconnection area include one historic site and one prehistoric isolate (AS 2010k, p. 30).
- **Lockhart Substation to Tortilla Substation Fiber Optic Line.** Seventeen resources and three isolates fall within 150 feet of the Lockhart to Tortilla Substation fiber optic line including five prehistoric sites, 14 historic sites and one multi-component site. Two of these historic sites, the Atchison, Topeka and Santa Fe Mojave Railroad (P-36-6693H) and the National Old Trails Highway and Monument (P-36-2910) have previously been determined eligible for the National Register of Historic Places (AS 2010k, pp. 31-32).
- **Lockhart Substation to Kramer Substation Fiber Optic Line.** Eleven resources and eleven isolates fall within 150 feet of the Lockhart to Kramer fiber optic line, including four prehistoric isolates, seven historic isolates and eleven historic resources. Two of the historic resources, the Atchison, Topeka and Santa Fe Mojave Railroad (P-36-6693H) and the Kramer-Victor 115-kV Transmission Line (P-36-10316H) have previously been determined eligible for listing on the National Register of Historic Places. Additionally, one historic property, U.S. Highway 395 (P-36-07545H) is listed in the Office of Historic Preservation's Directory of Properties (AS 2010k, pp. 32-33).
- **Kramer Substation to Victor Substation Fiber Optic Line.** The records search for the Kramer to Victor Substation fiber optic line identified the highest number of resources – 35 resources and 61 isolates within 150 feet of the line. Isolates include 36 historic and 25 prehistoric. Five multi-component sites were identified, as well as 14 prehistoric resource and 16 historic resources. One historic resource, the Kramer-Victor 115-kV Transmission Line (P-36-10316H), has previously been determined eligible for listing on the National Register of Historic Places. Additionally, one historic property, U.S. Highway 395 (P-36-07545H) is listed in the Office of Historic Preservation's Directory of Properties (AS 2010k, pp. 33-36).

If cultural resources, including structures, are more than 45 years old, and might be affected by the project, the cultural resources need to be evaluated for eligibility for listing on the California Register of Historical Resources (CRHR) and the National Register of Historic Places (NRHP). The Office of Historic Preservation Directory of Properties in the Historic Property Data File for San Bernardino County lists four historic properties in or near the project area. The National Old Trails Highway and Monument (P-36-2910), the Atchison, Topeka, and Santa Fe Mojave Railroad (P-36-6693H), and the Kramer-Victor 115-kV transmission line (P-36-10316H) have all been determined eligible for the National Register of Historic Places. U.S. Highway 395 (P-36-07545H) is listed in the Office of Historic Preservation's Directory of Properties Historic Property Data File.

SCE would request a list of Native American contacts from the Native American Heritage Commission (NAHC) and a contact program initiated as part of future CEQA/NEPA analysis. Those tribes that were contacted as a result of the AMS project would also be contacted during this outreach (AS 2010K, p. 39).

Potential Impacts of Proposed Downstream Upgrades

Ground disturbance, the presence of vehicles driving over the top of sites and the installation of new towers could damage archaeological resources. During the planning phase, pedestrian surveys would need to be conducted within all work areas and a geoarchaeological study may be necessary in areas of underground trenching to assess the potential for discovery of resources.

After the work area is defined and after archaeological and historic surveys are complete, prehistoric and historic properties may be identified in areas that have not been previously protocol-level surveyed. If any resources are determined eligible for the CRHR and/or the NRHP, the proposed project may result in an impact to prehistoric or historic resources. Whether the impact is significant would need to be determined after the resources are evaluated. The reasons for eligibility would determine the impact. Known and newly identified resources would be treated using standard treatment methods, including data recovery and public outreach.

Impact Minimization Measures

Staff recommends that after the construction area has been identified, and after work for CEQA and Section 106 has been completed, that prehistoric and historic resources be evaluated for eligibility for listing in the CRHR and/or NRHP, if it appears that any would be affected by the proposed project. Sites that have been evaluated as not eligible warrant no further consideration and avoidance is not required. Sites that have not been evaluated and sites that are considered potentially eligible would be treated as eligible resources pending formal evaluation.

Data recovery may be conducted as a mitigation measure for archaeological sites that are recommended as eligible to the CRHR or NRHP and would be impacted by the proposed project. Monitoring of project-related excavation within an archaeological site is not appropriate mitigation and may destroy the site. Should any cultural materials be encountered during construction or other ground-disturbing activities, all activities in the vicinity of the find (within 50 feet) should cease until the significance of the discovery is evaluated by a qualified archaeologist. If the discovery is determined significant, mitigation would be necessary, including compliance with provisions of the National Historic Preservation Act and consultation with the California State Historic Preservation Officer regarding appropriate mitigation.

Conclusion

The majority of sites in the 300-foot wide records search corridor are historic sites related to transportation and infrastructure activity, including roads, railroads and transmission lines, and resources related to farming activities such as structures, wells and refuse scatters, and residential activities such as refuse scatters. Prehistoric resources consist of lithic scatters and isolates. While it is anticipated that environmental impacts, including those on cultural resources, would be mitigated to a

less-than-significant level, it is possible that the project corridor has sensitive cultural resources that could be affected. Additionally, even if SCE were to follow the standard treatments for cultural resources in the impact area, there would likely be some cumulative effects because standard treatment measures, while reducing the impact to less-than-significant, do not completely eliminate the impact.

3.4 GEOLOGY AND PALEONTOLOGY

Environmental Setting

The proposed project is located in the Mojave Desert physiographic province in Southern California. The Mojave Desert is bounded on the north and northwest by the Tehachapi Mountains, on the west by the Garlock fault, on the east by the Colorado River, and on the south and southwest by the San Andreas Fault. The Mojave Desert is a broad interior region of isolated mountain ranges which separate vast expanses of desert plains and interior drainage basins.

The topography in the Mojave Desert of California is predominately southeast to northwest, and is associated with similarly-oriented faulting. A secondary east to west orientation correlates with structural trends in the Transverse Ranges physiographic province.

The region encompassing the proposed project is characterized by broad alluvial basins of Cenozoic sedimentary and volcanic materials overlying older plutonic and metamorphic rocks. The plutonic and metamorphic rocks are exposed as eroded hills throughout the region. The alluvial basins are up to several thousand feet thick.

Potential Impacts of Proposed Downstream Upgrades

Geology

Soils and rock testing should be conducted and analyzed by a professional, licensed geotechnical engineer or geologist to determine existing foundation conditions. The results of the geotechnical investigation would then be applied to the project's engineering design and this would ensure that potential impacts associated with problematic soils and slope instability are reduced to less than significant levels.

Construction would occur in relatively flat terrain and the geologic investigation described above would identify the affected soils and their site-specific erosion potential. Erosion control BMPs would be used where excavation and grading occurs as would be required by the project National Pollution Discharge Elimination System (NPDES) permits and the SWPPP (see the **Soils and Water Resources** section of this appendix). With proper construction practices there should be no notable erosion or transport of sediment from the site. Considering these factors, there should be little or no impact due to erosion or loss of topsoil. Potential impacts would be less than significant.

Regional and local geologic conditions would not be altered significantly by the long-term operation of the proposed upgrades. No major or unique geologic or physical features would be directly affected by the anticipated downstream upgrades.

The project area is subject to ground shaking from nearby and distant earthquakes. Project structures would be designed to meet current seismic design standards. More detailed investigations would identify whether ground rupture potential exists within the downstream upgrades; although, lines are typically designed to span the fault zones. Due to the depth to groundwater, liquefaction is not expected to occur. A properly designed facility would reduce the minor threat of damage to the proposed facilities as a result of lateral spreading, subsidence, liquefaction, or collapse to less than significant levels

Paleontology

Construction of the telecommunications facilities could disturb significant paleontological resources located within the project area as a result of construction-related ground disturbances. Indirect impacts to paleontological resources may include erosion of features due to channeling of runoff or damage to outcrop areas due to earth-shaking activities associated with drilling activities. Impacts to paleontological resources, if present, would be potentially significant.

Minerals

Since there are no known mining operations identified in the project area, construction of the downstream upgrades is unlikely to interfere with daily ongoing or planned mining operations.

Impact Minimization Measures

Site-specific geotechnical and seismic conditions would be appropriately addressed in the detailed engineering design and construction of the anticipated downstream upgrades. The following mitigation measures are recommended to reduce potential impacts:

- Soils testing and analysis should be conducted by a professional, licensed Geotechnical Engineer or Geologist, to determine existing soil conditions. Borings in a sufficient quantity to adequately gather variations in the site soils should be conducted to remove sample cores for testing. The type of soils, soil pressure, relative compaction, resistivity, and percolation factor are among the items that should be tested for. If contaminants are encountered, special studies and remediation measures in compliance with environmental regulations should be implemented by qualified professionals.
- Transmission structures, telecommunication facilities and substation facilities should be designed in accordance with current California Building Code (CBC) seismic standards and the design requirements and methodology of the Electrical Power Research Institute (EPRI).
- Transmission structures, telecommunication facilities and substation facilities should be designed in accordance with recommendations provided in preliminary geotechnical reports and as amended by future geotechnical investigations with respect to collapsible.

In addition, implementation of the recommended mitigation measures discussed under **Soils and Water Resources** would reduce the amount of erosion that would result from

construction (e.g., preparation and implementation of a SWPPP). With implementation of measures and best management practices that would ensure proper re-vegetation, erosion control, drainage, seismic design, among other requirements, downstream upgrades would result in a less than significant impact to geology.

Recommended mitigation for potential paleontological resources would provide for a paleontological resources inventory after final project design, pre-construction planning for monitoring and treatment of paleontological resources, and for monitoring during construction. The mitigation should require a qualified paleontological monitor and qualified paleontologist to monitor for significant subsurface fossils and then collect, analyze and curate any significant fossils found. In addition, the following mitigation measures are recommended for paleontological resources:

- Prior to initiation of project construction activities, the proposed project area and access roads should be surveyed by a Qualified Paleontologist.
- Based on the results of the paleontological resource survey, a paleontological resource management plan should be prepared and submitted to the CPUC and BLM or DOE for review and approval.
- All project construction staff should be trained in the importance of paleontological resources and the routine identification of fossil resources.

Implementation of these suggested mitigation measures would reduce project impacts to paleontological resources to a less than significant level.

Conclusion

SCE would comply with applicable LORS pertinent to the anticipated downstream upgrades. No significant geological, paleontological or mineral resources have been identified in the proposed project area; however, technical investigations/surveys have not yet been performed. The upgraded lines and substation equipment would be designed and constructed in accordance with the seismic requirements of SCE's Construction Standards and CPUC General Order 95 and EPRI. With implementation of recommended mitigation and compliance with applicable LORS, the proposed project would have minimal potential to impact geological, paleontological or mineral resources.

3.5 LAND USE

Environmental Setting

The Land Use analysis for the telecommunication/congestion management system (proposed DU project) focuses on the proposed project's compatibility with the existing and planned land uses, and the proposed project's consistency with local land use plans, ordinances, and policies. The anticipated downstream upgrades are located partially within the AMS project boundaries and utilizes existing transmission towers in established utility corridors. The proposed substation and interconnection facilities are within the jurisdiction of the County of San Bernardino (county). The majority of the fiber optic lines are also within the county's jurisdiction, with portions of the lines also within the jurisdictions of the cities of Barstow and Adelanto. As such, the proposed telecommunication/congestion management system would be subject to consistency with the general plan of each jurisdiction. In addition, lands within the sites proposed for

the system are subject to the BLM's West Mojave Plan (WMP), which states all new linear facilities must be located within a utility corridor (BLM 2005). The plan also identifies conservation areas; however, the project components are not proposed within a conservation area.

Land within the proposed project area consists primarily of undeveloped land where the dominant land uses are open space, agricultural, and rural residential. In addition, the portions of the fiber optic lines within the cities of Barstow and Adelanto and the proposed interconnection to the Kramer Substation would be constructed in areas with urban land uses including residential, commercial, and industrial development.

Potential Impacts of Proposed Downstream Upgrades

The proposed Lockhart Substation and associated facilities would be located within the boundary of the AMS. Land use related impacts for the AMS project site are included in Section 5.5 of the SSA. Outside of the AMS project site, the telecommunication/congestion management system would also include the proposed transmission line loops to the Kramer—Coolwater 220-kV transmission line and three fiber optic lines. Although final design information is not available, it is assumed existing transmission right-of-way would be utilized for these components. Therefore, the system would not involve changing existing or planned land uses in the county or the cities of Barstow or Adelanto. Furthermore, since the utility corridors are established land uses, the system is not expected to conflict with applicable LORS.

Construction of the Lockhart Substation would be located within the boundaries of the AMS project and grading for the substation site would be included within Abengoa's overall grading design. Construction methodology for the new 220-kV transmission structures, removal of the existing 220-kVtransmission structures, and stringing the 220-kV conductor would take place within the boundaries of the existing AMS or within the existing SCE 220-kV transmission line right-of-way. Construction of the fiber optic lines would utilize SCE's existing Victor, Roadway, Kramer, Tortilla, and Coolwater substations, as well as SCE's Barstow Service Center, and the proposed Lockhart Substation as marshalling yards, to support the installation of the telecommunications facilities required for the proposed project. Any construction impacts to land use would be temporary and short term. Because construction would be temporary and would not displace any existing use, the impact would not be significant.

Impact Minimization Measures

The telecommunication/congestion management system would be constructed within the proposed AMS project boundaries and within existing utility corridors. To minimize land use impacts, the transmission line route should follow existing SCE rights-of-way where feasible, and any new rights-of-way should be developed along parcel edges and in accordance with all applicable land use LORS. Authorization and use would be subject to administrative review at the time of issuance of a final CPUC decision regarding the authorization or use.

Staff recommends that SCE post notices on the right-of-way and provide notices to properties within 300 feet of sites where the public would be affected by construction activities. Notices should be posted approximately one month prior to commencing

work. At right-of-way ingress and egress points, postings should be placed along the right-of-way and at work sites approximately two weeks prior to the closing of public access. Recommended mitigation should require SCE to identify and provide a public liaison person before and during construction to respond to public concerns about construction disturbances.

Conclusion

The telecommunication/congestion management system would not cause a change in land use. Since the proposed system is proposed to be located entirely within existing and established rights-of-way, it would not disrupt or divide the physical arrangement of an established community. Also for these reasons, the telecommunication/congestion management system would not restrict existing or future land uses along the route.

3.6 NOISE AND VIBRATION

Environmental Setting

The proposed project is located within the western portion of San Bernardino County, in remote areas, and in the surrounding areas of the cities of Barstow and Adelanto. Noise regulations in the downstream upgrades area are provided by the County. A LORS compliance analysis is presented in Section 5.8.3 of the AMS AFC and would also apply to this project.

Lockhart Substation and Interconnection

The Lockhart Substation site and some of the associated interconnection facilities are proposed to be located within the limits of the AMS. As described in the **Noise** section of the AMS SSA, the proposed site is located on private land in a remote area approximately 5.5 miles northeast of the intersection of SR 58 and Harper Lake Road in the county of San Bernardino. There are no noise-sensitive receptors located in proximity to these facilities.

Lockhart to Tortilla Substation Fiber Optic Line

The Lockhart to Tortilla fiber optic line is located partially within the AMS boundary and mostly along existing transmission line corridors all the way to Tortilla Substation in the city of Barstow. There are noise sensitive receptors located in proximity to the southern portion of this alignment, including residential areas adjacent to this route, primarily in the developed areas surrounding Barstow.

Lockhart to Kramer Substation Fiber Optic Line

The Lockhart to Kramer fiber optic line is located partially within the AMS project site, but mostly along existing utility corridors all the way to Kramer Substation. Most of this route is in remote areas of San Bernardino County with the exception of the far west end of the route that traverses a mixed-use retail/commercial zone near the intersection of Highway 395 and SR 58.

Kramer to Victor Substation Fiber Optic Line

The Kramer to Victor fiber optic line is located mostly along Highway 395 in an undeveloped portion of San Bernardino County. However, the southern portion of the route would traverse through residential neighborhoods, which are considered noise-sensitive land uses.

Potential Impacts of Proposed Downstream Upgrades

The proposed project would generate noise above ambient levels from construction of the substation and interconnection facilities, and installation of the telecommunication cables. Construction noise would include the operation of construction equipment and vehicles at the proposed construction sites, and the transport of construction materials and workers as vehicle trips to and from the project sites. Construction would generate temporary noise levels from construction equipment and vehicles during support demolition, site grading activities, conveyance line and pole installation, substation construction, and surface paving. Construction along the communication line routes would occur on weekdays from 7 a.m. to 7 p.m.; thus, construction noise from line activity would be temporary and short term (1 to 2 workdays) at any one location along the route. Construction of site facilities (i.e., substation) would be over a longer term (approximately 1 year) at the substation site.

Noise impacts from construction are a function of the noise generated by equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise-generating activities. Potential impacts to noise-sensitive receptors from construction noise would be limited to receptors in proximity to site facilities and conveyance line routes. Construction would occur on weekdays between 7 a.m. and 7 p.m. and would not disturb typical weeknight sleep when in proximity to housing receptors. Daytime receptors such as schools and hospitals could be temporarily subjected to and affected by construction noise, including instantaneous maximum noise levels and/or noise levels averaged over time and duration depending on the type of construction (conveyance line or site facility) and proximity to receptors.

The construction equipment required for this project is anticipated to be typical (e.g., no pile drivers or rock blasting), but may include pavement breakers along roadways for underground lines or pole footings. Typical construction equipment for the project options is estimated to generate maximum noise levels of short duration not to exceed 90 A-weighted decibels (dBA) at 50 feet, or average levels of approximately 80 dBA equivalent sound level (Leq) at 50 feet. Without intervening topography or structures, these levels would attenuate over distance at a conservative rate of approximately 6 dBA per doubling of distance (i.e., 80 dBA at 50 feet would attenuate to approximately 74 dBA at 100 feet, and approximately 68 dBA at 200 feet, etc.).

Project construction noise is not anticipated to be substantial and would not exceed San Bernardino County and CEQA significance thresholds. Project operational noise is anticipated to be negligible, as the constructed substation noise would be limited to emergency generators and occasional operation and maintenance activities. Similarly, noise from the installed overhead fiber optic cables would be limited to occasional operation and maintenance activities.

The San Bernardino County Noise Ordinance does not limit construction noise levels. Areas approximately 100 feet from project construction would experience average construction noise levels attenuated to less than 75 dBA Leq (averaged over 1 hour), which many municipal jurisdictions have adopted as an acceptable construction noise level. However, receptors within this distance would be subject to maximum instantaneous construction noise levels of up to 85 dBA, which could be disturbing to receptor activities such as concentration within offices or classrooms, or convalescing at hospitals. Increasing the distance from the construction activities would further attenuate construction noise, thereby lessening the disturbance.

After construction, the proposed substation facilities would generate noise from limited operations and maintenance activities, which may increase short-term ambient noise levels in proximity to the constructed facilities. The effect of operational noise levels on receptors is expected to be less than significant since the substation facilities are remote from receptors.

Construction-noise exposure to sensitive receptors along the fiber optic corridors would be of relatively short duration (approximately 1 to 2 days) at each receptor. Therefore, the combined noise impact of overlapping utility routes at a receptor would be several noise events of short duration staggered over the overall construction period for all of the anticipated downstream upgrades. The communication lines would not generate operational noise except for maintenance activities, including emergency repair.

Lockhart Substation and Interconnection

The substation and interconnection would generate noise primarily from facility site construction (i.e., substation and interconnection elements) and linear facilities installation (i.e., fiber optic cable); minor noise would be generated from the post-construction operation and maintenance of the constructed substation. Construction activities would include site grading, facility installation, paving, and landscaping. Project noise from the substation and interconnection are not anticipated to be substantial, and anticipated to be less than and not to exceed any County or CEQA significance thresholds. Noise-sensitive receptors are not located in proximity to the site and would not be affected by construction noise. Noise impacts for the AMS project site are included in Section 5. 6 of the AMS SSA, and were generally found to be less than significant with implementation of mitigation.

Construction of new 220-kV transmission structures to replace the existing 220-kV transmission structures may require the installation and operation a temporary concrete batch plant within the boundaries of the AMS for purposes of footings for the new transmission structures. The possible concrete batch plant located at the substation site would generate temporary, short-term noise during installation and operation. Due to its remote location, the plant's construction and operation would not result in noise impacts to sensitive receptors. In addition, the batch plant's operation would be limited to weekday, daytime operation per the County Noise Ordinance. Concrete batch plant operations generate noise levels in the range of mid-70 dBA at 100 yards, depending on design specifications of the plant. Truck traffic transporting materials to the plant (e.g.,

aggregate) generates additional noise levels, which can be of concern depending on the truck route. However, the batch plant and truck route would not be located in proximity to noise-sensitive receptors.

Lockhart to Tortilla Substation Fiber Optic Line

The Lockhart to Tortilla fiber optic line includes approximately 31 miles of new fiber optic cable to be installed aboveground on both existing and new poles, except for approximately 1,900 feet of cable that would be installed in both a new underground conduit along Harper Lake Road and an existing underground conduit near the Tortilla Substation.

The overhead cable would require the construction of approximately 55 new poles between the Lockhart Substation and Harper Lake Road. Construction noise from stringing cable on existing poles would be less than noise from trenching and new pole construction. As noted for the substation and interconnection activities above, typical construction equipment for the proposed project is estimated to generate maximum noise levels of short duration not to exceed 90 dBA at 50 feet, or average levels of approximately 80 dBA Leq at 50 feet. Trenching uses typical construction equipment. At 100 feet, these levels would attenuate below typical levels of significance (75 dBA Leq).

Since San Bernardino County does not establish construction noise level limits, trenching activities for the proposed project would not result in a significant noise impact, but would generate temporary short-term noise levels that could be a nuisance to the receptors nearest the trenching activities. Since the line would be located in existing utility rights-of-way along existing roadways, off-road construction vehicle travel is anticipated to be minor.

Lockhart to Kramer Substation Fiber Optic Line

The Lockhart to Kramer line includes approximately 18 miles of new fiber optic cable to be installed above ground on existing and new poles, except for approximately 3,100 feet of cable that would be installed in an underground conduit. The overhead cable at this location would require the construction of approximately 30 new poles. The majority of this line would involve stringing cable on existing overhead utility poles, limiting the construction noise impacts to stringing equipment.

The majority of this alignment is within existing utility rights-of-way in remote areas away from noise sensitive receptors. Ground-disturbing activities including new trenching for underground cable within the AMS property and excavation for the footings of new poles would generate typical construction noise levels. The stringing and installation of fiber optic cable on existing poles would generate lower noise levels associated with equipment and installation vehicles. Refer to the typical noise levels, above, under both the Lockhart Substation and Lockhart to Tortilla fiber optic line.

Kramer to Victor Substation Fiber Optic Line

The Kramer to Victor fiber optic line includes approximately 36 miles of new fiber optic cable to be installed above ground on existing and new poles, except for approximately 2,300 feet of cable that would be installed in an underground conduit within Bellflower

Street and underground conduits within the Victor and Kramer substations. The overhead cable would require the construction of approximately 30 new poles along existing utility rights-of-way and along existing roadways. Construction activities for trenching for the underground cable in Bellflower Street would result in typical construction noise; however, the addition of equipment for pavement cutting could elevate noise levels by 5 to 10 dBA Leq. San Bernardino County does not have a dBA threshold and no significant impacts are anticipated. The stringing and installation of fiber optic cable on existing poles would generate fairly low noise levels, as noted above.

Impact Minimization Measures

It is likely that no additional noise control features or mitigation measures are needed beyond the proposed project's compliance with all applicable noise and vibration LORS for both operation and construction. The proposed project is not anticipated to produce significant adverse noise impacts on people within the affected area, directly, indirectly, or cumulatively.

3.7 SOCIOECONOMICS

Environmental Setting

This preliminary analysis of potential socioeconomic impacts relies on a qualitative assessment of the environmental setting. When a CEQA and NEPA review is conducted, a complete demographic screening should be conducted based on information contained in *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality, 1997) and *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses* (Council on Environmental Quality, 1998). The demographic screening analysis will determine the potentially affected area in which to analyze impacts.

Populations within a six-mile radius of the AMS site were considered in the **Socioeconomic** section of the AMS SSA. This area encompasses the proposed Lockhart Substation and interconnection as well as the northern portions of the proposed Lockhart to Tortilla Substation and Lockhart to Kramer Substation fiber optic lines. The total minority population is 49.17 percent and the total low-income population is 10.21 percent within this area. These percentages are likely to be lower in consideration of the entire DU project area which encompasses the cities of Adelanto, Barstow, and Victorville.

Potential Impacts of Proposed Downstream Upgrades

Typically, long-term employment of people from regions outside the study area could potentially result in significant adverse socioeconomic impacts as a result of relocations and population influx; this would not be required for the DU project. No significant adverse socioeconomics impacts would occur as result of the construction or operation of the anticipated downstream upgrades. The downstream upgrades would not cause a significant adverse impact on population, employment, housing, public finance, local economies, or public services. In addition, because there would be no adverse project-related socioeconomic impacts, minority and low-income populations would not be

disproportionately impacted. The anticipated downstream upgrades would slightly benefit the study area in terms of an increase in local expenditures and payrolls during construction. These activities would have a short-term positive effect on the local and regional economy. No impact minimization measures are recommended.

3.8 SOIL AND WATER RESOURCES

Environmental Setting

The downstream upgrades would be located within the Mojave River area in the western Mojave Desert. Characteristic landforms in the Mojave Desert include broad alluvial fans, old dissected terraces, playas, the Mojave River and its flood plain, and scattered mountains. The Mojave River originates where the West Fork of the Mojave River joins the Deep Creek River. The river flows northward and then eastward past the City of Barstow. A flood plain 0.5 to 1.0-mile wide flanks the Mojave River along most of its course. The environmental setting for the Lockhart substation and interconnection is described in the **Soil and Water Resources** section of the SSA. The proposed fiber optic line routes would cross numerous ephemeral streams and the Mojave River channel.

Potential Impacts of Proposed Downstream Upgrades

All construction activity would require water for dust suppression, soil compaction, drinking and sanitation. Portable sanitation facilities would also be required. The source of water during construction has not been identified. Portable sanitation facilities would have to be serviced regularly, with sanitation waste disposed of at a local treatment facility. Excavated soil would either be reused onsite or disposed of at an appropriately licensed waste facility. Construction waste generated would be disposed of at an appropriately licensed waste facility.

Lockhart Substation and Interconnection

Soil and stabilizing vegetation would be impacted during construction of the transmission interconnection. This construction would involve the preparation of existing roads for SCE construction vehicles and equipment. Preparation of these roads would require clearing of vegetation, blade-grading to remove potholes, ruts, and other surface irregularities, and recompaction to provide a smooth and dense surface. These roads would be graded to a width of approximately 14 feet with 2 foot shoulders on each side. New roads would be graded to similar specification as existing roads and would be constructed to ensure proper drainage to reduce road erosion and rutting.

Construction of the new towers would require an area of approximately 200 by 200 feet to be cleared of vegetation. The towers would require concrete footings set to approximately one to four feet above ground level. Removal of the existing tower would require a temporary laydown area that is approximately 150 by 150 feet, also cleared of vegetation. The footings of the existing tower would be removed, leaving holes of approximately 2 feet below ground surface that would be backfilled and regraded to ground level.

Temporary 220-kV structures may be used during the removal and replacement of the existing 220-kV structure. After the transfer is complete, these structures would have to

be removed. Construction and removal of these temporary structures would disturb the soil and vegetation. Soil and vegetation would also be disturbed by conductor and overhead ground wire stringing, which requires tensioning and pulling equipment. Three tensioning areas, 150 by 500 feet, would be required and three pull areas, 150 by 300 feet, would be required. In addition, six temporary conductor field snub/transfer areas, 150 by 200 feet, would be required to sag conductor wire to the correct tension.

Fiber Optic Lines

The fiber optic line routes would cross several soils types with differing susceptibility to wind and water erosion and compaction. The disturbed soil is more susceptible to erosion and compacted soil can accelerate storm water erosion. In addition, the proposed fiber optic line routes would cross numerous ephemeral streams and the Mojave River channel. Vehicles and equipment crossing these ephemeral streams and the river channel would disturb and compact the soil and potentially cause the loss of stabilizing vegetation. Existing and new poles installed in ephemeral streams and the river channel would be subject to channel scour during storm events.

Impact Minimization Measures

The **Soil and Water Resources** section of the SSA discusses mitigation measures that are designed to avoid and reduce the amount of soil loss due to wind and water erosion. These mitigation measures include implementation of a construction SWPPP. The Clean Water Act (CWA) (33 U.S.C. Section 1251 *et seq*.), formerly the Federal Water Pollution Control Act of 1972, regulates discharges through the NPDES permit process (CWA Section 402). In California, the NPDES program is administered by the State Water Resources Control Board (SWRCB). Pursuant to NPDES permit requirements, SCE would be required to prepare and adhere to a SWPPP that would minimize construction erosion. The SWPPP would include temporary and permanent BMPs to protect water quality and soil resources, demonstrate no increase in offsite flooding potential, and identify all monitoring and maintenance activities. SCE should complete all engineering plans, reports, and documents necessary for the lead agency to conduct a review of the project and provide a written evaluation as to whether the proposed grading, drainage improvements, and flood management activities comply with all requirements of the construction SWPPP. Examples of BMPs that should be included in the SWPPP are:

- The use of existing poles should be optimized during fiber optic cable installation to reduce the amount of soil and vegetation that could be disturbed and compacted.
- Erosion control measures should be developed and implemented to ensure minimum soil loss and to maintain water quality. Examples include: silt fences, sediment basins, sediment traps, check dams, fiber rolls, gravel bag berms, sandbag barriers, straw bale barriers, storm drain inlet protection, street sweeping and vacuuming, wind erosion control, soil binders and weighting agents, stabilized construction entrance/exit, stabilized construction roadway, and entrance/outlet tire wash.
- Measures should be taken to insure that contaminants would not be discharged from the construction site.

- All areas disturbed by the construction activity, except for access roads, should be restored to preconstruction conditions. This restoration may include grading and restoration of sites to original contours to facilitate natural re-vegetation, proper drainage, prevent erosion, and reseeding where appropriate.
- SCE should conduct a final inspection to ensure that all BMPs have been implemented successfully.

The following suggested measures or similar should be implemented in areas that are temporarily disturbed:

- Soils and vegetation disturbance and removal should be limited to the minimum area necessary for access and construction.
- Vehicles should be inspected daily for fluid leaks before leaving the staging area.
- Spill controls and cleanup plans and procedures should be developed. Spill-control and cleanup materials should be kept onsite at all times during construction. Workers should be trained in their use.

The following suggested measures or similar should be implemented for earth disturbing activities associated with work on tower footings:

- Removed topsoil should be segregated and stockpiled for reuse if practicable.
- All activity should be minimized during winter and other wet periods to avoid accelerating erosion and increasing compaction of the soil.
- All soil excavated for structure foundations should be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations.
- Use of ground-disturbing mechanical equipment to remove vegetation should be avoided on slopes over 30 percent or on highly erosive soils, unless it can be demonstrated that erosion of the disturbed slopes would not accelerate.

The following suggested measures or similar should be implemented during construction activities in and around any water bodies or ephemeral washes:

- Discharge of material, such as displaced soils and vegetation debris, within waters of the United States may be subject to USACE regulations under the CWA.
- Wetland delineation surveys should be conducted before each phase of project construction to identify jurisdictional wetlands and Waters of the U.S.
- Mitigation for the permanent loss of jurisdictional wetlands or Water of the U.S. should be provided per agreement with the USACE.
- Access ways should be located to avoid wetlands or, if necessary, crossed at the least sensitive feasible point.
- If wet areas cannot be avoided, SCE should use wide-track or balloon tire vehicles or timber mats.

- Grading should be minimized as much as possible. When required, grading should be conducted away from watercourses/washes to reduce the potential for material to enter the watercourse.
- Excavated material or other construction materials should not be stockpiled or deposited near or in stream banks or other watercourse perimeters.
- Sediment control devices, such as placement of native rock, should be used at all dry wash crossings as appropriate.
- All fill or rip-rap placed within a stream or river channel should be limited to the minimum area required for access or protection of existing SCE facilities.

Conclusion

It is expected that construction of the downstream upgrades would be done in compliance with all pertinent LORS. Crossing of jurisdictional waters, such as the Mojave River, may require a permit from the USACE and Lahontan Regional Water Quality Control Board for dredge and fill activities. Additionally, the downstream upgrades would need to implement measures similar to those discussed above as well as construction SWPPP/BMPs to avoid and reduce environmental impacts to soil and water resources to levels that are less than significant.

3.9 TRAFFIC & TRANSPORTATION

Environmental Setting

The anticipated downstream upgrades would involve construction of the Lockhart Substation, looping of and transmission lines and connecting the AMS, within and adjacent to the AMS site. The project would also involve stringing new telecommunication / fiber optic lines adjacent to, and across, portions of two highways (SR 58 and Highway 395) and numerous surface streets such as: Harper Lake Road, Summerset Road, Community Boulevard, Lenwood Road, Sun Valley Road, and Bonanza Road.

SR 58 and Highway 395 are mostly 4-lane[1], high speed, divided roadways in the project area. The traffic volumes are 12,100 on SR 58 (near Harper Lake Road) and 7,800 on Highway 395 (south of SR 58) (AS 2010a; Table 5.13-2). The surface streets described above are 2-lane roadways with relatively light traffic volumes.

Potential Impacts of Proposed Downstream Upgrades

Lockhart Substation and Interconnection

Traffic and transportation impacts for the AMS project site are included in Section 5.10 of the SSA, and were generally found to be less than significant with implementation of mitigation. Impacts for substation-related activities would create similar types of impacts but at a reduced level.

[1] Caltrans is pursuing a construction project to widen the only 2-lane section of SR 58 (east of Harper Lake Road) to 4 lanes.

Fiber Optic Lines

The anticipated downstream upgrades would involve a 12-person construction crew and approximately 7 small- to medium-size trucks (with some pulling trailers). The potential congestion impacts from a 12-person crew are negligible. Assuming all personnel commuted to and from the construction area in their own vehicles, this would equate to 24 trips per day. As all of the construction is expected to occur in SCE rights-of-way (not in the roadways), the construction workers are not anticipated to drive in the streets as part of the construction activity. They may need to occasionally cross a street during the course of the construction, but this would be infrequent and not contribute to any congestion.

To put the expected 24 trips per day into perspective, the expected trip generation from the AMS project is 2,278 trips per day during construction and 250 trips per day during typical operations. The addition of 24 trips per day would be imperceptible on the study area roadways and would not result in any impacts.
Installation of fiber optic lines would not require any road closures or lane reductions. However, should the temporary closure of any roadways or lanes (for example, to string cable from pole-to-pole across a roadway or trench under a roadway), then SCE should identify these issues. Depending on the roadway closed/lane reduced and the duration of its closure/lane reduction, impacts to traffic and transportation during construction could be potentially significant without mitigation.

Routine maintenance required for the substation, towers and fiber optic lines would not generate traffic and transportation impacts due to limited occurrences and vehicle use.

Impact Minimization Measures

No significant traffic impacts would result from construction and/or operation of the Lockhart Substation, interconnection, and telecommunication facilities. Construction vehicles would comply with all local, state, and federal LORS. It is recommended that SCE prepare a Construction Traffic Control Plan to identify any issues or roadway closures and appropriate treatment and mitigation.

Conclusion

The fiber optic line construction would require an average of four personnel for each of the three segments and would not result in any long-term significant impacts. The Lockhart Substation would be an un-staffed facility; no personnel would be assigned to the station for daily operations. Routine maintenance would require periodic trips to the station or to check on fiber optic lines and interconnection lines, but traffic associated with those trips is considered negligible. No significant traffic impacts are projected as a result of the proposed project. Construction vehicles would comply with all local, state, and federal LORS.

3.10 WASTE MANAGEMENT AND HAZARDOUS MATERIALS

Environmental Setting and Potential Impacts

Construction and operation of the proposed Lockhart Substation would require the limited use of hazardous materials such as fuels, lubricants, and cleaning solvents. The

fiber optic lines and related facilities would be routed mostly through undeveloped publicly-owned desert land with relatively few activities that could generate hazardous wastes or contaminated areas.

Waste management activities associated with the anticipated downstream upgrades would include the storage, transport, recycling, or disposal of all project waste streams. Waste streams generally include solid waste, including excavated soil that could not be backfilled, vegetation and sanitation waste as well as empty cable reels and cut-off pieces of fiber optic cable. All waste streams are regulated and discharges or disposal of any waste material either requires specific permitting, or disposal at a permitted facility based on the type of waste. Both solid and liquid waste streams can be either hazardous or non hazardous, depending on the constituents in the waste stream and the characteristics (e.g., ignitability, reactivity, toxicity, and corrosivity) of the waste. The status of the waste stream determines both the storage options for the material, and the disposal method for the material. With exception of the proposed Lockhart substation, limited quantities of waste materials would be generated.

Solid waste disposal sites are permitted as either Class III facilities, which accept municipal solid waste, or Class I facilities which accept hazardous waste. Within San Bernardino County, there are seven existing Class III commercial solid waste disposal facilities which could accommodate the wastes generated by the downstream upgrades.

Impact Minimization Measures

Staff recommends that the following measures be implemented during construction to mitigate potential impacts resulting from improper waste or hazardous materials management:

- A Phase 1 Environmental Site Assessment should be prepared to identify documented contamination sites relative to project sites outside of existing rights-of-way. Additional analysis and avoidance/mitigation measures may be needed based on initial results.
- If visual contamination indicators are observed during construction, the contractor should be required to stop work until the material is properly characterized and appropriate measures are taken to protect human health and the environment. A Professional Engineer or Professional Geologist should inspect the site, determine what is required to characterize the nature and extent of contamination, and provide a report to the CPUC and DTSC with findings and recommended actions.
- A waste management plan should be prepared to ensure that all construction materials and debris would be removed from the area and recycled or properly disposed of offsite.
- Construction waste should be recycled where feasible.
- Hazardous waste handling should incorporate the following: properly store, package, and label all hazardous waste; use only approved transporters; prepare hazardous waste manifests; keep detailed records; and appropriately train employees to comply with state and federal hazardous waste management requirements.

- Hazardous wastes should be stored onsite in accordance with accumulation time limits and then properly manifested, transported to, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies.
- Portable liquid waste systems (port-a-potties) should be utilized at all construction locations, including regular maintenance of the facilities.

Conclusion

The downstream upgrades would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during both project construction and operation. In addition, the site should be managed such that contaminants would not pose a significant risk to humans or to the environment. Implementing the measures recommended above or similar for construction and operation would avoid impacts to workers and the environment.

3.11 WORKER SAFETY/PUBLIC HEALTH AND SAFETY

Environmental Setting

Fire support services to the anticipated downstream upgrades area would be under the jurisdiction of the San Bernardino County Fire Department (SBCFD), North Desert Division. There are a total of twenty fire stations within the SBCFD North Desert Division, the closest of which would be Hinkley Station #125, in Hinkley; Silver Lakes/Helendale Station #4, located off Route 66 between Barstow and Victorville; and Harvard Station #46, located northeast of Barstow. Response time would vary as some stations are staffed with paid on-call firefighters, and others are staffed with full-time personnel. All personnel at the SBCFD North Desert Division are trained as Emergency Medical Technicians (EMT) Level-1 and as first responders to hazardous materials incidents. The large majority of personnel are also trained paramedics (SBCFD 2010 in the SSA).

Potential Impacts of Proposed Downstream Upgrades

Two issues are assessed in worker safety:

1. The potential for impacts on the safety of workers during construction, and operations activities, and

2. Fire prevention/protection, emergency medical response, and hazardous materials spill response during construction, and operations.

Worker safety issues are thoroughly addressed by Cal/OSHA regulations. If all LORS are followed, workers would be adequately protected and no impacts would occur. No impact minimization measures are recommended. Compliance with LORS would also protect the public.

3.12 VISUAL RESOURCES

Environmental Setting

The regional landscape in the anticipated downstream upgrades area is formed by north-south-trending mountain ranges separated by broad valleys and is characterized by native low, shrubby Mojave creosote scrub vegetation and an absence of trees. Notable man-made features in the area include numerous high-voltage electric transmission lines of various sizes and configurations, electric substations, highways, and sparse commercial, industrial and residential development.

Lockhart Substation and Interconnection

The proposed Lockhart Substation would be located on the AMS project site, which is in unincorporated San Bernardino County in the Harper Lake Valley of the western Mojave Desert. Refer to Section 4.12 (**Visual Resources**) of the AMS SSA for a description of the AMS visual resources setting, which would also apply to the proposed Lockhart Substation and interconnection area.

Lockhart to Tortilla Substation Fiber Optic Line

The existing high-voltage transmission lines are the predominant visual reference point along the northern portion of the route east of the proposed Lockhart Substation and along Harper Lake Road; this portion of the route is bound mostly by open space and limited agriculture.

Where the route turns and heads east along SR 58, the Hinkley Substation is the primary visual focus since it is the only structure in the vicinity and is surrounded by open space. Most of this portion of the route along SR58 can be described as flat terrain, abutted on both sides of road by open space, agriculture, and rural residential toward the east end of this segment. The existing poles along Summerset Road, Community Boulevard, and Lenwood Road traverse through similar, flat terrain, with the addition of more rural residential uses on either side of the roads. The route continues south crossing railroad tracks and Main Street, which is the main thoroughfare into Barstow.

As the existing overhead transmission line crosses south of Main Street along Sun Valley Drive and then northeast, the visual setting consists of more of mixed land uses, including commercial, residential, and light industrial, followed by medium density residential land uses along I Street and Bonanza Road, until the existing overhead transmission line traverses through an open field in a southeast direction to the Tortilla Substation. The substation and existing overhead line are situated in the middle of an open field surrounded by residential communities to the west and north. No significant visual resources exist along the Lockhart to Tortilla Substation fiber optic line.

Lockhart to Kramer Substation Fiber Optic Line

The northern portion of the Lockhart Substation to Kramer Substation fiber optic route is described visually as vast desert open space marked only by the existing transmission structures and line and dirt roads crisscrossing the route. The route on the west side of Highway 395, heading to the Kramer Substation, is more of a retail, industrial setting,

since the crossroads of Highway 395 and SR 58 are surrounded by service stations, restaurants, and the Kramer Substation. The existing overhead transmission line is not the dominant visual feature near this intersection. The cable would continue south connecting with the Kramer Substation, which is a relatively large and industrial facility. No significant visual resources exist along the Lockhart to Kramer Substation fiber optic line.

Kramer to Victor Substation Fiber Optic Line

As noted above, the Kramer Substation is a dominant feature at the crossroads of SR 58 and Highway 395; however, this industrial land use is located near an intersection with a number of retail and commercial land uses, including fuel stations and restaurants. As such, the substation is not considered a visual distraction given the nature of this intersection. The proposed fiber optic cable between Kramer and Victor substations would follow within the rights-of-way of three existing transmission line corridors that parallel the west side of Highway 395. These three existing transmission lines are prominent in the view of motorists driving along this stretch of the highway. Views to the west are interrupted by the existing transmission structures and line since the corridors are close to the highway's western right-of-way.

The existing visual setting between the Kramer Substation and three quarters of this alignment south consists of undeveloped open space with varying topography, but mostly gently rolling slopes and knolls within approximately 0.25 mile of the west side of Highway 395. The terrain to the east is relatively flat, with fairly long-distance views to the east across the desert. At approximately 5.4 miles south of the Kramer Substation, the three existing transmission lines bend westerly to route around one of the higher knolls. At this point, the transmission towers and lines are not visible from Highway 395 for approximately one mile.

As the proposed route nears the city of Adelanto, retail, commercial, light industrial, and residential land uses become more evident along both sides of the highway. The proposed fiber optic line would transition from new poles to existing poles that continue along the west side of the highway, turning slightly west along Bellflower Street and through commercial and then residential land uses.

The existing transmission line poles follow along the east side of Bellflower Street until a transition to underground trenching is required within this street, just south of Lee Avenue. This area consists of medium to high-density residential land uses on both sides of the street, so the visual character of this proposed underground segment is more urban, with existing utility poles a common feature that blend in with the setting.

The fiber optic cable would transition back to overhead south to Bartlett Avenue where the existing poles head east toward Highway 395. This area continues to be characterized as urban with more retail and commercial uses as the poles near the intersection of Highway 395. This visual setting of retail and commercial urban land uses continues south and all along the highway corridor until the existing poles intersect with Palmdale Avenue Road and head east to the Victor Substation. The existing overhead poles and line for this southern portion of the alignment are not prominent visual features and tend to blend into the urban setting.

The Victor Substation, a large substation similar to the Kramer Substation, is east of Highway 395 but still within a fairly urban setting between the retail and commercial uses along the highway and residential communities to the east. The substation is a prominent visual feature along this stretch of Palmdale Road.

Potential Impacts of Proposed Downstream Upgrades

The proposed Lockhart Substation and interconnection facilities are consistent with the adjacent solar power-generating facility to the northwest and the existing high-voltage transmission lines. The substation structure would not exceed the heights of proposed AMS facilities and the substation and interconnection elements are not located in an area considered to have sensitive visual features.

Fiber optic cable would be installed overhead on new poles and existing poles as well as underground. New poles would be located within existing utility rights-of-way and parallel to existing overhead lines. The new poles would be equal to or lower in height to the existing wooden transmission poles and substantially smaller in scale than the existing 220-kV towers. Stringing activities and construction equipment would be located within existing utility rights-of-way. Because the fiber optic cable would either utilize existing overhead utility poles, be placed underground, or utilize new poles within existing utility corridors that already contain overhead transmission lines, these cables would represent only a minor visual change and would be consistent in character with existing facilities.

Construction and operation of the downstream upgrades would not adversely affect scenic vistas, would not damage or remove any scenic resources, and would not degrade existing visual character or quality. Further, the anticipated downstream upgrades would not result in sources of substantial light or glare that would impact day or nighttime views, with implementation of design features below.

Impact Minimization Measures

With the inclusion of the following recommended mitigation measures or similar, potential visual impacts related to construction activities would be less than significant:

- During construction of the telecommunications system, work sites should be kept clean of debris and construction waste. Material and construction storage areas should be selected to minimize views from public roads, trails, and any nearby residences.
- Where excavated materials would be visible from sensitive viewing locations, such materials should be disposed of in a manner that is not visually evident and does not create visual contrasts.
- All areas disturbed during construction should be appropriately rehabilitated in conformance with applicable Erosion Control and Revegetation Plans.

With the inclusion of the following recommended mitigation measures or similar, potential visual impacts related to operation activities would likely be less-than-significant:

- Non-specular and non-reflective cable should be used wherever the cable is strung overhead in order to reduce its visibility and visual contrast;
- Hardware used on overhead sections should be non-reflective and non-refractive.

Conclusion

Construction of the downstream upgrades would require only permanent disturbance for construction of the Lockhart substation and temporary disturbance for installation of new poles and trenching for underground conduits. Placement of the Lockhart substation at the AMS site would not increase visible impacts associated with the AMS project.

Since the telecommunications system would mostly utilize existing overhead utility poles, be placed underground, or install new poles within existing transmission line corridors, the fiber optic cable would constitute a relatively minor visual change. The addition of the new poles would not substantially alter the existing visual setting of the DU project area. The use of non-specular cable and non-reflective and non-refractive hardware would minimize the potential for any long-term impacts associated with operation of the telecommunications system. The DU project would not cause a reduction in scenic quality and no significant visual impacts are expected.

4.0 SUMMARY OF CONCLUSIONS

This analysis of downstream upgrades was prepared to inform the Energy Commission Committee and the general public of the potential direct and indirect effects of this project, which is considered a reasonably foreseeable development resulting from the AMS project. The analysis of potential environmental impacts is based on a planning-level project description of required facilities and measures to minimize potential effects are recommended.

The proposed project would not result in significant and unmitigable impacts to any issue area. The following issue areas would not be impacted by the proposed project: Facility Design, Power Plant Efficiency, Power Plant Reliability, and Transmission Line Safety and Nuisance. For the remainder of the issue areas, it is anticipated that environmental impacts associated with the proposed downstream upgrades would be less than significant with implementation of the recommended mitigation measures identified herein. Additional measures may be required by CPUC and BLM or DOE upon further environmental analysis pursuant to CEQA and NEPA, once preliminary project design information is available.

5.0 REFERENCES

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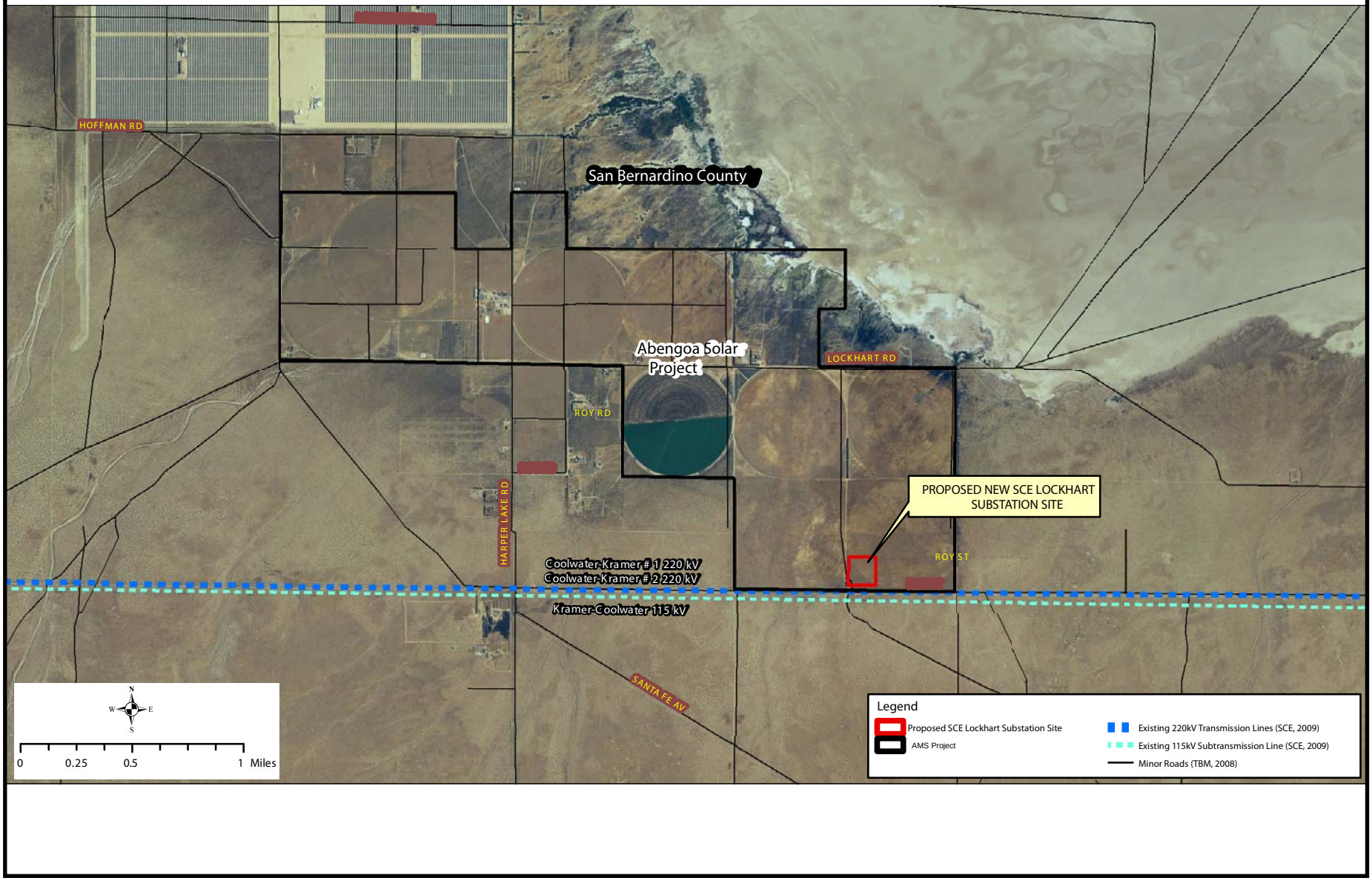
TRANSMISSION SYSTEM ENGINEERING - APPENDIX A - FIGURE 1

Abengoa Mojave Solar Project - Proposed SCE Lockhart Substation Site



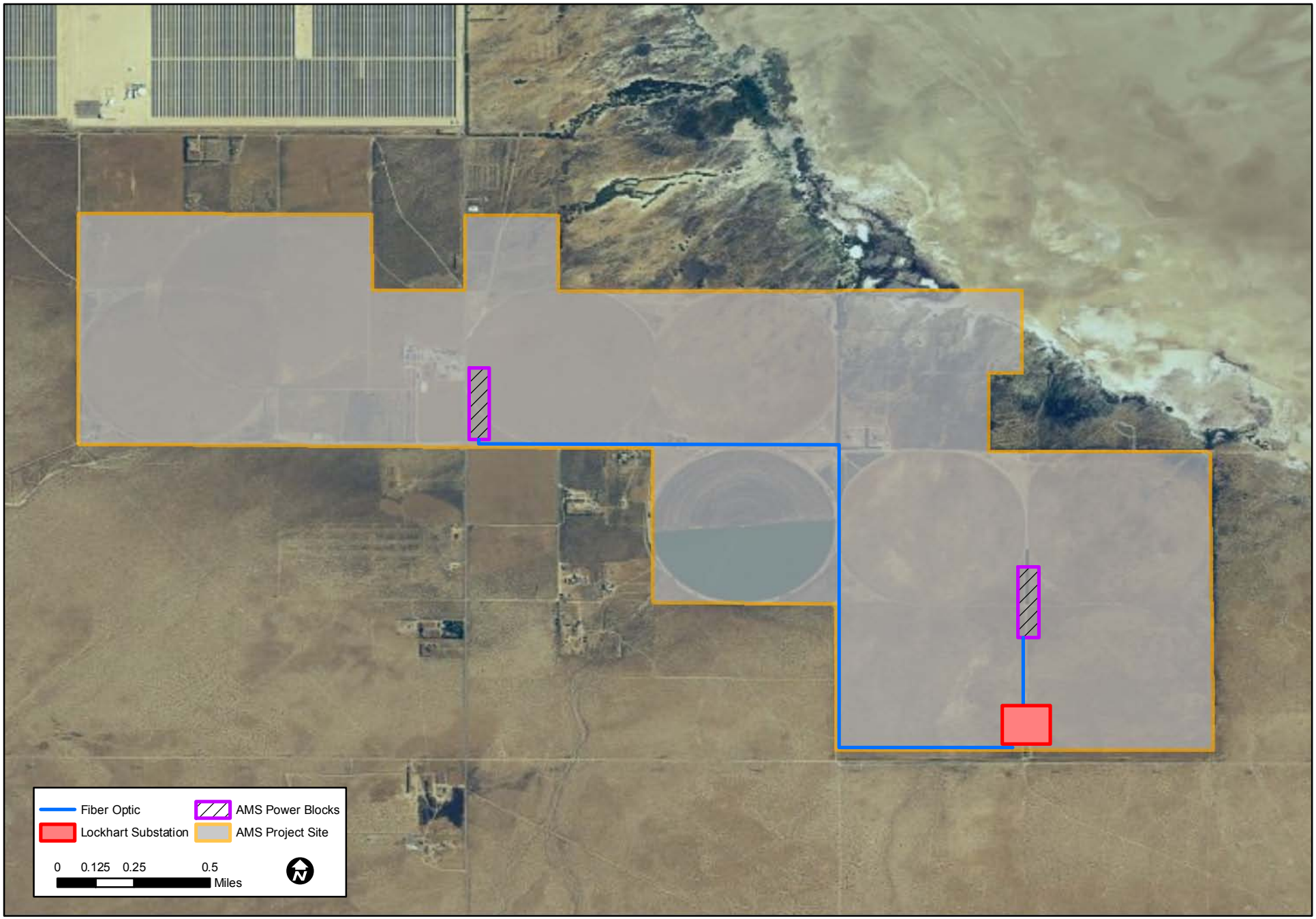
TRANSMISSION SYSTEM ENGINEERING

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: SCE Lockhart Substation Project Description for Abengoa Solar Inc., 4-15-2010, Fig. 1

TRANSMISSION SYSTEM ENGINEERING - APPENDIX A - FIGURE 2

Abengoa Mojave Solar Project - AMS to Lockhart Substation Fiber Optic Lines



TRANSMISSION SYSTEM ENGINEERING

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

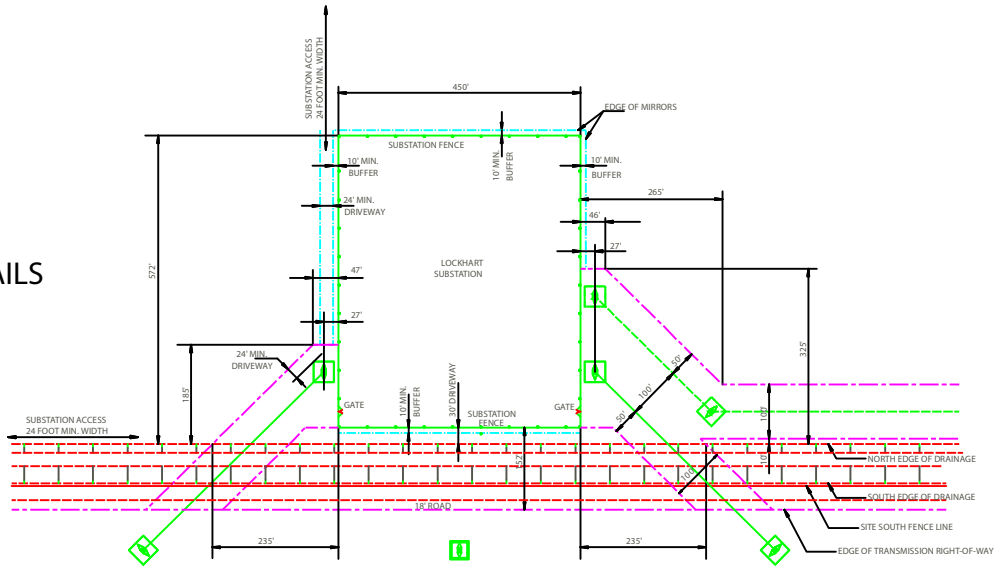
SOURCE: Adapted from SCE Lockhart Substation Project Description for Abengoa Solar Inc., 4-15-2010, Fig. 3-5

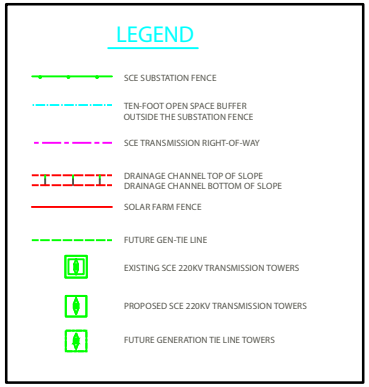
TRANSMISSION SYSTEM ENGINEERING - APPENDIX A - FIGURE 3

Abengoa Mojave Solar Project - Lockhart Substation Interconnection

TRANSMISSION SYSTEM ENGINEERING

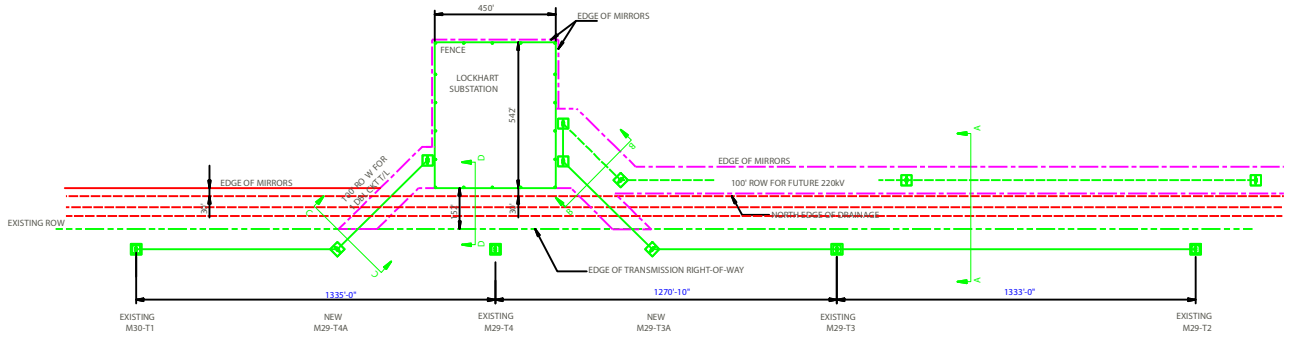
SUBSTATION DETAILS





Note: CONCEPTUAL ENGINEERING, DO NOT SPOT

SITE PLAN

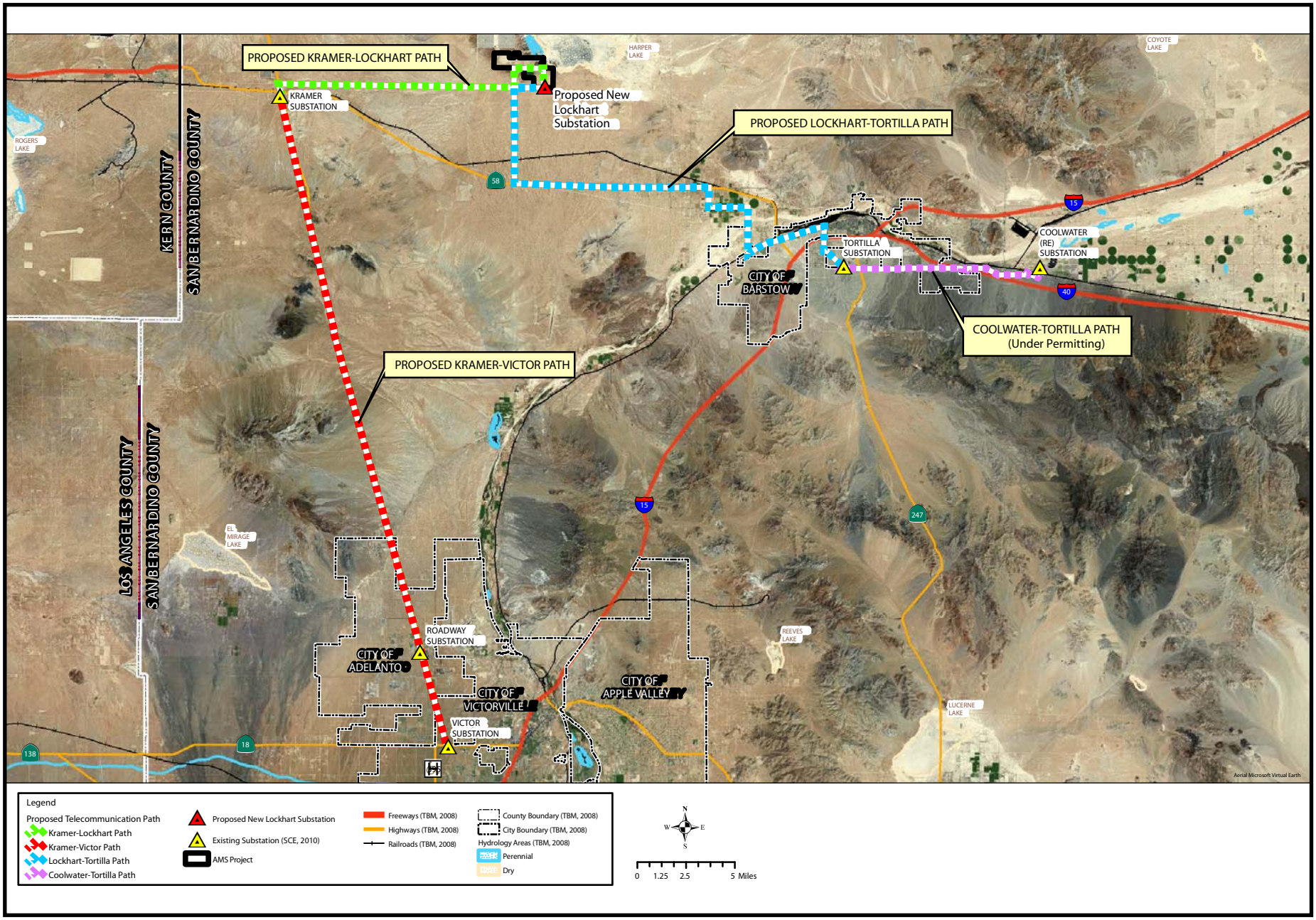


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: SCE Lockhart Substation Project Description for Abengoa Solar Inc., 4-15-2010, Fig. 2

TRANSMISSION SYSTEM ENGINEERING - APPENDIX A - FIGURE 4

Abengoa Mojave Solar Project - Overview of Proposed Fiber Optic Lines

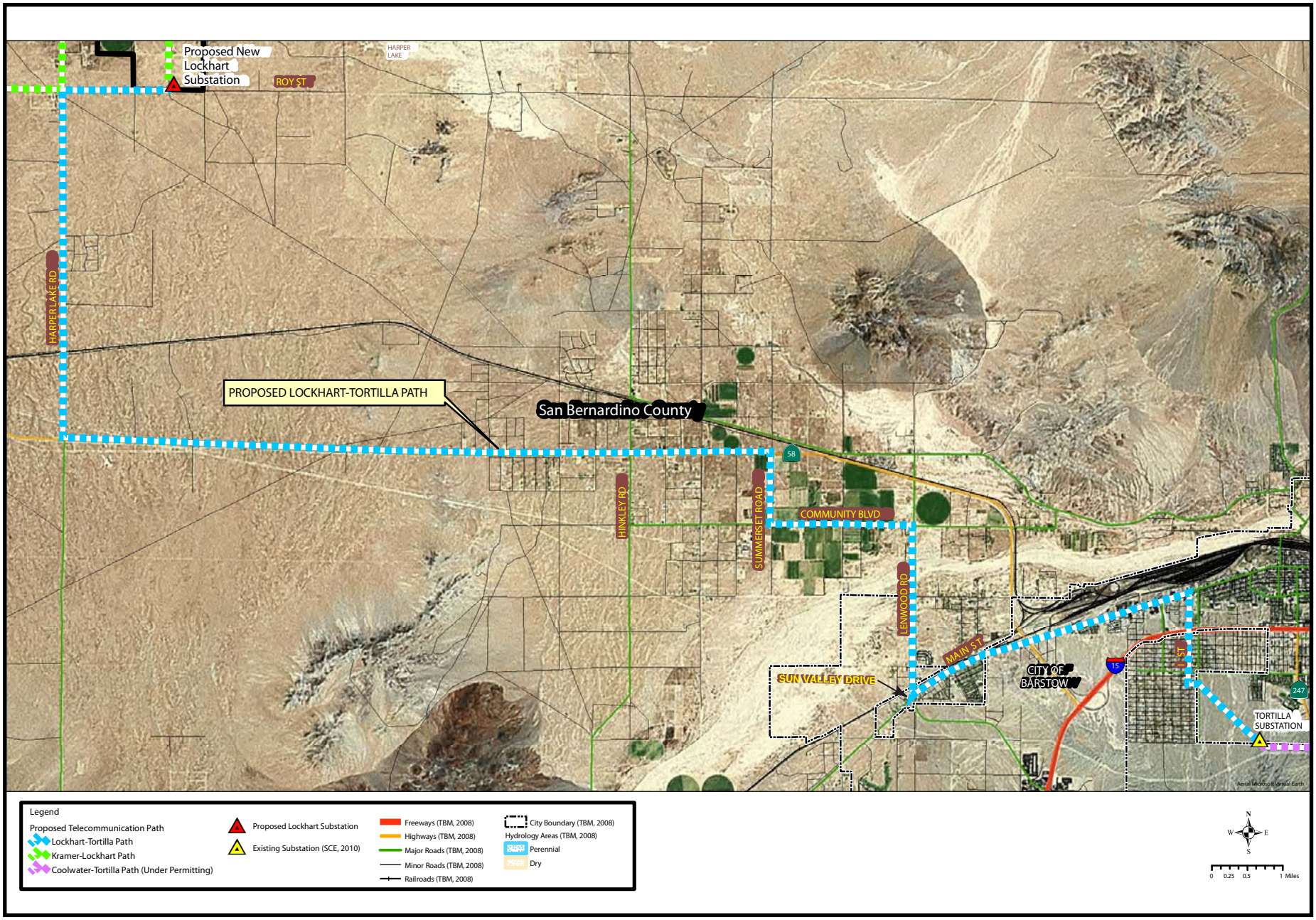


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: SCE Lockhart Substation Project Description for Abengoa Solar Inc., 4-15-2010, Fig. 3-1

TRANSMISSION SYSTEM ENGINEERING - APPENDIX A - FIGURE 5

Abengoa Mojave Solar Project - Proposed Lockhart to Tortilla Fiber Optic Line



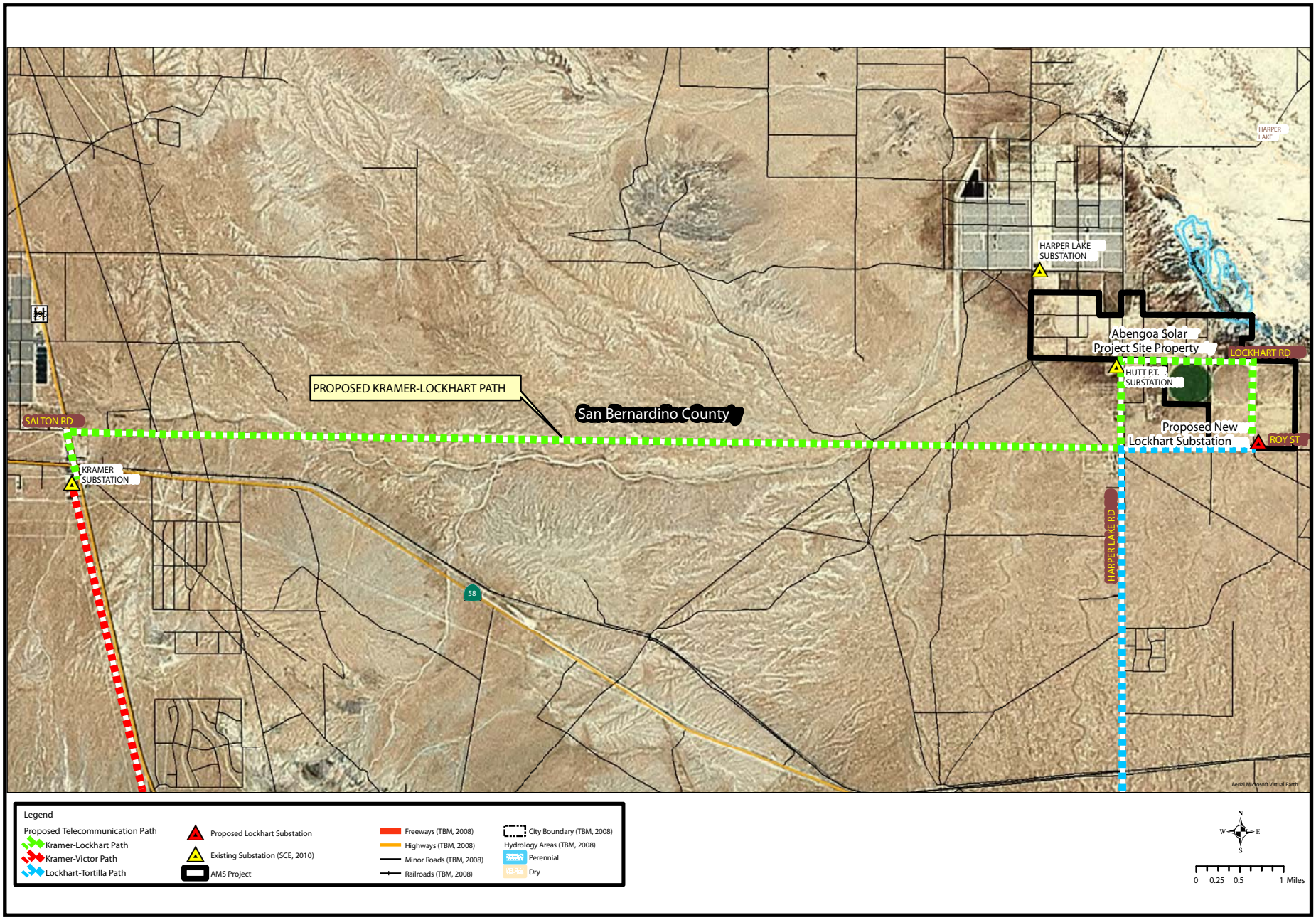
TRANSMISSION SYSTEM ENGINEERING

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: SCE Lockhart Substation Project Description for Abengoa Solar Inc., 4-15-2010, Fig. 3-3

TRANSMISSION SYSTEM ENGINEERING - APPENDIX A - FIGURE 6

Abengoa Mojave Solar Project - Proposed Lockhart to Kramer Fiber Optic Lines



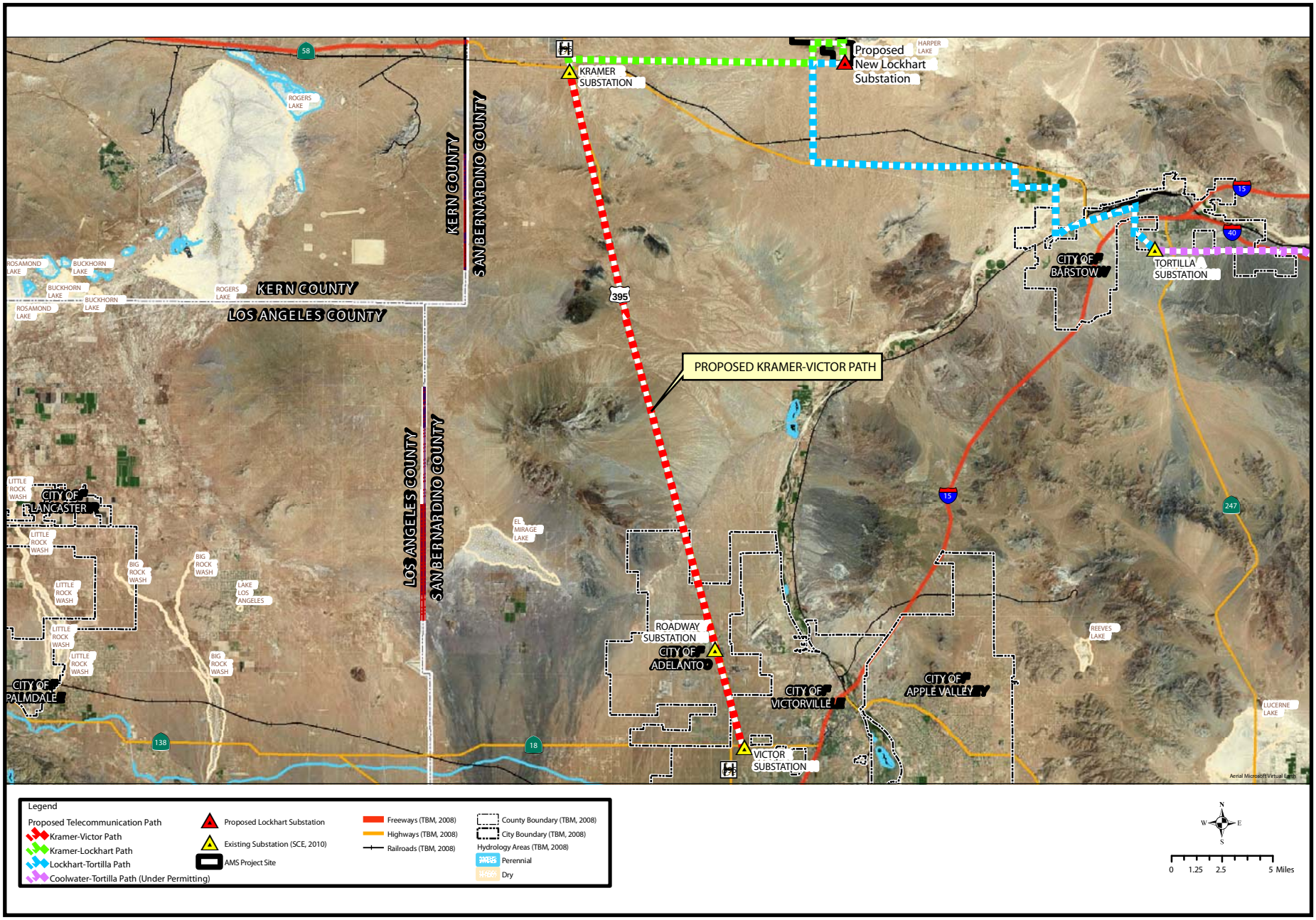
TRANSMISSION SYSTEM ENGINEERING

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: SCE Lockhart Substation Project Description for Abengoa Solar Inc., 4-15-2010, Fig. 3-2

TRANSMISSION SYSTEM ENGINEERING - APPENDIX A - FIGURE 7

Abengoa Mojave Solar Project - Proposed Kramer to Victor Fiber Optic Line



TRANSMISSION SYSTEM ENGINEERING

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: SCE Lockhart Substation Project Description for Abengoa Solar Inc., 4-15-2010, Fig. 3-6

PREPARATION TEAM

ABENGOA MOJAVE SOLAR
09-AFC-5
PREPARATION TEAM

Executive Summary ..... Craig Hoffman

Transmission System Engineering .....Ajoy Guha, P.E. and Mark Hesters

Transmission System Engineering – Appendix A..... Heather Blair

Project Assistant .....April Albright

Staff Counsel.....Christine Hammond

DECLARATION OF
Craig Hoffman

I, Craig Hoffman, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division, as a Project Manager (Planner III).

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the **Executive Summary** for the **Abengoa Mojave Solar** project (09-AFC-5) based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 6/10/10 Signed: Original signed by C. Hoffman

At: Sacramento, California

CRAIG D. HOFFMAN

EDUCATION

Master of Rural and Town Planning May 1997
California State University, Chico

Bachelor of Arts in History; Minor in Planning and Development May 1995
California State University, Chico

PROFESSIONAL EXPERIENCE

California Energy Commission June 2009 to Present
Siting, Transmission and Environmental Protection Division

Project Manager
Responsible for the day-to-day management of the certification process for thermal power plants of 50 megawatts or greater along with transmission lines, fuel supply lines, and related facilities to serve them. Works as a team leader on the coordination of activities and work product of technical specialists in 20 environmental and engineering disciplines. Coordinates project calendaring, public notices, workshops and public hearing meetings, the preparation of a preliminary staff assessment (draft EIR) and final staff assessment (final EIR). Responsible for identifying key technical and process issues and notifying management team of issues and process concerns. Recommends actions, policies and procedures affecting projects and program direction in order to ensure that needed energy facilities were authorized in an expeditious, safe and environmentally acceptable manner, consistent with the requirements of the Warren-Alquist Act and the California Environmental Quality Act (CEQA).

Trinity Investment Partners December 2008 to June 2009

Senior Associate
Was involved in project site investigation, due diligence, feasibility reports, budgets, funding source books and presentations to financial investors and institutions. Projects ranged in complexity and were typically impaired brownfield developments. Interacted with local jurisdiction community development staff to determine appropriate project land use mix and determine design feature limitations. The selection of project sites and land use assumptions were important to gain funding and financial backing to move

forward with the entitlement and development of projects. Prepared CEQA screening studies in order to determine potential impacts and provide the jurisdictions base line information for preparation of CEQA environmental reviews.

RCH Group / The Hodgson Company November 2007 to December 2008

Project Manager
Provided a full-range of real estate consulting and advisory services in mixed-use land development, entitlement processing, urban design and project management. These services included a range of legal, strategic, management and political advisory services - from advocating a project property before government agencies to resolving conflicts among project participants. Was the project manager for several large specific plans in the Sacramento region. This included coordination with owners groups, consultants, city and county jurisdictions, preparation of budgets, time lines and process charts and interaction with public and jurisdictional groups. Coordinated the preparation of EIRs and EIS's for projects along with securing proposals from various consultants to prepare technical studies for the environmental document. Also prepared numerous property evaluation and feasibility reports for lending institutions on foreclosed properties including large development entitlements.

Dunmore Communities / Dunmore Capital April 2005 to September 2007

Project Manager
As a project manager, was involved in project development from the acquisition of undeveloped property to the ultimate development of a successful project. These projects included the entitlement of large land parcels for master planned communities, commercial developments and residential subdivisions. Prepared due diligence, feasibility reports, and budgets; interacted with local jurisdiction staff; was involved in the layout and development of land plans; worked on design charettes; presented projects at public hearings; processed construction documents and helped facilitate building contracts and activities. Coordinated the preparation of EIRs and EIS's for projects along with securing proposals from various consultants to prepare technical studies for the environmental document. Prepared CEQA screening studies in order to determine potential impacts and provide the jurisdictions base line information for preparation of CEQA environmental reviews.

Pacific Municipal Consultants January 2000 to April 2005

Associate and Senior Planner
As a public agency contract planner, provided current, long range and environmental planning services to numerous city and county jurisdictions. Work efforts included the processing of General Plan Amendments, Specific Plans, Rezones, Williamson Act Contracts, Annexations, Vesting Tentative Subdivision Maps, Tentative Subdivision

Maps, Use Permits, Design Review for large scale residential master plans, commercial centers, multi-family projects, and mixed-use sites, policy document preparation, and appropriate environmental documentation for projects consistent with the requirements of CEQA. Presentations to community groups, Planning Commissions, City Councils and Board of Supervisors were routine activities and an integral part of public hearing process.

Was a senior planner from 2001 to 2003 and was the lead current planner for the City of Elk Grove from 2003 to 2005. Was responsible for the management of projects that were complicated, had the potential for public scrutiny and the city needed the projects to move forward. Was the lead planner on the Laguna Ridge Specific Plan and coordinated the planning process, the EIR and all approval documents.

Sierra County Planning Department October 1997 to January 2000

Planner II

Responsible for current planning functions including review, recommendation, and presentation to Planning Commission and Board of Supervisors. Evaluation of land-use and development applications, including general plan amendments, zone amendments, zone variances, special use permits, site plan review, reclamation plans, and tentative parcel map review, for consistency with County and State regulations. Prepared environmental documents as required by CEQA for development projects. A typical environmental document was the preparation of a mitigated negative declaration with attached technical studies. Review of building applications for consistency with General Plan, Zoning Ordinance and other County policies. Answer public inquiries regarding county planning and building issues, demographics and statistics.

DECLARATION OF
Ajoy Guha

I, **Ajoy Guha**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division, as an Associate Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the **Transmission System Engineering** for the **Abengoa Mojave Solar** project (09-AFC-5) based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 23, 2010 Signed: Original signed by A. Guha

At: Sacramento, California

RESUME

AJOY GUHA

Associate Electrical Engineer
California Energy Commission
1516 Ninth Street, MS 46
Sacramento, CA 95814

EDUCATION:

MSEE, POWER SYSTEMS ENGINEERING, PURDUE UNIVERSITY, INDIANA
BSEE, ELECTRICAL ENGINEERING, CALCUTTA UNIVERSITY, INDIA

CERTIFICATIONS:

REGISTERED PROFESSIONAL ENGINEER, CALIFORNIA, INDIANA & ILLIINOIS
MEMBER OF IEEE; MEMBER OF THE INSTITUTION OF ENGINEERS OF INDIA

SUMMARY OF PROFESSIONAL BACKGROUND:

Ajoy Guha, P. E. has 34 years of electric utility experience with an extensive background in evaluating and determining current and potential transmission system reliability problems and their cost effective solutions. He has a good understanding of the transmission issues and concerns. He is proficient in utilizing computer models of electrical systems in performing power flow, dynamic stability and short circuit studies, and provide system evaluations and solutions, and had performed generator interconnection studies, area transfer and interconnected transmission studies, and prepared five year transmission alternate plans and annual operating plans. He is also experienced in utilizing Integrated Resource Planning computer models for generation production costing and long term resource plans, and had worked as an Executive in electric utilities and experienced in construction, operation, maintenance and standardization of transmission and distribution lines.

WORK EXPERIENCE:

CALIFORNIA ENERGY COMMISSION, ENERGY FACLITIES SITING AND ENVIRONMENTAL DIVISION, SACRAMENTO, CA, 11/2000-Present.
Working as Associate Electrical Engineer in the Transmission System Engineering unit on licensing generation projects. Work involves evaluating generation interconnection studies and their impacts on transmission system, and providing staff assessments and testimony to the commission, and coordination with utilities and other agencies.

ALLIANT ENERGY, DELIVERY SYSTEM PLANNING, MADISON, WI, 4/2000-9/2000.
Worked as Transmission Services Engineer, performed Generator Interconnection studies and system planning studies.

IMPERIAL IRRIGATION DISTRICT, POWER DEPT., Imperial, California, 1985-1998.
Worked as Senior Planning Engineer in a supervisory position and in Transmission, Distribution and Integrated Resource planning areas. Performed interconnection studies for 500 MW geothermal plants and developed plan for a collector system, developed methodologies for transmission service charges , scheduling fees and losses. Worked as the Project Leader in the 1992 Electricity Report (ER 92) process of the California Energy Commission. Worked as the Project Leader for installation of an engineering computer system and softwares. Assumed the Project Lead in the standardization of construction and materials, and published construction standards.

CITY LIGHT & POWER, Frankfort, Indiana, 1980 – 1985.
Worked as Assistant Superintendent and managed engineering, construction and operation depts.

WESTERN ILLINOIS POWER CO-OP., Jacksonville, Illinois, 1978 – 1980.
Worked as Planning Engineer and was involved in transmission system planning.

THE CALCUTTA ELECTRIC SUPPLY CORPORATION LTD. (CESC), Calcutta, India, 1964 –1978.
Worked as District Engineer and was responsible for managing customer relations, purchasing and stores, system planning, construction, operation and maintenance departments of the most industrialized Transmission and Distribution division of the Utility. Worked as PROJECT MANAGER for construction of a 30 mile Double Circuit 132 kV gas-filled Underground Cable urban project. During 1961-63, worked as Factory Engineer for design, manufacturing and testing of transformers, motor starters and worked in a coal-fired generating plant.

DECLARATION OF
Mark Hesters

I, Mark Hesters, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division, as a Senior Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the **Transmission System Engineering** for the **Abengoa Mojave Solar** project (09-AFC-5) based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 23, 2010 Signed: Original signed by M. Hesters

At: Sacramento, California

Mark Hesters

916-654-5049
mark.hesters@energy.state.ca.us

Qualifications

- Analyzed the reliability impacts of electric power plants for nine years.
- As an expert witness, produced written and oral testimony in numerous California Energy Commission proceedings on power plant licensing.
- Expertise in power flow models (GE PSLF and PowerWorld), production cost models (GE MAPS), Microsoft word-processing, spreadsheet and database programs.
- Contributing author to many California Energy Commission reports.
- Represented the Energy Commission in the development of electric reliability and planning standards for California.

Experience

Senior Electrical Engineer

2005-Present California Energy Commission, Sacramento, CA

- Program manager of the transmission system engineering analysis for new generator Applications of Certification.
- Lead the development of transmission data collection regulations.
- Overhauled the transmission data adequacy regulations for the Energy Commission's power plant certification process.
- Participated in the analysis of regional transmission projects.
- Technical lead for Commission in regional planning groups.
- Energy Commission representative to the Western Electric Coordinating Council Operations Committee.

Associate Electrical Engineer

1998–2005 California Energy Commission, Sacramento, CA

- Lead transmission systems analyst for power plant licensing under 12-month, 6-month and 21-day licensing processes.
- Provided expert witness testimony on the potential transmission impacts of new power plants in California Energy Commission licensing hearings.
- Authored chapters for California Energy Commission staff reports on regional transmission issues.
- Studied the economics of transmission projects using electricity production simulation tools.
- Analyzed transmission systems using the GE PSLF and PowerWorld load flow models.
- Collected and evaluated transmission data for California and the Western United States

Electric Generation Systems Specialist

1990–1998 California Energy Commission, Sacramento, CA

- Lead generation planner for southern California utilities.
- Analyzed electric generation systems using complex simulation tools.
- Provided analysis on the impact of resource plans on air quality and electricity costs for California Energy Commission reports.
- Developed modeling characteristics for emerging technologies.
- Evaluated resource plans.

Education

1985–1989 University of California at Davis Davis, CA

- B.S., Environmental Policy Analysis and Planning

DECLARATION OF
Heather Blair

I, Heather Blair, declare as follows:

1. I am presently employed as a consultant to the California Energy Commission in the Siting, Transmission and Environmental Protection Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Biological Resources** and **Transmission System Engineering – Appendix A** for the **Abengoa Mojave Solar** project (09-AFC-5) based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 23, 2010 Signed: Original signed by H. Blair

At: Sacramento, California

HEATHER BLAIR
Environmental Scientist

ACADEMIC BACKGROUND

M.S., Conservation Biology, Sacramento State University, In Progress
B.S., Ecology, San Diego State University, 2004

PROFESSIONAL EXPERIENCE

Heather Blair is an Environmental Scientist experienced in a range of natural resource investigations and environmental impact analysis including botanical and wildlife research, inventory, and survey techniques; technical writing; and data analysis. She has experience preparing environmental documents pursuant to applicable federal, state and local environmental regulations, including the California Environmental Quality Act, National Environmental Policy Act, and the California and federal Endangered Species Acts.

Aspen Environmental Group — 2004 to present

Selected project experience at Aspen includes the following:

Power Generation and Transmission Interconnection Projects

- **California Energy Commission.** Aspen has a multi-year contract to provide support to the Energy Facility Planning and Licensing Programs. Under this contract Ms. Blair has participated in the following projects:
  - **Biological Resources Assessment for the Abengoa Mojave Solar Project.** Ms. Blair is currently serving as the lead technical staff for the analysis of impacts to biological resources from the 250 MW power plant in the Mojave Desert. Important biological issues include impacts to Harper Dry Lake from potentially decreased water availability, desert tortoise, and Mojave ground squirrel.
  - **Biological Resources Assessment for the San Joaquin Solar 1&2 Hybrid Project.** Ms. Blair is currently serving as the lead technical staff for the analysis of impacts to biological resources from the 107 MW solar thermal/biomass hybrid power plant. Important biological issues include potential impacts to San Joaquin kit fox habitat and movement corridor connectivity.
  - **Biological Resources Assessment for the Genesis Solar Energy Project.** Ms. Blair is currently serving as the assistant technical staff for the analysis of impacts to biological resources from the 250 MW power plant in an undeveloped area of the Sonoran Desert. Important biological issues include direct and indirect (downstream) impacts to ephemeral drainages from site development and indirect impacts to sand dune dependent vegetation and wildlife communities from disruption of Aeolian processes.
  - **Biological Resources Assessment for the Carlsbad Energy Center.** Ms. Blair is currently serving as the lead technical staff for the analysis of impacts to biological resources from the 540 MW CECP. Important biological issues include potential impacts to Agua Hedionda Lagoon and consistency with the Carlsbad Habitat Management Plan. Ms. Blair recently testified as an expert witness in biological resources during Evidentiary Hearings before the Commission.
  - **Biological Resources Assessment for the CPV Sentinel Project.** Ms. Blair served as the lead technical staff for the analysis of impacts to biological resources from the 850 MW CPV Sentinel project. Important biological issues include potential impacts from groundwater drawdown to the mesquite hummock plant community and the special-status species it supports.
  - **Biological Resources Assessment for the CPV Vaca Station Project.** Ms. Blair is currently serving as the lead technical staff for the analysis of impacts to biological resources from the 660 MW CPVVS.

Important biological issues include potential impacts to giant garter snake from reduced flows in Old Almao Creek and loss of Swainson's hawk foraging habitat.

- **Biological Resources Assessments for the Marsh Landing and Willow Pass Generating Stations.** Ms. Blair is currently serving as the lead technical staff for the analysis of impacts to biological resources from the 930 MW MLGS and 550 MW WPGS. Important biological issues include potential indirect impacts to listed plant species in the Antioch Dunes National Wildlife Refuge from nitrogen deposition.
- **Biological Resources Assessments for the Panoche and Starwood Energy Centers.** Ms. Blair served as the lead technical staff for the analysis of impacts to biological resources from the 400 MW Panoche Energy Center and 120 MW Starwood Project. These projects required coordination with USFWS and CDFG regarding impacts to the State and federally listed San Joaquin kit fox.

- **Northern California CO2 Storage Pilot, Confidential Client, CEQA and NEPA compliance, (2008).** Contributed to the preparation of Department of Energy NEPA environmental questionnaire to comply with Category Exclusion requirements and preparation of the Initial Statement under CEQA for the proposed CO_2 sequestration pilot test site in Montezuma Hills, California. Ms. Blair conducted focused nesting surveys of the State-threatened Swainson's hawk (*Buteo swansonii*).
- **Arizona Utilities CO_2 Storage Pilot, CEC and University of California, NEPA compliance, (2007).** Contributed to the preparation of Department of Energy NEPA environmental questionnaire to comply with Category Exclusion requirements for the proposed CO_2 sequestration pilot test site near Joseph City, Arizona. Ms. Blair conducted focused surveys of the federally endangered Peebles Navajo cactus (*Pediocactus peeblesianus* var. *peeblesianus*).
- **Environmental Screening Tool for Out-of-State Renewables, KEMA and CEC, Staff (2009).** Assessed the potential for California laws, ordinance, regulations and standards to be impacted by out-of-state renewable facilities seeking RPS certification. Ms. Blair prepared the assessment of impacts associated with geothermal projects.
- **Nuclear Power Plant Assessment (Assembly Bill 1632).** Ms. Blair managed the preparation of and was a contributing author for a major Appendix to the Nuclear Power Plan Assessment Report for the Energy Commission. This report evaluated nuclear power issues in the state in response to recent legislation (AB 1632), including environmental issues associated with alternatives (including renewable) to the state's two nuclear facilities.
- **Diablo Canyon Power Plant Steam Generator Replacement Project.** Ms. Blair supported the management team in preparing the project description, alternatives and supporting sections of the Draft and Final EIR.

<u>Transmission Line and Substation Projects</u>

- **Sunrise Powerlink Transmission Line Project.** Under contract to the California Public Utilities Commission (CPUC), Aspen prepared an EIR/EIS for a 150-mile proposed transmission line from Imperial Valley Substation, near El Centro, California, to Peñasquitos Substation in northwestern San Diego County. The Proposed Project would potentially deliver renewable resources from the Imperial Valley via a 500 kV transmission line to a new 500/230 kV substation, and from the new substation to western San Diego via 230 kV overhead and underground transmission lines. Ms. Blair analyzed the impacts to wilderness and recreation. Additionally, she wrote the project description and assisted with overall project support.
- **TANC Transmission Project.** Aspen was awarded a contract with the Transmission Agency of Northern California (TANC) for CEQA/NEPA and environmental permitting support for 600-miles of proposed 500 and 230 kV transmission lines between Lassen County and Santa Clara County, California. The project included evaluation of over 600 additional miles of alternative routes, six new substations, and modifications to six existing substations. Ms. Blair was the Deputy Project Manager, responsible for coordinating the biological and cultural resource field surveys. The project was cancelled in July 2009.

- **Sacramento Area Voltage Support Project.** Under contract to Western Area Power Administration (Western) and in cooperation with SMUD, Aspen prepared an SEIS and EIR for a double-circuit 230 kV circuit between Western's O'Banion/Sutter Power Plant and Elverta Substation/Natomas Substation. Ms. Blair was part of the project management team and managed the wetland delineation, Biological Survey Report, and Biological Evaluation.

- **North Area ROW Maintenance Project**. Under contract to Western, Ms. Blair is currently providing project support to prepare an Environmental Assessment and Operation and Maintenance Program associated with the operation and maintenance procedures along Western's transmission line ROWs between Sacramento (Sutter/Yuba County line) and the Oregon border. This project also includes a detailed survey of the biological and cultural resources along 434 miles of North Area ROW, 342 miles of COTP ROW, and several hundred miles of access and maintenance roads. Ms. Blair is working closely with project management and resource specialists to coordinate and execute over 800 miles of surveys. She conducted wildlife inventory and surveyed portions of ROW for sensitive species and recorded habitat types, jurisdictional waters and infrastructure using a Trimble GeoXT GPS unit. Additionally, Ms. Blair was integrally involved in the management and development of the North Area O&M GIS database.

- **Categorical Exclusions for Routine Operation and Maintenance.** Under contract to Western, Ms. Blair has prepared multiple CXs for routine maintenance activities along Western's CVP, PACI, and COTP transmission line ROWs and access roads. She has developed a streamlined and highly efficient system to use the results and analysis for the North Area ROW Maintenance Project to complete these documents.

- **GIS Data Verification and Resource Database Development for the Trinity County PUD Direct Interconnection Project.** Under contract to Western, Ms. Blair was the Deputy Project Manager for this project and also be coordinated and conducted biological resources in support of the development of an O&M GIS database, which included identification of sensitive resources and associated project conservation measures for this new segment of Western's CVP transmission system.

- **Seventh Standard Substation Project.** Under contract to the CPUC, Ms. Blair prepared the biological resource section of an Initial Study/Mitigated Negative Declaration for a proposed 4.9 acre 115/21 kV substation and transmission interconnection in northwest Bakersfield, Kern County, California. Important biological issues included impacts to the State and federally listed San Joaquin kit fox and western burrowing owl (a California species of special concern), as well as compliance with the Metropolitan Bakersfield Habitat Conservation Plan.

- **Atlantic–Del Mar Reinforcement Project Mitigated Negative Declaration**. Under contract to the CPUC, Ms. Blair served as an assistant environmental monitor during the construction of four miles of overhead transmission towers and lines and approximately 1.3 miles of underground lines. The project involved trenching, horizontal drilling and blasting and requires avoidance of several wetlands, seasonal pools and threatened and endangered species.

- **Miguel-Mission 230 kV #2 Project EIR Addendum**. Under contract to the CPUC, Ms. Blair helped to prepare a detailed addendum associated with engineering design changes for the Miguel-Mission 230 kV #2 Project.

<u>Other Infrastructure, Resource Management, and Monitoring Projects</u>

- **Hazardous Fuels and Vegetation Management for Angeles National Forest.** Under contract to the U.S. Forest Service, Ms. Blair conducted botanical and wildlife surveys at approximately 100 sites ranging from one to 2500 acres throughout the Angeles National Forest. Modifications to current fuel management practices were proposed in response to increased frequency and intensity of wildfire resulting from climate change. She prepared 75 Biological Evaluations/Biological Assessments that assessed the biological impacts of proposed fuel management practices throughout the forest.

- **Rare Plant Surveys for the East Branch Extension Pipeline Project.** Under contract to the Department of Water Resources, Ms. Blair conducted rare plant surveys of the endangered Santa Ana River wooly star (*Eriastrum densifolium* ssp. *sanctorum*) and the state and federally endangered slender horned spine flower (*Dodecahema leptoceras*) in response to the proposed construction of a water pipeline through San Bernardino and Riverside Counties.
- **Upper San Antonio Creek Watershed Giant Reed Removal Project.** Ms. Blair prepared the biological resource analysis of an Initial Study to remove invasive plant species from the Upper San Antonio Creek Watershed. Required field survey and development of impact avoidance measures for several special-status species, including California red-legged frog, southern steelhead, and riparian nesting birds.
- **Least Tern Monitoring for the Montezuma Slough Tidal Wetlands Restoration Project**. Under contract to EcoBridges Environmental, Ms. Blair monitored the nesting success of three nesting colonies of the federally and State endangered least tern. This effort involved counting and mapping the nest sites and tern chicks once a week for two years.
- **Endangered Species Monitoring for the Lomita Canal Vegetation Clearing Project**. Monitored the federally threatened California Red-legged frog and the state- and federally endangered San Francisco Giant Garter Snake during vegetation clearing activities along the Lomita Canal at the San Francisco International Airport. Involved identification of these species, relocation of California red-legged frogs, and re-direction of work in the event a SF Garter Snake was spotted.

PREVIOUS EXPERIENCE

Soil Ecology and Restoration Group ***January to May 2004***

Research Assistant. Ms. Blair assisted in managing the greenhouse where native seeds were germinated and propagated. In this role, she collected seeds from native plants and analyzed the composition of the soil present in their native habitat to ensure seedling viability. The plants were subsequently used in the restoration of degraded habitat as contracted by the U.S. Army Corps of Engineers and others.

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

APPLICATION FOR CERTIFICATION
FOR THE *ABENGOA MOJAVE SOLAR POWER PLANT*

Docket No. 09-AFC-5
PROOF OF SERVICE
(Revised 6/8/2010)

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*indicates change

DECLARATION OF SERVICE

I, April Albright, declare that on June 30, 2010, I served and filed copies of the attached Supplemental Staff Assessment – Part C. The original documents, filed with the Docket Unit, are accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[http://www.energy.ca.gov/sitingcases/abengoa/index.html].**

The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

For service to all other parties:

✓ sent electronically to all email addresses on the Proof of Service list;

_____ by personal delivery;

✓ CDs delivered on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date. **Hard copies are available upon request.**

AND

For filing with the Energy Commission:

✓ **sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (preferred method);**

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-5
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Original signed by: _____
April Albright