DOE/EIS-0414

Energia Sierra Juarez U.S. Transmission Line Project

Final Environmental Impact Statement

Volume 1

May 2012

U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability
Washington, DC 20585

Cooperating Agency – County of San Diego
San Diego, CA

Department of Energy
Washington, DC 20585

May 2012

Dear Sir/Madam:

Enclosed for your review and comment is the *Energia Sierra Juarez U.S. Transmission Line Project Final Environmental Impact Statement* (DOE/EIS-0414), prepared by the Department of Energy (DOE) pursuant to the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations. The County of San Diego, California, is a cooperating agency in the preparation of this final EIS.

The DOE proposed Federal action in the final EIS is the granting of a Presidential permit to Energia Sierra Juarez U.S. Transmission, LLC (ESJ), for the construction, operation, maintenance, and connection of either a 230-kilovolt (kV) or a 500-kV electric transmission line that would cross the U.S.-Mexico border in the vicinity of Jacumba, California, in eastern San Diego County. DOE has prepared this final EIS to evaluate the potential environmental impacts in the United States of the proposed action and the range of reasonable alternatives, including the No Action alternative. Under the No Action alternative, the Presidential permit would not be granted, and the proposed transmission line would not cross the U.S.-Mexico border. Four action alternatives were identified in this EIS which were carried forward for detailed analysis (a Double-Circuit 230-kilovolt (kV) Transmission Line, a Single-Circuit 500-kV Transmission Line, and revised routes for the Double-Circuit 230-kV and Single-Circuit 500-kV Transmission Lines). DOE has identified the revised Double-Circuit 230-kV route (Alternative 4A) as its preferred alternative.

DOE will use the EIS to ensure that it has the information it needs for informed decision-making. Copies of the final EIS are available for public review at the Jacumba and Campo-Moreno Village Branch libraries or may be obtained from Dr. Jerry Pell. The EIS also is available on the ESJ project website (http://www.esjprojecteis.org/). The final EIS is both on this website and on the DOE NEPA website at http://energy.gov/nepa/eis-0414-presidential-permit-application-energia-sierra-juarez-transmission-line-california.

As required by CEQ NEPA regulations (40 CFR 1506.10), DOE will announce its decision on the proposed action in a Record of Decision in the *Federal Register* no sooner than 30 days after the U.S. Environmental Protection Agency publishes the Notice of Availability of this final EIS.

If you have any questions or comments on the final EIS, or would like additional copies, please contact me either by mail at the Office of Electricity Delivery and Energy Reliability, OE-20, U.S. Department of Energy, Washington, DC 20585-0001, by telephone at 202-586-3362, by fax at 202-318-7761, or by e-mail (preferred) at Jerry.Pell@hq.doe.gov. However, please note that conventional mail to DOE tends to be delayed and possibly damaged because of security screening. Also, if you have received the Summary volume and the included CD but would prefer the full paper version, please contact me.

Very truly yours,

Jerry Pell

Jerry Pell, Ph.D., ~~CCM~~
Environmental Scientist
Project Manager
Office of Electricity Delivery
and Energy Reliability

COVER SHEET

Responsible Federal Agency: U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability

Cooperating Agency: County of San Diego

Title: Final Environmental Impact Statement for the Energia Sierra Juarez U.S. Transmission Line

Location: San Diego County, California

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For general information on the U.S. Department of Energy *National Environmental Policy Act* (NEPA) process, write or call:

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Abstract: Energia Sierra Juarez U.S. Transmission, LLC (ESJ), a subsidiary of Sempra U.S. Gas and Power, has applied to the U.S. Department of Energy (DOE) for a Presidential permit to construct, operate, maintain, and connect a 1.7-mile transmission line (0.65 miles in the U.S.) across the international border between the U.S. and Mexico, near the town of Jacumba, California. A DOE Presidential permit is required before anyone can construct, operate, maintain, and connect an electric transmission line across the U.S. border. DOE must decide whether to issue a Presidential permit for the project.

DOE published a *Federal Register* "Notice of Intent to Prepare an Environmental Assessment and to Conduct Public Scoping Meetings; Baja Wind U.S. Transmission, LLC" on August 4, 2008 (73 FR 45218), held public scoping meetings in Jacumba, California, on August 28, 2008, and solicited written and electronic comments on the scope of the Environmental Assessment. Based on the comments received, DOE determined that an EIS would be the appropriate NEPA document for the proposed Presidential permit. Accordingly, on February 25, 2009, DOE issued in the *Federal Register* a "Notice of Intent to Prepare an Environmental Impact Statement; Energia Sierra Juarez U.S. Transmission, LLC" (74 FR 8517), but did not open an additional scoping period; however, it did indicate that any additional comments received would be considered to the extent practicable.

Public Comments: In preparing this final EIS, DOE considered comments received during the scoping period (August 2, 2008, through September 3, 2008) and public comment period on the draft EIS (September 17, 2010, through November 1, 2010). Comments on the draft EIS were accepted during the 45-day period following publication of (EPA's) Notice of Availability in the *Federal Register* on September 17, 2010; DOE continued to accept late comments to the extent practicable, i.e., until September 2011. DOE held three public hearings on the Draft EIS in Jacumba, California, on October 5, 2010; Boulevard, California, on October 6, 2010; and San Diego, California, on October 7, 2010. All comments, including the late comments, were considered during preparation of this final EIS. Volume 3 contains the comments received during the public comment period on the draft EIS and DOE's responses to these comments. This final EIS contains revisions and new information based in part on comments received on the draft EIS. Vertical change bars in the margins indicate the locations of these revisions and new information. Editorial corrections and deletions are not indicated. Volume 3 is an entirely new part of this EIS; therefore it does not contain change bars.

The EIS addresses the environmental impacts of the proposed transmission line and the range of reasonable alternatives. Six alternatives were identified in this EIS, five of which were carried forward for detailed analysis (the No Action Alternative, a Double-Circuit 230-kilovolt (kV) Transmission Line, a Single-Circuit 500-kV Transmission Line, and a revised route for the Double-Circuit 230-kV or Single-Circuit 500-kV Transmission Line). DOE has identified the revised Double-Circuit 230-kV route (Alternative 4A) as its preferred alternative. DOE will use the EIS to ensure that it has the information it needs for informed decision-making. Copies of the final EIS are available for public review at the Jacumba and Campo-Moreno Village Branch libraries or may be obtained from Dr. Jerry Pell. The EIS also is available on the project EIS website (http://www.esjprojecteis.org). As required by CEQ NEPA regulations (40 CFR 1506.10), DOE will announce its decision on the proposed action in a Record of Decision in the *Federal Register* no sooner than 30 days after the U.S. Environmental Protection Agency publishes the Notice of Availability of the final EIS.

Table of Contents

VOLUME 1 FINAL ENVIRONMENTAL IMPACT STATEMENT

VOLUME 2 APPENDICES

LIST OF TABLES

LIST OF FIGURES

VOLUME 3 COMMENTS AND RESPONSES DOCUMENT

The following table lists the substantive revisions to the draft EIS as a result of public comments. These revisions are reflected in Volumes 1 and 2 of this final EIS.

Summary of Revisions to the Draft EIS	
EIS Section	**Substantive Revisions from Draft EIS to Final EIS**
EIS Volume 1 Main EIS Volume	
Front matter	Updated cover sheet and table of contents; added this summary of substantive revisions from the draft EIS to the final EIS.
Summary	Updated the EIS Summary to be consistent with the final EIS analysis. Included updated summary of impacts and mitigations.
1.0 Introduction	Clarified DOE's purpose and need for the ESJ U.S. Transmission Line project.
	Added discussion of distributed electrical generation and use of existing transmission lines in Mexico as alternatives that are outside the scope of this NEPA document.
	Updated the EIS chronology and public review process.
	Added summary of issues raised during the EIS public comment period.
	Identified DOE's preferred alternative as the newly added Alternative 4A (Revised 230-kV Route).
2.0 Project Description	Added details of revised transmission line routes (Alternatives 4A and 4B), including new Figure 2-1b.
	Added details of the applicant's proposed groundwater well that would be used for construction water supply.
	Clarified that tower or pole lighting would not be required by the U.S. Border Patrol.
	Updated the applicant-proposed measures based on new information from the applicant regarding fire protection and traffic control measures.
	Added discussion of the potential use of the existing transmission lines in Mexico as an alternative that is outside the scope of this NEPA document.
	Updated the status of the ECO Substation project environmental review process.
	Added description of the revised ECO Substation location, which is the basis for ESJ's description of revised transmission line routes (Alternatives 4A and 4B).
	Updated the comparison of impacts of alternatives based on updated analyses of each discipline.

Summary of Revisions to the Draft EIS	
EIS Section	**Substantive Revisions from Draft EIS to Final EIS**
	Updated the summary of impacts (Table 2-4).
	Identified DOE's preferred alternative as the 230-kV transmission line on lattice towers, in the revised alignment (Alternative 4A).
3.0 Affected Environment, Impacts and Mitigation	Clarified the extent to which DOE used the County of San Diego environmental review guidelines in the preparation of this EIS.
	Added discussion to all resource topics of potential impacts associated with the revised transmission line routes (Alternatives 4A and 4B).
	Added discussion to all resource topics of potential impacts associated with the proposed groundwater well use.
3.1 Biological Resources	Updated status of DOE's consultation with USFWS, which was concluded in March 2011.
	Updated discussion of baseline conditions for special status species, including Peninsular bighorn sheep and golden eagles.
	Added further discussion of potential impacts to large avian species from electrocution, and discussion of potential impacts from nighttime lighting of transmission towers or poles.
	Added discussion of potential impacts of helicopter use on biological resources during construction.
	Added further discussion of cross-border migration patterns and potential cross-border impacts to Peninsular bighorn sheep, golden eagles, and other species of concern.
	Revised Mitigation Biology-1 (Worker Training) to clarify that a qualified biologist would provide the biological resources training to contractor personnel both prior to construction and prior to major (non-routine) repair and maintenance during operations.
3.2 Visual Resources	Added reference to the recent designation of segments of Old Highway 80 and I-8 as scenic highways in the County of San Diego General Plan.
	Clarified the location of nearby residences and corresponding key observation points.
	Added minor clarifications to discussion of transmission line visual impacts and potential cross-border visual impacts, including a change in the visual setting since the draft EIS was published due to the construction of several new wind turbines in the Sierra Juarez mountains in Mexico (unrelated to the ESJ Wind project), and their visibility from the U.S.
	Revised Mitigation VIS-2 to specify "dulled metal finish and nonspecular conductors."

Summary of Revisions to the Draft EIS	
EIS Section	**Substantive Revisions from Draft EIS to Final EIS**
3.3 Land Use	Updated the County of San Diego General Plan status (plan update was approved August 3, 2011) and revised the project location General Plan land use designation (the site was re-designated to Rural Land, 80-acre parcels).
	Clarified the location of residences relative to the alternative corridors.
3.4 Recreation	No substantive changes were made to this section.
3.5 Cultural Resources	Added discussion of the historic status of Old Highway 80.
	Added discussion of the site-specific cultural resources analysis of the groundwater well construction site.
	Added Figure 3.5-2 to indicate the revised transmission line route alternatives (Alternatives 4A and 4B).
	Added mitigation Cultural-2 which would require subsurface cultural investigations for the proposed groundwater well access road.
	Added mitigation Cultural-3 which would require subsurface cultural investigations of the revised 500-kV Route (Alternative 4B), if constructed.
3.6 Noise	Added table listing the corona discharge sound level estimates for the revised transmission line routes (Alternatives 4A and 4B).
	Clarified the description and location of project area noise receptors.
3.7 Transportation and Traffic	Clarified and updated I-8 highway traffic statistics.
	Updated the discussion of wind turbine transportation scenarios based on applicant-provided information, which confirmed that turbines would be transported across the Otay Mesa border crossing.
	Added discussion of a Traffic Control Plan, which would be prepared in accordance with County Planning standard requirements.
	Revised traffic-related mitigation measures to include a requirement to coordinate with CAL FIRE.
	Added discussion of potential limitations on aerial fire-fighting efforts due to the presence of the transmission lines.
3.8 Public Health	Clarified the types of hazardous materials and hazardous wastes that could be generated during construction, and added references to applicable laws and regulations.
	Updated mitigation Public Health-1 to include a provision to ensure that imported soil is free of contamination.
3.9 Fire and Fuels Management	Added discussion of the Development Agreement executed with the Rural Fire Protection District and revised fire protection mitigations specific to the ESJ U.S. Transmission Line project, as recommended by the RFPD.

Summary of Revisions to the Draft EIS	
EIS Section	**Substantive Revisions from Draft EIS to Final EIS**
	Corrected the local fire response capability statistics and response procedures for the project area based in input from the RFPD.
	Clarified discussion regarding the frequency of fuel management under the transmission lines.
	Added further discussion of potential impacts to the U.S. from wind turbine fires, failures and associated hazards from the ESJ Wind project in Mexico.
	Added further discussion of the project's potential to result in increased fire hazard and impacts to local fire fighting capabilities.
	Added discussion of potential limitations on aerial fire-fighting efforts due to the presence of the transmission lines.
	Added the applicant-proposed measure to prepare and implement a Construction Fire Plan.
	Added reference to fire-related documents and correspondence, provided in Appendix B of the EIS.
3.10 Air Quality and Climate Change	Updated construction emissions estimates based on the applicant's revised estimates of soil hauling requirements.
	Added discussion of the potential CO2 sequestration capacity of alkaline soils and related potential project impacts due to soil disturbance.
	Added discussion of potential air quality and greenhouse gas emissions due to wind turbine back-up generation.
3.11 Water Resources	Described the aquifer testing results conducted by the County of San Diego for the planned groundwater well usage during construction.
	Clarified discussion of surface water features to indicate that no surface water features traverse the U.S.-Mexico border in the project area.
	Added discussion of groundwater quality and quantity at the planned construction groundwater well, based on County of San Diego reports.
3.12 Geology and Soils	Clarified certain soil descriptions and potential for erodibility.
3.13 Socioeconomics	Updated Census data with 2010 statistics, to the extent available.
	Added discussion of the potential for short-term, minor impacts to tourism in the project area.
	Added further discussion of the project's potential to result in decreased property values and increased fire insurance rates.
3.14 Environmental Justice	Updated the income and ethnicity data with 2010 statistics, as available. These new statistics indicated a change in the project area to "low-income."

Summary of Revisions to the Draft EIS	
EIS Section	**Substantive Revisions from Draft EIS to Final EIS**
3.15 Utilities and Services	Added discussion of the International Boundary and Water Commission permit requirement for monuments.
	Updated the mitigation to include coordination with CAL FIRE.
3.16 Unavoidable Impacts	Added description of potential unavoidable impacts on Transportation and Traffic.
4.0 Connected Actions	The analysis of potential impacts and recommended mitigations related to the ECO Substation switchyards and SWPL loop-in are revised to incorporate relevant information from the ECO Substation Draft EIR/EIS.
	Added description of the revised ECO Substation location, and discussion of potential impacts of this location in comparison to the original proposed site.
5.0 Cumulative Impacts	Added several projects to the cumulative impact analysis, including several wind energy projects; revised Figure 5-1 to show the location of these projects.
	Updated the status of several projects that were already included in the draft EIS cumulative impact analysis.
	Revised the cumulative impacts analysis to more clearly address the sum of impacts from past, present and reasonably foreseeable actions.
6.0 Irretrievable and Irreversible Commitment of Resources	No changes were made to this section.
7.0 Short-Term Use and Long-Term Productivity	No changes were made to this section.
8.0 Applicable Laws, Regulations, Permits, and DOE Orders	Added the International Boundary and Water Commission permit requirement to the list of required permits.
9.0 Consultation and Coordination	Updated the record of consultations to include local agency contacts, including Rural Fire Protection District and other local agency offices.
10.0 References	Added references for correspondence and documents used to prepare the final EIS.
11.0 List of Preparers	Updated the list of preparers.
12.0 Conflict of Interest	No changes were made to this section.
Volume 2 Appendices	
Appendix A: Scoping Report	No changes were made to this appendix.

Summary of Revisions to the Draft EIS	
EIS Section	**Substantive Revisions from Draft EIS to Final EIS**
Appendix B: Project Details	Added plot plans and grading plans for the revised transmission line routes (Alternatives 4A and 4B). Added engineering design drawings for the transmission structures indicating dimensions of phase separation (relevant for potential impacts to large avian species from electrocution).
	Added documentation from ESJ and the County of San Diego Fire Authority and Rural Fire Protection District, indicating concurrence with the applicant's Fire Protection Plan, and concurrence on fire-related mitigation measures.
	Added a groundwater supply analysis prepared by the County San Diego geologist and a project water availability form signed by the Jacumba Community Services District. Added the Phase 1 Environmental Site Assessment prepared for the project parcels.
Appendix C: Biological Resources Technical Report	Added excerpts from the applicant's 2010 biological resources technical reports prepared for the groundwater well access site (east of Jacumba) and for the revised alternative routes (Alternatives 4A and 4B).
	Added DOE's March 8, 2011 letter to U.S. Fish and Wildlife Service indicating the outcome of consultation with the USFWS.
Appendix D: Cultural Resources	Added DOE's April 18, 2012 letter to the California State Historic Preservation Officer requesting concurrence on DOE's findings regarding Section 106 of the National Historic Preservation Act.
	Replaced the applicant's March 2010 cultural study for the transmission line alternative routes with the May 2010 cultural study for transmission line area; the May 2010 study includes both the original alternatives (Alternatives 2 and 3) and the revised routes (Alternatives 4A and 4B).
	Added the applicant's 2010 cultural resources technical report prepared for the groundwater well access site.
Appendix E: Noise	Added the applicant's May 2010 noise analysis for the revised alternative routes (Alternatives 4A and 4B). Added vendor specifications of typical electrical conductor designs.
Appendix F: Air Quality Calculations	Revised air quality emissions estimates based on further analysis of PM10 impacts since publication of the draft EIS, based on applicant's revised construction planning assumptions.
Appendix G: Agency Consultation	Added U.S. Dept. of Defense January 12, 2011 letter of non-objection to the project.
	Added U.S. Dept. of State's January 27, 2011 letter of non-objection to the project.
Appendix H: Conflict of Interest	No changes were made to this appendix.
Appendix I: Distribution List	Added the EIS distribution list.

Summary of Revisions to the Draft EIS	
EIS Section	**Substantive Revisions from Draft EIS to Final EIS**
Volume 3 Comments and Responses	
Volume 3 Comments and Responses Document	Added Volume 3 Comments and Responses. Section CR.5 of this volume provides reproductions of the written letters and oral comment transcripts on the draft EIS (left side of page), and DOE's response to the comments (right side of page).

Abbreviations Used In This Work

°C	degrees Celsius
°F	degree Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
AC	Advisory Circular
ACEC	Area of Critical Environmental Concern
APE	Area of Potential Effect
APM	applicant-proposed measure
ATV	all-terrain vehicle
B.P.	before present
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BHP	brake horsepower
BLM	U.S. Bureau of Land Management
BMP	Best Management Practice
C	combustion particle
C_2H_3Cl	vinyl chloride
CAAQS	California Ambient Air Quality Standards
CAISO	California Independent System Operator
CAL FIRE	California Department of Forestry and Fire Protection
Cal-ISO	California Independent System Operator
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDWR	California Department of Water Resources
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations

CH_4	methane
cKOP	candidate key observation point
cm	centimeter
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
Conservation Program	East County Multiple Species Conservation Program
County DPLU	County of San Diego Department of Planning and Land Use
CPUC	California Public Utilities Commission
CRMP	Conceptual Resource Management Plan
CUPA	California Unified Program Agency
CWHR	California Wildlife Habitat Relationships
dB	decibel
dBA	A-weighted decibel
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
E&E	Ecology and Environment, Inc.
E.O.	Executive Order
EA	Environmental Assessment
ECO Substation	East County Substation
EDAW	EDAW, Inc.
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMF	electromagnetic field
ESA	Endangered Species Act
ESJ	Energia Sierra Juarez U.S. Transmission, LLC
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration

FIRM	Flood Insurance Rate Maps
FR	Federal Register
Gen-Tie	Generator-tie line
GHG	greenhouse gases
GIS	Geographic Information System
GWP	global warming potential
H_2S	hydrogen sulfide
ha	hectares
HFC	hydrofluorocarbon
HHD	heavy heavy duty
hp	horsepower
Hz	hertz
I	Interstate
ICAPCD	Imperial County Air Pollution Control District
IEC	International Electrotechnical Commission
IPCC	Intergovernmental Panel on Climate Change
kcmil	one thousand circular mils
km	kilometer
KOP	key observation point
kph	kilometers per hour
kV	kilovolt
kV/m	kilovolt per meter
kW	kilowatt
lb/day	pounds per day
LD	light duty
L_{dn}	day night level
L_{eq}	equivalent level
LOS	level of service
m	meter
MBTA	Migratory Bird Treaty Act
MD	medium duty
mg/L	milligrams per liter
mph	miles per hour

MSA	Metropolitan Statistical Area
MSDS	material safety data sheet
msl	mean sea level
MW	megawatts
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Program
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NGL	Natural Gas Liquids
NHPA	National Historic Preservation Act
NIEHS	National Institute of Environmental Health Sciences
NO_2	nitrogen dioxide
NOI	Notice of Intent
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NSR	New Source Review
O_3	ozone
OHV	off-highway vehicle
Pb	lead
PEA	Proponent's Environmental Assessment
PFC	perfluorocarbon
PM_{10}	fine particulate matter with diameter no greater than 10 microns
$PM_{2.5}$	fine particulate matter with diameter no greater than 2.5 microns
ppmv	parts per million by volume
QCB	Quino checkerspot butterfly
qty	quantity
RBC	Rocks Biological Consulting
RDA	Rural Development Area

RDEIR/SDEIS	Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement
REC	recognized environmental condition
RMP	Resource Management Plan
ROC	reactive organic compound
ROD	Record of Decision
ROG	reactive organic gas
ROI	region of influence
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SCAQMD	South Coast Air Quality Management District
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas and Electric Company
Sempra	Sempra Generation (or Sempra U.S. Gas and Power)
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_4	sulfates
SPS	Special Protection System
SRA	Subregional Area
SRMA	Special Recreation Management Area
SWMP	Stormwater Management Plan
SWPL	Southwest Powerlink
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
tons/yr	tons per year
TSCA	Toxic Substances Control Act
U.S.	United States
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers

USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
V/m	volts per meter
VKT	vehicle kilometers traveled
VMT	vehicle miles traveled
VOC	volatile organic carbons
WHO	World Health Organization

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SUMMARY

S.1 BACKGROUND AND OVERVIEW

On December 18, 2007, Baja Wind U.S. Transmission, LLC (now, Energia Sierra Juarez U.S. Transmission, LLC [referred to herein as ESJ]), a subsidiary of Sempra U.S. Gas and Power (formerly Sempra Generation, and referred to herein as Sempra), applied to the U.S. Department of Energy (DOE) for a Presidential permit in accordance with Executive Orders (E.O.) 10485 and 12038, and 10 Code of Federal Regulations (CFR) §205.320 *et seq*. The Presidential permit (OE Docket Number PP-334), if issued, would authorize ESJ to construct, operate, maintain, and connect the United States (U.S.) portion of an electric transmission line that would cross the international border between the U.S. and Mexico, near the town of Jacumba, California. The U.S. portion of the double-circuit 230-kilovolt (kV) or single-circuit 500-kV transmission line (referred to herein as the ESJ U.S. Transmission Line project) would be 0.65 mile (1.05 kilometers) in length, and would transmit up to 1,250 megawatts (MW) of wind-generated electricity (Figures S-1 and S-2).

DOE has determined that issuance of a Presidential permit for this proposed project would constitute a major federal action that may have a significant impact upon the environment within the context of the National Environmental Policy Act of 1969 (NEPA). NEPA requires that federal agencies integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and the range of reasonable alternatives to those actions. DOE initially determined that the appropriate level of environmental review under NEPA for granting the requested Presidential permit was an Environmental Assessment (EA). On August 4, 2008, DOE published in the *Federal Register* its *Notice of Intent to Prepare an Environmental Assessment and to Conduct Public Scoping Meetings; Baja Wind U.S. Transmission, LLC* (73 FR 45218) (NOI). The NOI explained that if at any time during preparation of the EA DOE determined that an Environmental Impact Statement (EIS) was needed, DOE would issue an NOI to prepare an EIS in the *Federal Register*, and in that case, the scoping process for the EA would serve as the scoping process that normally would follow an NOI to prepare an EIS. Accordingly, in preparing such an EIS DOE would consider any comments on the scope of the EA received during the scoping process.

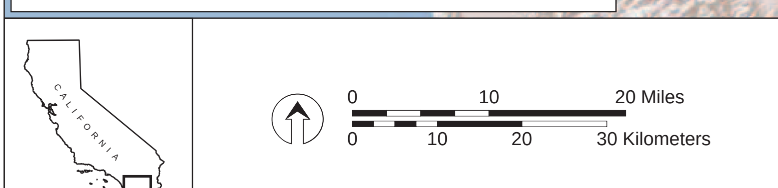
Issuance of the EA NOI opened a 30-day public comment period that closed September 3, 2008. As discussed further in Section S.7 (Public Participation), based on the comments received and the potential for significant impacts, DOE determined that an EIS would be the appropriate NEPA document. In particular, public comments indicated the following potential impacts due to the presence of transmission lines and wind turbines: impacts to biological resources including avian mortality and impacts on protected, threatened, endangered, or sensitive species of animals or plants, or their critical habitats; potential impacts to visual resources; and potential impacts to public safety related to wildfire hazards. On February 25, 2009, DOE published in the *Federal Register* a second NOI: *Notice of Intent to Prepare an Environmental Impact Statement; Energia Sierra Juarez U.S. Transmission, LLC* (74 FR 8517) (DOE/EIS-0414). The EIS NOI indicated that any additional scoping comments received by March 27, 2009, would be considered by DOE in defining the scope of the EIS, and that comments received or postmarked after that date would be considered to the extent practicable.

DOE prepared this EIS in compliance with the Council on Environmental Quality regulations for implementing NEPA (40 CFR Parts 1500–1508) and DOE's NEPA regulations (10 CFR Part 1021). The preparation of an EIS includes two formal opportunities for public input: (1) the public scoping period, and (2) the draft EIS public comment period, both of which are described further in the Public Participation section of this summary. The County of San Diego is a cooperating agency in EIS preparation. Following the draft EIS public comment period, DOE, in coordination with the County of San Diego, prepared a final EIS that responds to oral and written comments received on the draft EIS. Other environmental review requirements are being implemented in coordination with or integrated with the NEPA process to the fullest extent possible, namely, floodplains and wetlands assessments, in accordance with E.O. 11988 and E.O. 11990, respectively (both signed on May 24, 1977) and 10 CFR Part 1022; Clean Air Act Conformity requirements; threatened and endangered species consultation required under the Endangered Species Act; and consultation under the National Historic Preservation Act.

S.2 PURPOSE AND NEED

ESJ has applied to DOE for a Presidential permit that would allow the company to construct, operate, maintain, and connect approximately 0.65 miles (1 km) of new single-circuit 500-kV or double-circuit 230-kV transmission line in the U.S. that would cross the U.S.-Mexico border to connect with transmission to be built in Mexico.

The purpose and need for DOE's action is to respond to the ESJ request for a Presidential permit. DOE may issue or amend a Presidential permit if it determines that the action is in the public interest and after obtaining favorable recommendations from the U.S. Departments of State and Defense. DOE received notices of non-objection from these agencies dated January 12, 2011 (Department of Defense) and January 27, 2011 (Department of State). In determining whether a proposed action or a reasonable alternative is in the public interest, DOE considers the impact of the proposed action and the identified alternatives on the environment pursuant to NEPA, the proposed action's impact on the reliability of the U.S. electric power supply system, and any other factors that DOE may consider relevant. If DOE determines that granting a Presidential permit is in the public interest, the information contained in the EIS will also help to inform DOE's decision regarding potential mitigation measures and other conditions of the permit. DOE will issue a Record of Decision (ROD) no sooner than 30 days after the U.S. Environmental Protection Agency's (EPA) publication of a "*Notice of Availability of the Final EIS*" in the *Federal Register*. The Presidential permit, if approved, would be issued subsequent to the ROD.



Source(s):
AECOM 2010b; Sempra Generation 2010; USGS 2006.

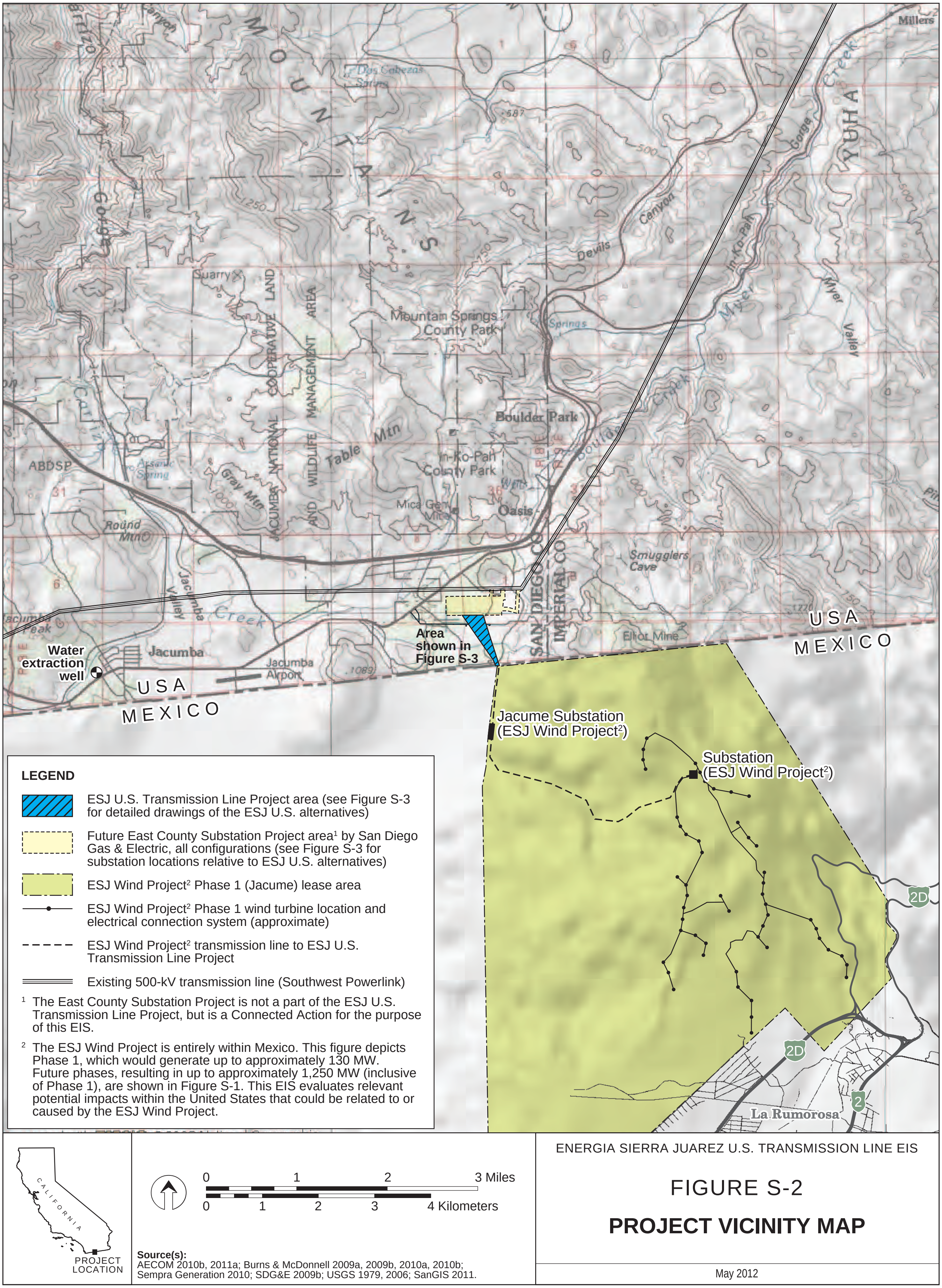
ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE S-1

PROJECT REGIONAL MAP

May 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-3218300\1ESJ_EIS_Figures\Figure_1-1_ProjectRegion_8x11_v10.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy



Source(s):
AECOM 2010b, 2011a; Burns & McDonnell 2009a, 2009b, 2010a, 2010b; Sempra Generation 2010; SDG&E 2009b; USGS 1979, 2006; SanGIS 2011.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE S-2

PROJECT VICINITY MAP

May 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\Figure_1-2_ProjectVicinity100k_8x11_v15.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy

S.3 ESJ PROJECT OBJECTIVES

The ESJ stated objective for the proposed transmission line is to transport renewable electrical power generated by the ESJ Wind project in Mexico to the U.S. ESJ has indicated to the DOE that power generated by its proposed ESJ Wind project would potentially be partitioned between U.S. and Mexico energy markets (although the extent of partitioning, if any, is undetermined) and that "the proposed transmission line is expected to reduce the region's dependence upon conventional fossil fuel fired generation plants, and improve the region's ability to meet future electrical energy requirements." The ESJ projects would also help California utilities meet the renewable portfolio standards specified in California Executive Order S-14-08, which requires that by the end of 2020, 33% of retail electricity sales be generated from renewable energy sources.

S.4 COOPERATING AGENCY

On February 1, 2010, the County of San Diego accepted DOE's invitation to be a cooperating agency for preparation of this EIS. Separate from the DOE Presidential permit application process, ESJ has applied to the County of San Diego for a Major Use Permit (MUP) for the project, and the County must review the environmental impacts of that permit in accordance with the California Environmental Quality Act (CEQA). As a cooperating agency in DOE's NEPA EIS, the County of San Diego has provided information to DOE related to topics within the County's jurisdiction and expertise.

As a responsible agency under CEQA, the County of San Diego expects to use the East County (ECO) Substation Environmental Impact Report (EIR)/EIS for its permitting processes. The U.S. Bureau of Land Management and the California Public Utilities Commission (CPUC) prepared the ECO Substation EIR/EIS to address San Diego Gas and Electric Company's [SDG&E] proposed ECO Substation project (including switchyards and a loop-in [connection] to the Southwest Power Link [SWPL]), Iberdrola Renewables Tule Wind Energy project, and the ESJ U.S. Transmission Line project. EPA published a Notice of Availability of the Draft EIR/EIS for the SDG&E ECO Substation Project on December 23, 2010 (75 FR 80807). EPA published a notice regarding the Final EIR/EIS for the project in the *Federal Register* on October 14, 2011 (76 FR 63922, available online: http://www.gpo.gov/fdsys/pkg/FR-2011-10-14/pdf/2011-26610.pdf). Following certification of the EIR/EIS by CPUC, the County would use the ECO Substation EIR/EIS to make the appropriate CEQA findings for its discretionary action under CEQA. The County of San Diego Planning Commission would consider approval of a MUP for the ESJ U.S. Transmission Line project, for Major Impact Service Utility (Section 1350 of the County's Zoning Ordinance). Other County permits and approvals that ESJ would need to build the project include County right-of-way permits for construction, excavation, and road encroachment; grading permit; and improvement plans.

S.5 ALTERNATIVES ANALYZED

The following alternatives are analyzed in this EIS:

- **No Action Alternative.** Under this alternative DOE would not issue the Presidential permit. This alternative presents the environmental impacts in the U.S. as if the line is never constructed and provides a baseline against which the impacts in the U.S. of the action alternatives can be measured.

- **Action Alternatives.** Under these alternatives, DOE would issue the Presidential permit. Analysis of action alternatives below sets forth the impacts in the U.S. of constructing and operating a transmission line that would cross the U.S.-Mexico border.
  - **Alternative 2**. Double-Circuit 230-kV Transmission Line
  - **Alternative 3.** Single-Circuit 500-kV Transmission Line
  - **Alternative 4.** Revised Routing for Double-Circuit 230-kV or Single-Circuit 500-kV Transmission Line
    - **Alternative 4A.** Revised Double-Circuit 230-kV Transmission Line alignment (applicant's preferred alternative)
    - **Alternative 4B.** Revised Single-Circuit 500-kV Transmission Line alignment
    - These alternatives are shown on Figure S-3a (Alternatives 2 and 3) and Figure S-3b (Alternatives 4A and 4B)

S.5.1 Alternative 1 – No Action

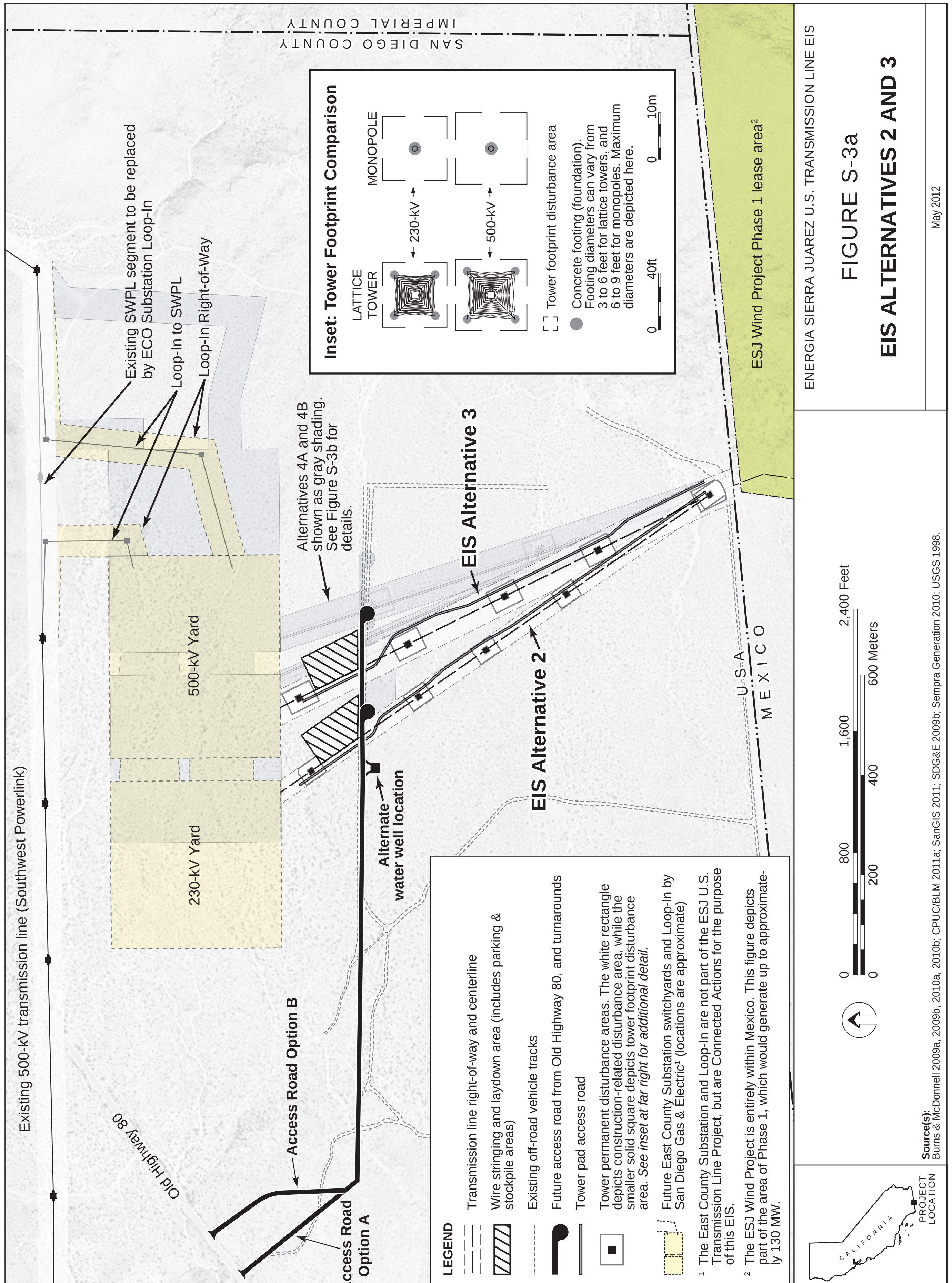
Under the No Action Alternative, DOE would not issue a Presidential permit for the ESJ U.S. Transmission Line and the line would not be built. The ESJ Wind project still could be constructed in Mexico, and the electrical generation from the wind turbines could either be confined entirely within Mexico or could enter the U.S. through a different transmission corridor. However, any alternative transmission corridor that crossed the international border would require a new Presidential permit application and would be subject to a separate NEPA review.

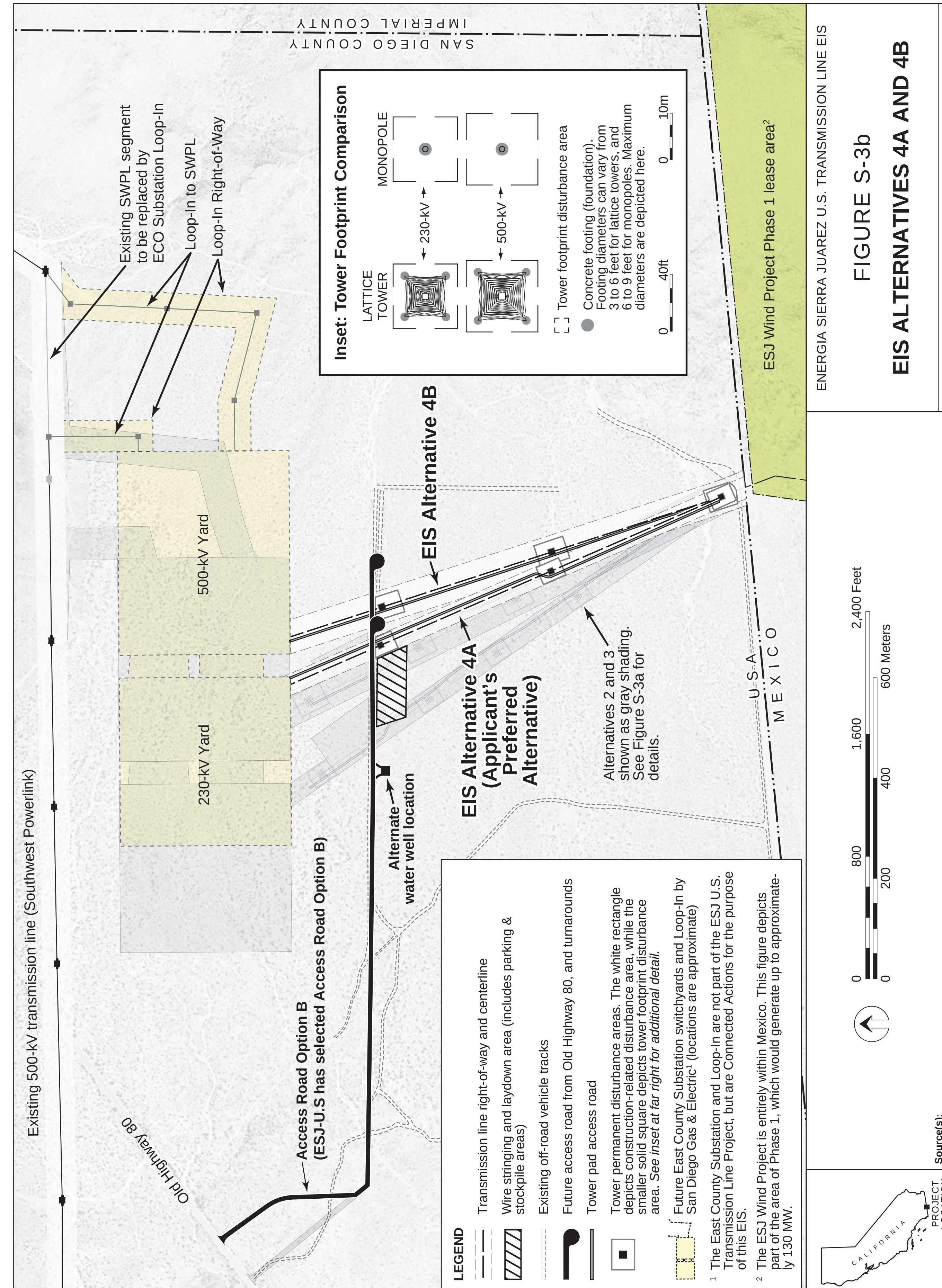
S.5.2 Alternative 2 – Double-Circuit 230-kV Transmission Line

Under Alternative 2, DOE would issue a Presidential permit for a double-circuit 230-kV transmission line (230-kV Route) across the U.S.-Mexico border. The total length of the 230-kV Route would be approximately 0.65 mile (1.05 km) between the proposed SDG&E ECO Substation switchyards and the international border (Figure S-3a). The line would continue south of the border for approximately 1 mile (1.6 km) to the ESJ Jacume Substation, the first point of interconnection in Mexico. An overhead static ground wire running above the conductors would have a fiber optic core for communications between the ESJ Jacume Substation in Mexico and the proposed SDG&E ECO Substation switchyards in the U.S. A loop-in in the proposed ECO Substation would connect the proposed line to the existing 500-kV SWPL.

S.5.2.1 Site Access

Old Highway 80 would be the primary roadway used for construction and maintenance access to the 230-kV Route. Access from Old Highway 80 to the transmission line site would require construction of a new 28-foot (8.5-meter [m]) wide property access road within an existing 40-foot (12.2-m) easement. ESJ has identified two options, Option A and B, for the access road from Old Highway 80. The locations and alignments for both options are shown in Figure S-3a (Alternatives 2 and 3) and Figure S-3b (Alternatives 4A and 4B).


ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS
FIGURE S-3a
EIS ALTERNATIVES 2 AND 3
May 2012
IMPERIAL COUNTY
SAN DIEGO COUNTY
Inset: Tower Footprint Comparison
LATTICE TOWER
MONOPOLE
230-kV
500-kV
Tower footprint disturbance area
Concrete footing (foundation). Footing diameters can vary from 3 to 6 feet for lattice towers, and 6 to 9 feet for monopoles. Maximum diameters are depicted here.
0 40ft
0 10m
ESJ Wind Project Phase 1 lease area²
Existing SWPL segment to be replaced by ECO Substation Loop-In
Loop-In to SWPL
Loop-In Right-of-Way
Alternatives 4A and 4B shown as gray shading. See Figure S-3b for details.
EIS Alternative 3
EIS Alternative 2
500-kV Yard
230-kV Yard
Alternate water well location
Existing 500-kV transmission line (Southwest Powerlink)
Access Road Option B
Access Road Option A
Old Highway 80
U.S.A.
MEXICO
0 800 1,600 2,400 Feet
0 200 400 600 Meters
LEGEND
Transmission line right-of-way and centerline
Wire stringing and laydown area (includes parking & stockpile areas)
Existing off-road vehicle tracks
Future access road from Old Highway 80, and turnarounds
Tower pad access road
Tower permanent disturbance areas. The white rectangle depicts construction-related disturbance area, while the smaller solid square depicts tower footprint disturbance area. See inset at far right for additional detail.
Future East County Substation switchyards and Loop-In by San Diego Gas & Electric¹ (locations are approximate)
¹ The East County Substation and Loop-In are not part of the ESJ U.S. Transmission Line Project, but are Connected Actions for the purpose of this EIS.
² The ESJ Wind Project is entirely within Mexico. This figure depicts part of the area of Phase 1, which would generate up to approximately 130 MW.
Source(s): Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2011a; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1998.
PROJECT LOCATION
CALIFORNIA
(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS_32183001\ESJ_EIS_Figures\
Figure_2-1a&b_EISAlternatives_2up_11x17_v15.ai (04/05/2012, 04:20 pm)
R. Wurgler/M. Schwartz/T. Murphy


ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS
FIGURE S-3b
EIS ALTERNATIVES 4A AND 4B
May 2012
IMPERIAL COUNTY
SAN DIEGO COUNTY
Inset: Tower Footprint Comparison
LATTICE TOWER
MONOPOLE
230-kV
500-kV
Tower footprint disturbance area
Concrete footing (foundation). Footing diameters can vary from 3 to 6 feet for lattice towers, and 6 to 9 feet for monopoles. Maximum diameters are depicted here.
0 40ft
0 10m
ESJ Wind Project Phase 1 lease area²
Existing SWPL segment to be replaced by ECO Substation Loop-In
Loop-In to SWPL
Loop-In Right-of-Way
EIS Alternative 4B
EIS Alternative 4A (Applicant's Preferred Alternative)
Alternatives 2 and 3 shown as gray shading. See Figure S-3a for details.
500-kV Yard
230-kV Yard
Alternate water well location
Existing 500-kV transmission line (Southwest Powerlink)
Access Road Option B (ESJ-U.S has selected Access Road Option B)
Old Highway 80
U.S.A.
MEXICO
0 800 1,600 2,400 Feet
0 200 400 600 Meters
LEGEND
Transmission line right-of-way and centerline
Wire stringing and laydown area (includes parking & stockpile areas)
Existing off-road vehicle tracks
Future access road from Old Highway 80, and turnarounds
Tower pad access road
Tower permanent disturbance areas. The white rectangle depicts construction-related disturbance area, while the smaller solid square depicts tower footprint disturbance area. See inset at far right for additional detail.
Future East County Substation switchyards and Loop-In by San Diego Gas & Electric¹ (locations are approximate)
¹ The East County Substation and Loop-In are not part of the ESJ U.S. Transmission Line Project, but are Connected Actions for the purpose of this EIS.
² The ESJ Wind Project is entirely within Mexico. This figure depicts part of the area of Phase 1, which would generate up to approximately 130 MW.
Source(s): Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2011a; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1998.
PROJECT LOCATION
CALIFORNIA
(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS_32183001\ESJ_EIS_Figures\
Figure_2-1a&b_EISAlternatives_2up_11x17_v15.ai (04/05/2012, 04:20 pm)
R. Wurgler/M. Schwartz/T. Murphy

S.5.2.2 Design Features

The 230-kV Route would be constructed within a 130-foot (40-m) permanent right-of-way and consist of either three to five 150-foot (46-m) steel lattice towers or up to five 150-foot (46-m) monopoles. Although the precise locations of the lattice towers or monopoles are not yet determined, the structures would be spaced a maximum of 1,500 feet (460 m) apart, would avoid sensitive cultural resources, and would not be placed within 150 feet (46 m) of the international border.

S.5.2.3 Construction

Construction of the transmission line would include the following activities:

- Clearing, grading, and grubbing
- Access road and pad construction
- Digging and drilling for tower foundations
- Pouring concrete foundations for towers
- Overhead electrical power system construction
- Final grading and site clean-up

Prior to construction of the transmission line, a staging site would be cleared at the northern end of the route, adjacent to the transmission right-of-way and north of the property access road. This area would provide a consolidated site for construction equipment laydown, vehicle parking, and wire stringing.

Construction activities would require approximately 20 to 25 workers per day for up to six months. Approximately 5 to 15 construction vehicles would operate onsite daily during construction, with approximately 10 to 20 worker vehicles entering or leaving the site each day.

Due to fire protection requirements (Section S.9.9) there would be no revegetation of the right-of-way after completion of construction. The area would not be fenced. During operation of the facility, minimal personnel (1 or 2) would be required to patrol and visually inspect the transmission facilities on a periodic basis. Road maintenance would be done as needed, and vegetation maintenance to prevent fuel build-up in a 30-foot (9.1-m) radius clear space around the tower footings (or 10-foot [3.0-m] radius around monopoles) would be done at least once a year. Operations and maintenance related traffic would typically consist of two vehicles entering and leaving the site each week.

Project construction would require an estimated 780,000 gallons (3 million liters) of water for watering of roads and minimizing dust generated from traffic and excavation activities and for aid in soil compaction. Water would be obtained from an existing non-potable (brackish) groundwater well in the town of Jacumba and trucked onto the site in tank trucks. The Jacumba Community Services District (JCSD) has agreed to provide groundwater from the existing JCSD Well #6 for this purpose. This well is located adjacent to Old Highway 80 in the western area of Jacumba, about 4.2 miles (6.8 km) from the ESJ U.S. Transmission Line project site, as indicated on Figure S-2. A short access road would be constructed on JCSD-owned property from Old

Highway 80 north to the well. In the event that the JCSD Well #6 is not used, ESJ would install a temporary water well onsite at a location shown on Figure S-3a.

S.5.3 Alternative 3 – Single-Circuit 500-kV Transmission Line

Under this alternative, DOE would issue a Presidential permit for the construction of a single-circuit 500-kV Transmission Line (500-kV Route) across the U.S.-Mexico border. The site access, design, and construction features of the 500-kV Route are very similar to those described above for the 230-kV Route. This section describes the key distinctions of the 500-kV Route. Table S-1 provides a side-by-side comparison of the two routes. The 500-kV Route would be constructed within a 214-foot (65-m) wide permanent right-of-way, extending 0.62 mile (1 km) from the U.S.-Mexico border to the proposed SDG&E ECO Substation switchyards (Figure S-3a). The 500-kV transmission line would be supported on either three to five 150-foot (46-m) steel lattice towers, or up to five 170-foot (52-m) steel monopoles spaced no more than 1,500 feet (460 m) apart. Although the precise locations of the lattice towers or monopoles within the right-of-way are not yet determined, the structures would be located a maximum of 1,500 feet (460 m) apart, would avoid sensitive cultural resources, and would not be placed within 150 feet (46 m) of the international border.

S.5.4 Alternative 4 – Revised Routing for Double-Circuit 230-kV Transmission Line (Applicant's Preferred Alternative) or Single-Circuit 500-kV Transmission Line

Alternative 4 was developed for the Final EIS to accommodate a revised location for the ECO Substation that has been proposed by SDG&E and is evaluated in the ECO Substation Project EIR/EIS. The revised substation location is shifted about 700 feet (213 m) east of the originally proposed ECO Substation location and is intended primarily to avoid cultural resources impacts. Alternative 4 consists of revised alignments for both the 230-kV and 500-kV transmission route options that would conform to the revised ECO Substation location. In its May 2010 filing with the County of San Diego, ESJ indicated that based on its understanding that SDG&E currently intends to construct the ECO Substation at the revised location, ESJ's preferred transmission line configuration is the revised route.

For the purpose of this EIS, the revised 230-kV route is referred to as Alternative 4A, and the revised 500-kV route is referred to as Alternative 4B. The Alternative 4 routes are essentially the same design as described for Alternatives 2 and 3, except that the terminus of 230-kV Route (Alternative 4A) would be shifted about 700 feet (213 m) east of the proposed 230-kV Route, and the 500-kV Route (Alternative 4B) terminus would be shifted about 550 feet (168 m) east of the proposed 500-kV Route. Under either revised route, the transmission line would cross the U.S.-Mexico border at the same location as under Alternatives 2 and 3.

Table S-1
230-kV Route and 500-kV Route Parameters

Parameter	230-kV Alternative Interconnection	500-kV Alternative Interconnection
Maximum Capacity	1,250 megawatts	1,250 megawatts
Number of Circuits	Double-Circuit	Single-Circuit
Minimum Ground Clearance	34 feet (10.4 m)	39 feet (11.9 m)
Width of Permanent Right-of-Way	130 feet (39.6 m)	214 feet (65.2 m)
Number of Structures	3 to 5	3 to 5
Maximum Spacing Between Structures	1,500 feet (460 m)	1,500 feet (460 m)
Permanent Impacts at Each Structure[1]	120 feet x 160 feet (0.44 acre; 0.18 ha)	150 feet x 200 feet (0.69 acre; 0.28 ha)
Permanent Impacts for All Structures (assuming 5 structures)	2.2 acres (0.89 ha)	3.45 acres (1.4 ha)
Area of Permanent Vegetation Removal	9.75 acres (3.9 ha)	10.77 acres (4.4 ha)
Construction Laydown/Parking/Stringing Area	1.98 acres (0.8 ha)	1.88 acres (0.76 ha)
Maximum Height of Lattice Towers	150 feet (46 m)	150 feet (46 m)
Maximum Base of Lattice Towers	29 feet x 29 feet (9 m x 9 m)	34 feet x 34 feet (10.4 m x 10.4 m)
Foundation of Lattice Towers at Each Corner	3 – 6 feet (1 – 2 m) diameter	3 – 6 feet (1 – 2 m) diameter
Maximum Height of Steel Monopoles	150 feet (46 m)	170 feet (52 m)
Foundation of Steel Monopoles	6 – 9 feet (2 – 3 m) diameter and up to 40 feet (12.2 m) deep	7 – 9 feet (2 – 3 m) diameter and up to 40 feet (12.2 m) deep

[1] In accordance with ESJ's Fire Plan for the project, a cleared space will be maintained around the tower or monopoles structures, and no restoration of impacted areas is proposed in the remainder of the construction area. Consequently, for planning purposes, there are no "temporary" disturbances and all land disturbances are considered permanent. ESJ has proposed the creation of a conservation easement to address this permanent impact. The proposed location for the easement is on the eastern edge of ESJ's property, adjacent to an existing U.S. Bureau of Land Management (BLM) Wilderness area (Section S.9.1).

Under Alternative 4A, the total length of the revised 230-kV Route would be 0.62 mile (1 km) between the future ECO Substation switchyard and the international border, which is slightly shorter than for the Alternative 2 Route (0.65 mile [1.05 km]). Engineering design and construction methods for Alternative 4A would be substantially the same as Alternative 2, with minor changes to the overall acreage of disturbance, a slight revision to the construction staging location, and a slightly longer access road from Old Highway 80. Because the access road would be slightly longer, a proportionately larger volume of road construction material and number of associated truck deliveries would be required, compared to the original 230-kV Route.

Under Alternative 4B, the total length of the revised 500-kV Route would be 0.59 mile (0.95 km) between the future ECO Substation switchyard and the international border, which is slightly shorter than the Alternative 3 Route (0.62 mile [1.0 km]). Engineering design and construction methods, as well as operations and maintenance activities, for Alternative 4B would be substantially the same as Alternative 3, with minor changes to the overall acreage of disturbance, a slight revision to the construction staging location, and a slightly longer access road from Old Highway 80.

Operation and maintenance activities for the revised 230-kV or 500-kV Routes would be the same as for Alternatives 2 and 3.

The revised 230-kV Route and 500-kV Route details are listed in Table S-2 and shown in Figure S-3b. Alternatives 2 and 3 can be compared with Alternatives 4A and 4B by viewing Figures S-3a and S-3b.

Table S-2
Land Disturbance for Alternative 4 – Revised 230-kV or 500-kV Routes

Project Components	Alternative 4A (Revised 230-kV Route)	Alternative 4B (Revised 500-kV Route)
Construction Lay-Down/ Parking/Stringing Area	2.0 acres [0.8 ha]	1.9 acres [0.77 ha]
28-foot Property Access Road and Turn Around[1]	4.5 acres (1.82 ha)	4.5 acres (1.82 ha)
Transmission Tower Access Road	0.68 acre (0.36 ha)	0.65 acre (0.32 ha)
Permanent Impacts (5 towers and 30-foot fire clearing)[2]	2.2 acres (0.89 ha)	3.45 acres (1.4 ha)
150-Foot by 20-Foot Access Road to Existing Water Well	0.063 acres (0.03 ha)	0.063 acres (0.03 ha)
Totals[3]	9.78 acres (3.93 ha)	10.83 acres (4.36 ha)

1 The 28-foot (8.5 m) property access road is located within a 40-foot (12.2 m) easement. The entire 40-foot (12.2 m) easement could be impacted during construction. Therefore, impacts to the entire 40-foot (12.2 m) easement have been assumed for this calculation. The acreage of disturbance is based on property access road Option B in order to indicate the greatest amount of potential impact. Values are approximate.

2 Depending on final design, 3 to 5 towers would be installed. Values are approximate.

3 The total amount of land disturbance shown in this row is larger than the sum of the rows above due to rounding.

DOE has identified its preferred alternative as Alternative 4A (Revised 230-kV Route) on lattice towers.

S.6 ESJ WIND PROJECT IN MEXICO AND IMPACTS IN THE UNITED STATES

The ESJ Wind project in Mexico would be constructed in phases, with up to 52 wind turbines constructed in Phase 1. Power output from Phase 1 would be 130 MW assuming nominally 2.5 MW per turbine, and potentially up to 156 MW if the output reaches 3 MW per turbine (the wind turbines have not been selected by ESJ, so actual generating capacity may vary, depending on the selected manufacturer and specific model). Phase 1 would be located on the furthest north land leased by ESJ (an area referred to as the Jacume lease area), north of the town of La Rumorosa, Mexico. Figure S-1 depicts the general location of the project in eastern San Diego County and Baja California. Figure S-2 provides a more detailed map of Phase 1 of the ESJ Wind project and preliminary proposed project locations. As shown in Figure S-2, the wind turbines nearest to the U.S. would be located no closer than approximately 0.7 mile (1.1 km) south of the U.S. border.

The present plan for the wind turbines is as follows: A typical turbine design that may be used for this project is similar to Siemens Power Generation's SWT-2.3-101 Wind Turbine (this is a 2.3 MW machine). The maximum rotational speed of turbine rotor blades averages between 6 and 16 revolutions per minute for a 2.5 MW turbine. The total height of the combined tower structure and rotor blades would likely be up to 431 feet (130.5 m), depending on the tower height and the turbine rotor blade diameters. The rotor diameter for the Siemens SWT-2.3-101 is approximately 333 feet (101 m). The total distance from blade tip at the six o'clock position to the ground surface would be at least 97 feet (29.5 m).

Up to approximately 30 percent of the wind turbine units would be lighted (actual percentage would be dictated by Mexican regulatory requirements). It is anticipated that lighting would generally follow U.S. FAA guidelines or equivalent Mexican guidelines. Other infrastructure to support the wind turbines would include access roads, electrical substations, and transmission lines from the substations to the U.S.-Mexico border, where the lines would link to the ESJ U.S. Transmission Line, as shown in Figure S-2.

Subsequent expansion of the ESJ Wind project in Mexico, if executed, is presently planned to consist of additional phases of wind turbines, up to a maximum build-out of 1,250 MW. The timing and location for installation of subsequent phases have not been determined, but ESJ's current leaseholds would place the location of those subsequent phases south of the town of La Rumorosa (Figure S-1) and thus farther from the border.[1]

As discussed below in Section S.8.2, NEPA does not require an analysis of environmental impacts that occur within another sovereign nation that result from actions approved by that sovereign nation. DOE does analyze all impacts that occur in the U.S. from connected actions in a foreign country. Accordingly, DOE here considers potential impacts within the U.S. from connected transmission facilities in Mexico and from the associated ESJ Wind project in Mexico.

[1] This reflects the latest information provided to DOE by the applicant as of the date of publication.

For all impacts topics considered in the EIS, DOE evaluated the potential impacts in the U.S. due to related activities in Mexico. The two areas with the greatest potential for cross-boundary impacts are biological resources and visual resources. As described further in Section S.9.1, potential impacts to biological resources in the U.S. could occur if construction or operation of the ESJ Wind project and the associated transmission lines in Mexico impeded the cross-border movement of wildlife or caused mortality to such wildlife, including birds afforded international protection under international treaties and the Migratory Bird Treaty Act (MBTA). Construction and operation of the wind facilities, coupled with elevated levels of human activity from workers and visitors to the wind farm, could alter wildlife behavior, including possible avoidance of the area. Construction of the ESJ Wind project could result in the destruction or abandonment of active migratory bird nests and operation of the turbines could result in the loss of migratory birds and migratory bats that collide with the turbine blades. Future phases would increase this development footprint and thus potentially increase the impact to birds protected under the MBTA.

ESJ has obtained an environmental permit from the Mexican government for the ESJ Wind project. DOE reviewed a partial translation of the Mexican MIA permit (or La Manifestación de Impacto Ambiental, modalidad regional [MIA-R]). The permit requires a baseline study (at least one year) of potential impacts to birds (including migratory species) and bats prior to the operation of the proposed wind farm. If the baseline study shows that birds and bats could be adversely impacted, the permit requires future mitigation to protect or minimize adverse impacts on these bird and bat populations.

As described further in Section S.9.2, wind turbines constructed in Mexico as part of the EJS Wind project would be visible from several U.S. locations. The wind turbines would appear as an assemblage of light-colored vertical forms in a landscape predominantly natural in appearance. Predicted visual impacts from wind turbines would be moderate-to-high for viewers at observation points in the community of Jacumba and from a nearby recreational area (Table Mountain ACEC) and low-to-moderate for viewers at an observation point on Interstate 8. During clear weather, aviation safety lighting on wind turbines (if lighting is required by Mexican agencies) would also be visible from viewing points in the U.S. Future phases would increase the number of wind turbines in Mexico. Subsequent expansion of the ESJ Wind project would be located south of the town of La Rumorosa (Figure S-1), sufficiently distant from the U.S. viewing points such that visual impacts are not expected.

As described further in Section S.9.9, impacts could also occur in the U.S. if a wildfire were to travel north across the U.S.-Mexico border as a result of an incident associated with the ESJ Wind project transmission lines in the vicinity of the border, or as a result of a fire that originates in the wind turbine development area. The Mexican permit requires a Fire Protection Plan to be prepared prior to construction in coordination with relevant agencies. The purpose of the plan would be to evaluate the likelihood of fire sources, identify preventive measures, and develop site-specific action plans in the event of a fire in the ESJ Wind project area.

S.7 ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

DOE considered several additional alternatives but dismissed them from detailed analysis, as discussed below.

S.7.1 Alternative Transmission Line Route

During the initial planning and siting process for the transmission line, ESJ considered one additional route alternative for an overhead transmission line. The route considered was located west of and parallel to the routes of Alternatives 2 and 3 and terminated at an alternative substation location on the north side of Old Highway 80, east of Jacumba. It extended approximately 1 mile (1.6 km) north across U.S. land and required a slightly longer line in Mexico than Alternatives 2 and 3. This concept was developed by ESJ prior to SDG&E's application filing for the ECO Substation Project. Given the current proposed location of the SDG&E ECO Substation, and the distance between this route and the substation, this alternative is no longer considered feasible or practical and is not considered a reasonable alternative.

S.7.2 Underground Transmission Line

It is technically feasible to install transmission lines underground. Commenters on the scope of this EIS and the County of San Diego, which is a cooperating agency for this EIS, requested that the EIS consider the alternative of placing the proposed transmission line underground for its entire length from the Mexican substation to the proposed SDG&E ECO Substation. The commenters stated that an underground transmission alternative would have less environmental impact, including lower visual impacts and lower fire risk, than an aboveground transmission line. The County also stated that an underground line would reduce impacts to biological resources, visual resources, recreation, public health and safety, fire and fuels management, and geology and soils.

Largely because underground transmission lines are substantially more expensive than aboveground lines, underground transmission lines are primarily used in dense urban areas where overhead routes may not be feasible. In addition to the cost, utility experience with underground transmission lines is limited, particularly at higher voltages. Dissipation of heat from the conductors is a particular challenge in building and maintaining underground transmission lines. The ECO Substation EIR/EIS dismissed the alternative of underground installation of a 500-kV transmission line, stating that this is not a commercially viable option using current technology. Where underground installation of high-voltage alternating current transmission lines is seriously considered, including lines of 500-kV, it is typically only for relatively short distances in locations where there are major constraints on aboveground transmission. For instance the Sunrise Powerlink EIR/EIS considered a two-mile, 500-kV line feasible for a site where aboveground lines could conflict with current land uses.

An underground transmission line would avoid most of the potential visual resource impacts associated with an overhead line that used either the lattice tower or monopole designs. An underground line also would be more reliable, e.g., less susceptible to weather-related outages. However, this benefit is offset to some extent by the fact that a failure underground is relatively more difficult to locate and repair.

Construction of an underground transmission line would involve significantly greater ground disturbance and associated environmental impacts than the proposed aboveground line, as underground construction would require trenching throughout the entire length of the transmission line route. Trenching along the entire length of the line would result in more disturbance to biological resources, soils, and cultural resources during construction than an overhead transmission line and would afford less opportunity to avoid sensitive resources. During operation, fire and fuel management would be less a concern for an underground transmission line than for an overhead line, but the land above and in the vicinity of the line would have to be kept free of shrubs to avoid direct interference by roots, and access roads would be needed along the entire length of the line in order to provide access to repair outages.

Placing the transmission line underground may reduce public exposure to electric and magnetic fields (EMF). Studies indicate that underground alternating current (AC) cables produce no aboveground electric field; however, magnetic field strengths from AC power lines buried underground are similar to magnetic strengths for power lines above ground. Magnetic field strengths above underground AC lines depend on the details of the installation. Because underground transmission lines are typically 4 feet (1.2 m) below ground, at the ground surface the magnetic fields from individual conductors tend to be higher than for aboveground lines. However, because underground conductors are typically spaced much closer together than aboveground conductors, the fields of the individual conductors partially cancel each other to produce a combined magnetic field that is smaller than the fields of the individual conductors. Therefore, magnetic field exposure under this alternative could be greater or smaller than exposure from aboveground transmission lines.

A potential undergrounding approach to minimize ground disturbance in installation of an underground line is to use horizontal directional drilling techniques. Horizontal directional drilling uses a directional boring technique over relatively long distances compared to conventional boring techniques. Horizontal directional drilling minimizes the total ground disturbance required. However, due to its high cost, this method is typically used only at major infrastructure or sensitive resource crossings where trenching and conventional boring techniques are not feasible (e.g., to cross under highways or major streams).

The cost of undergrounding has been shown to be substantially higher than placing aboveground wires, generally between 5 and 10 times the cost of aboveground transmission lines. According to ESJ, undergrounding of the ESJ U.S. Transmission Line is estimated to cost $20.3 million, while the same stretch of overhead line is projected to cost less than $2 million.

Based on these considerations, DOE does not consider the construction of an underground transmission line to be a reasonable alternative, and no further analysis is provided.

S.7.3 Existing Western Energy Coordinating Council Transmission Corridor

The potential of a direct interconnection to Mexican transmission lines using the existing Western Energy Coordinating Council (WECC) transmission corridor was considered but dismissed from detailed analysis for several reasons. The WECC Path 45 transmission corridor generally runs through northern Baja, Mexico, in an east-west orientation, and connects the California grid to the Mexican grid, at existing international border crossings in Imperial County and San Diego County. According to the applicant, the WECC transmission corridor would not provide enough interconnection capability with the U. S. grid to deliver the capacity of the ESJ Wind project and would not meet reliability objectives when local renewable resources are unavailable. This alternative would also have greater impacts because substantial changes to transmission lines would be required in Mexico. Import capacity of the Comisión Federal de Electricidad into the United States is limited to 800 MW and, therefore, would not be able to accommodate the planned generation of 1,250 MW from the ESJ Wind Project without substantial upgrades. The applicant maintains that such upgrades would require detailed studies and new international agreements that would likely delay delivery of power from the ESJ Wind project. Furthermore, the proposed project reflects the shortest distance between the ESJ Wind project and the ECO Substation, so any other potential routing would be longer with likely commensurate greater impacts. The ECO Substation EIR/EIS also concluded that use of WECC Path 45 would not meet the objectives of the project.

Therefore, this alternative is not considered a reasonable alternative to the proposed project and is dismissed from further consideration.

S.8 PUBLIC PARTICIPATION

DOE conducted two scoping meetings on August 26, 2008, in the town of Jacumba, California, during the public comment period following the NOI for EA preparation. The meetings provided the public with the opportunity to learn more about the proposed project and to provide comments on potential environmental issues associated with the project. A total of 18 people spoke at the meetings. In addition, DOE received scoping comments in the form of 8 letters from private citizens, government agencies, and non-governmental organizations. The following key issues were identified during the scoping process:

- visual impacts
- avian mortality
- impacts on protected, threatened, endangered, or sensitive species of animals or plants, or their critical habitats
- impacts on cultural or historic resources
- impacts on human health and safety, with particular focus on wildfire hazards due to presence of the proposed transmission line
- impacts on air quality and water resources
- impacts on land use
- impacts from development of wind generation

In addition, several commenters stated that an EA was not adequate, and that an EIS should be prepared.

Based on the comments received and the potential for significant impacts, DOE determined that an EIS would be the more appropriate NEPA document as discussed above. The second, EIS NOI was also sent to federal, state and local agency representatives; tribes; conservation organizations; local libraries and newspapers; and local stakeholder organizations and individuals in the vicinity of the proposed project. In response to the EIS NOI, DOE received 7 letters or emails from private citizens, government agencies, and non-governmental organizations, including one letter from a Native American tribe (Quechan Tribe).

DOE also sent letters to various federal and California state agencies specifically requesting their input. Several agencies have responded to these letters, providing recommendations for the EIS and/or indicating an interest in reviewing the draft EIS and participating in project meetings.

A project website maintained for DOE (http://www.esjprojecteis.org/) provides background information on the proposed action and DOE's NEPA process. All agency letters and comments received in response to both NOIs are available on the website.

The draft EIS was distributed to interested agencies, organizations, and the general public for review and comment in September 2010. Notification of draft EIS availability was sent to those on the project website mailing list. DOE held three public hearings on the draft EIS during the comment period (Jacumba, California on October 5, 2010; Boulevard, California on October 6, 2010; and San Diego, California on October 7, 2010). Transcripts of the public hearings are available on the project website and in Volume 2 (Comment Response Document) of this final EIS.

DOE also received written comments from government officials, organizations, and individuals. DOE, in coordination with the County of San Diego (cooperating agency), has considered all comments received during the public review period and prepared this final EIS. The final EIS provides responses to the comments received on the draft EIS, identifies DOE's preferred alternative, and includes changes to the draft EIS in response to comments or new information received.

S.8.1 Issues within the Scope of this EIS

The issues summarized below were raised by commenters during scoping and are addressed in the EIS.

Visual Resources. Commenters raised concerns about changes in the visual character of the project area due to the placement of industrial facilities in a rural, open space setting. Specific concerns were raised regarding the daytime and nighttime views of the proposed wind turbines along prominent ridgelines of the Sierra Juarez Mountains; the proposed ESJ U.S. Transmission Line; and other planned projects that would place new infrastructure in the project area, including the ECO Substation switchyards and related transmission line improvements.

Birds. Commenters raised concerns about avian mortality due to transmission line and wind turbine construction and operation. They also suggested that birds protected by the MBTA should be addressed in the impact analysis.

Protected or Sensitive Species and Critical Habitats. Commenters suggested that the analysis should discuss critical habitat and wildlife movement for protected species in the project area, including Peninsular bighorn sheep, Quino checkerspot butterfly, and California condor; and include measures to mitigate potential impacts to these species and their habitats. Commenters also expressed concerns related to potential impacts on present and potential future preserve lands within the Las Californias Binational Conservation Initiative and suggested avoidance of land that would be necessary to meet preserve objectives.

Cultural and Historic Resources. Cultural resource concerns raised by commenters related to potential disturbance to buried archeological resources in the project area and consideration of the broader cultural landscape. DOE has consulted with the Quechan Tribe and the Campo Band.

Human Health and Safety, Fire Hazards, and Homeland Security. Commenters suggested that the project would introduce a new fire hazard area in a remote area of existing high fire hazards. Concerns were also expressed regarding increased electric and magnetic fields, road construction that could lead to increased illegal activity related to the U.S.-Mexico border, and vulnerability of the transmission line to damage due to illegal border activity. In accordance with DOE NEPA guidance, the EIS also considers potential consequences of intentional destructive acts such as sabotage and terrorism.

Air Quality. Commenters suggested that the analysis address traffic-induced dust due to increased off-road vehicle traffic and increased U.S. Border Patrol traffic, as well as greenhouse gas emissions.

Water Resources. Commenters indicated that groundwater is scarce in the project area and suggested that the analysis should address groundwater impacts and groundwater impact minimization measures.

Land Use. Commenters indicated that the County of San Diego is in the process of updating its General Plan, and the County intends for the project area to remain rural. The comments suggested that the ESJ U.S. Transmission Line project and other proposed development projects could alter the rural character of the project area by introducing industrial development, and that these projects should be reviewed for consistency with the applicable General Plan (including the Mountain Empire Subregional Plan), codes and ordinances.

Connected Actions. Commenters asked for the EIS to include assessment of the impacts of SDG&E's ECO Substation project as a connected action. The proposed SDG&E ECO Substation Project has several elements, including the ECO Substation switchyards; a loop-in to the existing SWPL transmission line; an approximately 13.3-mile (21.4 km) 138-kV transmission line to Boulevard Substation; and associated upgrades to the Boulevard Substation (located west of the project area near the community of Boulevard). DOE has assessed the ECO Substation switchyards and SWPL loop-in components of the project as connected actions because the ESJ U.S. Transmission Line would interconnect directly to the ECO Substation facility and Loop-In.

S.8.2 Issues Outside the Scope of this EIS

DOE has determined that the following issues that were raised by commenters during scoping are outside the scope of the EIS.

Emergency Outage Plans. Commenters requested that emergency outage plans be examined as part of the EIS, particularly in relation to homeland security issues. The development of emergency outage response plans is the purview of local public safety officials and is outside the scope of the EIS. Also, outside of the NEPA process, DOE will perform an electric reliability study to ensure that the existing U.S. power supply system would remain fully operational upon the sudden loss of power, regardless of the cause of the outage.

Impacts in Mexico. Several commenters asked DOE to evaluate the impacts associated with the construction and operation of wind turbines and associated development activities on the environment in Mexico, not just in the U.S. DOE does not agree that such an analysis is appropriate for several reasons.

First, the federal action evaluated in the EIS is not the building of the wind turbines, but the permitting of the construction, operation, maintenance, and connection of an electric transmission facility at the U.S. international border.

Secondly, NEPA does not require an analysis of environmental impacts that occur within another sovereign nation that result from actions approved by that sovereign nation. E.O. 12114 (January 4, 1979) requires federal agencies to prepare an analysis of significant impacts from a federal action in certain defined circumstances and exempts agencies from preparing analyses in others. The E.O. does not require federal agencies to evaluate impacts outside the U.S. when the foreign nation is participating with the U.S. or is otherwise involved in the action [Section 2-3(b)]. The Mexican government has been involved in the evaluations of the environmental impacts associated with the wind project in Mexico. Further, the ESJ Wind project would be constructed in accordance with all applicable Mexican laws, standards, rules, and regulations. The agencies in Mexico with potential jurisdiction over the activities proposed within Mexico include the Comisión Federal de Electricidad, Comisión Reguladora de Energía, Secretaría de Medio Ambiente y Recursos Naturales, and Instituto Nacional de Ecología.

Finally, the federal action would not affect the global commons (e.g., outer space, Antarctica), and the federal action would not produce a product, emission, or effluent that is “prohibited or strictly regulated by federal law in the U.S. because its toxic effects on the environment create a serious public health risk” or which involves regulated or prohibited radioactive materials.

Sunrise Powerlink Project. Several commenters suggested that SDG&E’s application for construction of the Sunrise Powerlink project should be assessed as a connected action to the ESJ U.S. Transmission Line project. The CEQ NEPA regulations require EISs to assess the environmental impacts of connected actions. Connected actions are actions closely related to the proposed action addressed in an EIS. They are further defined (in 40 CFR 1508.25(a)1) as actions that:

- automatically trigger other actions that may require environmental impact statements;
- cannot or will not proceed unless other actions are taken previously or simultaneously; or
- are interdependent parts of a larger action and depend on the larger action for their justification.

Commenters suggested that the Sunrise Powerlink is a connected action because the ESJ U.S. Transmission Line project would depend upon construction of the Sunrise Powerlink to provide adequate electrical transmission line capacity (i.e., due to the currently inadequate capacity of the existing SWPL). While the Sunrise Powerlink and ESJ U.S. Transmission Line projects are complementary in that they would facilitate the operation of the electricity-generating facilities in Mexico, they are independent actions that serve distinct objectives and that can proceed separately.[2] The Sunrise Powerlink was the subject of a separate EIR/EIS prepared for BLM under NEPA and the CPUC under CEQA. The Sunrise Powerlink is currently under construction and is planned for operation in 2012. In this EIS, impacts of the Sunrise Powerlink are considered as cumulative impacts for the ESJ U.S. Transmission Line project.

SDG&E ECO Substation Project Additional Infrastructure. As noted above, the proposed SDG&E ECO Substation Project has several elements, including the ECO Substation switchyards, a loop-in to SWPL, an approximately 13.3-mile (21.4 km) 138-kV transmission line to Boulevard Substation; and associated upgrades to the Boulevard Substation. DOE considers the ECO Substation switchyards and the loop-in to SWPL to be connected actions for the purpose of this EIS because the ESJ U.S. Transmission Line would interconnect directly to this facility. Several commenters suggested that additional proposed infrastructure associated with SDG&E's application for construction of the ECO Substation Project should also be assessed as connected actions to the ESJ U.S. Transmission Line project because the ESJ U.S. Transmission Line project would depend upon interconnection to the SWPL and/or to Sunrise Powerlink. Only the first point of interconnection with the U.S. electrical transmission grid is a connected action for the ESJ U.S. Transmission Line project. The additional SDG&E ECO Substation Project components beyond the switchyards and loop-in are independent of the ESJ U.S. Transmission Line project; that is, the ESJ U.S. Transmission Line project does not depend on these components, and these components are neither triggered by nor dependent on the project. Therefore, these elements are not connected actions for the purpose of this EIS, but are considered as potential sources of cumulative impacts.

Cumulative Impacts from Speculative Future Renewable Energy Projects. Commenters requested that the cumulative impact analysis in the EIS consider the impacts of numerous potential renewable energy projects, particularly projects to be located in northern Baja California, Mexico, that have been announced by various developers or mentioned in media accounts. Guidance from the CEQ on conducting cumulative impact assessments recommends

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[2] In its May 30, 2008, letter to DOE, Sempra provided the following explanation regarding the relationship between the ESJ U.S. and Sunrise Powerlink projects:

"Although one of the attributes of the Sunrise project is that it would address the previously discussed SPS [Special Protection System] limitation, this would benefit all potential generators seeking interconnection to SWPL or the Imperial Valley Substation, including renewable projects located in Imperial Valley. These Sunrise benefits will occur regardless of whether the generation associated with Baja Wind U.S. [now ESJ] is built or not. Thus, the decision to build the Sunrise project will be made regardless of the potential existence or not of Baja Wind U.S. [now ESJ] or its associated generation.

Conversely, if Sunrise is not built, Sempra Generation would seek to have the CAISO [California Independent System Operator] and SDG&E evaluate alternative transmission to accommodate Sempra Generation's interconnection requests. Order No. 888 requires transmission facility owners to offer transmission to generators to their interconnection to grid. The Sunrise and Baja Wind [now ESJ] projects have different purposes and justifications, are proposed by different entities, have independent utility and different triggers and actions are necessary to implement projects. In conclusion, the Sunrise and Baja Wind U.S. [now ESJ] projects are completely independent projects and decisions to proceed with each project will be made separately and independently of the outcome of the other."

that the consideration of impacts from future projects be limited to projects that are reasonably foreseeable. DOE has limited its identification of reasonably foreseeable projects to those proposals with the potential to be executed within the next 10 years; that is, they are funded for future implementation or are included in firm near-term plans. Projects predicted to be developed after 10 years are generally presumed to be speculative and thus are not reasonably foreseeable.

Use of the Proposed Transmission Line for Non-Renewable Energy Projects. Commenters expressed concern that the proposed transmission line could eventually be used to support non-renewable energy generation projects in Mexico that would have additional effects in the U.S. (e.g., impacts due to the construction and operation of natural gas-fired power plants in Mexico that might use the proposed transmission line to export electricity to the U.S.). Commenters pointed out that Sempra has constructed other infrastructure in Mexico near the project area (including a natural gas pipeline from its Natural Gas Liquids facility in Ensenada and a water pipeline) that could facilitate such development. ESJ has indicated to DOE that the proposed electrical transmission line is intended to be used only for renewable generation. Accordingly, any alternative future use of the transmission corridor would require a new or revised Presidential permit application to be filed with DOE and would be subject to a separate NEPA review. Therefore, the possible use of the line for non-renewable energy is outside the scope of this EIS.

S.8.3 Issues Raised During Public Comment Period

The following are some of the major topics of comments submitted during the public comment period.

Project Purpose and Need. Commenters questioned the project’s purpose and need, and asserted that the cross-border transmission line could eventually become available for fossil-fueled generation. ESJ has indicated to DOE that the proposed electrical transmission line is intended to be used only for renewable generation. Accordingly, any alternative future use of the transmission corridor would require a new or revised Presidential permit application to be filed with DOE and would be subject to a separate NEPA review. Therefore, the possible use of the line for non-renewable energy is outside the scope of this EIS.

Distributed Electricity Generation as an Alternative. Commenters asked for consideration of distributed small-scale electricity generation, such as solar panels in urban settings, as an alternative to large-scale wind energy development and associated long-distance transmission lines. Alternative approaches for energy generation are outside the scope of the EIS because they do not respond to DOE’s purpose and need, which is to respond to the ESJ request for a Presidential permit.

Additional Project Alternatives. Commenters asked for consideration of the use of existing transmission lines in Mexico (e.g., Western Energy Coordinating Council Path 45 transmission line in northern Baja California, which crosses the U.S.-Mexico border near San Diego). The EIS has been revised to include consideration of the potential use of the existing Western Energy Coordinating Council (WECC) transmission corridor as an alternative to the applicant’s proposed project.

Commenters requested additional analysis of the alternative of installing the transmission line underground. Revised discussion of this alternative is provided this final EIS, but DOE has not altered its conclusion that this is not a reasonable alternative.

Connected Actions. Several comments asserted that the Sunrise Powerlink is a connected action because the existing Southwest Powerlink has insufficient electrical capacity to support the full buildout of the ESJ Wind project, and thus the ESJ U.S. Transmission Line project could not proceed without the additional capacity that Sunrise would provide.

Commenters also asked that the whole of the SDG&E ECO Substation project be considered a connected action. DOE considers only the first points of interconnection with the electrical transmission grid (i.e., SDG&E's ECO Substation switchyard facility and SWPL loop-in) to be connected actions. The additional SDG&E ECO Substation Project components beyond the switchyards and loop-in are not considered connected actions to the ESJ U.S. Transmission Line project.

Cumulative Projects. Several comments indicated additional projects that should be addressed in the cumulative impact assessment, including several renewable energy development projects in the border region, as well as land use developments in Boulevard and other nearby communities. Certain projects were added to the list of cumulative projects and these projects were considered in the cumulative impacts assessment. Some projects could not be included due to the lack of sufficient information for assessment.

Cross-Border Biological Resource Impacts and Mitigations. Several comments asked for additional information about potential cross-border impacts of the ESJ Wind project on birds (particularly golden eagles) protected under the MBTA and the Bald and Golden Eagle Protection Act (BGEPA). The EIS is revised to provide additional information and analysis on this topic.

Commenters asked for additional analysis of potential cross-border impacts to Peninsular bighorn sheep and provided photographs of incidental sightings of bighorn sheep. The EIS is revised to include further discussion of potential impacts to bighorn sheep, including potential cross-border impacts.

Commenters asked that DOE impose mitigation on the ESJ Wind project. DOE is not in a position to require mitigation measures to be implemented in Mexico. The Final EIS identifies some of the mitigations that are included in the Mexican permit for the ESJ Wind project.

Visual Resource impacts. Commenters indicated that views of the transmission lines, combined with other planned developments, would diminish the visual character of the project area, including nighttime visual impacts if the transmission towers are lighted. The EIS is revised to provide further discussion of cumulative visual impacts.

Fire Hazards. Several comments, including comments from the San Diego Rural Fire Protection District, expressed concern about the adequacy of existing fire response resources and applicant-proposed measures to address potential construction-related and long-term fire hazard risks. The EIS is revised to include information on developments since the Draft EIS was published, including the applicant's agreement with the fire district, its commitment to several fire protection measures to address fire district concerns, and the district's response.

Several comments requested further analysis of the potential cumulative fire hazard impacts of the combined introduction of industrial wind turbines (including the ESJ Wind project in Mexico), new substations, and new transmission lines. These combined projects would increase fire hazards in the project area, which has a high fire hazard severity rating due to dry conditions and high winds. Several examples of wind turbine accidents and fires were presented, and it was suggested that increased fire hazards would also result in increased fire insurance rates, a socioeconomic impact.

With respect to comments regarding potential fire hazards originating from the ESJ Wind project, the EIS is expanded to include information about design features that could be installed on individual wind turbines to reduce the probability of a fire, e.g., lightning arresters and thermal monitoring systems that detect temperature increases and automatically shut off the generating system above a critical thermal threshold.

Water Resources. The County of San Diego asked for expanded discussion of potential impacts from the use of groundwater from a groundwater well for use during construction. The EIS is updated to include a description of the project's proposed use of an existing groundwater well, and an analysis of potential impacts to the local groundwater basin.

Socioeconomic Impacts. Commenters asserted that the project would enable economic development and employment in the project region. Other commenters expressed concerns that the project would facilitate the export of American jobs, increase the U.S. dependence on foreign energy, and undermine American environmental and labor laws. Impacts of the project on employment and economic conditions in the project area are considered in the EIS. However, the topics of labor policy and California energy policy are outside the scope of the NEPA process. DOE will consider comments on these topics as well as all other comments received in this proceeding in the course of evaluating the Presidential permit application.

Some comments expressed concern about potential impacts on property values and tourism income in the project area. The EIS is revised to include discussion of additional reviews of available research on potential impacts to property values and tourism income.

Environmental Justice. Several commenters expressed concern that local communities, which include low income and minority populations, would experience reduced property values, reduced tourism income, and be disproportionately impacted by the ESJ U.S. Transmission Line project, in combination with other proposed projects. The EIS discussions of environmental justice impacts have been expanded to include more information on this topic. Commenters also questioned statements in the Draft EIS concerning the absence of low-income populations in the project area. Updated census data were added to the EIS, and it was determined that, with the addition of 2009 data, the data now indicate that one of the census tracts in the vicinity of the alternative corridors is considered low income, as compared to the County. Although the new data do change the EIS conclusion regarding the presence of low-income populations in the surrounding area, the data do not change the conclusion that minority and low-income populations, within the meaning of Executive Order 12898, would not experience disproportionately high and adverse impacts from the proposed action.

Backup Generation. Because wind energy is intermittent, commenters asked that the impact assessment include potential impacts from the use of fossil-fueled generation that could be required for backup generation when the ESJ Wind turbines are idle. The EIS provides additional discussion on the topic of back-up generation for renewable energy sources. The issue of grid reliability will, however, be considered by DOE external to the NEPA process.

Mitigation Measures. Commenters requested clarification as to how the potential mitigation measures identified in the EIS would be implemented. They also urged DOE to require mitigation for the ESJ Wind project in Mexico. DOE clarifies the role of the NEPA document in identifying potential mitigation measures in a manner appropriate for evaluating their potential effectiveness in mitigating impacts. Should the Presidential permit be issued to ESJ, it could include mitigation measures as required conditions of the permit.[3] DOE is not in a position to require mitigation measures to be implemented in Mexico. The Final EIS identifies some of the mitigations that are included in the Mexican permit for the ESJ Wind project.

S.9 COMPARISON OF POTENTIAL ENVIRONMENTAL IMPACTS AMONG ALTERNATIVES

The following discussion summarizes the environmental implications of the action alternatives, organized by resource area. Both temporary impacts during construction and long-term impacts during operation of the proposed transmission line are considered. The ESJ proposal incorporates various measures that are designed to avoid or minimize potential impacts related to construction and operation of the transmission line. Descriptions of these applicant-proposed measures (APMs) are included in the discussion. APMs were considered as part of the project in determining the potential for impacts. Additional mitigation measures that could be implemented to further reduce potential impacts of the action alternatives and, which could be considered for adoption in DOE's Record of Decision, are also discussed. Under the No-Action Alternative, the transmission line would not be built, and there would be no changes to existing conditions in the various resource areas.

Following this discussion is Table S-3, which is organized by resource area and compares the potential impacts for the alternatives and lists potential additional mitigation measures for the action alternatives.

S.9.1 Biological Resources

All action alternatives (Alternatives 2, 3, and 4) would result in permanent disturbance to approximately 10 acres (4 ha) of natural vegetation and wildlife habitat. The areas that would be affected are classified in two habitat types: Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub. These habitats support a wide range of plants and wildlife, including

[3] ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

special status wildlife that has been observed onsite or that has the potential to occur onsite. Due to fire safety concerns, there would be no revegetation or restoration of areas disturbed by the proposed project.

Under Alternative 2, construction of the double-circuit transmission line would result in the loss of up to 9.72 acres (3.9 ha) of vegetation and wildlife habitat. These permanent impacts would be offset by a proposed conservation easement (in accordance with County of San Diego Guidelines), described below. Construction of the transmission line would also potentially result in minor temporary disturbances to wildlife and breeding birds due to traffic and increased noise along the right-of-way. Construction activities would also increase the potential for introduction of non-native invasive species, which is a known concern in the desert region. Following completion of construction activities, the presence of the transmission line could result in an increase in avian collisions and electrocution. The design specifications of the proposed ESJ U.S. transmission line would follow industry standards for avian protection on power lines (APLIC 2006), in order to minimize the risk of avian electrocution. Operation of the transmission line would also result in long-term and major impacts to vegetation and wildlife habitat in the event of a transmission line-caused wildfire.

The analysis of special-status species addressed potential impacts to plant and wildlife species that meet one or more of the following criteria: listed or proposed for listing as threatened or endangered under the federal Endangered Species Act or the California Endangered Species Act; protected under the federal MBTA or BGEPA; listed on the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California; considered by the County of San Diego to be rare, endangered, or threatened or sensitive; included on the County of San Diego's lists of sensitive animal species; or designated by California Department of Fish and Game as a Species of Special Concern, Watch List, Specially Protected Mammal, or a California Fully Protected species.

No special-status plants were observed in the survey area during rare plant surveys. Therefore, no impacts to special status plant species are anticipated. Four special-status wildlife species were observed during the project surveys or have a high potential to occur: northern red diamond rattlesnake, California horned lark, loggerhead shrike, and San Diego black-tailed jack rabbit. Vegetation clearance would remove potential foraging and nesting habitat for nesting birds, including California horned lark and loggerhead shrike. Construction is not expected to affect the northern red diamond rattlesnake population. Construction would remove cover and foraging habitat for the San Diego black-tailed jackrabbit and could destroy active burrows if present.

Five other federally-listed wildlife species were identified by USFWS as potentially occurring in the vicinity of the project: Quino checkerspot butterfly, arroyo toad, southwestern willow flycatcher, California condor, least Bell's vireo, and Peninsular bighorn sheep. The project site lacks suitable riparian and woodland habitat for arroyo toad, southwestern willow flycatcher, and least Bell's vireo; therefore, these species are considered to have a low potential to occur onsite and no impacts are expected to occur as a result of construction activities. Designated critical habitat for the Quino checkerspot butterfly is approximately 3.6 miles (5.8 km) west of the most westerly portion of the proposed project and would not be affected by project construction. Project site surveys did not document the presence of any Quino checkerspot butterfly or populations of host plants used at the larval stage by the species. As a result, the species is not expected to occur in the project area and would not be impacted by the project.

The project site is within the range of the California condor, which has been reintroduced into the region in an ongoing effort to re-establish the population within its historic range. This species is considered to have a very low probability of occurring in the project area based on limited distribution within its historic range and the absence of recent sightings in the project vicinity (with the exception of a 2007 sighting near Jacumba). Transmission structures are expected to have a long life span, thus if populations are reestablished, collision or electrocution would be more likely. The applicant's design provides for a minimum horizontal separation of 13 ft (132 inches, 4 m) and a minimum vertical separation of 9 feet (108 inches, 2.7 m) between conductors and structures, with larger separations between conductors. These separations should avoid electrocution of large avian species including condors, should any condors pass through the project area.

The designated critical habitat and known populations of the Peninsular bighorn sheep are approximately 2 miles (3.2 km) from the project site; thus, project construction would not affect the designated critical habitat for this species. However, vegetation clearing within the right-of-way and the main access road would result in permanent impacts to potential forage material for this species.

Under Alternative 3, construction of the single-circuit 500-kV transmission line would result in the loss of up to 10.77 acres (4.4 ha) of vegetation and wildlife habitat which would be offset by the proposed conservation easement. All other impacts would be as described for the 230-kV Route.

Biological resource studies conducted for the project encompassed the Alternative 4 routes. The Alternative 4 routes are very similar to the Alternative 2 and 3 routes in the type and density of vegetation types, local site topography and drainage, the potential for sensitive species, and overall acreage of disturbance. Operation and maintenance activities for the revised 230-kV or 500-kV Routes would be the same as described above for the Alternative 2 and 3 Routes. The conservation easement discussed for Alternatives 2 and 3 would also be applied under the Alternative 4, with the required size of the easement determined from the acreages of different vegetation types affected. All other impacts would be the same as the 230-kV Route and 500-kV Route.

Construction of a groundwater well access road would result in permanent impacts to 0.038 acre (0.02 ha) of desert saltbush and 0.042 acre (0.02 ha) of southern cottonwood willow riparian habitat. Impacts to these resources would be mitigated by preservation of similar habitat at a 1:1 or higher ratio.

Under all action alternatives, impacts to biological resources also in the U.S. would occur if construction or operation of the proposed ESJ Wind project and the associated transmission lines in Mexico impeded the cross-border movement of wildlife, destroyed or fragmented habitat for wildlife that move or migrate between Mexico and the U.S., or resulted in "take" of those animals (e.g., migratory birds) afforded international protection under international treaties. Cross-border movement of certain terrestrial wildlife species (particularly large mammals) is already impeded by the U.S.-Mexico Border Fence where present. The ESJ Wind project would consist of numerous wind turbines dispersed over a large geographic area, and the development area would not be fenced. However, construction and operation of the wind facilities and associated access roads and support facilities, coupled with loss/alteration of vegetative cover and elevated levels of human activity from workers and visitors to the wind farm, could result in wildlife avoidance of the area.

Neither the proposed transmission line segment in Mexico nor the ESJ Wind project Phase 1 turbines would be located within known major migration corridors or habitats such as major wetlands and riparian areas that would support large concentrations of birds. Nonetheless, cross-border migratory birds will traverse the border in the project area to various degrees (e.g., raptors often follow ridgelines), and thus the potential exists for Phase 1 and future phase operation of the ESJ Wind project to result in direct mortality of cross-border migratory birds due to collisions with transmission lines and wind turbines. Construction of the Phase 1 wind turbines could impact up to 5,200 acres (2,104 ha) of chaparral, pine forest, and possibly some desert communities in Mexico that may support migratory birds that move between Mexico and the United States and that are protected under international treaties.

Construction of the ESJ Wind project and operation of the turbines could result in the loss of migratory birds that collide with the turbine blades. Raptors, in particular, may be vulnerable to collisions with wind turbines when hunting prey, depending on the ground-to-rotor clearance and siting of turbines in relation to rim edges. Other birds, which migrate at night, could collide with towers. If aviation safety lighting is installed on the transmission towers/poles in Mexico, this could impact migratory birds, whose flight patterns may be disturbed by artificial lighting.

ESJ has obtained an environmental permit from the Mexican government for the ESJ Wind project. DOE reviewed a partial translation of the Mexican MIA permit. The permit requires a baseline study (at least one year) of potential impacts to birds (including migratory species) and bats prior to the operation of the proposed wind farm. If the baseline study shows that birds and bats could be adversely impacted, the permit requires future mitigation to protect or minimize adverse impacts on these bird and bat populations.

There is limited empirical data regarding the extent to which golden eagles that move across the U.S.-Mexico border could be impacted by the ESJ Wind project. The San Diego Zoo's Institute for Conservation Research (ICR) has been conducting golden eagle and California condor studies in the ESJ Wind project region in Mexico. This multiyear research effort's principal goals are to evaluate populations of golden eagles in the area, determine movement patterns of condors and resident golden eagles, assess risks to the population from wind turbine installations, and develop recommendations on project design, construction, and operation to avoid golden eagle and California condor mortality as a result of the project.

These research efforts were started in 2009 and are still in process. The research has included helicopter and ground surveys for golden eagles and their nests. ICR reports that the nearest active golden eagle nest in Mexico is located over 40 miles (64 km) southeast of the property boundary for the Phase 1 portion of the ESJ Wind project. The Condor population in Mexico is concentrated in an area over 100 miles (160 km) south of the border, and there are no Condors in the wild in San Diego County. Among other items, the report concludes and recommends:

With only one incursion in 9 years by California condors into the ESJ Phase 1 area it appears that the risk of impact to the California condors reintroduced in Mexico is relatively small, although this may change as the population continues to grow.

The limited sightings of golden eagles in the ESJ Phase 1 area and lack of suitable nesting habitat appears to indicate a limited potential risk of impact.

ESJ has indicated that it intends to continue this study effort in order to obtain further understanding of golden eagle populations and their territories as well as to monitor condor movements.

This ongoing study indicates that there is low potential for eagle and condor mortality impact however, population impacts could still occur due to the wind turbines' contribution to cumulative effects.

For these reasons, to the extent that information is available, indications are that the potential for impact on the U.S. environment as a result of operation of the ESJ Wind project is not significant and is appropriately analyzed in the DEIS.

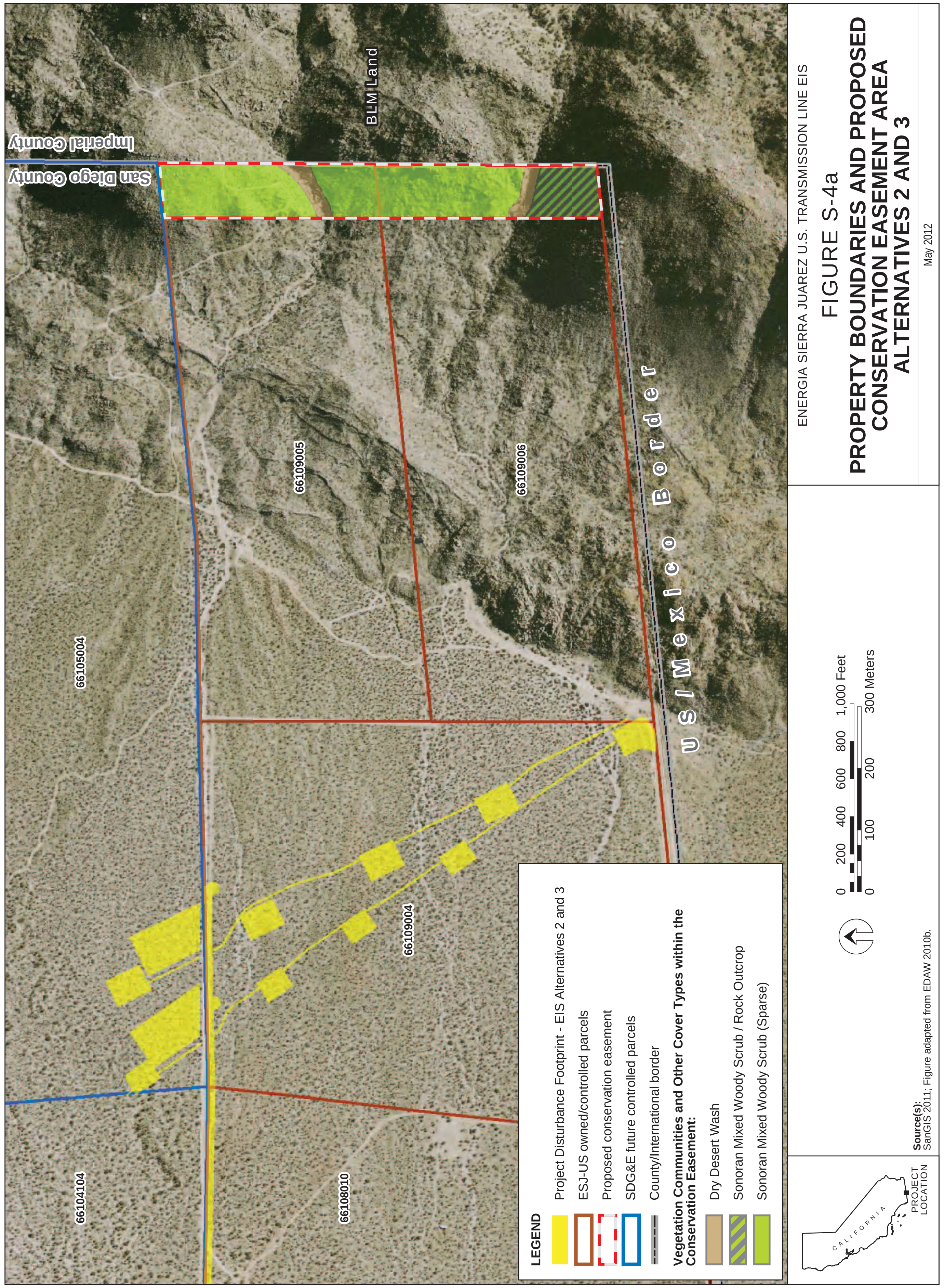
The USFWS is responsible for enforcing the MBTA and BGEPA; however, the USFWS does not have responsibility for enforcement of these regulations outside of the United States. Migratory birds, including golden eagles, are protected by international treaties, including the 1937 Convention for the Protection of Migratory Birds and Game Mammals (50 Stat. 1311; TS 912, as amended in 1972). The Mexican government is a signatory to this treaty and is responsible for addressing impacts to this species within Mexico. The U.S. government as a signatory to this treaty also has an interest in potential impacts to "birds denominated as migratory, whatever may be their origin, which in their movements live temporarily in the United States of America and the United Mexican States."

APMs that are intended to minimize impacts to biological resources and are considered in assessing impacts of both transmission line alternatives are:

- To compensate for the loss of native scrub habitat that would be disturbed during construction and would not be revegetated or restored after construction due to fire protection considerations, ESJ would place a portion of the project property under a conservation easement for preservation. ESJ proposes placing the easement on a portion of its property east of the proposed transmission line (Figure S-4). This preserved area would adjoin a large open space tract of land to the east (Jacumba Mountains Wilderness) under ownership of BLM. The mitigation ratio and specific location of the preserved area would be subject to review and approval by the County of San Diego and possibly other resource agencies. Depending on the alternative and property access road option selected, the compensatory mitigation site could be up to 15 acres (6.1 ha) in size.
- ESJ has prepared a Conceptual Resource Management Plan (CRMP) for management of the conservation easement area. The plan provides a framework and specific measures for the interim and long-term management of the easement until such time that a formal land management entity can assume the long-term management of the land. The CRMP is written with the assumption that BLM or a non-profit organization would be the long-

term Land Manager of the easement. At the time of this EIS preparation, ESJ is coordinating with BLM to have the federal agency assume management responsibilities for the easement. In the event that BLM does not assume the role of long-term Land Manager of the compensation site, the CRMP would remain in effect and would be implemented by ESJ, until a non-profit organization is found to serve as the long-term Land Manager.

- Prior to construction or vegetation clearing on any site, suitable nesting habitat and trees within 500 feet (152 m) of the construction work area would be surveyed for breeding activity to determine if raptors or other sensitive wildlife species (such as California horned lark or loggerhead shrike) are nesting. If nesting is confirmed, no construction activity would occur within 500 feet (152 m) of raptor nests or sensitive species nests, unless measures are implemented to reduce noise levels below 60 A-weighted decibel (dBA) hourly equivalent level (L_{eq}) to minimize disturbance to those species. If measures are implemented to reduce noise levels, noise monitoring would be conducted to determine that measures are effective to reduce noise to below 60 dBA hourly L_{eq}.
- Repair of heavy equipment, if necessary, would occur as far away as practicable from areas where nesting raptors or other sensitive species may be present; manufacturers' standard noise control devices would be equipped on all construction equipment (including generators and compressors); and the construction contractor would maintain all construction vehicles and equipment in proper operating condition and provide mufflers on all equipment.
- Noise analyses would be performed during construction activities adjacent to sensitive habitats or potential active nests of raptors or other sensitive species, and temporary noise attenuation barriers would be erected to reduce construction-related noise to below 60 dBA hourly L_{eq} at the location of the habitat or potential activity nests if necessary.
- Flagging or construction fencing would be installed to restrict encroachment into biologically sensitive areas and to minimize the potential establishment of non-native species.
- In accordance with County of San Diego guidelines, ESJ has prepared a Stormwater Management Plan (SWMP) that provides for the installation of several construction best management practices (BMPs) to avoid and minimize impacts to natural communities of special concern (i.e., Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub); special status plants (if found during pre-construction surveys), and special status animals (such as northern red diamond rattlesnake, California horned lark, loggerhead shrike, and San Diego black-tailed jack rabbit).
- Vegetation removal would occur prior to the start of breeding season of sensitive species (generally February 1 to September 15), and construction activities that coincide with raptor breeding season (generally February 1 to September 30) would be monitored. If project activities are determined through monitoring to adversely affect raptor foraging and/or nesting, then either construction activities would be modified to reduce or eliminate the identified effects, or construction would be halted until it is determined that nesting is complete or the affected raptors abandon their nest.



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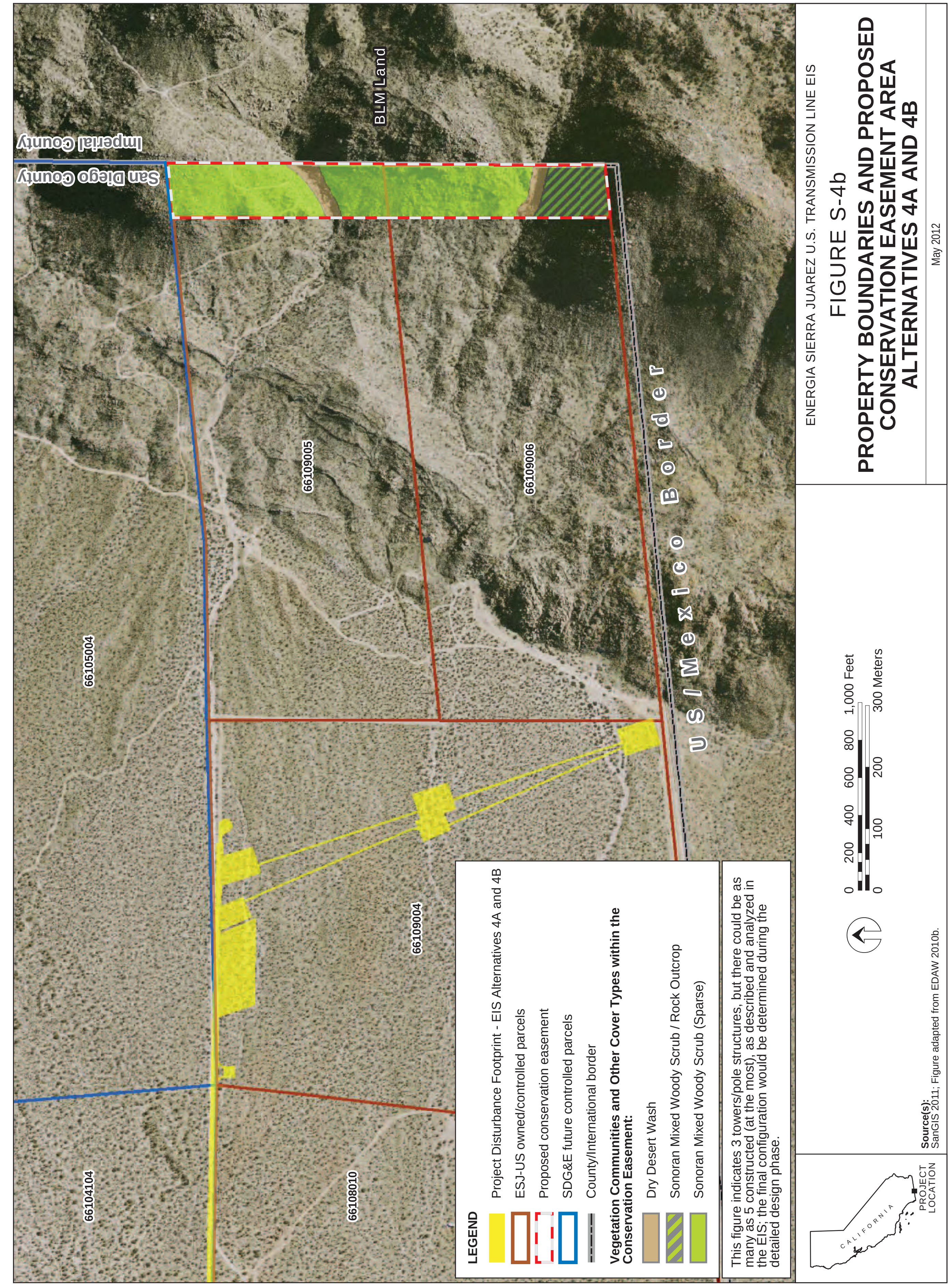

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- If any habitat for the California horned lark or San Diego black-tailed jackrabbit, or any foraging habitat for raptors is unavoidably disturbed, the additional acreage of disturbance would be included in the conservation easement described above.

Potential mitigation measures in addition to the APMs described above as having the potential to further minimize potential impacts to biological resources are:

- Worker training for contractor personnel to ensure that construction workers are aware of the sensitive biological resources that potentially occur in the construction areas and the protection measures that should be followed within these areas;
- Measures to prevent entrapment of San Diego black-tailed jackrabbit and other wildlife, including covering of excavations at the end of each work day; and
- Development and implementation of a weed control plan to minimize the potential for weed introduction during construction, and to address post-construction maintenance and weed control procedures during the operational life of the project.

S.9.2 Visual Resources

Under all action alternatives, construction of the transmission line would result in permanent potentially moderate-to-major adverse visual impacts due to land scarring. In addition, views of construction equipment and activity from surrounding recreational areas and highways would result in a temporary moderate adverse impact. Following completion of construction activities, the presence of the transmission line would result in long-term moderate adverse impacts to visual resources. The visual resource analysis compares the visual impacts of lattice towers and monopoles. In general, the overall visual quality at key observation points is expected to diminish more if monopoles are erected than if lattice towers are erected. This is because the steel latticework of the towers would be partially absorbed by the grey tones and rough texture of the backdrop, whereas the opaque mass of the monopoles would contrast with the existing backdrop.

Wind turbines constructed in Mexico as part of the EJS Wind project would be visible from several U.S. locations, including locations in or near the communities of Jacumba and Boulevard; Interstate 8; Old Highway 80; Anza-Borrego Desert State Park; and BLM-administered lands, including Table Mountain Area of Critical Environmental Concern (ACEC), Jacumba Wilderness, and certain lands in the Yuba Desert. The numerous wind turbines would appear as an assemblage of light-colored vertical forms in a landscape predominantly natural in appearance. In addition, construction of the ESJ Wind Project could cause some level of land scarring. However, based on the distance between the wind turbines and visual receptors in the U.S., as well as intervening topography, any land scarring associated with the turbines would not be highly visible from the U.S. (see Figure S-2 for a depiction of area topography and the location of the ESJ Wind project in relation to the town of Jacumba). Predicted visual impacts from wind turbines would be moderate-to-high for viewers at observation points in Jacumba and Table Mountain ACEC and low-to-moderate for viewers at an observation point on Interstate 8. During clear weather, aviation safety lighting on wind turbines (if lighting is required by Mexican agencies) would also be visible from viewing points in the U.S.

Future phases of the ESJ Wind project, if executed, would increase the number of wind turbines in Mexico. Subsequent expansion would be located south of the town of La Rumorosa (Figure S-1), sufficiently distant from the U.S. viewing points such that visual impacts are not expected.

Potential mitigation measures not proposed as APMs that could reduce potential visual impacts from the transmission line are: (1) reducing the reflectivity and visual contrast of construction equipment and towers and (2) reducing the color contrast and views of land scars by avoiding landform alteration and implementing measures such as contour grading to blend graded surfaces with existing terrain. These measures could reduce potential impacts to minor levels.

S.9.3 Land Use

No adverse land use impacts are anticipated under any of the action alternatives. Construction and operation of the proposed transmission line is a permitted use under the County's existing and recently updated General Plan land use designation, and under the existing zoning (with a Major Use Permit). No mitigation measures are indicated for land use beyond those already indicated for other issue areas. The County of San Diego would make the final determination of consistency with the General Plan, the Mountain Empire Subregional Plan, and Zoning Ordinance. Additional mitigation measures may be imposed by the County during its review.

S.9.4 Recreation

Because all of the action alternatives are on private land and are not adjacent to state or federal wilderness or recreation areas, there would be no direct effects on recreation. However, users of public recreation areas in the vicinity (identified in Section S.9.2 above) could be affected indirectly by increased traffic, noise, and visual changes. Construction of the transmission line would result in minor temporary increases in vehicle traffic and travel times to and from nearby recreation areas. However, roadways have enough capacity to accommodate the increased traffic without affecting level of service, so recreational users would not experience adverse effects. Following completion of construction activities, the presence of the transmission line would result in long-term minor indirect impacts to recreational areas due to alterations to existing scenic vistas and increases in ambient noise levels during foul weather (due to corona noise described in Section S.9.6 below). Although the transmission line would encroach upon the views and compromise the integrity of the largely intact desert setting, the overall change to the views from recreation areas would be low. Similarly, based on the distances from the transmission line, no increases in ambient noise levels are anticipated to occur at any other nearby recreational facilities due to corona effect during foul weather. No mitigation measures are indicated.

S.9.5 Cultural Resources

ESJ commissioned the preparation of an Archaeological and Historical Investigations Report to investigate the potential presence of significant resources within the project area and vicinity. There are 11 known prehistoric archaeological sites in the area potentially affected by project construction. Construction of the revised 500-kV Route (Alternative 4B) would result in impacts to two additional known cultural resource sites that have not been tested. In addition, the proposed construction water well access road is located within the site boundary for two previously recorded archaeological sites; and, a segment of Old Highway 80 that traverses the southern boundary of the proposed groundwater well access road has been determined to be a contributing element to the resource's listing on the National Register of Historic Places as a "historic property" and on the California Register of Historic Resources as a historic resource.

ESJ has incorporated measures into its project design to eliminate potential impacts to these resources. Under the 230-kV Route and 500-kV Route alternatives, construction of the transmission line and construction water well access road would result in the potential for minor impacts to currently unknown cultural resources and/or human remains. ESJ would comply with legal requirements related to protection of these resources and has committed to several APMs to reduce or avoid potential impacts. If human remains are discovered, ESJ would stop work within 50 feet (15 m) of the discovery; ESJ would also contact the County of San Diego coroner and a professional archaeologist to determine the significance of the discovery. Depending on the recommendations of the coroner and/or archaeologist, ESJ would consult with the County of San Diego to establish additional feasible and appropriate mitigation measures to be implemented into the project.

APMs intended to avoid potential impacts to cultural resources are as follows:

- Avoidance of impacts to significant cultural resources that have been identified at the project site through redesign of the project, where feasible, or by redirecting workers and vehicles away from known sites during construction and facility operation.
- Monitoring of ground-disturbing activities by a qualified archaeologist. A Native American representative would be invited to participate in site monitoring.
- Implementation of a testing program and data recovery prior to ground-disturbing activities at identified significant sites.
- Avoidance of cultural resource sites by redirecting pedestrian and vehicular traffic away from the site during construction and facility operation.
- Significance testing of any incidental discoveries during construction, as outlined in applicable agency guidelines.
- Additional field surveys for any areas that may be disturbed due to project changes.

A potential mitigation measure not proposed as an APM that would further minimize the potential for cultural resources impacts during construction is worker training of contractor personnel to ensure that construction workers are aware of the potential for archaeological discoveries during construction. To achieve its goals, the employee training session should be conducted by a qualified archaeologist and should include a description of the kinds of cultural resources that may be encountered during construction and the steps to be taken if such finds are unearthed. Other potential mitigation measures not proposed as an APM are sub-surface investigations prior to construction within the revised 500-kV route (if it is constructed), and within the proposed construction water well access road, and implementation of recommendations from these investigations, in order to minimize potential impacts to known resources in these areas.

Operation of a transmission line under either alternative would not involve ground disturbance; therefore, no impacts to cultural resources are anticipated during operation.

DOE compliance with National Historic Preservation Act (NHPA) Section 106 consultation requirements are on-going.

S.9.6 Noise

All of the action alternatives would introduce new sources of sound into a rural environment, where sound is generated by wind and other natural sources, traffic on nearby roadways, occasional air traffic, and activities at a shooting range approximately 1 mile to the west. Average sound levels generally are below 50 dBA during daytime hours and below 40 dBA at night.

Under the 230-kV Route alternative, construction of the double-circuit transmission line would result in minor temporary increases in ambient noise levels; however, construction would occur during the hours of the day allowed by the County of San Diego ordinance and, thus, would be consistent with the County's requirements. The nearest noise-sensitive receptor is a residence (unoccupied) located approximately 1,600 feet (490 m) west of the construction area. During construction, the sound level at this location would be approximately 60 dBA, which is well below the County's 75-dBA threshold for daytime construction noise impacts. Construction-related truck traffic along existing roadways would also generate increases in sound levels. However, because of the existing high traffic levels on Interstate 8, the increase in sound levels from trucks accessing the project in the vicinity of that roadway would not be perceptible.

Once operational, increased sound levels from transmission lines are due primarily to corona discharge, which is a small electrical discharge along the wire that produces crackling and hissing sounds as well as small amounts of light. These discharges result from electrical energy passing over surface irregularities that occur along the transmission lines, such as scratches, nicks, dust, or water drops that can affect a conductor's electrical surface gradient. The resulting noise caused by corona discharge varies depending on conductor size and configuration. Minor temporary increases in ambient noise level caused by corona noise during infrequent foul weather events are anticipated during operation of the transmission line. A noise analysis conducted for the project determined that both of the possible configuration options for conductors on a 230-kV line would meet the County of San Diego's nighttime property line sound level limit of 45 dBA (the model results indicate a maximum 8.8 dBA at the property line for the 230-kV configuration options). Therefore, the impact of corona-generated sound during operation of the project would be minor, but would occur sporadically for the life of the project. No mitigation measures are indicated.

Under the 500-kV Route alternative, construction impacts would be as described for the 230-kV Route. However, the corona effect increases with voltage, and analysis of potential corona noise determined that only two of the four possible configuration options for conductors on a 500-kV line would meet the County of San Diego's nighttime property line sound level limit of 45 dBA (the model results indicate a maximum 35.4 and 38.8 dBA at the property line for the two 500-kV configuration options that would meet the County's noise standard). ESJ has committed to choosing only those options which would meet the criterion; therefore, the level of corona-generated sound would be somewhat larger than described for the 230-kV Route, but would meet the county criteria. The revised routes under Alternative 4 are located slightly farther from the nearest sensitive receptor (an unoccupied mobile home). Impacts of sound generated by the corona effect would be the same for the revised 230-kV and 500-kV Routes as for Alternatives 2 and 3, respectively. No additional mitigation measures are indicated.

S.9.7 Transportation and Traffic

Under any of the action alternatives, construction of the transmission line would result in a minor temporary increase in traffic on local roadways, a minor potential for adverse impacts to traffic safety at the project's ingress/egress, and a short-term minor potential for roadway damage. These minor impacts would be avoided with the implementation of a traffic control plan, as required by the County of San Diego prior to issuance of a MUP for transmission line construction and prior to approval of construction or grading permits. ESJ is working with the County of San Diego to develop road improvements at the site entrance in accordance with the County's traffic safety design standards.

During project construction, water trucks would use Old Highway 80, an existing paved roadway, between the well site on the west side of Jacumba and the construction site, east of Jacumba. Old Highway 80 currently has substantial additional capacity such that the potential impact of up to two additional trucks per day on the road would be short term and is considered minor.

Under any of the action alternatives, operation of the transmission line would result in a minor potential for adverse impacts to air traffic safety with U.S. Border Patrol's aircraft patrol along the U.S.-Mexico border. Aerial fire-fighting efforts could also be compromised by the presence of the transmission lines. Visibility of the transmission lines by low-flying spotter aircraft and aircraft that apply aerial retardant could be obstructed due to smoke, thus limiting the ability of pilots to work safely in the project area. Consultation with the U.S. Border Patrol and the California Department of Forestry and Fire Protection prior to starting construction is a potential mitigation measure (not proposed by the applicant) that could minimize these impacts.

Wind turbines and associated equipment would originate in the U.S. and be transported to the ESJ Wind project sites within Mexico via the Otay Mesa border crossing in San Diego County. Transport of wind turbine components could result in temporary impacts to U.S. roadways, including increased congestion, roadway damage and an increased potential for traffic accidents due to the increased number of oversized trucks traveling on major highways. Trucks would use established truck hauling routes on major U.S. highways to transport the turbines, and the increased volume of traffic would be a small percentage of overall shipping activity. Regardless of the final transport route selected, the contracted hauling company would be required to follow each state's regulations for oversize vehicles and obtain the necessary permits from all applicable jurisdictions located between the origination point within the U.S. and the U.S.-Mexico border. This would minimize the potential for impacts along U.S. roadways.

S.9.8 Public Health and Safety

There would be little potential to expose the public to hazardous materials or contaminated soil as a result of project construction for any of the action alternatives. However, construction would require the routine transport, handling, and onsite storage of petroleum products such as fuel and lubricating oil and hazardous materials such as paints, as well as waste products with these constituents. Such activities are not expected to generate substantial quantities of hazardous wastes, and would not require onsite storage or treatment of hazardous materials or hazardous wastes. A Spill Prevention and Control Plan implemented as an APM would outline measures to prevent, control, and minimize impacts from a spill of petroleum substances, hazardous materials, or wastes during construction. Construction materials that pose a potential contamination risk to storm water would be managed to minimize potential storm water contact. Solid and liquid waste would be reused and/or recycled to the extent practicable, or disposed of properly if deemed not reusable or recyclable. The small amounts of hazardous waste (primarily vehicle fuels and lubricants) that could be produced as byproducts of construction would be disposed of in accordance with local, state, and federal regulations. The hazardous materials would also be stored aboveground and in secondary containment to prevent offsite discharges. Portable sanitary facilities would be used by all construction personnel, would be located on non-paved areas, 50 feet (15 m) away from drain inlets, and would be serviced regularly.

No contaminated soils or potential areas of contamination have been identified in areas that would be disturbed by construction. However, a potential mitigation measure (not proposed by the applicant) to reduce the possibility of public exposure to previously unidentified contaminated soils is training of construction personnel to identify potential contamination prior to beginning work (e.g., through odor detection and visual observation of discolored soils or oil sheens).

If imported soil is required to backfill excavated areas, ESJ should sample the soil prior to backfilling to ensure that it is free of contamination.

During operation of the transmission line, there would be a minor potential for public exposure to induced currents and electrical field interference. To reduce the potential impact, ESJ would incorporate grounding features into the project design in accordance with industry design standards for electrical transmission structures. Maintenance workers and members of the public who are present in the immediate vicinity of the line would be temporarily exposed to the EMF generated by the transmission line, but because there are no public trails, recreational areas, or other developments to cause visitors to linger near the line, there would be little public exposure to EMF. EMF levels would be higher for the 500-kV Route alternative than for the 230-kV Route alternative because electric fields increase in strength as voltage increases. At the nearest residence (an unoccupied mobile home about 1,600 feet [490 m] west of the 230-kV Route and about 2,000 feet [610 m] west of the 500-kV Route), EMF levels from the line would be far below typical household levels.

DOE considered the potential for impacts from intentionally destructive acts. The aboveground electrical transmission lines and supporting structures would be located within an unfenced utility right-of-way and would, therefore, be accessible to those desiring to damage the system. The proposed transmission line would present no greater target for intentional destructive acts than any other high-voltage transmission line in the U.S. Past experience along the thousands of miles of electrical transmission lines in the country suggests that intentional destructive acts against the proposed transmission structures would be unlikely. If such an act were to occur and succeed in destroying towers or other project-related equipment, the main consequence for the public would be disruption of electrical service.

S.9.9 Fire and Fuels Management

All of the action alternatives would result in major increases in wildfire hazards during construction and operation of the transmission line. Factors leading to increased wildfire hazard would include introduction of new ignition sources; potential introduction of invasive nonnative plants that can change wildfire frequency, timing, and spread; and creation of a potential obstacle to firefighting. Aerial fire-fighting efforts could also be compromised by the presence of the transmission lines. Transmission lines create a hazard for low-flying spotter aircraft and aircraft that apply aerial retardant. Visibility of the transmission lines could be obstructed due to smoke, thus limiting the ability of pilots to work safely in the project area.

The transmission line would be a potential source of wildfire ignitions for the life of the project and would increase the risk of a wildfire. Impacts from operation of the transmission line would be reduced to some extent by the implementation of an APM, the project's Fire Protection Plan. The Plan (developed in coordination with, and approved by, the San Diego Rural Fire Protection District) specifies measures to prevent fires caused by operation of the transmission line. For example, to reduce potential fuel, there would be no revegetation of the right-of-way. ESJ executed a Development Agreement with the San Diego Rural Fire Protection District on March 3, 2011. The agreement was approved by the District Board on April 5, 2011. ESJ has also worked with the District to develop agreed upon mitigations for fire protection that the District agrees would adequately address fire risks posed by the project. The District approved those recommended conditions in June 2011, and concluded that they adequately mitigate potential fire risk from the project and has sent them to the County of San Diego.

Potential mitigation measures in addition to the APM described above that would further reduce potential fire impacts are:

- Development and implementation of a Construction Fire Prevention Plan specifying measures to be implemented during project construction.
- Coordination of ESJ activities with emergency fire suppression activities. To help minimize impacts on fire-fighting ability associated with construction and operation of the transmission line, ESJ could coordinate fire suppression activities with appropriate fire agencies, and implement routine maintenance and inspections of the towers and conductors to remove any potential fire hazards.
- Removal of hazards (brush and dead or decaying vegetation) from work areas prior to starting construction or maintenance work.

Another potential mitigation measure, described above in Section S.9.1, is the development and implementation of a weed control plan to minimize the potential for weed introduction during construction, and to address post-construction maintenance and weed control procedures during the operational life of the project.

Impacts could occur in the U.S. due to activities associated with the ESJ Wind project if a wildfire were to originate in Mexico and travel north across the U.S.-Mexico border. This situation could result from an incident associated with the ESJ Wind project transmission lines in the vicinity of the border (similar to the operational risks identified for the ESJ transmission line), or as a result of a fire that originates in the wind turbine development area. DOE reviewed a partial translation of the Mexican MIA permit. The permit requires a Fire Protection Plan to be prepared prior to construction in coordination with relevant agencies. The purpose of the plan would be to evaluate the likelihood of fire sources, identify preventive measures, and develop site-specific action plans in the event of a fire in the ESJ Wind project area. Burning is not permitted for land clearing.

S.9.10 Air Quality and Climate Change

Under all of the action alternatives, construction of the transmission line would result in minor increases in several criteria pollutants or their precursors (reactive organic gases that contribute to ozone formation; carbon monoxide; nitrogen oxides; sulfur oxides; and particulate matter [PM_{10}] due to fugitive dust) and greenhouse gases. Most of San Diego County is currently designated a federal attainment or unclassifiable area for all criteria pollutants except ozone (8-hour), for which the project area is classified as nonattainment. With regard to state criteria, the project area is currently classified as a “serious” ozone nonattainment area and a nonattainment area for particulates measured as PM_{10} and $PM_{2.5}$.

Maximum construction emissions of criteria pollutants are estimated to be well below applicable thresholds, including general conformity thresholds. The temporary increase in fugitive dust from construction activity would be minimized by complying with the San Diego Air Pollution Control District’s Rule 55 – Fugitive Dust Control. This rule requires development and implementation of a Dust Control Plan. The Plan will specify several dust control measures including: use of water or non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas with sufficient frequency to maintain an effective level of soil moisture or cohesion; suspension of construction grading on days when the wind gusts exceed 25 mph (40 kilometers per hour [kph]); use of rattle plates (grizzlies) to minimize mud and dust from being transported onto paved roadway surfaces from dirt or gravel roads; covering all trucks hauling soil and other loose material; limiting vehicle speeds to 15 mph (24 kph) on unpaved roads; street sweeping and vehicle washing; and covering or stabilizing exposed stockpiles. The Dust Control Plan would emphasize water conservation by limiting water application strictly to necessary quantities.

Because it would transmit electricity from wind turbines, operation of the transmission line would potentially result in a long-term reduction of greenhouse gas emissions. This electricity transmission would aid in reducing the need to generate electricity within the U.S. using fossil fuel, which could indirectly lead to reduced emissions from fossil fuel-fired power plants. The minor impacts from air emissions during construction and operation could be further minimized by implementing additional potential mitigation measures (not identified by the applicant); these potential mitigations include: using low-emission construction equipment, minimizing vehicle idling, and encouraging carpooling among construction personnel.

S.9.11 Water Resources

Water resources impacts would be the same for all of the action alternatives. Construction of the proposed transmission line would result in temporary minor impacts to groundwater supply due to use of groundwater for dust abatement, cleaning construction equipment, and concrete production for tower foundations.

The applicant proposes to obtain water for dust control from an existing non-potable groundwater well (JCSD Well #6) and this request has been approved by the Jacumba Community Services District. Because the total water requirement of 2.4 acre-feet (2,950 cubic m) would be less than 0.1 percent of the estimated annual groundwater recharge of 2,700 acre-feet (3.3 million cubic m), project water use would not impact the locally available water supply. Since water resources are generally scarce in the project area, this short-term minor impact could be further reduced by the use of non-potable water sources.

The County of San Diego analyzed the potential use of 2.4 acre-feet (2,950 cubic m) of groundwater on the project area and regional groundwater resources in accordance with the County's guidelines. Results of a pump test on the proposed source well indicate that the well could easily supply the water needed for the project. Additional tests to determine the effect of groundwater pumping on other nearby wells led the County of San Diego to predict drawdown of 0.3 foot in the nearest adjacent well. Based on the County's guidelines, this would be a minor impact.

In the event that the JCSD Well #6 is not used, ESJ would install a temporary water well onsite at a location shown on Figure S-3. As with the use of Well #6, use of water from an on-site well would have minimal impact on groundwater availability in the area. The alternate water well site is not near other supply wells, so the pumping approximately 2.4 acre-feet of water would not interfere with other groundwater uses.

Surface water resources in the vicinity of the corridors consist of ephemeral creeks and washes that flow only in response to rainfall events. Onsite investigations identified three minor ephemeral drainage features in the area of the alternative corridors. The proposed transmission line would require the installation of up to five lattice towers or steel monopoles. Road improvements would include the realignment and widening of an existing east-west access road between Old Highway 80 and the northern portion of the transmission line corridor, and construction of a new north-south maintenance access road parallel to the transmission towers. Grading would be required at each tower or pole location, and along the access roadway and maintenance road. Due to the area's topography, which ranges from level to gently rolling, grading would not be extensive. Installation of the towers or monopoles is expected to result in the permanent disturbance of approximately 0.44 acre (0.2 ha) at the base of each tower separated by a distance of approximately 1,500 feet (457 m) (monopoles would result in a slightly smaller area of disturbance). Total permanent land disturbance would be approximately 9.7 acres (3.9 ha) and would have a minimal impact on the overall surface water flows of the right-of-way.

An APM that would contribute to minimizing the potential water quality impacts of construction is the implementation of the SWMP that ESJ has prepared for the project. The SWMP is designed to manage the quality of stormwater runoff from the land disturbance activities associated with the project in accordance with the requirements of the Clean Water Act (CWA) and County of San Diego's guidelines. The Best Management Practices (BMPs) outlined in the SWMP would be implemented prior to commencement of field construction activities. BMPs would be maintained during and after construction and until final stabilization of the soil is accomplished at the site. According to the SWMP, the minimum temporary erosion and sediment control practices that would be used include: stockpile management, maintenance of the construction entrance/exit, silt fence, wind erosion prevention measures, street sweeping and vacuuming on existing paved roads, and sandbag barriers. Temporary silt fence and sandbag cross barriers would be placed on the downhill side of the entire right-of-way to capture any silt during the construction phase of the project. Although it is not anticipated that the design would include clearing or grading of any slopes that are more than 3 feet in height, if such activity is required, ESJ would implement slope protection measures. Onsite construction workers would remove litter at the end of each day. All waste material generated during construction would be deposited in dumpsters or covered bins that would be removed from the project site by a licensed waste hauler for proper disposal. Portable toilets would be provided for use by the construction workers. These facilities would be installed and removed from the site by a licensed portable sanitation company and the waste material would be disposed of at an approved facility.

A final site cleanup and inspection would be conducted by ESJ, in coordination with local agencies, at the completion of construction. Post-construction erosion and sediment control BMPs as well as final soil stabilization and cleanup BMPs would be implemented.

No surface water features traverse the U.S.-Mexico border in the project area, and there is no apparent evidence of historical flash flooding or significant surface flows such that transmission facilities on either side of the border would be exposed to flood damage risks. Therefore, construction and operation activities in Mexico would not result in effects in the U.S. related to surface water hydrology and water quality. No impacts to surface water or groundwater are anticipated during the operation of the transmission line.

S.9.12 Geology and Soils

Under all action alternatives construction of the transmission line would result in a minor temporary increase in soil disturbance and erosion, which would be minimized by implementation of the project's SWMP. There is a potential for erosion impacts after completion of construction due to improperly controlled site runoff; these impacts would be minor provided that the control measures outlined in the SWMP are left in place, inspected, and maintained until final stabilization has occurred. The potential for soil erosion could be further reduced by limiting modifications to the access road to the extent practical in areas that are sensitive to disturbance and that have a high erosion potential. This additional potential mitigation measure (not identified by the applicant) would reduce potential erosion both during and after construction.

Onsite soils have a high potential to corrode steel, but potential impacts of corrosion on operation of the transmission line would be largely avoided by not placing uncoated steel in contact with onsite soils and by a proposed inspection, maintenance, and repair program that would be planned to identify and remedy corrosion problems before they result in a structural failure. During operations there would a minor potential for structure failure/damage of project facilities due to seismic ground-shaking from earthquakes associated with one of the major faults in the region (such as the magnitude 7.2 earthquake that occurred on a fault located 54 miles [87 km] southeast of the corridor on April 4, 2010). Although such seismically induced groundshaking could damage project facilities, the overhead transmission lines and their support structures would be designed for dynamic loading under variable wind conditions that exceed earthquake loads. This design feature minimizes the potential for seismically-induced groundshaking to cause significant damage. No impacts related to soil liquefaction are anticipated. No impacts related to slope instability are anticipated.

S.9.13 Socioeconomics

Under all alternatives, construction of the transmission line would result in minor temporary beneficial impacts to local businesses through increased expenditure of wages for goods and services. During operation of the transmission line, minor short-term adverse impacts to property values due to visual impacts are anticipated. Research indicates that while there is some evidence that overhead transmission lines have the potential to reduce the value of nearby property, any effects are usually smaller than anticipated and difficult to quantify due to the individuality of properties/neighborhoods, differences in personal preferences of individual buyers/sellers, and the weight of other factors that contribute to a person's decision to purchase a property. Other factors (e.g., neighborhood factors, square footage, size of lot, irrigation potential) are more likely than overhead transmission lines to be major determinants of the sales price of property. There is insufficient evidence to determine the likely impact of transmission lines on tourism, but any impact from the proposed transmission lines would likely be short-term and minor. No mitigation measures are indicated.

S.9.14 Environmental Justice

No disproportionately high or adverse impacts to low-income or minority populations are anticipated under any action alternative. More than 50 percent of the residents in the areas surrounding the alternative corridors are classified as minorities, indicating the presence of a minority population. The census tract that includes the proposed transmission line right-of-way contains a greater percentage of population below the poverty level than the general area and is considered low-income.

Construction and operation of the proposed transmission line would not expose the minority and low-income population to disproportionately high and adverse impacts. These activities would not result in major adverse health and safety, air quality, noise, socioeconomic, or other impacts on local communities. There is sufficient distance between the right-of-way and the nearest residents that the identified minor impacts would not disproportionately affect nearby minority populations in comparison to the general public. No information suggests that there are differential patterns of consumption or use of natural resources that would cause minority populations to experience substantially different impacts than the general population. Therefore, there is no potential for the operation of the transmission line to cause disproportionately high or adverse impacts to minority or low-income populations in comparison to the general population. No mitigation measures are indicated.

S.9.15 Services and Utilities

Under all action alternatives construction of the transmission line would result in temporary minor increased demand for solid waste utilities and for law enforcement at the U.S.-Mexico border. The temporary minor increased demand for solid waste utilities during construction would be minimized by complying with the County of San Diego construction and demolition debris ordinance. The effect of increased demand for border law enforcement could be minimized by the additional mitigation measure (not identified by the applicant) of coordinating with the U.S. Border Patrol and local law enforcement to ensure the construction site is secure and to identify site-specific security measures.

A permit is required from the International Boundary and Water Commission (IBWC) before construction commences. The IBWC will review project component locations in relation to the international boundary and the monuments, and all structures must be off-set from the international boundary by a minimum of 3 feet and allow a clear line-of-sight between any affected monuments.

Operation of the transmission line would not result in added population; therefore, it would not result in an increased demand for public services or utilities. See Section S.9.9 (Fire and Fuels Management) for information on increased demand for fire protection. See Section S.9.11 (Water Resources) for information on water supply and demand for project construction and operations.

S.10 CONNECTED ACTIONS

The construction and operation of the proposed ECO Substation switchyards and SWPL Loop-In are connected actions for the ESJ U.S. Transmission Line.

Potential impacts of construction and operation of the ECO Substation switchyards and SWPL loop-in were assessed based on recently completed analyses conducted jointly by the CPUC and BLM (including the ECO Substation EIR/EIS and the 2008 Sunrise Powerlink Project EIR/EIS), as well as SDG&E's August 2009 Proponent's Environmental Assessment. The results of the evaluation indicate the following unavoidable potentially moderate or major impacts:

- Construction of the ECO Substation switchyards and SWPL loop-in would result in permanent removal of 14.5 acres (9.3 ha) of mixed desert scrub and 74.3 acres (30.1 ha) of juniper woodland vegetation. Under County of San Diego Guidelines, such vegetation removal would require compensatory mitigation to offset the permanent impacts.
- The presence of the ECO Substation switchyards and SWPL loop-in would result in unavoidable moderate adverse impacts to visual resources as viewed by motorists on Old Highway 80.
- The presence of the ECO Substation switchyards and SWPL loop-in would result in a long-term ongoing source of potential ignitions that could be a hazard to firefighting. This is considered a major and unavoidable impact.
- Construction of the ECO Substation switchyards and SWPL loop-in would result in potentially major and unavoidable air quality impacts due to emissions of fugitive dust and nitrogen oxides.

Operation of the facilities would also result in minor air quality impacts from carbon monoxide emissions. Potential fugitive release of the greenhouse gas sulfur hexafluoride (SF_6) during switchyard operation is estimated as equivalent to 684 metric tons of carbon dioxide per year, but SDG&E has committed to measures to minimize the release of this chemical.

All other identified potential impacts are considered minor or would be reduced to minor levels with the implementation of SDG&E's proposed measures and other mitigation measures recommended by CPUC and BLM and identified in the prior analyses of the ECO Substation as contained in the October 2011 Final ECO Substation EIR/EIS and the 2008 Sunrise Powerlink Project EIR/EIS.

S.11 CUMULATIVE IMPACTS

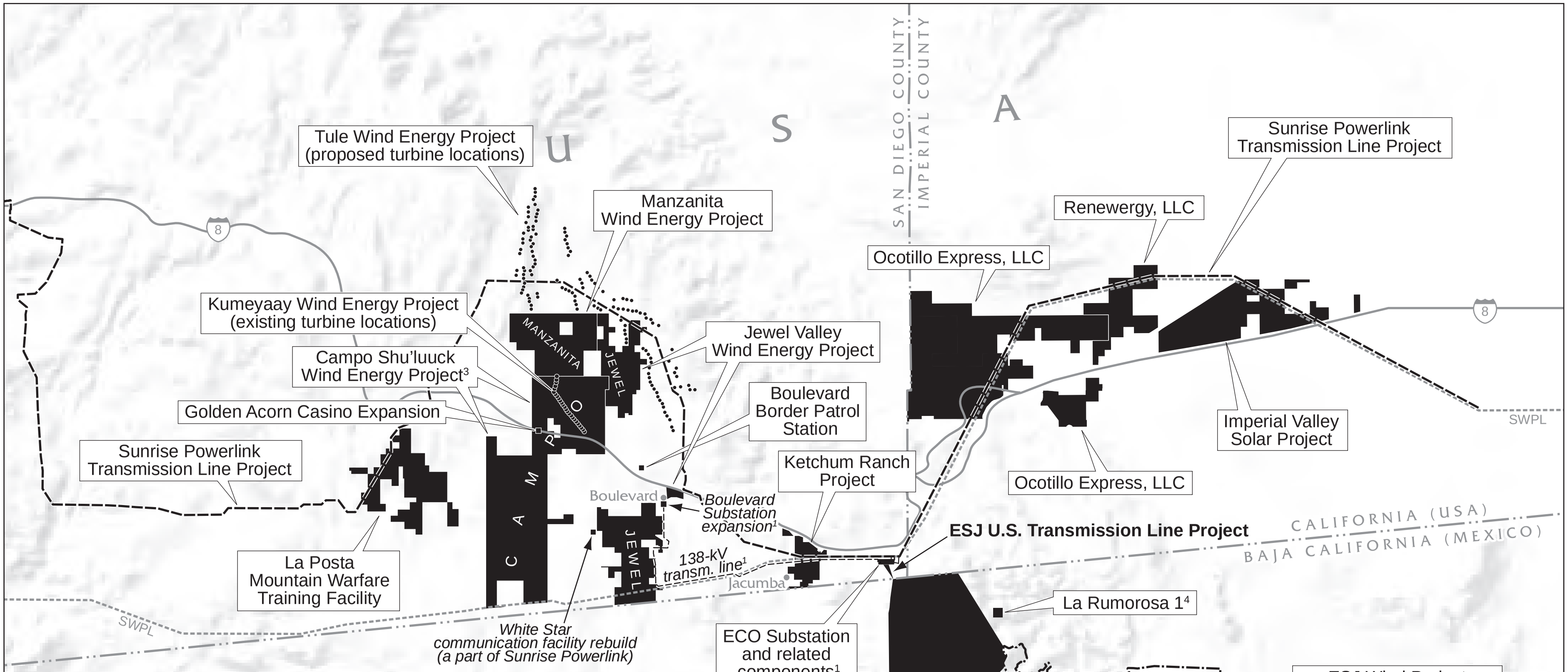
Cumulative impacts that could occur as a result of the ESJ U.S. Transmission Line project when combined with the impacts of other past, present, and reasonably foreseeable future actions were evaluated for both construction and operation periods. The region of influence varies for each resource area and depends primarily on the distance a potential impact could reach.

Several actions were evaluated in the cumulative impacts analysis. Energy-related actions included:

- Sunrise Powerlink Transmission Line project (currently under construction)
- All elements of the SDG&E ECO Substation project
- Tule Wind Energy project
- Campo Shu'luuk Wind Energy project
- SDG&E Manzanita Wind project
- Jewel Valley Wind project
- Ocotillo Wind projects (Palm Canyon Wash and Sugarloaf Mountain)
- Renewergy Wind project, Kumeyaay Wind project (existing turbines)
- Imperial Valley Solar project
- La Rumorosa I wind project (existing turbines located in Mexico)

Other development projects considered in the analysis include: U.S. Border Patrol Boulevard Station, Campo Casino Expansion, and the Ketchum Ranch residential development project (Figure S-5). In addition, the assessment evaluated the potential cumulative impacts associated with implementation of the following regional plans: County of San Diego General Plan Update (approved August 2011), BLM South Coast Resource Management Plan Revision, BLM Eastern San Diego County Resource Management Plan Revision, County of San Diego East County Multiple Species Conservation Plan, and the BLM/DOE Solar Energy Development Plan.

Long-term and major cumulative impacts were identified with regard to biological resources, visual resources, recreation, and fire and fuels management. Potential short- and long-term cumulative impacts to all other resource areas are considered minor.



[1] The ECO Substation (switchyards and Loop-In) are Connected Actions for the purpose of this EIS. The Boulevard Substation expansion and 138-kV transmission line to Boulevard Substation are components of the ECO Substation Project.

[2] The ESJ Wind Project is entirely within Mexico. Phase 1 would generate up to approximately 130 MW. Future phases would result in up to approximately 1,250 MW (inclusive of Phase 1).

[3] This figure depicts the Campo Indian Reservation; the precise location of the proposed wind energy project on the reservation has not yet been determined.

[4] In late 2009, five 2-MW wind turbines were installed near the border in Mexico as part of the La Rumorosa 1 project. The exact location of these turbines is unknown to DOE; therefore the position of the project on this figure is approximate.

CALIFORNIA
AREA SHOWN IN THIS FIGURE

0 5 10 15 Miles
0 5 10 15 20 Kilometers

Source(s):
AECOM 2010b; Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2011a, 2011b; SDG&E 2009b; Sempra Generation 2010; USGS 2006.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE S-5

PROJECTS CONSIDERED IN CUMULATIVE IMPACTS ANALYSIS

May 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_5-1_ProjectsConsideredInCumulative_plus_ESJ_11x8_v13.ai (04/05/2012, 04:17 pm) R. Wurgler/T. Murphy

With regard to biological resources, construction and operation of the ESJ U.S. Transmission Line project, in combination with other projects considered in this analysis, could result in cumulative short-term impacts (e.g., construction noise) and long-term impacts (e.g., habitat loss) to special status plant or wildlife species, nesting birds, or habitat. Existing linear development features including I-8 and Old Highway 80 to the north, and the U.S.-Mexico border fence to the south, have the potential to inhibit the north-south movement of large terrestrial wildlife species through the area. The ESJ U.S. Transmission Line project design incorporates widely spaced transmission towers (or monopoles), which would not substantially interfere with connectivity between blocks of habitat or potentially block or substantially interfere with the movement of terrestrial wildlife.

Implementation of the major projects considered in the cumulative analysis would cumulatively affect 7,459 acres (3019 ha) of habitat in the region, while securing the protection of an additional 8,189 acres (3314 ha) in conservation easements. No potential cumulative impacts to the Quino checkerspot butterfly are expected because field surveys for this species at the ESJ U.S. Transmission Line and ECO Substation project sites did not identify any individual or larval host plants.

The presence of the proposed transmission line, the ESJ Wind project, and other electrical transmission and wind projects in the region could result in impacts to migratory birds due to collisions with transmission lines, towers, or turbines, and due to electrocution. The projects considered in this cumulative analysis would not be within any known major bird migration corridors or major daily use areas. Further, high-voltage transmission lines with large conductors and transmission support structures are relatively visible to birds, which minimizes the potential for collisions. However, some loss of migratory raptors is a likely cumulative impact.

Mitigation measures recommended by the CPUC and BLM for the ECO Substation 138-kV transmission lines would require that the project implement APLIC recommendations and development of Avian Protection Plans. Similar mitigations have been required for the Sunrise Powerlink project and other regional transmission line projects. The ESJ transmission structures would also conform to APLIC recommendations and provide a separation of at least 72 inches between energized conductors or between energized conductors and grounded equipment. These measures will greatly reduce the potential for avian electrocution, however, some risk of electrocution will remain for the life of these projects.

Conservation efforts of the Las Californias Binational Conservation Initiative could be impacted to the extent that the presence of wind and other development projects, and associated impacts to native habitats and habitat linkages, could reduce the conservation value of certain targeted conservation properties. Potential impacts include hindering the creation of new conservation properties or a reduction in the size of conservation lands by making land acquisition and consolidation more costly and difficult, and by reducing the attractiveness of some areas for inclusion in the conservation program.

With regard to visual resources, the combined presence of the actions considered in the cumulative analysis would result in an increase in industrialization of the landscape, diminished visual quality, and an increase in visual contrast in eastern San Diego County and western Imperial County. The combined size and character of introduced structures associated with each action would result in considerable structure contrast, view blockages, and skylining in the region and would cumulatively cause long-term, major impacts to the existing visual character of the region.

Since the visual analysis for this EIS was conducted, the intactness of the Sierra Juarez landscape has been compromised by the construction of the Parque Eo1ico La Rumorosa I wind energy project facility (unrelated to the ESJ Wind project). This wind project consists of five wind turbines on approximately 256-foot (78 m) towers (similar tower heights as will be used by ESJ Wind), on land approximately 3 miles (5 km) from the southern extent of the ESJ Wind project. Each of the five turbines has night lighting for aviation hazards. These turbines are currently visible from Old Highway 80, BLM lands, and the community of Jacumba. The presence of these turbines has introduced new focal points on the silhouette of the Sierra Juarez Mountains, thus contributing to cumulative impacts on visual resources. Other potential wind projects have been announced in the Sierra Juarez Mountains of northern Baja, Mexico. These projects have the potential to further diminish the quality of views from the U.S. of the Sierra Juarez Mountains.

Because distant views of the surrounding landscape are a valuable component of recreational use of the region, any diminishment of the landscape's undeveloped character is considered an indirect, but potentially major, impact to recreational resources. Accordingly, the ESJ U.S. Transmission Line project structures, in combination with the other actions considered in the analysis would result in indirect impacts on recreational use of BLM-managed lands. Because the ESJ U.S. Transmission Line project structures in and of themselves would not substantially change the character of views from these areas, the ESJ U.S. Transmission Line project would have a minor but long-term contribution to this major adverse cumulative impact.

With regard to fire and fuels management, the presence of the overhead transmission lines associated with the actions considered in this analysis would create multiple ongoing sources of potential wildfire ignitions. Line faults can be caused by such unpredictable events as conductor contact by floating debris, gun shots, and helicopter collisions; these events are rare but would be unavoidable. This is considered a major long-term cumulative impact. Implementation of the Fire Protection Plan proposed by ESJ would reduce the probability of igniting a wildfire and reduce the impacts of fires when they occur; however, the potential for ignition would remain. Therefore, the ESJ U.S. Transmission Line project would make an unavoidable contribution to this major cumulative impact.

Table S-3
Summary of Impacts by Resource Area

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Biological Resources	No impacts to habitat/vegetation, sensitive species or breeding birds would occur	Permanent removal of up to 9.78 acres of Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub habitat/vegetation (would be offset by conservation easement) Potential for long-term major impacts to habitat in the event of a fire Minor temporary disturbances to wildlife and breeding birds during construction (noise and traffic increases) Minor potential for introduction of non-native invasive species during construction Potential for avian collisions Minor beneficial impact to raptors (potential for roosting on structures)	Permanent removal of up to 10.83 acres of Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub habitat/vegetation (offset by conservation easement) All other impacts would be the same as described for the 230-kV Route	Permanent removal of up to 9.78 acres of Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub habitat/vegetation (would be offset by conservation easement) All other impacts would be the same as described for Alternative 2 (230-kV Route)	Permanent removal of up to 10.83 acres of Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub habitat/vegetation (offset by conservation easement) All other impacts would be the same as described for Alternative 3 (500-kV Route)	Worker training Measures to prevent wildlife entrapment Weed Control Plan Habitat replacement at groundwater well access site

[4] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table S-3
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Visual Resources	No impacts to visual resources would occur	Permanent moderate to major adverse impacts due to land scarring from excavation Temporary moderate adverse impacts due to views of construction equipment and activity Moderate long-term adverse impacts to visual resources during operation of transmission line Wind turbines constructed in Mexico as part of the EJS Wind project, including any associated safety lighting, would be visible from several viewing points in the U.S.	Impacts would be essentially the same as described for Alternative 2 (230-kV Route) except that there would be potential for larger land scar and monopoles, if erected, would be slightly more visible	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 3 (500-kV Route)	Reduce color contrast and views of land scars Reduce visual contrast of towers and conductors
Land Use	No impacts to land use would occur	No adverse impacts are anticipated	No adverse impacts are anticipated	No adverse impacts are anticipated	No adverse impacts are anticipated	None indicated

4 Applicant Proposed Measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table S-3
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Recreation	No impacts to recreation would occur	Minor temporary indirect impacts during construction from increased traffic Minor long-term indirect impacts during operation from changes to views from recreational areas	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated
Cultural Resources	No impacts to cultural resources would occur	No adverse impacts to known cultural resources along alignment are anticipated Potential for adverse impacts to archaeological site along well access road Minor potential for impacts to unknown cultural resources	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Worker training to reduce potential for impacts to unknown cultural resources Subsurface investigation of cultural resources at the groundwater well access site, and at the revised 500-kV route (if constructed)

[4] Applicant Proposed Measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table S-3
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Noise	No changes in the noise environment	Minor temporary increases in ambient noise levels during construction (about 60 dBA at the nearest dwelling unit) but below County of San Diego thresholds Minor temporary increases in ambient noise level during operation, caused by corona noise during foul weather but below County of San Diego thresholds (45 dBA at the property line)	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated

4 Applicant-proposed Measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table S-3
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Transportation and Traffic	No impacts to transportation and traffic would occur	Minor temporary increase in traffic on local roadways during construction Minor potential for adverse impacts to traffic safety at ingress/egress during construction Short-term minor potential for roadway damage during construction Long-term minor potential for adverse impacts to air traffic safety during operation Temporary impacts to U.S. roadways from increased oversized trucks traffic to transport wind turbines for ESJ Wind project in Mexico	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Consult with and inform U.S. Border Patrol and CAL FIRE to avoid adverse impacts to air traffic safety for their activities

[4] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table S-3
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Public Health and Safety	No impacts to public health and safety would occur	Minor long-term potential for public exposure to induced currents and electrical field interference during operation	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated for public exposure to induced currents and electrical field interference Evaluate unanticipated contamination sites to prevent exposure to contaminated soils during construction Sample imported backfill soil to ensure it is free of contamination

[4] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table S-3
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Fire and Fuels Management	No impacts to fire and fuels management would occur	Major temporary increase in fire hazards during construction Major permanent increase in unavoidable ignition source and fire hazards during operation Major permanent adverse impacts to fire-fighting ability during operation Minor potential for introduction of non-native invasive species during construction or during long-term in the fuel management control areas Some potential for impacts in the U.S. due to the ESJ Wind project if a wildfire orginating in Mexico were to spread across the U.S.-Mexico border	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Develop and implement Construction Fire Prevention Plan Coordinate with emergency fire suppression activities Remove hazards from work area Weed Control Plan

4 Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table S-3
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Air Quality and Climate Change	No impacts to air quality or climate change would occur	Minor temporary increase in criteria pollutants (reactive organic gases, carbon monoxide, nitrogen oxides, sulfur oxides, and fugitive dust) and greenhouse gases during construction Minor short-term increase in criteria pollutants during operation Potential long-term reduction in greenhouse gas emissions during operation (beneficial)	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Use low-emission construction equipment Minimize vehicle idling Encourage carpooling
Water Resources	No impacts to water resources would occur	Temporary minor impacts to water supply due to water use during construction	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Use non-potable water

[4] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table S-3
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Geology and Soils	No impacts to geology and soils would occur	Minor temporary increase in soil disturbance and erosion during construction Minor long-term potential for erosion during operation Minor long-term potential for adverse impacts to structures due to corrosive soils Minor long-term potential for structure failure/damage due to seismic ground-shaking	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Limit modifications of access road in areas which are very sensitive to disturbance
Socioeconomics	No socioeconomic impacts would occur	Minor temporary beneficial impacts to local businesses during construction Minor long-term beneficial impacts to county revenue (property taxes) Minor short-term adverse impacts to property values due to visual impacts	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated

[4] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table S-3
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[4]
Environmental Justice	No changes in impacts to low-income or minority populations would occur	No disproportionately high or adverse impacts to low-income or minority populations are anticipated	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated
Services and Utilities	No impacts to services and utilities would occur	Temporary minor increased demand for law enforcement services during construction Temporary minor increased demand for solid waste utilities during construction	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Coordinate with local enforcement agencies and secure construction site

4 Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS; accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

SECTION 1

Introduction

On December 18, 2007, Baja Wind U.S. Transmission, LLC (now, Energia Sierra Juarez U.S. Transmission, LLC [referred to herein as ESJ]), a subsidiary of Sempra U.S. Gas and Power (formerly Sempra Generation, and referred to herein as Sempra), applied to the U.S. Department of Energy (DOE) for a Presidential permit in accordance with Executive Orders (E.O.) 10485 and 12038, and 10 Code of Federal Regulations (CFR) §205.320 *et seq*.[1] The Presidential permit (OE Docket Number PP-334), if issued, would authorize ESJ to construct, operate, maintain, and connect the United States (U.S.) portion of an electric transmission line that would cross the international border between the U.S. and Mexico, near the town of Jacumba, California (Figures 1-1 and 1-2). The U.S. portion of the double-circuit 230-kilovolt (kV) or single-circuit 500-kV transmission line (referred to herein as the ESJ U.S. Transmission Line project) would be 0.65 mile (1.05 kilometers [km]) in length, and would transmit up to 1,250 megawatts (MW) of wind-generated electricity (Figure 1-1).

A project overview is provided below, and additional project details are provided in Section 2 (Proposed Action and Alternatives). Project details are based on the ESJ December 18, 2007, application letter to DOE, as amended on March 19, 2008, and August 25, 2008. Additional project details were provided by ESJ to the County of San Diego during 2009 and 2010; these materials were also used in this Environmental Impact Statement (EIS). ESJ application documents are available on the project website at http://www.ESJProjectEIS.org, and on the DOE website at http://energy.gov/nepa/eis-0414-presidential-permit-application-energia-sierra-juarez-transmission-line-california (see PP-334).

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[1] According to Sempra's website (http://www.semprausgp.com), "Sempra U.S. Gas and Power, LLC is not the same company as the utility, San Diego Gas & Electric (SDG&E) or Southern California Gas Co. (SoCalGas), and Sempra U.S. Gas and Power, LLC is not regulated by the California Public Utilities Commission. According to Sempra's August 28, 2009, letter to DOE (available on the project website), in its initial application, Sempra made reference to Baja Wind, S. de R.L. de C.V. (Baja Wind), a subsidiary of Sempra Energy Mexico, as the entity undertaking the development in Mexico of the La Rumorosa Wind Energy Project. Baja Wind, S. de R.L. de C.V. was renamed Energia Sierra Juarez S. de R.L. de C.V. (ESJ Wind) to more accurately reflect the location of the project. Sempra Energy no longer refers to the project as La Rumorosa Wind or any such derivatives and instead uses the term Energia Sierra Juarez, ESJ, or ESJ Wind. Energia Sierra Juarez S. de R.L. de C.V. remains a subsidiary of Sempra Energy Mexico.

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_1-1_ProjectRegion_8x11_v10.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy

CALIFORNIA
AREA SHOWN IN THIS FIGURE

0 10 20 Miles
0 10 20 30 Kilometers

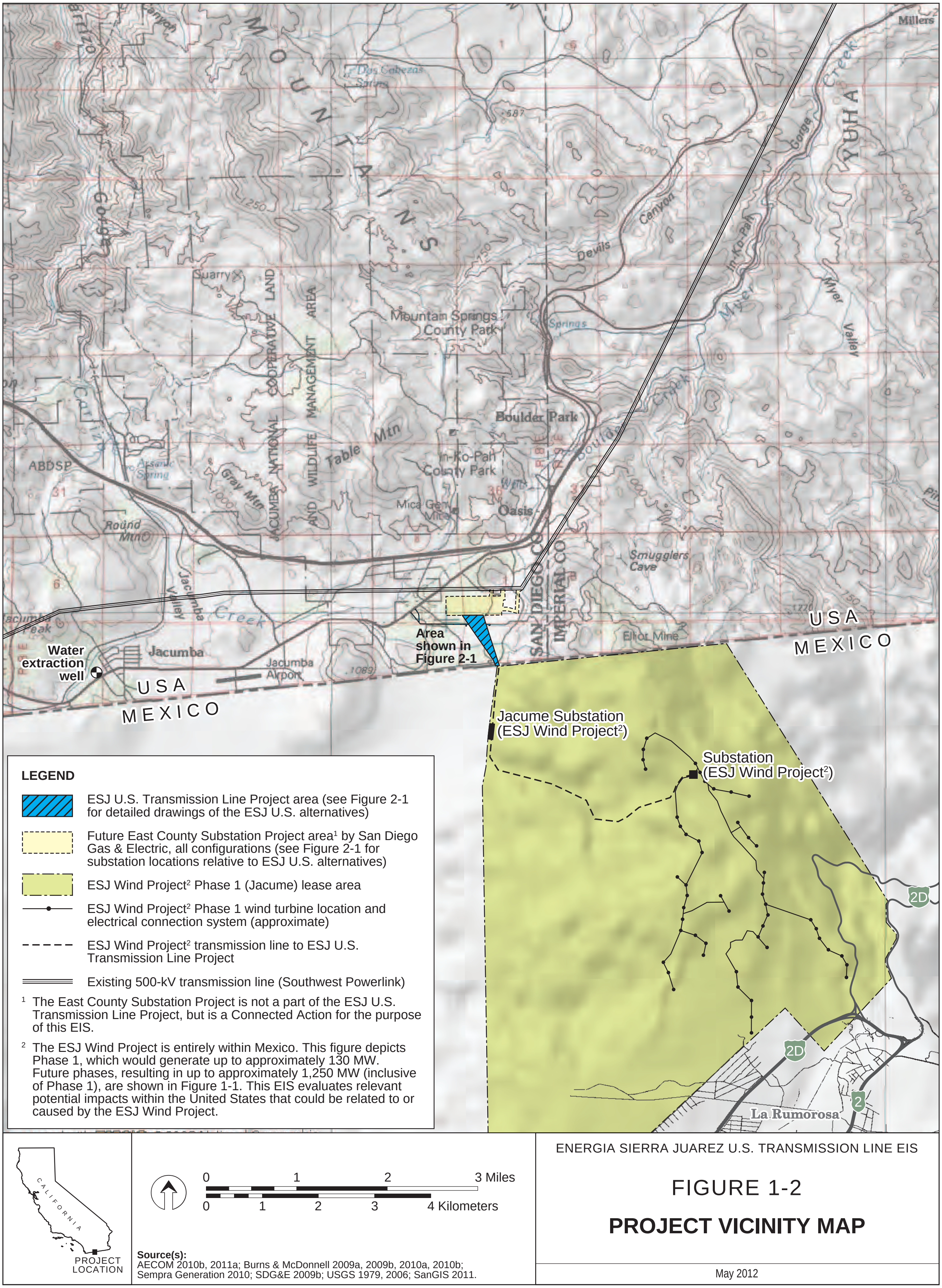
Source(s):
AECOM 2010b; Sempra Generation 2010; USGS 2006.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 1-1

PROJECT REGIONAL MAP

May 2012



Source(s):
AECOM 2010b, 2011a; Burns & McDonnell 2009a, 2009b, 2010a, 2010b; Sempra Generation 2010; SDG&E 2009b; USGS 1979, 2006; SanGIS 2011.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 1-2

PROJECT VICINITY MAP

May 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_1-2_ProjectVicinity100k_8x11_v15.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy

DOE has determined that issuance of a Presidential permit would constitute a major federal action that may have a significant impact upon the environment within the context of the National Environmental Policy Act of 1969 (NEPA). DOE prepared this EIS in compliance with the requirements of NEPA, the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500–1508), and with its NEPA implementing procedures (10 CFR Part 1021).

This EIS was prepared to meet the following key objectives:

- Identify and assess potential impacts on the natural and human environment that would result from implementation of the proposed project in the U.S.;
- Describe and evaluate reasonable alternatives to the proposed project in the U.S. that would avoid or minimize adverse effects to the environment, including the No Action Alternative; and
- Identify specific mitigation measures, as appropriate, to minimize environmental impacts.

For the purposes of this EIS, the term "ESJ U.S. Transmission Line project" or "ESJ U.S. project" refers to all ESJ project-related transmission line activities within the U.S, and the term "ESJ Wind project" refers to all project-related activities within Mexico.[2]

Within the U.S., the transmission line is proposed to be constructed on private land. There would be no construction on federal land, and DOE is the only federal agency with direct permitting authority over the proposed project.

A Major Use permit would be required from the County of San Diego; in July 2009, ESJ applied to the County for the permit. Additional application information was filed with the County in November 2009, February 2010, and May 2010.

As a cooperating agency in this NEPA EIS, the County of San Diego has provided information to DOE related to topics within the County's jurisdiction and expertise. The County does not expect to use this EIS to help fulfill its obligations under the California Environmental Quality Act (CEQA).

1.1 BACKGROUND

1.1.1 Overview of the ESJ U.S. Transmission Line Project Presidential Permit Process

Table 1-1 provides a timeline for the project that lists the milestones and sequence of events for ESJ and DOE actions that pertain to the Presidential permit review, including the environmental review process that led to the publication of this EIS.

[2] The term "transmission" is used throughout this document for purposes of clarity. It is understood that, in accordance with Federal Energy Regulatory Commission (FERC) terminology, the proposed transmission line would be a Generator-tie line ("Gen-Tie"). As such, the transmission line, if approved and constructed, would not be required to provide open access transmission capability, as defined in applicable FERC regulations.

Table 1-1 ESJ Application Time Line	
Date	**Activity**
December 18, 2007	DOE received Baja Wind (now ESJ) project application
March 19, 2008	DOE received amended Baja Wind (now ESJ) project application, including additional information on the 230-kV alternate transmission line design
August 4, 2008	DOE issued *Federal Register* Notice of Intent (NOI) to Prepare an Environmental Assessment (EA)
August 25, 2008	DOE received second letter amendment to the Baja Wind project application to change the project name from Baja Wind U.S. Transmission, LLC, to Energia Sierra Juarez U.S. Transmission, LLC (ESJ)
August 26, 2008	Public scoping meetings in Jacumba, California
September 3, 2008	Scoping period ended
February 25, 2009	DOE issued *Federal Register* NOI to Prepare an EIS
March 27, 2009	End of period to submit additional comments on the scope of the EIS
September 22, 2009	Scoping Report published and available on the ESJ project website
September 30, 2010	Draft EIS published and available on the ESJ project website
November 2, 2010	Close of public comment period on the Draft EIS

1.1.2 Description of the ESJ U.S. Transmission Line Project

The ESJ U.S. Transmission Line project is described in the December 18, 2007, application letter to DOE as amended on March 19, 2008, and August 25, 2008. (All of these documents are available on the project website and the DOE website.)

ESJ would construct either a double-circuit 230-kV transmission line or a single-circuit 500-kV electric transmission line to connect to the Imperial Valley-Miguel segment of the Southwest Powerlink[3] (SWPL) 500-kV transmission line and provide up to 1250 MW of energy from renewable energy generators to be located in the general vicinity of La Rumorosa, Northern Baja

3 San Diego Gas and Electric Company's project documents state: "San Diego Gas & Electric's (SDG&E) single 500-kV interconnection to the grid is the Southwest Powerlink (SWPL), a 500-kV transmission line connecting the Palo Verde Nuclear Generating Station in Arizona and SDG&E's Miguel Substation in California. The SWPL is owned jointly by SDG&E, Arizona Public Service, and the Imperial Irrigation District." (http://regarchive.sdge.com/sunrisepowerlink/info/PEA/Chapter_1/Chapter1_executive_summary.pdf)

California, Mexico. Delivery within California of the output of ESJ Wind turbines in Mexico would be scheduled by the California Independent System Operator (Cal-ISO)[4].

The proposed transmission line would have a total length of approximately 1.65 miles (2.65 km), including both the U.S. and Mexican portions of the line. The proposed line would be constructed on lattice towers or steel monopoles, extending south from the point of interconnection with SWPL for about 0.65 mile (1.05 km) to the U.S.-Mexico international border. From the international border, the proposed line would continue south for approximately 1 mile (1.6 km) to its first point of interconnection inside Mexico. Both the double-circuit 230-kV and single-circuit 500-kV facilities would require connection to a new substation that would be built in the U.S. by San Diego Gas and Electric Company (SDG&E) as parts of its East County (ECO) Substation Project. If the ESJ U.S. transmission line is a 230-kV facility, the 230/500-kV transformation would occur at that new substation. If the ESJ U.S. transmission line is a 500-kV facility, a substation would be required in Mexico for transformation from the wind-farm voltage to 500-kV.

The proposed action considered in this EIS is the issuance of a Presidential permit that would authorize the U.S. portion of the proposed transmission line. In addition, the EIS considers potential impacts in the U.S. from the connected transmission facilities and associated ESJ Wind project in Mexico (e.g., potential impacts to migratory golden eagles; impacts to visual resources in the U.S. from transmission lines and wind turbine facilities in Mexico; air quality impacts from dust entering the U.S. from construction in Mexico; and potential wildfire hazards to the U.S. from construction and operation of the ESJ Wind project in Mexico). The ESJ U.S. Transmission Line project transmission line would include up to five support structures, either monopole towers or steel lattice towers similar to the existing 500-kV SWPL structures. Towers or poles would be spaced approximately 1,500 feet (457 meters [m]) apart. The towers or poles would be 150 feet (46 m) tall, except that if the ESJ U.S. transmission line is a 500-kV facility the monopoles would be 170 feet (52 m) tall.

The ECO Substation switchyards would occupy approximately 58 acres (23.5 hectares [ha]) between the ESJ U.S. Transmission Line project and Old Highway 80, in close proximity to the existing SWPL. The specific design, location, and acreage requirement for the ECO Substation switchyards are expected to be determined as a result of a decision process between SDG&E and the California Public Utilities Commission (CPUC). The purpose of the SDG&E ECO Substation Project is to meet several objectives as described in the EIR/EIS prepared jointly by CPUC and BLM.[5] These objectives include: provide an interconnection hub for various renewable generation sources, thus eliminating the need for multiple switching stations along

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4 The Cal-ISO is the independent system operator of California's wholesale power grid, maintaining reliability and directing the flow of electric power along the long-distance, high voltage power lines that connect California with neighboring states, as well as Mexico and British Columbia. The Cal-ISO evaluates energy schedules in the so-called "day-ahead" and "hour-ahead" markets and allocates the available transmission capacity to support the implementation of these schedules.

5 The ECO Substation application documents, including the Proponent's Environmental Assessment (PEA), are available online at: http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/PEA_ECOSUB.htm. The ECO Substation Project EIR/EIS is available online at:

http://www.cpuc.ca.gov/environment/info/dudek/ecosub/ECO_Final_EIR-EIS.htm

SWPL; expand the interconnection capability of the southeastern transmission system to accommodate planned generation in the region, as well as future as-yet-unplanned generation; improve control, increase operational flexibility, and enhance the reliability of the regional transmission system; increase the reliability of electrical service for Boulevard, Jacumba, and other surrounding communities; and, maximize the use of existing utility rights-of-way and access roads. The proposed ECO Substation switchyards are not a part of the ESJ U.S. Transmission Line project, but they are considered a connected action for the purpose of this EIS because the ESJ U.S. Transmission Line would interconnect directly to this facility. Additional infrastructure that SDG&E proposes as a part of the ECO Substation Project includes a loop-in to SWPL; an approximately 13.3 mile (21.4 km) 138-kV transmission line to Boulevard Substation; and associated upgrades to the Boulevard Substation (located west of the project area near the community of Boulevard). DOE has determined that only the first points of interconnection with the electrical transmission grid (i.e., SDG&E's ECO Substation switchyard facility and SWPL loop-in) are connected actions. Therefore, the additional SDG&E ECO Substation Project components beyond the switchyards and loop-in are not considered connected actions to the ESJ U.S. Transmission Line project.

The ESJ Wind project in Mexico would be constructed in phases, with up to 52 wind turbines constructed in Phase 1. Power output from Phase 1 would be 130 MW assuming nominally 2.5 MW per turbine, and potentially up to 156 MW if the output reaches 3 MW per turbine (the wind turbines have not been selected by ESJ, so actual generating capacity may vary depending on the selected manufacturer and specific model). Phase 1 would be constructed on the furthest north land leased by ESJ (an area referred to as the Jacume lease area), north of the town of La Rumorosa, Mexico. Expansion of the ESJ Wind project in Mexico would generate up to 1,000 MW of additional power.[6] The timing and location for installation of subsequent phases have not been determined, but current leaseholds would place the location of those subsequent phases south of the town of La Rumorosa. The location and scale of additional development is considered in the EIS to the extent that such development could result in effects in the U.S.

Figure 1-1 depicts the regional location of the ESJ U.S. Transmission Line project. Figure 1-2 provides a map of both the ESJ U.S. Transmission Line project and Phase 1 of the ESJ Wind project locations. The wind turbine locations shown on Figure 1-2 are preliminary and subject to refinement based on ongoing siting studies. The wind turbines nearest to the U.S. would be approximately 0.7 mile (1.1 km) south of the U.S. border. Section 2 provides additional details of the ESJ U.S. Transmission Line project components that are proposed to be constructed in the U.S.

6 According to Sempra's August 28, 2009, letter to DOE, ESJ requests that the import capacity in the Presidential permit be limited to the physical capacity of the transmission line (1,250 MW) and that power on this line be limited to renewable energy projects. To date, Sempra has submitted three interconnection requests to Cal-ISO, totaling 1,120 MW. Although it is possible to submit interconnection requests to completely fill the physical capacity of the transmission line, interconnection requests to the Cal-ISO are very expensive and have a limited shelf life. It is unclear how long it would take for the ESJ Wind project to reach the 1,120 MW that it currently has in interconnection requests, and therefore Sempra concluded that it is not prudent to submit additional requests to completely fill the line's capacity.

1.2 PURPOSE AND NEED

ESJ has applied to DOE for a Presidential permit for its project. The permit would allow the company to construct, operate, maintain, and connect approximately 0.65 mile (1.05 km) of new single-circuit 500-kV or double-circuit 230-kV transmission line in the U.S. that would cross the U.S.-Mexico border to connect with transmission to be built in Mexico.

The purpose and need for DOE's action is to respond to the ESJ request for a Presidential permit. DOE may issue or amend a Presidential permit if it determines that the action is in the public interest and after obtaining favorable recommendations from the U.S. Departments of State and Defense. DOE received notices of non-objection from these agencies dated January 12, 2011 (Department of Defense) and January 27, 2011 (Department of State); these letters are provided in Appendix G. In determining whether a proposed action or a reasonable alternative is in the public interest, DOE considers the impact of the proposed action and the identified alternatives on the environment pursuant to NEPA, the proposed action's impact on the reliability of the U.S. electric power supply system, and any other factors that DOE may consider relevant. If DOE determines that granting a Presidential permit is in the public interest, the information contained in the EIS will also help to inform DOE's decision regarding potential mitigation measures and other conditions of the permit. DOE will issue a Record of Decision (ROD) no sooner than 30 days after the U.S. Environmental Protection Agency's (EPA) publication of a *Notice of Availability of the Final EIS* in the *Federal Register*. The Presidential permit, if approved, would be issued subsequent to the ROD.

1.3 ESJ PROJECT OBJECTIVES

The ESJ stated objective for the proposed transmission line is to transport renewable electrical power generated by the ESJ Wind project in Mexico to the U.S. ESJ has indicated to DOE that power generated by phases beyond Phase 1 of its proposed ESJ Wind project could potentially be partitioned between U.S. and Mexico energy markets (although the extent of partitioning, if any, has not been determined as of this writing)[7] and that, "the proposed transmission line is expected to reduce the region's dependence upon conventional fossil fuel fired generation plants, and improve the region's ability to meet future electrical energy requirements."[8] The ESJ projects would also help California utilities meet the renewable portfolio standards specified in California Executive Order S-14-08, which requires that by the end of 2020, 33% of retail electricity sales be generated from renewable energy sources.[9]

1.4 COOPERATING AGENCY

On February 1, 2010, the County of San Diego accepted DOE's invitation to be a cooperating agency for preparation of this EIS. Separate from the DOE Presidential permit application process, ESJ has applied to the County of San Diego for a Major Use Permit (MUP) for the project, and the County must review the environmental impacts of that permit in accordance with

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7 August 16, 2011 email from Sempra Generation to DOE, available on the project website: http://www.esjprojecteis.org/docs/deiscomments/ESJDEIScomment-Abreau_Alberto_Sempra_2011-08-16.pdf

8 December 18, 2007 application to DOE, at page 4, available on the project website: http://www.esjprojecteis.org/docs/Sempra_Application_(PP-334).pdf

9 http://gov.ca.gov/news.php?id=11072

CEQA. As a responsible agency under CEQA, the County of San Diego expects to use the East County (ECO) Substation Environmental Impact Report (EIR)/EIS for its permitting processes. The U.S. Bureau of Land Management (BLM) and the California Public Utilities Commission (CPUC) have prepared the ECO Substation EIR/EIS to address SDG&E proposed ECO Substation project (including switchyards and a loop-in [connection] to the Southwest Powerlink [SWPL]), Iberdrola Renewables Tule Wind Energy project, and the ESJ U.S. Transmission Line project. EPA published a Notice of Availability of the Draft EIR/EIS for the SDG&E ECO Substation Project on December 23, 2010 (75 FR 80807). The Environmental Protection Agency published a notice regarding the Final EIR/EIS for the project in the *Federal Register* on October 14, 2011 (76 FR 63922, available online: http://www.gpo.gov/fdsys/pkg/FR-2011-10-14/pdf/2011-26610.pdf). Following certification of the EIR/EIS by the CPUC, the County would use the ECO Substation EIR/EIS to make the appropriate CEQA findings for its discretionary action under CEQA. The County of San Diego Planning Commission would then consider approval of a Major Use Permit for the ESJ U.S. Transmission Line project, as a Major Impact Service Utility (Section 1350 of the County's Zoning Ordinance). Other County permits and approvals that ESJ would need to build the project include County right-of-way permits for construction, excavation, and road encroachment; grading permit; and improvement plans.

As a cooperating agency in this NEPA EIS, the County of San Diego has provided information to DOE related to topics within the County's jurisdiction and expertise. The County does not expect to use this EIS to help fulfill its obligations under CEQA.

1.5 PUBLIC PARTICIPATION AND THE NEPA PROCESS

1.5.1 Public Scoping

DOE initially determined that the appropriate level of environmental review under NEPA for considering whether to grant the requested Presidential permit was an Environmental Assessment (EA). On August 4, 2008, DOE published in the Federal Register its *Notice of Intent to Prepare an Environmental Assessment and to Conduct Public Scoping Meetings; Baja Wind U.S. Transmission, LLC* (73 FR 45218) (NOI). The NOI explained that DOE would be assessing potential environmental impacts and issues associated with the proposed project. The NOI was sent to interested parties, including federal, state, and local officials; agency representatives; tribes; conservation organizations; local libraries and newspapers; and local stakeholder organizations and individuals in the vicinity of the proposed transmission line. Issuance of the EA NOI opened a 30-day public comment period that closed September 3, 2008. The NOI also stated that, "[if] at any time during preparation of the EA DOE determines that an Environmental Impact Statement (EIS) rather than an EA is needed, DOE will issue a Notice of Intent to prepare an EIS in the *Federal Register*. In that case, this scoping process will serve as the scoping process that normally would follow a Notice of Intent to prepare an EIS. Accordingly, DOE will consider any comments on the scope of the EA received during this scoping process in preparing such an EIS."

DOE conducted two scoping meetings in San Diego County, California, during the public comment period following the NOI for EA preparation. Both meetings were held in the town of Jacumba on August 26, 2008. The meetings provided the public with the opportunity to learn more about the proposed project and to provide comments on potential environmental issues associated with the project. A total of 18 people spoke at the meetings, and their comments were transcribed by a court reporter. Transcripts of the scoping meetings are posted on the project website and on the DOE website. In addition, DOE received scoping comments in the form of eight letters from private citizens, government agencies, and non-governmental organizations. All comments received are available on the project website.

The following key issues were identified during the scoping process:

- visual impacts;
- avian mortality;
- impacts on protected, threatened, endangered, or sensitive species of animals or plants, or their critical habitats;
- impacts on cultural or historic resources;
- impacts on human health and safety, with particular focus on wildfire hazards due to presence of the proposed transmission line;
- impacts on air quality and water resources;
- impacts on land use; and
- impacts from development of wind generation.

In addition, several commenters stated that an EA was not adequate, and that an EIS should be prepared.

Based on these comments and the potential for significant impacts, DOE determined that an EIS would be the more appropriate NEPA document. On February 25, 2009, DOE issued in the *Federal Register* a second NOI: *Notice of Intent to Prepare an Environmental Impact Statement; Energia Sierra Juarez U.S. Transmission, LLC* (74 FR 8517). The EIS NOI was also sent to federal, state, and local officials; agency representatives; tribes; conservation organizations; local libraries and newspapers; and local stakeholder organizations and individuals in the vicinity of the proposed project. The EIS NOI did not announce the opening of an additional scoping period, but it did indicate that any additional comments received by March 27, 2009, would be considered by DOE in defining the scope of the EIS, and that comments received or postmarked after that date would be considered to the extent practicable. In response to the EIS NOI, DOE received seven letters or emails from private citizens, government agencies, and non-governmental organizations, including one letter from a Native American Tribe (Quechan Tribe). A Scoping Report was prepared to summarize the scoping comments. The EIS NOI and Scoping Report are provided in Appendix A, and all comments received in response to the two NOIs are available on the project website.

DOE also sent letters to various federal and California state agencies specifically requesting their input. Several agencies have responded to these letters, providing information for the EIS, and/or indicating an interest to review the draft EIS and participate in project meetings. All comments received to date in response to the agency letters are available on the project website.

Native American Consultation

Native American consultation has occurred through responses to the NOI. In addition, pursuant to regulatory guidance (E.O. 13084), DOE contacted the appropriate Native American groups to offer them the opportunity to consult with DOE regarding the ESJ U.S. Transmission Line project on a government-to-government basis. A total of 13 Native American contacts were made based on the results of a sacred lands search for the project corridor from the Native American Heritage Commission (NAHC). The following discussion summarizes the results of consultations to date.

On March 9, 2009, DOE received an email from the Quechan Tribe in response to the NOI. In its response letter dated April 14, 2009, DOE acknowledged the Tribe's concern about potential cumulative impacts from several projects within the Quechan Indian Tribe's traditional land area, and invited the Tribe to participate in government-to-government consultation. In its initial correspondence to DOE, the Tribe indicated that the project is within the Quechan Tribe's traditional land area and there are several resources affiliated with the Tribe in the area. The Tribe requested that they be allowed to participate in the cultural resource evaluation. They also stated that the EIS should consider the cultural and biological resources within the project area and in the natural landscape. After further correspondence between DOE representatives and the Tribe, a Quechan representative indicated on November 30, 2009, that upon further review of the project location, the project lies outside of the traditional land area of the Quechan, and that the Quechan would defer comments on this project to the Kumeyaay Nation and support that Tribe as needed.

On June 29, 2009, DOE received a letter from the Campo Band of the Kumeyaay Nation in response to DOE's May 28, 2009, letter. The Campo Band requested a consultation meeting between the Campo Band and DOE on this project to discuss cultural resources and historic preservation activities. A DOE representative met with the Campo Band on September 16, 2009, to discuss the project and provide for further coordination during EIS preparation. DOE's consultation with the Campo Band did not identify any significant cultural resources issues. DOE will continue to coordinate with the Campo Band to the extent appropriate during the EIS process.

Appendix D provides copies of consultation letters regarding the preparation of this EIS that were sent to and received from Native American Tribes. This correspondence is also posted on the project website.

1.5.1.1 Issues Within the Scope of the EIS

The issues summarized below were raised by commenters during scoping and are addressed in the draft EIS.

Visual Resources. Commenters raised concerns about changes in the visual character of the project area due to the placement of industrial facilities in a rural, open space setting. Specific concerns were raised regarding the daytime and nighttime views of the proposed wind turbines along prominent ridgelines of the Sierra Juarez Mountains; the proposed ESJ U.S. Transmission Line; and other planned projects that would place new infrastructure in the project area, including the ECO Substation switchyards and related transmission line improvements. These issues are addressed in Section 3.2 (Visual Resources).

Birds. Commenters raised concerns about avian mortality due to transmission line and wind turbine construction and operation. They also suggested that birds protected by the Migratory Bird Treaty Act (MBTA) should be addressed in the impact analysis. These issues are addressed in Section 3.1 (Biological Resources).

Protected or Sensitive Species and Critical Habitats. Commenters suggested that the analysis should discuss critical habitat and wildlife movement for protected species in the project area, including Peninsular bighorn sheep, Quino checkerspot butterfly, and California condor; and include measures to mitigate potential impacts to these species and their habitats. Commenters also expressed concerns related to potential impacts on present and potential future preserve lands within the Las Californias Binational Conservation Initiative and suggested avoidance of land that would be necessary to meet preserve objectives. These issues are addressed in Section 3.1 (Biological Resources).

Cultural and Historic Resources. Cultural resource concerns raised by commenters related to potential disturbance to buried archeological resources in the project area and consideration of the broader cultural landscape. DOE has consulted with the Quechan Tribe and the Campo Band. These issues are addressed in Section 3.5 (Cultural Resources).

Human Health and Safety, Fire Hazards, and Homeland Security. Commenters suggested that the project would introduce a new fire hazard area in a remote area of existing high fire hazards. Concerns were also expressed regarding increased electric and magnetic fields, road construction that could lead to increased illegal activity related to the U.S.-Mexico border, and vulnerability of the transmission line to damage due to illegal border activity. In accordance with DOE NEPA guidance, the EIS also considers potential consequences of intentional destructive acts such as sabotage and terrorism. These issues are addressed in Section 3.8 (Public Health and Safety) and Section 3.9 (Fire and Fuels Management).

Air Quality. Commenters suggested that the analysis address traffic-induced dust due to increased off-road vehicle traffic and increased U.S. Border Patrol traffic, as well as greenhouse gas emissions. These issues are addressed in Section 3.10 (Air Quality and Climate Change).

Water Resources. Commenters indicated that groundwater is scarce in the project area and suggested that the analysis should address groundwater impacts and groundwater impact minimization measures. These issues are addressed in Section 3.11 (Water Resources).

Land Use. Commenters indicated that the County of San Diego is in the process of updating its General Plan, and the County intends for the project area to remain rural. The comments suggested that the ESJ U.S. Transmission Line project and other proposed development projects could alter the rural character of the project area by introducing industrial development, and that these projects should be reviewed for consistency with the applicable General Plan (including the Mountain Empire Subregional Plan), codes and ordinances. These issues are addressed in Section 3.3 (Land Use).

Connected Actions. Commenters asked for the EIS to include assessment of the impacts of SDG&E's ECO Substation project as a connected action. The proposed SDG&E ECO Substation Project has several elements, including the ECO Substation switchyards, a loop-in to the existing SWPL transmission line; an approximately 13.3-mile (21.4 km) 138-kV transmission line to

Boulevard Substation; and associated upgrades to the Boulevard Substation (located west of the project area near the community of Boulevard). DOE has assessed the ECO Substation switchyards and SWPL Loop-In components of the project as connected actions because the ESJ U.S. Transmission Line would interconnect directly to the ECO Substation facility and Loop-In. These issues are addressed in Section 4 (Connected Actions - ECO Substation and SWPL Loop-In).

Refer to the Scoping Report in Appendix A for additional discussion of issues raised. The Scoping Report and the actual comments are available on the project website at http://ESJProjectEIS.org.

1.5.1.2 Issues Outside the Scope of the EIS

DOE has determined that the following issues that were raised by commenters during scoping or during public comment on the draft EIS (Section 1.5.2) are outside the scope of the EIS.

Emergency Outage Plans. Commenters requested that emergency outage plans be examined as part of the EIS, particularly in relation to homeland security issues. The development of emergency outage response plans is the purview of local public safety officials and is outside the scope of the EIS. Also, outside of the NEPA process, DOE will perform an electric reliability study to ensure that the existing U.S. power supply system would remain fully operational upon the sudden loss of power, regardless of the cause of the outage.

Impacts in Mexico. Several commenters asked DOE to evaluate the impacts associated with the construction and operation of wind turbines and associated development activities on the environment in Mexico, not just in the U.S. DOE has analyzed impacts that could occur in the U.S. as a result of these activities in Mexico, but DOE deems an analysis of other impacts in Mexico to be inappropriate for several reasons.

First, the federal action evaluated in the EIS is not the building of the wind turbines, but the permitting of the construction, operation, maintenance, and connection of an electric transmission facility at the U.S. international border.

Secondly, NEPA does not require an analysis of environmental impacts that occur within another sovereign nation that result from actions approved by that sovereign nation. E.O. 12114 (January 4, 1979) requires federal agencies to prepare an analysis of significant impacts from a federal action in certain defined circumstances and exempts agencies from preparing analyses in others. The E.O. does not require federal agencies to evaluate impacts outside the U.S. when the foreign nation is participating with the U.S. or is otherwise involved in the action [Section 2-3(b)]. The Mexican government has been involved in the evaluations of the environmental impacts associated with the wind project in Mexico. Further, the ESJ Wind project would be constructed in accordance with all applicable Mexican laws, standards, rules, and regulations. The agencies in Mexico with potential jurisdiction over the activities proposed within Mexico include the Comisión Federal de Electricidad, Comisión Reguladora de Energía, Secretaría de Medio Ambiente y Recursos Naturales, and Instituto Nacional de Ecología. DOE reviewed a partial translation of the Mexican MIA permit (or La Manifestacion de Impacto Ambiental, modalidad regional [MIA-R]). The permit requires various mitigations for identified impacts. For example, the permit requires a baseline study (at least one year) of potential impacts to birds (including migratory species) and bats prior to the operation of the proposed wind farm. If the baseline study shows that birds and bats could be adversely impacted, the permit requires future mitigation to protect or minimize adverse impacts on these bird and bat populations. The permit also requires preparation and implementation of a Fire Protection Plan.

Finally, the federal action would not affect the global commons (e.g., outer space, Antarctica), and the federal action would not produce a product, emission, or effluent that is "prohibited or strictly regulated by federal law in the U.S. because its toxic effects on the environment create a serious public health risk" or which involves regulated or prohibited radioactive materials.

Sunrise Powerlink Project. Several commenters suggested that SDG&E's application for construction of the Sunrise Powerlink project should be assessed as a connected action to the ESJ U.S. Transmission Line project. DOE has determined that the Sunrise Powerlink project is not a connected action to the ESJ Transmission Line project. The CEQ definition of connected action (40 CFR 1508.25(1)) states, in part, that actions are connected if they:

- Automatically trigger other actions which may require environmental impact statements.
- Cannot or will not proceed unless other actions are taken previously or simultaneously.
- Are interdependent parts of a larger action and depend on the larger action for their justification.

The ESJ Transmission Line project is not dependent on Sunrise because the ESJ Transmission Line project will interconnect to the grid using the Southwest Powerlink via a loop-in from the ECO substation (i.e., not Sunrise Powerlink).[10] Further, Sunrise Powerlink project construction is underway and will be completed regardless of whether or not the ESJ Transmission Line project goes forward. The Sunrise Powerlink project is considered in the cumulative impact assessment in this EIS (Section 5).

SDG&E ECO Substation Project Additional Infrastructure. As noted above, the proposed SDG&E ECO Substation Project has several elements, including the ECO Substation switchyards, a loop-in to SWPL, an approximately 13.3-mile (21.4 km) 138-kV transmission line

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[10] In its May 30, 2008, letter to DOE, Sempra provided the following explanation regarding the relationship between the ESJ U.S. and Sunrise Powerlink projects:

> Although one of the attributes of the Sunrise project is that it would address the previously discussed SPS [Special Protection System] limitation, this would benefit all potential generators seeking interconnection to SWPL or the Imperial Valley Substation, including renewable projects located in Imperial Valley. These Sunrise benefits will occur regardless of whether the generation associated with Baja Wind U.S. [now ESJ] is built or not. Thus, the decision to build the Sunrise project will be made regardless of the potential existence or not of Baja Wind U.S. [now ESJ] or its associated generation.
>
> Conversely, if Sunrise is not built, Sempra Generation would seek to have the CAISO [California Independent System Operator] and SDG&E evaluate alternative transmission to accommodate Sempra Generation's interconnection requests. Order No. 888 requires transmission facility owners to offer transmission to generators to their interconnection to grid. The Sunrise and Baja Wind [now ESJ] projects have different purposes and justifications, are proposed by different entities, have independent utility and different triggers and actions are necessary to implement projects. In conclusion, the Sunrise and Baja Wind U.S. [now ESJ] projects are completely independent projects and decisions to proceed with each project will be made separately and independently of the outcome of the other.

to Boulevard Substation; and associated upgrades to the Boulevard Substation. DOE considers the ECO Substation switchyards and the loop-in to SWPL to be connected actions for the purpose of this EIS because the ESJ U.S. Transmission Line would interconnect directly to this facility. Several commenters suggested that additional proposed infrastructure associated with SDG&E's application for construction of the ECO Substation Project should also be assessed as connected actions to the ESJ U.S. Transmission Line project. Only the first point of interconnection with the U.S. electrical transmission grid is a connected action for the ESJ U.S. Transmission Line project. The additional SDG&E ECO Substation Project components beyond the switchyards and loop-in are independent of the ESJ U.S. Transmission Line project; that is, the ESJ U.S. Transmission Line project does not depend on these components, and these components are neither triggered by nor dependent on the project. Therefore, these elements are not connected actions for the purpose of this EIS, but are considered as potential sources of cumulative impacts.

Cumulative Impacts from Speculative Future Renewable Energy Projects. Commenters requested that the cumulative impact analysis in the EIS consider the impacts of numerous potential renewable energy projects, particularly projects to be sited in northern Baja, Mexico, that have been announced by various developers or mentioned in media accounts. Guidance from the CEQ on conducting cumulative impact assessments recommends that the consideration of impacts from future projects be limited to projects that are reasonably foreseeable. DOE has limited its identification of reasonably foreseeable projects to those proposals with the potential to be executed within the next 10 years; that is, they are funded for future implementation or are included in firm near-term plans. Projects predicted to be developed after 10 years are generally presumed to be speculative and thus are not reasonably foreseeable.

Use of the Proposed Transmission Line for Non-Renewable Energy Projects. Commenters expressed concern that the proposed transmission line could eventually be used to support non-renewable energy generation projects in Mexico that would have additional effects in the U.S. (e.g., impacts due to the construction and operation of natural gas-fired power plants in Mexico that might use the proposed transmission line to export electricity to the U.S.). Commenters pointed out that Sempra has constructed other infrastructure in Mexico near the project area (including a natural gas pipeline from its Natural Gas Liquids facility in Ensenada and a water pipeline) that could facilitate such development. ESJ has assured DOE that the proposed electrical transmission line is intended to be used only for renewable generation. Accordingly, any alternative future use of the transmission corridor would require a new or revised Presidential permit application to be filed with DOE and would be subject to a new and separate NEPA review. Therefore, the possible use of the line for non-renewable energy is not deemed reasonably foreseeable at this time and is outside the scope of this EIS.

Distributed Electricity Generation as an Alternative. Commenters on the draft EIS asked for consideration of distributed small-scale electricity generation, such as solar panels in urban settings, as an alternative to large-scale wind energy development and associated long-distance transmission lines. Alternative approaches for energy generation are outside the scope of the EIS because they do not respond to DOE's purpose and need, which is (as discussed in Section 1.2) to respond to the ESJ request for a Presidential permit.

1.5.2 Public Review of the Draft EIS

The draft EIS was distributed to interested agencies, organizations, and the general public for review and comment in September 2010 (75 FR 57005; Notice of Availability issued September 17, 2010). The draft EIS and Notice of Availability are also available on the ESJ U.S. project website: http://www.ESJProjectEIS.org/index.htm. Notification of draft EIS availability was sent to those on the project website mailing list.

DOE held three public hearings on the draft EIS during the comment period (Jacumba, California on October 5, 2010; Boulevard, California on October 6, 2010; and San Diego, California on October 7, 2010), which closed on November 1, 2010. The dates and times of the hearings were announced on the project website and in local news media. The hearings provided interested parties with an additional opportunity to comment on the draft EIS and to participate in the decision-making process. The hearings included a presentation by DOE and an oral comment session in which attendees were invited to formally enter their comments on the draft EIS into the public record. Transcripts of the public hearings were recorded by a court reporter and are available on the project website and in Volume 3 (Comment and Response Document) of this final EIS.

DOE responded to written comments from 43 government officials, organizations, and individuals. DOE continued to consider comments received since the close of the public comment period up until September 2011. All comments that DOE responded to are provided in the Comments and Responses Document (Volume 3) of this final EIS, together with DOE's responses. Note that the project website provides copies of certain letters that were received well after the close of the comment period for which DOE does not provide a written response. DOE has reviewed these recent comments and found them to be similar to comments received previously that have been addressed in the EIS Comments and Responses Document. (DOE will continue to post such comments as they arrive for a while as a public service.)

1.5.2.1 Summary of Issues Raised During Public Comment Period

The following are some of the major topics of comments submitted during the public comment period.

Transmission of Non-renewable Energy. Commenters questioned the project's purpose and need, and asserted that the cross-border transmission line could eventually become available for fossil-fueled generation. As discussed in Section 1.5.1, ESJ has assured DOE that the proposed electrical transmission line is intended to be used only for renewable generation. Accordingly, any alternative future use of the transmission corridor would require a new or revised Presidential permit application to be filed with DOE and would be subject to a new and separate NEPA review. Therefore, the possible use of the line for non-renewable energy is not deemed reasonably foreseeable at this time and is outside the scope of this EIS.

Distributed Electricity Generation as an Alternative. As noted in Section 1.5.1.2, commenters asked for consideration of distributed small-scale electricity generation, such as solar panels in urban settings, as an alternative to large-scale wind energy development and associated long-distance transmission lines. Alternative approaches for energy generation are outside the scope of the EIS because they do not respond to DOE's purpose and need, which (as discussed in Section 1.2) is to respond to the ESJ request for a Presidential permit.

Additional Project Alternatives. Commenters asked for consideration of the use of existing transmission lines in Mexico (e.g., the Western Energy Coordinating Council Path 45 transmission line in northern Baja California, which crosses the U.S.-Mexico border near San Diego). The EIS has been revised to include consideration of the potential use of the existing Western Energy Coordinating Council (WECC) transmission corridor as an alternative to the applicant's proposed project. A new subsection, Section 2.8.1, discusses why the potential of a direct interconnection to Mexican transmission lines using the WECC transmission corridor was considered but dismissed from detailed analysis.

Commenters requested additional analysis of the alternative of installing the transmission line underground. Revised discussion of this alternative is provided in Section 2.8.3 of this final EIS, but DOE has not altered its conclusion that this is not a reasonable alternative.

Connected Actions. Several comments asserted that the Sunrise Powerlink transmission line is a connected action because the existing Southwest Powerlink has insufficient electrical capacity to support the full buildout of the ESJ Wind project, and thus the ESJ U.S. Transmission Line project could not proceed without the additional capacity that Sunrise would provide.

Commenters also asked that the whole of the SDG&E ECO Substation project be considered a connected action. As discussed in Section 1.5.1.2, DOE considers only the first points of interconnection with the electrical transmission grid (i.e., SDG&E's ECO Substation switchyard facility and SWPL loop-in) to be connected actions. The additional SDG&E ECO Substation Project components beyond the switchyards and loop-in are not considered connected actions to the ESJ U.S. Transmission Line project.

Cumulative Projects. Several comments indicated additional projects that should be addressed in the cumulative impact assessment, including several renewable energy development projects in the border region, as well as land use developments in Boulevard and other nearby communities. Certain projects were added to the list of cumulative projects and these projects were considered in the cumulative impacts assessment. Some projects could not be included due to the lack of sufficient information for assessment.

Cross-Border Biological Resource Impacts and Mitigations. Several comments asked for additional information about potential cross-border impacts of the ESJ Wind project on birds (particularly golden eagles) protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. DOE has incorporated additional information and analysis into Section 3.1 of the final EIS regarding potential impacts from ESJ wind project activities in Mexico on the San Diego County golden eagle population whose daily range spans the border between Mexico and the United States.

Commenters asked for additional analysis of potential cross-border impacts to Peninsular bighorn sheep and provided photographs of incidental sightings of bighorn sheep. The EIS is expanded in response to comments to include further discussion of potential impacts to bighorn sheep, including potential cross-border impacts.

Commenters asked that DOE impose mitigation on the ESJ Wind project. DOE is not in a position to require mitigation measures to be implemented in Mexico. The final EIS identifies some of the mitigations that are included in the Mexican permit for the ESJ Wind project.

Visual Resource Impacts. Commenters indicated that views of the transmission lines, combined with other planned developments, would diminish the visual character of the project area, including nighttime visual impacts if the transmission towers are lighted. The EIS has been revised to provide further discussion of cumulative visual impacts.

Fire Hazards. Several comments, including comments from the County of San Diego Rural Fire Protection District, expressed concern about the adequacy of existing fire response resources and applicant-proposed measures to address potential construction-related and long-term fire hazard risks. The EIS is revised to include information on developments since the draft EIS was published, including the applicant's agreement with the fire district, its commitment to several fire protection measures to address fire district concerns, and the district's response.

Several comments requested further analysis of the potential cumulative fire hazard impacts of the combined introduction of industrial wind turbines (including the ESJ Wind project in Mexico), new substations, and new transmission lines. These combined projects would increase fire hazards in the project area, which has a high fire hazard severity rating due to dry conditions and high winds. Several examples of wind turbine accidents and fires were presented, and some commenters suggested that increased fire hazards would also result in increased fire insurance rates, which would be a socioeconomic impact.

With respect to comments regarding potential fire hazards originating from the ESJ Wind project, the EIS is expanded to include information about design features that could be installed on individual wind turbines to reduce the probability of a fire, e.g., lightning arresters and thermal monitoring systems that detect temperature increases and automatically shut off the generating system above a critical thermal threshold. Example measures from the Tule Wind project in southern San Diego County are listed and referenced. It is not known whether the ESJ Wind project, located as it is in Mexico, plans to incorporate these or other specific fire prevention and control measures. The final EIS identifies some of the mitigations that are included in the Mexican permit for the ESJ Wind project, including the requirement for a Fire Protection Plan.

Water Resources. The County of San Diego and other commenters asked for expanded discussion of potential impacts from the use of groundwater from a groundwater well for use during construction. The EIS is updated to include a description of the project's proposed use of an existing groundwater well, and an analysis of potential impacts to the local groundwater basin based on the County of San Diego's detailed analysis of potential groundwater impacts.

Socioeconomic Impacts. Some commenters asserted that the project would enable economic development and employment in the project region, while, on the other hand, other commenters expressed concerns that the project would facilitate the export of American jobs, increase the U.S. dependence on foreign energy, and undermine American environmental and labor laws. Impacts of the project on employment and economic conditions in the project area are considered in Section 3.13. However, the topics of labor policy and California energy policy are outside the scope of the NEPA process. DOE will consider comments on these topics as well as all other comments received in this proceeding in the course of evaluating the Presidential permit application.

Some comments expressed concern about potential impacts on property values and tourism income in the project area. These topics are discussed in Section 3.13, which has been expanded to include discussion of additional reviews of available research on potential impacts to property values and tourism income.

Environmental Justice. Several commenters expressed concern that local communities, which include low income and minority populations, would experience reduced property values, reduced tourism income, and be disproportionately impacted by the ESJ U.S. Transmission Line project, in combination with other proposed projects. The EIS discussions of environmental justice impacts have been expanded to include more information on this topic. Commenters also questioned statements in the draft EIS concerning the absence of low-income populations in the project area. Updated census data were added to the EIS, and it was determined that, with the addition of 2009 data, the data now indicate that one of the census tracts in the vicinity of the alternative corridors is considered low income, as compared to the County. Although the new data do change the EIS conclusion regarding the presence of low-income populations in the surrounding area, the data do not change the conclusion that minority and low-income populations, within the meaning of Executive Order 12898, would not experience disproportionately high and adverse impacts from the proposed action.

Backup Generation. Commenters asked that the impact assessment include potential impacts from the use of fossil-fueled generation that could be required for backup generation when the ESJ Wind turbines are idle. The EIS provides additional discussion on the topic of back-up generation for renewable energy sources. The issue of grid reliability will, however, be considered by DOE external to the NEPA process.

Mitigation Measures. Commenters requested clarification as to how the potential mitigation measures identified in the EIS would be implemented. They also urged DOE to require mitigation for the ESJ Wind project in Mexico. DOE clarifies the role of the NEPA document to identify potential mitigation measures in a manner appropriate for evaluating their potential effectiveness in mitigating impacts. Should the Presidential permit be issued to ESJ, it could include mitigation measures as required conditions of the permit.[11] As previously noted, DOE is not in a position to require mitigation measures to be implemented in Mexico.

1.5.3 Final EIS and Record of Decision

DOE, in coordination with the County of San Diego (cooperating agency), has considered the comments received during the public review period and prepared this final EIS. The final EIS provides responses to the comments received on the draft EIS, identifies DOE's preferred alternative, and includes changes to the draft EIS in response to comments or new information received. The final EIS has been revised to incorporate information from the ECO Substation EIR/EIS, which was published after the draft EIS was published. The final EIS considers an additional alternative, Alternative 4, that was developed to conform with an alternative ECO Substation location identified in that EIR/EIS.

[11] ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

DOE will publish and circulate the final EIS as required by 40 CFR 1502.19, and EPA will publish a Notice of Availability in the *Federal Register*. DOE's decision will be issued in the form of a Record of Decision (ROD) no sooner than 30 days after EPA publishes its "Notice of Availability of the Final EIS" in the *Federal Register*. The Presidential permit, if approved, would be issued subsequent to the ROD.

1.5.3.1 Preferred Alternative

DOE's preferred alternative is the newly added Alternative 4A (Revised 230-kV Route). Alternatives 4A and 4B would conform to the revised location of the ECO Substation, which was shifted about 700 feet (213 m) east of the originally proposed ECO Substation location in order to avoid potential impacts to cultural resources. In its May 2010 filing with the County of San Diego, ESJ indicated that, based on its understanding that SDG&E currently intends to construct the ECO Substation Alternative, ESJ's preferred transmission line configuration is the relocated route as shown on Figure 2-1b (AECOM, 2010b). DOE's preferred alternative is discussed further in Section 2.12.

1.6 ORGANIZATION OF THIS ENVIRONMENTAL IMPACT STATEMENT

Volume 1 of this EIS contains 12 sections. Volume 2 provides 9 appendices. Volume 3 provides the comments received on the draft EIS, and DOE's responses to those comments. Brief summaries of the main components of the EIS follow:

Volume 1 Final EIS

- **Section 1** introduces the EIS, discussing pertinent background information; describes the purpose of and need for the DOE and applicant actions, public participation, and EIS organization.
- **Section 2** describes the alternatives considered in the EIS, and the connected actions.
- **Section 3** discusses the environmental setting in the area of the project; the potential environmental impacts of the alternatives, including impacts in the U.S. resulting from the ESJ Wind project in Mexico; recommended measures to avoid or reduce impacts; and unavoidable adverse effects.
- **Section 4** discusses the potential impacts of connected actions (ECO Substation switchyard and SWPL loop-in).
- **Section 5** discusses the potential cumulative impacts.
- **Section 6** discusses the major irreversible and irretrievable commitments of natural and man-made resources.
- **Section 7** discusses the relationship between short-term use of the environment and long-term productivity.
- **Section 8** identifies the applicable environmental laws, regulations, permits, and DOE Orders.
- **Section 9** provides a list of agencies and individuals contacted during preparation of this EIS.

- **Section 10** lists references cited in the main text of the EIS.
- **Section 11** lists the names, education, and experience of persons who helped prepare the EIS, and the subject areas for which each preparer was responsible.
- **Section 12** provides a glossary of technical terminology used in the EIS.

Volume 2 Appendices

- **Appendix A** provides the EIS NOI and September 2009 Scoping Report. This report summarizes the comments received during public scoping and provides an index for major issues that arose in scoping. (The Scoping Report and actual comment letters are also available on the project website).
- **Appendix B** provides supplemental engineering details of the ESJ U.S. Transmission Line project.
- **Appendix C** provides supplemental biological resources data and copies of correspondence with the U.S. Fish and Wildlife Service (USFWS).
- **Appendix D** provides cultural resource technical reports, consultation letters regarding the preparation of this EIS that were sent to and received from Native American Tribes, and copies of other correspondence with Native American Tribes and the California State Historic Preservation Officer.
- **Appendix E** provides data in support of the noise analysis.
- **Appendix F** provides data in support of the air quality analysis.
- **Appendix G** provides copies of consultation letters regarding the preparation of this EIS that were sent to and received from federal and state agencies.
- **Appendix H** provides a contractor disclosure statement.
- **Appendix I** provides the EIS distribution list.

Volume 3 Comments and Responses Document

Volume 3 provides authentic reproductions of the public comments received on the draft EIS, and DOE's responses to comments.

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SECTION 2

PROPOSED ACTION AND ALTERNATIVES

The purpose of Section 2 is to describe the applicant's proposed project and alternatives to the project.

2.1 PROPOSED ACTION

The proposed action considered by DOE is the issuance of a Presidential permit for the construction and operation of ESJ U.S. Transmission Line project. The remainder of this section provides a description of the applicant's project and project alternatives.

2.2 APPLICANT'S PROJECT OVERVIEW

ESJ proposes to construct and operate the ESJ U.S. Transmission Line, an electric transmission line that would cross the international border between the U.S. and Mexico near the town of Jacumba, California. ESJ would construct either a double-circuit 230,000 volt (230-kV) transmission line or a single-circuit 500-kV electric transmission line which would connect up to 1,250 megawatt (MW) of electrical power from renewable energy generators (the ESJ Wind project) to be located in the general vicinity of La Rumorosa, Northern Baja California, Mexico, with the Imperial Valley-Miguel segment of the SWPL 500-kV transmission line. The applicant states that there is potential for energy markets in both the U.S. and Mexico to have direct access to energy produced by the ESJ Wind project, but the degree of energy partitioning between the two markets, if any, is unknown at this time.[1] The ESJ Wind project will be developed in phases. Phase 1 would be constructed on the furthest north land leased by ESJ (an area referred to as the Jacume lease area), north of the town of La Rumorosa, Mexico (see Figure 1-1). The proposed double-circuit 230-kV route would have a total length of approximately 1.7 miles (2.7 km), while the proposed single-circuit 500-kV route would have a total length of approximately 1.8 miles (2.8 km) (including both the U.S. and Mexican portions of the line, to the first point of interconnection in Mexico). On the U.S. side, the proposed line would be constructed on lattice towers or steel monopoles. The interconnection for the transmission line to the U.S. transmission grid system (to the existing SWPL) would be provided by SDG&E at its proposed ECO Substation switchyard facility (the SDG&E ECO Substation Project is discussed further in Section 2.9) (SDG&E 2009a).

As noted in Section 1 (Introduction), for the purposes of this draft EIS, the term "ESJ U.S. Transmission Line project" refers to all ESJ project transmission line activities within the U.S., and the term "ESJ Wind project" refers to all ESJ project activities within Mexico; the international border delineates the separations between these American and Mexican projects.

[1] http://www.esjprojecteis.org/docs/Sempra_Response_to_DOE_Questions_2011-07-01.pdf

2.3 ALTERNATIVE 1 – NO ACTION ALTERNATIVE

Under the No Action Alternative, DOE would not issue a Presidential permit for the ESJ U.S. Transmission Line and the line would not be built. The ESJ Wind project still could be constructed in Mexico, and the electrical generation from the wind turbines could either be confined entirely within Mexico or could enter the U.S. through a different transmission corridor. However, any alternative transmission corridor that crossed the international border would require a new Presidential permit application and would be subject to a separate NEPA review.

2.4 ALTERNATIVE 2 – DOUBLE-CIRCUIT 230-KV TRANSMISSION LINE

Under Alternative 2, DOE would issue a Presidential permit for a double-circuit 230-kV transmission line (230-kV Route) across the U.S.-Mexico border. This section describes the design, construction activities, and operations and maintenance activities for Alternative 2. For purposes of this discussion, Alternative 2 is referred to as "the 230-kV Route."[2]

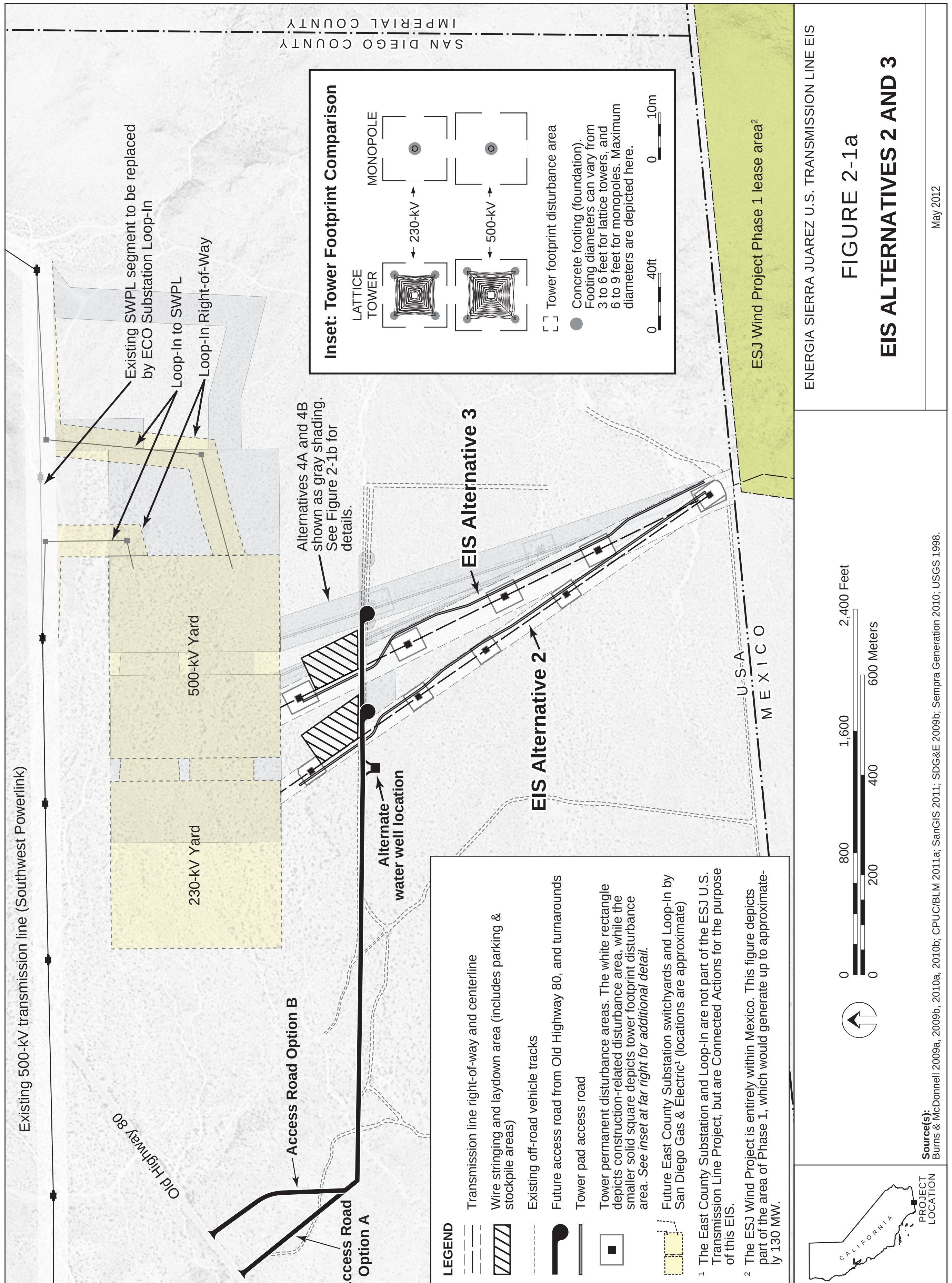
2.4.1 Project Location and Design

The project location is shown in Figures 1-1 and 1-2 in Section 1 (Introduction). Detailed views of the 230-kV Route are shown in Figure 2-1a. The 230-kV transmission lines would be supported on either 150-foot (46 m) steel lattice towers similar to the existing 500-kV SWPL structures, or 150-foot (46 m) steel monopoles. The towers or monopoles would be spaced no more than 1,500 feet (460 m) apart. The ESJ U.S. Transmission Line project would require 3 to 5 steel lattice towers or up to 5 steel monopoles.

The 230-kV Route would connect with SDG&E's proposed ECO Substation 138/230-kV switchyard, which in turn would interconnect to SWPL. The ECO Substation switchyards are proposed to be located approximately 0.65 mile (1 km) north of the U.S.-Mexico border and approximately 3.8 miles (6 km) east of Jacumba in the southeast corner of San Diego County near the Imperial County line (Figures 1-1 and 1-2) (SDG&E 2009a).

The total length of the 230-kV Route would be approximately 0.65 mile (1.05 km) between the future ECO Substation switchyard and the international border. The 230-kV line would continue south of the border for approximately 1 mile (1.6 km) from the international border to the first point of interconnection in Mexico, at the proposed ESJ Jacume Substation. An additional overhead static ground wire running above the conductors would have a fiber optic core for communications between the ESJ Jacume Substation in Mexico and the proposed SDG&E ECO Substation switchyard in the U.S. A loop-in in the proposed ECO Substation would connect the proposed line to the existing 500-kV SWPL.

[2] The applicant's materials refer to the single-circuit 500-kV route as "Route A1" and to the double-circuit 230-kV route as "Route A2." These terms are not used in the remainder of this EIS.



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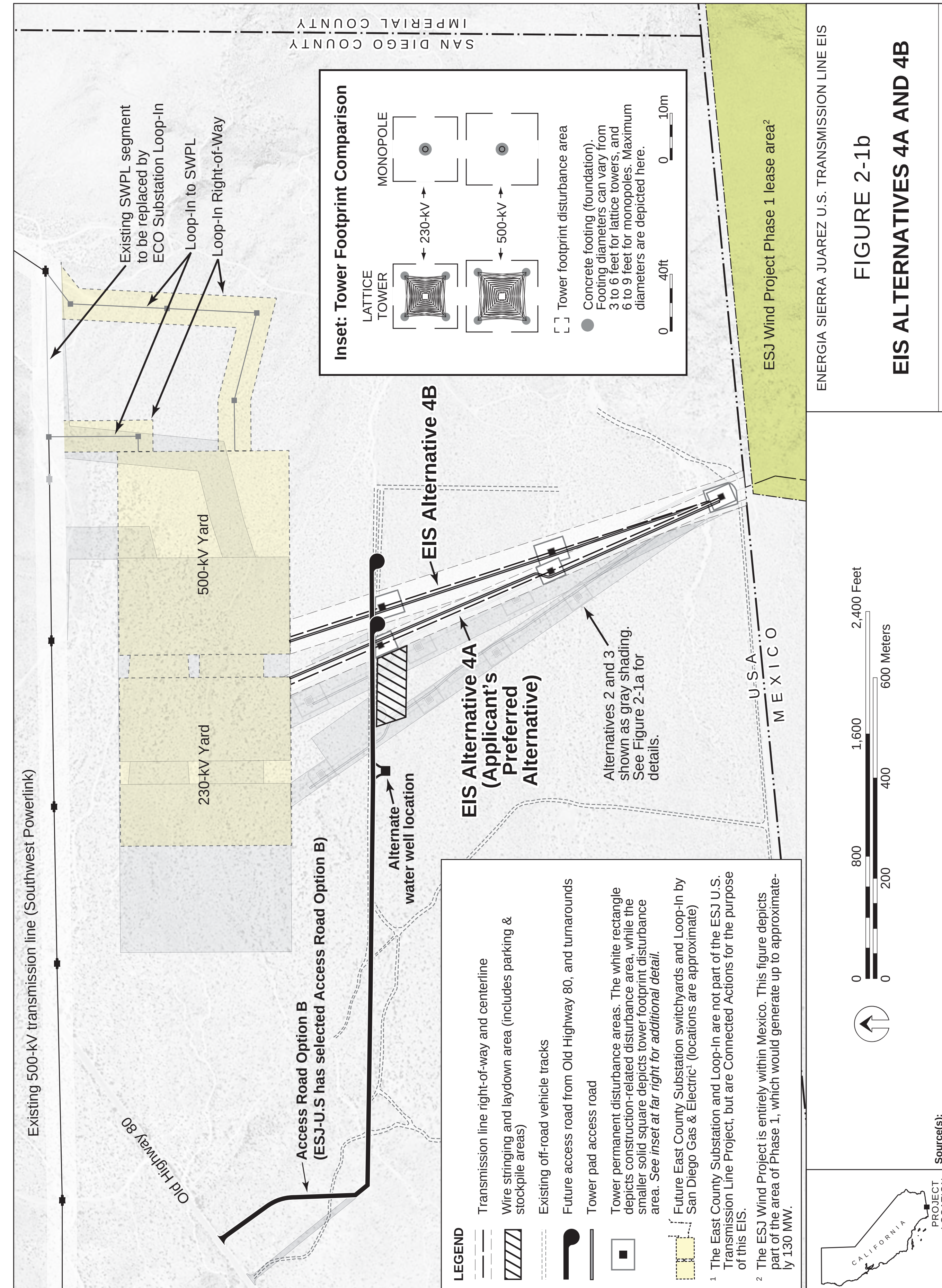

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Site Access. Access to the ESJ U.S. Transmission Line project area would be provided by Interstate Highway 8 (I-8), Carrizo Gorge Road, and Old Highway 80, as shown in Figure 2-1. ESJ evaluated two options, Option A and B, for the property access road from Old Highway 80. The locations and alignments for both options are shown in Figure 2-1a. Both options would require construction of a new 28-foot (8.5 m) wide access road from Old Highway 80 to the site. This road would be constructed within a 40-foot (12.2 m) easement serving the properties where the 230-kV Route would be located. Road material would consist of decomposed granite (a type of gravel), and the road would terminate at a 36-foot (11 m) radius turnaround. The property access road easement to the 230-kV Route would be 0.77 mile (1.24 km) in length for both options. According to the County of San Diego, ESJ has selected access Road B as its preferred access, and they have provided appropriate easement documentation to the County of San Diego, demonstrating that they have been granted access to this location.[3] Additional discussion of site access is provided in Section 3.7 (Transportation and Traffic), and in Figure 3.7-1.

A new transmission line right-of-way access road would be constructed within the permanent right-of-way that would parallel the 230-kV Route for its entire length between the ECO Substation switchyard and the international border. This would be a graded dirt road approximately 12 feet (3.7 m) wide. Both the property access road and right-of-way access road would be maintained periodically through the life of the transmission line. This maintenance would include periodic grading and minor repairs.

Design Features. The transmission line would consist of a double-circuit 230-kV line and would be supported by either lattice towers or monopoles. The key features of this design are summarized in Table 2-1 (the features of the 500-kV Route alternative, described in Section 2.5, are also displayed in Table 2-1 to provide a side-by-side comparison). Elevation views of typical lattice tower and monopole designs that may be used are shown in Figure 2-2 and Figure 2-3, respectively. The proposed lattice tower and monopole designs provide for a minimum horizontal separation of 13 ft (132 inches, 4 m) and a minimum vertical separation of 9 ft (108 inches, 2.7 m) between conductors and structures, with larger separations between conductors.[4]

The 230-kV Route would be constructed within a 130-foot (40 m) permanent right-of-way. The right-of-way width would be the same for either the lattice towers or monopole design. A 1.98-acre (0.8 ha) staging site would be constructed at the northern end of the route, adjacent to the transmission line right-of-way, and north of the property access road (Figure 2-1a). This area would provide a permanent consolidated site for construction equipment laydown, vehicle parking, and wire stringing.[5]

3 Email correspondence from County of San Diego to DOE, November 15, 2011.

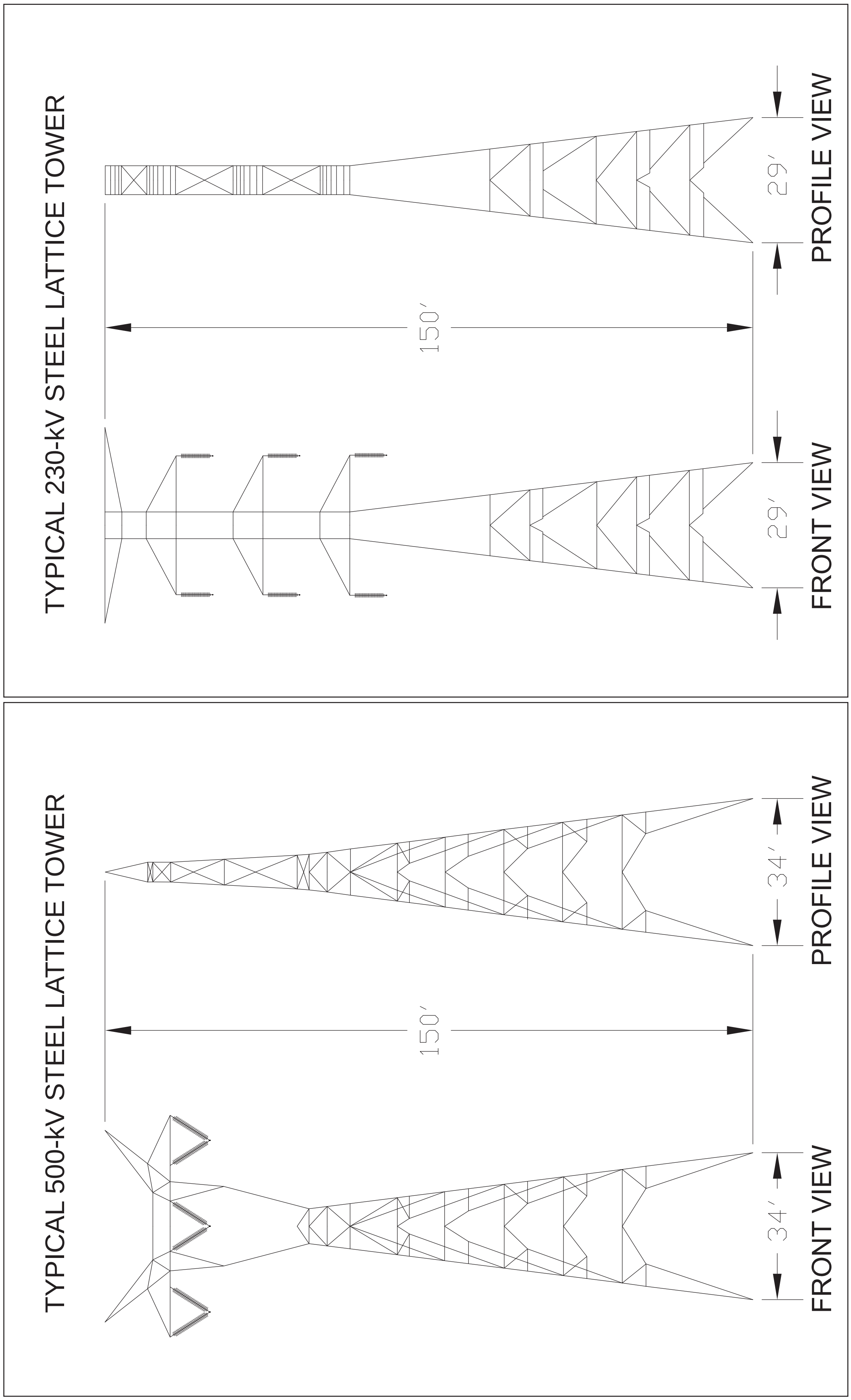
4 Applicant drawings indicating these tower and pole dimensions are provided in Appendix B and available on the project website at http://www.esjprojecteis.org/docs/334_sup_ap.pdf.

5 An original construction plan included a 0.69-acre (0.28-ha) equipment staging area at the same location as the currently proposed staging site, and an additional 100-foot wide (7.72-acre) or 70-foot wide (5.64-acre) temporary construction easement along the right-of-way for the 500-kV Route or 230-kV Route, respectively. The currently proposed approximately 2-acre (0.8-ha) consolidated staging site would result in substantially less surface disturbance than the original design. The temporary easement was eliminated from the original design to minimize the overall construction phase disturbed areas, including reducing the potential for impacts to cultural resources.

Table 2-1
230-kV Route and 500-kV Route Parameters

Parameter	230-kV Alternative Interconnection	500-kV Alternative Interconnection
Maximum Capacity	1,250 megawatts	1,250 megawatts
Number of Circuits	Double-Circuit	Single-Circuit
Minimum Ground Clearance	34 feet (10.4 m)	39 feet (11.9 m)
Width of Permanent Right-of-Way	130 feet (39.6 m)	214 feet (65.2 m)
Number of Structures	3 to 5	3 to 5
Maximum Spacing Between Structures	1,500 feet (460 m)	1,500 feet (460 m)
Permanent Impacts at Each Structure[1]	120 feet x 160 feet (0.44 acre; 0.18 ha)	150 feet x 200 feet (0.69 acre; 0.28 ha)
Permanent Impacts for All Structures (assuming 5 structures)	2.2 acres (0.89 ha)	3.45 acres (1.4 ha)
Area of Permanent Vegetation Removal	9.72 acres (3.9 ha)	10.77 acres (4.4 ha)
Construction Laydown/Parking/Stringing Area	1.98 acres (0.8 ha)	1.88 acres (0.76 ha)
Maximum Height of Lattice Towers	150 feet (46 m)	150 feet (46 m)
Maximum Base of Lattice Towers	29 feet x 29 feet (9 m x 9 m)	34 feet x 34 feet (10.4 m x 10.4 m)
Foundation of Lattice Towers at Each Corner	3 – 6 feet (1 – 2 m) diameter	3 – 6 feet (1 – 2 m) diameter
Maximum Height of Steel Monopoles	150 feet (46 m)	170 feet (52 m)
Foundation of Steel Monopoles	6 – 9 feet (2 – 3 m) diameter and up to 40 feet (12.2 m) deep	7 – 9 feet (2 – 3 m) diameter and up to 40 feet (12.2 m) deep

[1] In accordance with ESJ's Fire Plan for the project, a cleared space will be maintained around the tower or monopoles structures, and no restoration of impacted areas is proposed in the remainder of the construction area. Consequently, for planning purposes, there are no "temporary" disturbances and all land disturbances are considered permanent. ESJ has proposed the creation of a conservation easement to address this permanent impact. The proposed location for the easement is on the eastern edge of ESJ's property, adjacent to an existing U.S. Bureau of Land Management (BLM) Wilderness area (Section 3.1).



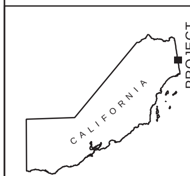
ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 2-2

TYPICAL STEEL LATTICE TOWERS

May 2012

Source(s):
Adapted from Burns & McDonnell 2009a, 2009b.



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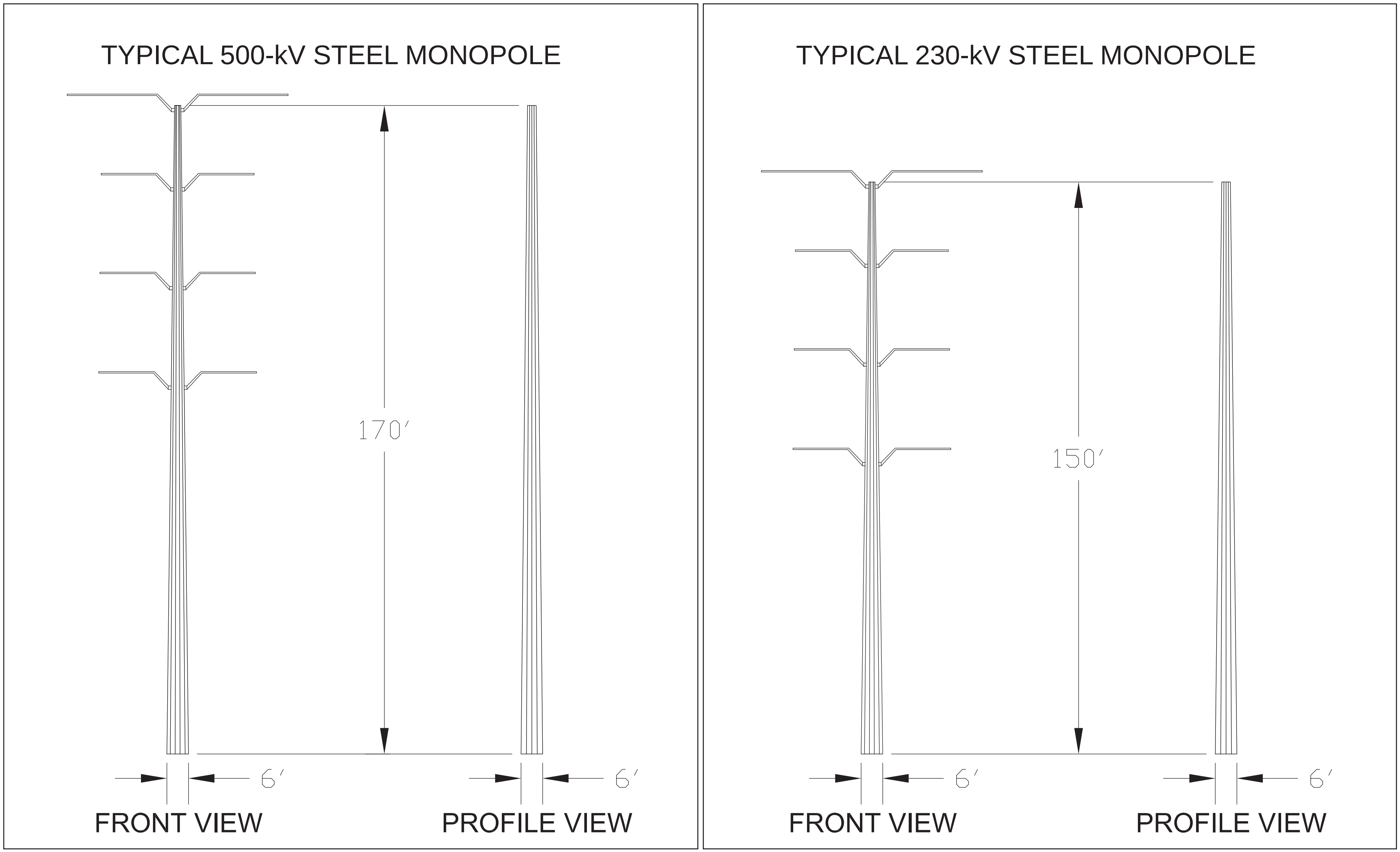

Source(s):
Adapted from Burns & McDonnell 2009a, 2009b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 2-3

TYPICAL STEEL MONOPOLES

May 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_2-3_TypicalMonopoles_11x8_v6.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy

The monopoles or lattice towers would be located no more than 1,500 feet (460 m) apart. The precise locations may be adjusted based on final design and, if necessary, to avoid sensitive cultural resources. The towers or poles would be placed 150 feet (46 m) north of the U.S.-Mexico border, which is beyond the minimum 60-foot (18 m) setback required under federal regulations.[6] Based on the typical 1,500-foot (457 m) span between lattice towers or monopoles, the nearest transmission structure in Mexico would be located approximately 150 feet (46 m) from the U.S.-Mexico border.[7]

2.4.2 Additional Engineering Details

Additional views of the project site and engineering details, including site topography, are provided in Appendix B. These materials include:

- Preliminary Plot Plans (Burns & McDonnell 2009c; Drawings P01 through P10 Rev. 1)
- Preliminary Grading Plans (Burns & McDonnell 2009b; Drawings C01 through C08 Rev. 1)

According to the Preliminary Grading Plan (Drawing C02, Revision 1), project construction would require import and export of earthwork materials for development of the all-weather road surfacing along the property access road (primarily decomposed granite [see earlier note about gravel]), tower pad grading, and foundation excavation.[8] The earthwork summary is provided in the grading notes on Drawing C02, Revision 1, provided in Appendix B.

Assuming a typical truck load of 18 cubic yards (14 cubic meters), these grading and construction activities would result in about 600 truck trips (about 540 export trips and about 55 import trips) for the 230-kV Route.[9] The total number of round trips would be somewhat reduced, if practical, by having import trucks leave the site with an export load, resulting in about 540 total round trips. Since the sources of the imported material and the destinations of the export material have not yet been identified, it is assumed that vehicles carrying earthwork material would travel to the site from either the east or west along I-8.

[6] According to Congressional Research Service (2009), in 1907, President Roosevelt reserved from entry and set apart as a public reservation all public lands within 60 feet (18.3 m) of the international boundary between the U.S. and Mexico within the State of California and the Territories of Arizona and New Mexico. Known as the "Roosevelt Reservation," this land withdrawal was found "necessary for the public welfare...as a protection against the smuggling of goods." The text of President Roosevelt's proclamation is available online at: http://www.theodore-roosevelt.com/trproclamations.html. The ESJ design would exceed this distance.

[7] The County of San Diego's Mountain Empire Subregional Plan Land Use Policy 2 requires a 150ft border setback. The policy states: "Create a buffer area of one hundred and fifty (150) feet in width along the international boundary line inclusive of the existing sixty-foot (60 foot) Public Reserve owned by the Federal Government."

[8] The engineering drawings provided in Appendix B are preliminary, and show the access road described herein as Option A.

[9] Of this total, about 90% of truck deliveries would be due to the property access road improvements, which are estimated to require about 9,300 cubic yards (7,110 cubic meters) of material to be delivered onsite for the 230-kV Route (Burns & McDonnell 2009b; included in Appendix B of this EIS). According to ESJ, this estimate is based on available topographic data, and this estimate is likely to be substantially reduced upon completion of a more detailed site topography survey.

2.4.3 Project Construction and Operations

Construction of the transmission line would include the following activities:

- Clearing, grading, and grubbing (clearing of roots and stumps)
- Access road and pad construction
- Digging and drilling for tower foundations
- Pouring concrete foundations for towers
- Overhead electrical power system construction
- Final grading and site clean-up

Vegetation would be cleared and grubbed along the proposed access roads. Vegetation debris would be disposed offsite at a County of San Diego-approved disposal facility. Limited grading would be required for the tower/pole pads and the temporary consolidated construction staging and wire stringing site. Topsoil removed during the grading of the tower areas and construction staging area would be stockpiled in the construction staging area, if necessary. This topsoil would be utilized during final grading of the road and tower areas. Although material would be brought on site (for example, road base), the site would require a net export of excavated material. Transmission towers/poles would be supported on excavated, reinforced concrete foundations. The monopole foundations would be excavated to a typical depth of up to 40 feet (12.2 m) using specialized excavation equipment. The tower foundations would be excavated to a considerably shallower depth (e.g., 10 feet [3 m]). Table 2-2 summarizes the amounts of land disturbance for all project components associated with the proposed route. As noted in Table 2-2, the maximum total disturbed acreage for the 230-kV Route would be 9.72 acres (3.93 ha) (estimated based upon the excavation required for property access road Option B, which is ESJ's preferred option). ESJ may utilize helicopter lift capability for placement of transmission line structures. This activity, as well as other construction methods noted here, is discussed further in the air quality assessment (Section 3.10 [Air Quality and Climate Change]).

Project construction would require approximately 20 to 25 workers per day for up to 6 months. Approximately 5 to 15 construction vehicles would operate onsite daily during construction, with approximately 10 to 20 worker vehicles entering and leaving the site each day. A list of estimated equipment and vehicle requirements and maximum utilization during the various activity phases is provided in Appendix B. This table provides a basis for the air quality estimated maximum construction emissions, provided in Section 3.10 (Air Quality and Climate Change).

Due to fire protection requirements there would be no revegetation of the right-of-way after completion of construction. During operation of the facility, minimal personnel (1 or 2) would be required to patrol and visually inspect the transmission facilities on a periodic basis. Vegetation maintenance to prevent fuel build-up in a 30-foot (9.1-m) radius clear space around the tower footings (or 10-foot [3.0-m] radius around monopoles) would be done at least once a year. Operations and maintenance related traffic would typically consist of two vehicles entering and leaving the site each week.

Table 2-2 Land Disturbance		
Project Components	**230-kV Route**	**500-kV Route**
Construction Lay-Down/ Parking/Stringing Area	1.98 acres (0.81 ha)	1.88 acres (0.77 ha)
28-foot Property Access Road and Turn Around[1]	4.5 acres (1.82 ha)	4.5 acres (1.82 ha)
Transmission Tower Access Road	0.9 acre (0.36 ha)	0.8 acre (0.32 ha)
Permanent Impacts (5 towers and 30-foot fire clearing)[2]	2.2 acres (0.89 ha)	3.45 acres (1.4 ha)
150-Foot by 20-Foot Access Road to Existing Water Well	0.06 acre (0.03 ha)	0.06 acre (0.03 ha)
Totals[3]	9.78 acres (3.93 ha)	10.83 acres (4.36 ha)

[1] The 28 foot (8.5 m) property access road is located within a 40 foot (12.2 m) easement. The entire 40 foot (12.2 m) easement could be impacted during construction. Therefore, impacts to the entire 40-foot (12.2 m) easement have been assumed for this calculation. The acreage of disturbance is based on property access road Option B, which is the applicant's preferred option, and in order to indicate the greatest amount of potential impact.

[2] Depending on final design, 3 to 5 towers would be installed. Values are approximate.

[3] The total amount of land disturbance shown in this row is larger than the sum of the rows above due to rounding.

Source: EDAW, Inc. 2009b.

Project construction would require an estimated 780,000 gallons (3 million liters) of water (assuming the use of two 2,500-gallon [9,500 liter] water trucks per day and a 6 day work week), for watering of roads and minimizing dust generated from traffic and excavation activities and for aid in soil compaction. Water would be obtained from an existing non-potable (brackish) groundwater well in the town of Jacumba and trucked onto the site in tank trucks. The Jacumba Community Services District (JCSD) has agreed to provide groundwater from the existing JCSD Well #6 for this purpose. This well is located adjacent to Old Highway 80 in the western area of Jacumba, about 4.2 miles (6.8 km) from the ESJ project site. The proposed use of groundwater is an integral part of the ESJ Transmission Line project.

The well location is shown on Figure 1-2. A new access road measuring 150 feet (45.7 m) by 20 feet (6.1 m) wide would be constructed on JCSD-owned property from Old Higway 80 north to the well. Additional details of the access road are provided in Appendix B. Both the access route and the well site are owned by the JCSD. Section 3 of this EIS provides an assessment of the potential impacts of the use of JCSD Well #6 by ESJ. In the event that the JCSD well is not used, ESJ would install a new temporary water well onsite at a location indicated in Figure 2-1b as "Alternate water well location."

Temporary onsite storage of water may be possible. Very little water would be needed when the facilities are in operation, and water use would mainly consist of occasional pressure washing of the insulators to remove dirt accumulation to minimize arcing. Water used during operations may be obtained from the same source used during construction.

Road maintenance activities are anticipated to occur no more than twice per year on average, but would be performed on an as-needed basis. No fencing is proposed. The transmission towers would be equipped with devices to prevent climbing on the towers and warning signs in English and Spanish that would alert the public to the electrical hazard.

ESJ received a “Determination of No Hazard to Air Navigation” from the Federal Aviation Administration (FAA) for each of the proposed tower locations. For each tower location, the FAA determination states: “The Aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation…” The determinations also indicate that: “Any height exceeding 170 feet [51.8 m] above ground level…will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.” Based on these determinations, ESJ does not propose to install lighting on the towers/poles.[10] A copy of each of the FAA determinations (FAA 2009) is provided in Appendix B. The U.S. Border Patrol has also indicated that the towers do not require lighting for the purpose of border operations (Soule 2011).

2.5 ALTERNATIVE 3 – SINGLE-CIRCUIT 500-KV TRANSMISSION LINE

Under this alternative, DOE would issue a Presidential permit for the construction of a single-circuit 500-kV Transmission Line (500-kV Route) across the U.S.-Mexico border. For purpose of this discussion, Alternative 3 is referred to as “the 500-kV Route.” The site access, design, and construction features of the 500-kV Route are very similar to those described above for the 230-kV Route. This section describes the key features of the 500-kV Route alternative.

The 500-kV Route would be located immediately east of the 230-kV Route, as shown in Figures 1-1 and 1-2 in Section 1 (Introduction); and in Figure 2-1a. Like the 230-kV Route, the 500-kV transmission lines would be supported on 3 to 5 steel lattice towers or up to 5 steel monopoles. The towers would be 150 feet (46 m) in height, and the monopoles would be 170 feet (52 m) in height. These heights compare to either 150-foot (46 m) steel lattice towers or 150-foot (46 m) steel monopoles for the 230-kV Route.

The 500-kV Route would connect with the 500-kV portion of SDG&E’s proposed ECO Substation switchyard, which in turn would interconnect to SWPL.

The total length of the 500-kV Route would be 0.62 mile (1 km) between the future ECO Substation switchyard and the international border, compared to 0.65 mile (1.05 km) for the 230-kV Route.

Road design and location for access to the 500-kV Route would be the same as for the 230-kV Route except that it would be slightly longer, 0.89 mile (1.43 km) in length for the Option A route, as compared to 0.77 mile (1.24 km) (Figure 2-1a).

The key features of the 500-kV Route design options are summarized above in Table 2-1. Elevation views of typical lattice tower and monopole designs are shown in Figures 2-2 and 2-3, respectively.

[10] Based on correspondence from the U.S. Border Patrol, DOE understands that the U.S. Border Patrol may request that ESJ install lighting to avoid potential hazards to their aviation operations.

The 500-kV Route would be constructed within a 214-foot (65-m) wide permanent right-of-way, compared to the narrower 130-foot (40-m) permanent right-of-way that would be required for the 230-kV Route.

Construction staging would be constructed at the northern end of the 500-kV Route, adjacent to the transmission right-of-way, and north of the property access road (Figure 2-1a). This area would be about the same size for both route alternatives (approximately 2.0 acres [0.8 ha] for the 230-kV Route and approximately 1.9 acres [0.77 ha] for the 500-kV Route; see Table 2-1).

Additional views of the 500-kV Route site and engineering details, including site topography, are provided in Appendix B. Engineering design and construction methods would be substantially the same for the 500-kV Route as for the 230-kV Route. Because the access road would be slightly longer, a proportionately larger volume of road construction material and number of associated truck deliveries would be required for the 500-kV Route than for the 230-kV Route.

Construction of the 500-kV Route transmission line would include the same activities, equipment, personnel and schedule as described above for the 230-kV Route. As noted in Table 2-2, the total disturbed acreage for the 500-kV Route would be 10.77 acres (4.36 ha), as compared to 9.72 acres (3.93 ha) for the 230-kV Route. A list of estimated equipment and vehicle requirements and maximum utilization during the various activity phases is provided in Appendix B. This table provides a basis for the air quality estimated maximum construction emissions, provided in Section 3.10 (Air Quality and Climate Change).

Operation and maintenance activities for the 500-kV Route would be the same as described above for the 230-kV Route. Minimal personnel (1 or 2) would be required to patrol and visually inspect the transmission facilities on a periodic basis. Operations and maintenance related traffic would typically consist of two vehicles entering and leaving the site each week.

2.6 ALTERNATIVE 4 – REVISED ROUTING FOR DOUBLE-CIRCUIT 230-KV TRANSMISSION LINE (APPLICANT'S PREFERRED ALTERNATIVE) OR SINGLE-CIRCUIT 500-KV TRANSMISSION LINE

As discussed further in Section 2.9, the ECO Substation would be permitted, constructed and operated by San Diego Gas and Electric (SDG&E). In August of 2009, SDG&E submitted a Proponent's Environmental Assessment (PEA) with the proposed ECO Substation location. Subsequently, SDG&E proposed an "ECO Substation Alternative" that was shifted about 700 feet (213 m) east of the originally proposed ECO Substation location (Insignia Environmental 2010a). The purpose of the revised substation location is to avoid potential impacts to cultural resources. In response to SDG&E's revised project, on May 28, 2010, ESJ submitted to the County of San Diego a revised project description that included both the originally proposed 230-kV and 500-kV transmission routes (Alternatives 2 and 3, respectively, as described above) and a new alternative alignment for both the 230-kV and 500-kV transmission route options that would conform to the revised ECO Substation location. In its May 2010 filing with the County, ESJ provided details of the revised alternative routes. For the purpose of this EIS, the revised 230-kV route is referred to as Alternative 4A, and the revised 500-kV route is referred to as Alternative 4B. The Alternative 4 routes are essentially the same design as described for Alternatives 2 and 3 above in Sections 2.4 and 2.5, except that the terminus of 230-kV Route (Alternative 4A) would be shifted about 700 feet (213 m) east of the 230-kV Route described in

Alternative 2, and the 500-kV Route (Alternative 4B) terminus would be shifted about 550 feet (168 m) east of the 500-kV Route described in Alternative 3. The revised alignments would interconnect with the 230/138-kV switchyard or 500-kV swithchyard of the ECO Substation Alternative Site. Under Alternative 4, the revised transmission lines would be supported on either three to five 150-foot steel lattice towers or three to five 170-foot steel monopoles. The 500-kV line would interconnect with the 500-kV swithcyard, and the 230-kV line would interconnect with the 230/138-kV switchyard of the ECO Substation alternative site location. The northernmost support structures would be located within the fenced portion of the proposed ECO Substation. In its May 2010 filing with the County, ESJ indicated that based on its understanding that SDG&E currently intends to construct the ECO Substation Alternative, ESJ's preferred transmission line configuration is the revised route (AECOM 2010b).

The revised 230-kV Route and 500-kV Route are shown in Figure 2-1b, and details are listed in Table 2-3. Figures 2-1a and 2-1b display both the original and revised ECO Susbtation switchyard locations and corresponding ESJ transmission line locations to more clearly reveal the differences between Alternatives 2 and 3, 4A and 4B. Both alternative routes 4A and 4B would cross the U.S.-Mexico border at the same location as described for Alternatives 2 and 3. The total length of the revised 230-kV Route would be 0.62 mile (1 km) between the future ECO Substation switchyard and the international border, which is slightly shorter than the for the Alternative 2 Route (0.65 mile [1.05 km]). The total length of the revised 500-kV Route would be 0.59 mile (0.95 km) between the future ECO Substation switchyard and the international border, which is slightly shorter than the Alternative 3 Route (0.62 mile [1.0 km]).

Road design and location for access to the revised 230-kV and 500-kV Routes would be the same as for the Alternative 2 Route except that the east-west access road would be slightly longer for each alternative (about 700 feet [213 m] longer for the revised 230-kV Route, and about 550 feet [168 m] longer for the revised 500-kV Route).

Construction staging would be located near the northern end of the revised 230-kV Route or 500-kV Route, adjacent to the transmission right-of-way, and south of the property access road on property owned by ESJ. The staging area would be about the same size for both the revised 230-kV and 500-kV Routes (approximately 2.0 acres [0.8 ha] for the revised 230-kV Route and approximately 1.9 acres [0.77 ha] for the revised 500-kV Route; see Table 2-3).

Additional views of the revised 230-kV Route and 500-kV Route sites and engineering details, including site topography, are provided in Appendix B. Engineering design and construction methods would be substantially the same for the revised routes as for the Alternative 2 and 3 Routes. Because the access road would be slightly longer for the revised routes, a proportionately larger volume of road construction material and number of associated truck deliveries would be required, compared to the original 230-kV and 500-kV routes.

Table 2-3
Land Disturbance for Alternative 4A (Revised 230-kV Route) and Alternative 4B (Revised 500-kV Route)

Project Components	Alternative 4A (Revised 230-kV Route)	Alternative 4B (Revised 500-kV Route)
Construction Lay-Down/ Parking/Stringing Area	2.0 acres [0.8 ha]	1.9 acres [0.77 ha]
28-foot Property Access Road and Turn Around[1]	4.5 acres (1.82 ha)	4.5 acres (1.82 ha)
Transmission Tower Access Road	0.68 acre (0.36 ha)	0.65 acre (0.32 ha)
Permanent Impacts (5 towers and 30-foot fire clearing)[2]	2.2 acres (0.89 ha)	3.45 acres (1.4 ha)
150-Foot by 20-Foot Access Road to Existing Water Well	0.063 acres (0.03 ha)	0.063 acres (0.03 ha)
Totals[3]	9.78 acres (3.93 ha)	10.83 acres (4.36 ha)

[1] The 28-foot (8.5 m) property access road is located within a 40-foot (12.2 m) easement. The entire 40-foot (12.2 m) easement could be impacted during construction. Therefore, impacts to the entire 40-foot (12.2 m) easement have been assumed for this calculation. The acreage of disturbance is based on property access road Option B, which is the applicant's preferred option, and in order to indicate the greatest amount of potential impact. Values are approximate.

[2] Depending on final design, 3 to 5 towers would be installed. Values are approximate.

[3] The total amount of land disturbance shown in this row is larger than the sum of the rows above due to rounding.

Source: AECOM 2010b

Construction of the revised 230-kV or 500-kV Routes would include the same activities, equipment, personnel and schedule as described above for the Alternative 2 and 3 Routes. As noted in Table 2-3, the total disturbed acreage for the revised 230-kV Route would be 9.78 acres (3.96 ha), which is the same acreage as for the Alternative 2 Route (with rounding); and, the total disturbed acreage for the revised 500-kV Route would be 10.83 acres (4.38 ha), which is the same acreage as for the Alternative 3 Route (with rounding). Operation and maintenance activities for the revised 230-kV or 500-kV Routes would be the same as described above for the Alternative 2 and 3 Routes.

2.7 APPLICANT-PROPOSED MEASURES APPLICABLE TO ALL ALTERNATIVES

As part of the proposed ESJ U.S. Transmission Line project, ESJ would incorporate various applicant-proposed measures (APMs) that are designed to avoid or minimize potential impacts related to construction and operation of the transmission lines. The environmental impact analyses for each resource area in Section 3 describe how the APMs would be applied to avoid or minimize impacts. APMs are summarized below for key environmental issues. These measures apply to all alternatives described above (in Sections 2.4, 2.5, and 2.6) for the ESJ U.S. Transmission Line project in the U.S.

Biological Resources. The project's potential effects on biological resources are described in Section 3.1 (Biological Resources). APMs intended to minimize impacts to biological resources are listed below and further described in Section 3.1 (Biological Resources). These measures would include:

- The County of San Diego's guidelines allow for mitigation of habitat through either the purchase mitigation within an established mitigation bank, onsite preservation, and/or offsite preservation with financial and legal agreements for long term management of the resource in perpetuity. To compensate for the loss of native scrub habitat that would be disturbed during construction and would not be revegetated or restored after construction due to fire protection considerations (as directed by the San Diego Rural Fire Protection District [Hunt Research Corporation 2009]), ESJ would place a portion of the project property under a conservation easement for preservation. A portion of ESJ's property in the eastern section of the site is proposed for preservation. This preserved area would adjoin a large open space tract of land to the east (Jacumba Wilderness) under ownership of BLM. The mitigation ratio would be subject to review and approval by the County of San Diego and possibly other resource agencies. Figure 3.1-5 in Section 3.1 (Biological Resources) shows the location of the proposed conservation easement. Depending on the alternative selected, the compensatory mitigation site would be up to 15 acres (6.1 ha) in size.

- ESJ has prepared a Conceptual Resource Management Plan (CRMP) for management of the conservation easement area. The plan provides a framework and specific measures for the interim and long-term management of the easement until such time that a formal land management entity can assume the long-term management of the land. At the time of this EIS preparation, ESJ is coordinating with BLM to have the federal agency assume management responsibilities of the easement. The CRMP is written with the assumption that BLM, or other non-profit organization, would be the long-term Land Manager of the easement. In the event that BLM does not assume the role of long-term Land Manager of the compensation site, the CRMP would remain in effect and would be implemented by ESJ, until some other non-profit organization is found to serve as the long-term Land Manager (AECOM 2010a). Additional discussion of the conservation easement and management plan is provided in Section 3.1 (Biological Resources).

- Prior to construction or vegetation clearing, suitable nesting habitat and trees within 500 feet (152 m) of the site would be surveyed for breeding activity to determine if raptors or other sensitive wildlife species are nesting. If nesting is confirmed, no construction activity would occur within 500 feet (152 m) of raptor nests or sensitive species, unless measures are implemented to reduce noise levels below 60 A-weighted decibel (dBA) hourly equivalent level (L_{eq})[11] to minimize disturbance to those species. If measures are implemented to reduce noise levels, noise monitoring would be conducted to determine that measures are effective to reduce noise to below 60 dBA hourly L_{eq}. The types of sensitive wildlife that are subject to this measure are identified in Section 3.1 (Biological Resources).

- Repair of heavy equipment, if necessary, would occur as far away as practicable from areas where nesting birds of sensitive species may be present; manufacturers' standard noise control devices would be equipped on all construction equipment (including

[11] Refer to Section 3.6 (Noise) for definitions of noise parameters.

generators and compressors); and the construction contractor would maintain all construction vehicles and equipment in proper operating condition and provide mufflers on all equipment.

- Noise analyses would be performed during construction activities adjacent to sensitive habitats or potential active nests of sensitive species; temporary noise attenuation barriers would be erected to reduce construction-related noise to below 60 dBA hourly L_{eq}, at the location of the habitat or potential activity nests if necessary; repair of heavy equipment would occur as far away as practical from areas where nesting birds of sensitive species may be present.
- Flagging or construction fencing would be installed to restrict encroachment into biologically sensitive areas and to minimize the potential establishment of pests and non-native species.
- In accordance with County of San Diego guidelines, ESJ has prepared a Stormwater Management Plan (SWMP) that provides for the installation of several construction best management practices (BMPs) to avoid and minimize impacts to natural communities of special concern (i.e., Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub), special status plants, and special status animals. BMPs are discussed further below under Water Resources, and in Section 3.11 (Water Resources).
- Vegetation removal would occur prior to the start of breeding season of sensitive species (generally February 1 to September 15), and construction activities that coincide with raptor breeding season of sensitive species (generally February 1 to September 30) would be monitored. If project activities are determined through monitoring to adversely affect raptor foraging and/or nesting, then either construction activities would be modified accordingly to reduce or eliminate the identified effects, or construction would be halted until it is determined that nesting is complete or the affected raptors abandon their nest.
- If any habitat for the California horned lark or San Diego black-tailed jackrabbit, or any foraging habitat for raptors is unavoidably disturbed, the additional acreage of disturbance would be included in the conservation easement described above.

The above APMs would be implemented at both the transmission line corridor work site and the offsite groundwater well access road construction site, as appropriate.

Cultural Resources. ESJ commissioned the preparation of an Archaeological and Historical Investigations Report to investigate the potential presence of signficant resources within the project area (EDAW, Inc. 2010a). As discussed further in Section 3.5 (Cultural Resources), certain sites were identified within the currently proposed project development area that are considered significant. To avoid potential impacts to these resources, ESJ would implement the report's recommendations (described further in Section 3.5 [Cultural Resources]) and the recommended APM, including:

- Avoidance of impacts to significant cultural resources that have been identified at the project site through redesign of the project, where feasible, or by redirecting workers and vehicles away from known sites during construction and facility operation.

- Implementation of cultural resource construction grading monitoring and a potential data recovery program, developed in accordance with the *County of San Diego Guidelines for Determining Significance and the Report Format and Content requirements*. The program would be conducted by a County of San Diego qualified archaeologist. The construction crew would not be responsible for monitoring for potential sensitive cultural resources. A Native American representative would be invited to participate in site monitoring, before disturbance, including any excavation.
- Implementation of a testing program and data recovery prior to ground-disturbing activities at identified significant sites.
- Avoidance of cultural resource sites by redirecting pedestrian and vehicular traffic away from the site during construction and facility operation.
- Significance testing of any incidental discoveries during construction, as outlined in applicable agency guidelines.
- Additional field surveys for any areas that may be disturbed due to project changes.

Water Resources. As noted above, ESJ has prepared a SWMP to manage the quality of stormwater runoff from the land disturbance activities associated with the project in accordance with the requirements of the Clean Water Act (CWA) and County of San Diego's guidelines. The BMPs outlined in the SWMP would be implemented prior to commencement of field construction activities. BMPs would be maintained during and after construction, and until final stabilization of the soil is accomplished at the site. According to the SWMP,[12] the minimum temporary erosion and sediment control practices that would be used include: stockpile management, maintenance of the construction entrance/exit, silt fence, wind erosion prevention measures, street sweeping and vacuuming, and sandbag barriers. Temporary silt fence and sandbag cross barriers would be placed on the downhill side of the entire right-of-way to capture any silt during the construction phase of the project. Although, it is not anticipated that the design would include clearing or grading of any slopes that are more than three feet in height, if such activity is required, ESJ would implement slope protection measures. Onsite construction workers would remove litter at the end of each day. All waste material generated during construction would be deposited in dumpsters or covered bins that would be removed from the project site by a licensed waste hauler for proper disposal. Portable toilets would be provided for use by the construction workers. These facilities would be installed and removed from the site by a licensed portable sanitation company and the waste material would be disposed of at an approved facility.

A final site cleanup and inspection would be conducted by ESJ, in coordination with local agencies, at the completion of construction. Post-construction erosion and sediment control BMPs, as well as final soil stabilization and cleanup BMPs, would be implemented. The use of BMPs is discussed further in Sections 3.11 (Water Resources) and 3.12 (Geology and Soils). The types and locations of proposed BMPs are also shown on the project engineering drawings provided in Appendix B.

[12] The SWMP prepared for the project is on file with the County of San Diego Department of Planning and Land Use.

Public Health and Safety. Project construction would require the routine transport, handling and onsite storage of petroleum products such as fuel and lubricating oil, and hazardous materials such as paints, as well as waste products with these constituents. A Spill Prevention and Control Plan is included in the SWMP. The Spill Prevention and Control Plan outlines the measures to prevent, control, and minimize impacts from a spill of petroleum substances or hazardous materials or wastes during construction. Construction materials that pose a potential contamination risk to storm water would be managed to minimize exposure to storm water. Solid and liquid waste would be reused and/or recycled to the extent practical, or disposed of properly if deemed not reusable or recyclable. The small amounts of hazardous waste (primarily vehicle fuels and lubricants) that could be produced as byproducts of construction would be disposed of in accordance with the local, state, and federal regulations. The hazardous materials would also be stored aboveground and in secondary containment to prevent discharges to receiving waters. Portable sanitary facilities would be used by all construction personnel, would be located on non-paved areas, 50 feet (15.2 m) away from drain inlets, and would be serviced regularly.

Fire and Fuels Management. ESJ prepared a Fire Protection Plan as provided in Appendix B (Hunt Research Corporation 2009). The Fire Protection Plan was submitted to the San Diego Rural Fire Protection District in Jamul, California, and to the County of San Diego Department of Planning and Land Use (DPLU) for approval. The Fire Protection Plan was approved by the Rural Fire Protection District Board in April 2011. The Fire Protection Plan serves to evaluate the impacts associated with the relationship between the proposed project and wildland fires. Primarily, the Fire Protection Plan is intended to ensure that the project does not unnecessarily expose people or structures to a significant risk of loss, injury or death involving wildland fires. Pursuant to County of San Diego Fuel Modification requirements for cellular communication tower facilities, which are comparable to the proposed electrical transmission towers or poles, the towers would have 30 feet (9 m) of fuel modification on all sides of the towers. Within this 30-foot (9.1-m) perimeter, the area should be cleared, concreted, and graveled, or vegetation should be cut to no more than 6 inches (15 centimeters [cm]) in height. ESJ would also provide a 10-foot (3-m) vertical clearance between vegetation and transmission lines/wires, and marking of towers. Further, no new shrubs, trees, or other plants would be planted in the right-of-way or in the 30-foot area on each side of the right-of-way. The right-of-way would be maintained on an annual basis, prior to May 1, or more often as needed to ensure adequately low levels of vegetation coverage (e.g., certain conditions such as heavy rainfall may necessitate more frequent clearing).

In accordance with applicable guidelines, no fuel modification (e.g., vegetation removal) would be done in sensitive habitat, or archaeological sites, or if otherwise prohibited, without permission of the County DPLU and other applicable resource agencies. As discussed above under Biological Resources, ESJ would place a portion of their project property in the project vicinity under a conservation easement to compensate for this loss of native vegetation.

Traffic and Transportation. ESJ is working with the County of San Diego to develop road improvements at the site entrance in accordance with the County's traffic safety design standards. As noted above, ESJ evaluated two options, Option A and B, for the property access road from Old Highway 80, and they have identified Option B as their preferred option. The locations and alignments for both options are shown in Figure 2-1. These design standards are discussed further in Section 3.7 (Traffic and Transportation). In addition, ESJ would prepare a

Traffic Control Plan to be implemented during construction and long-term maintenance and operations, in accordance with County of San Diego standard requirements for projects of this nature.

2.8 ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

The ESJ stated objective for the proposed transmission line is to transport electrical power generated by the ESJ Wind project in Mexico to the U.S. In its December 18, 2007, application, ESJ indicated that the power generated by its proposed ESJ Wind project would be exported to the U.S.[13] and that "the proposed transmission line is expected to reduce the region's dependence upon conventional fossil fuel fired generation plants, and improve the region's ability to meet future electrical energy requirements." According to the application, the ESJ U.S. Transmission Line project would also help California utilities meet the renewable energy portfolio standards specified in California Executive Order S-14-08, which requires that, by the end of 2020, 33% of retail electricity sales be generated from renewable energy sources.

DOE received several comments regarding alternatives considering different sources of power generation and ways to distribute power. However, the ESJ U.S. Transmission Line project is being proposed by a private developer to meet its objectives, and the federal government's "need" in this case is to meet the requirements of E.O. 10485 in its response to certain request for permits and approvals. Accordingly, certain alternatives are dismissed from further analysis.

2.8.1 Existing Western Energy Coordinating Council Transmission Corridor

The potential of a direct interconnection to Mexican transmission lines using the existing Western Energy Coordinating Council (WECC) transmission corridor WECC transmission corridor was considered but dismissed from detailed analysis for several reasons. The WECC Path 45 transmission corridor generally runs through northern Baja, Mexico, in an east-west orientation, and connects the California grid to the Mexican grid, at existing international border crossings in Imperial County and San Diego County (Korinek et al 2008[14]). According to the applicant, the WECC transmission corridor would not provide enough interconnection capability with the U. S. grid to deliver the capacity of the ESJ Wind project and would not meet reliability objectives when local renewable resources are unavailable (CPUC/BLM 2010). This alternative would also have greater impacts because substantial changes to transmission lines would be required in Mexico. Import capacity of the Comisión Federal de Electricidad (the Mexican state-owned electric utility) into the United States is limited to 800 MW and, therefore, would not be able to accommodate the planned generation of 1,250 MW[15] from the ESJ Wind Project without substantial upgrades. The applicant maintains that such upgrades would require detailed studies and new international agreements that would likely delay delivery of power from the ESJ Wind Project. Furthermore, the proposed project reflects the shortest distance between the ESJ Wind

[13] As indicated in Section 2.2, ESJ has indicated in August 2011 correspondence with DOE that there is potential for energy to be partitioned between the U.S. and Mexico markets; however, the degree of partitioning, if any, is uncertain at this time (Sempra Generation 2011).

[14] This report was prepared for the California Energy Commission and is available online: http://www.energy.ca.gov/2008publications/CEC-600-2008-008/CEC-600-2008-008.PDF.

[15] As noted earlier in Section 2, electricity generated from subsequent phases of ESJ Wind development could be partitioned between the U.S. and Mexico.

Project and the ECO Substation, so any other potential routing would be longer with likely commensurate greater impacts. The ECO Substation EIR/EIS (CPUC/BLM 2010; pages C-55-56) also concluded that use of WECC Path 45 would not meet the objectives of the project:

"ECO System Alternative 6 [the Path 45 interconnection alternative] would not meet project objectives criteria or feasibility criteria. This alternative would not be able to interconnect all of the ESJ Gen-Tie Project or all the region's planned renewable generation and, therefore, would only marginally meet project objectives."

Therefore, this alternative is not considered a reasonable alternative to the proposed project and is dismissed from further consideration.

2.8.2 Alternative Transmission Line Route (Route B)

During the initial planning and siting process for the ESJ U.S. Transmission Line project, ESJ considered one additional route alternative for an overhead transmission line (Alternative Route B) as shown in Figure 2-4. The route depicted in Figure 2-4 indicates that the Alternative Route B would be located west of and parallel to the location of the route proposed in Alternatives 2 and 3, and would terminate at an alternative substation location on the north side of Old Highway 80, east of Jacumba. Alternative Route B would extend approximately 1 mile (1.6 km) north across U.S. land and would require a slightly longer line in Mexico than Alternatives 2 and 3. This concept was developed by ESJ prior to SDG&E's application filing for the ECO Substation Project. (Further discussion of SDG&E's ECO Substation Project application filing and a description of that project are provided below in Section 2.9). Given the current proposed location of the SDG&E ECO Substation switchyard, and the distance between Route B and the ECO Substation switchyard (the transmission lines would need to run east along Old Highway 80, or parallel to the SWPL, for at least 1 mile [1.6 km] to the ECO Substation switchyard, for a total distance of at least 2 miles [3.2 km]), this alternative is no longer considered feasible or practical. For these reasons, construction of Alternative Route B is not considered a reasonable alternative, and no further analysis is provided.

2.8.3 Underground Transmission Line

It is technically feasible to install transmission lines underground. Commenters on the scope of this EIS and the County of San Diego, which is a cooperating agency for this EIS, requested that the EIS consider the alternative of placing the proposed transmission line underground for its entire length from the Mexican substation to the proposed SDG&E ECO Substation. The commenters stated that an underground transmission alternative would have less environmental impact, including lower visual impacts and lower fire risk, than an aboveground transmission line. The County also stated that an underground line would reduce impacts to biological resources, visual resources, recreation, public health and safety, fire and fuels management, and geology and soils (CPUC/BLM 2010).

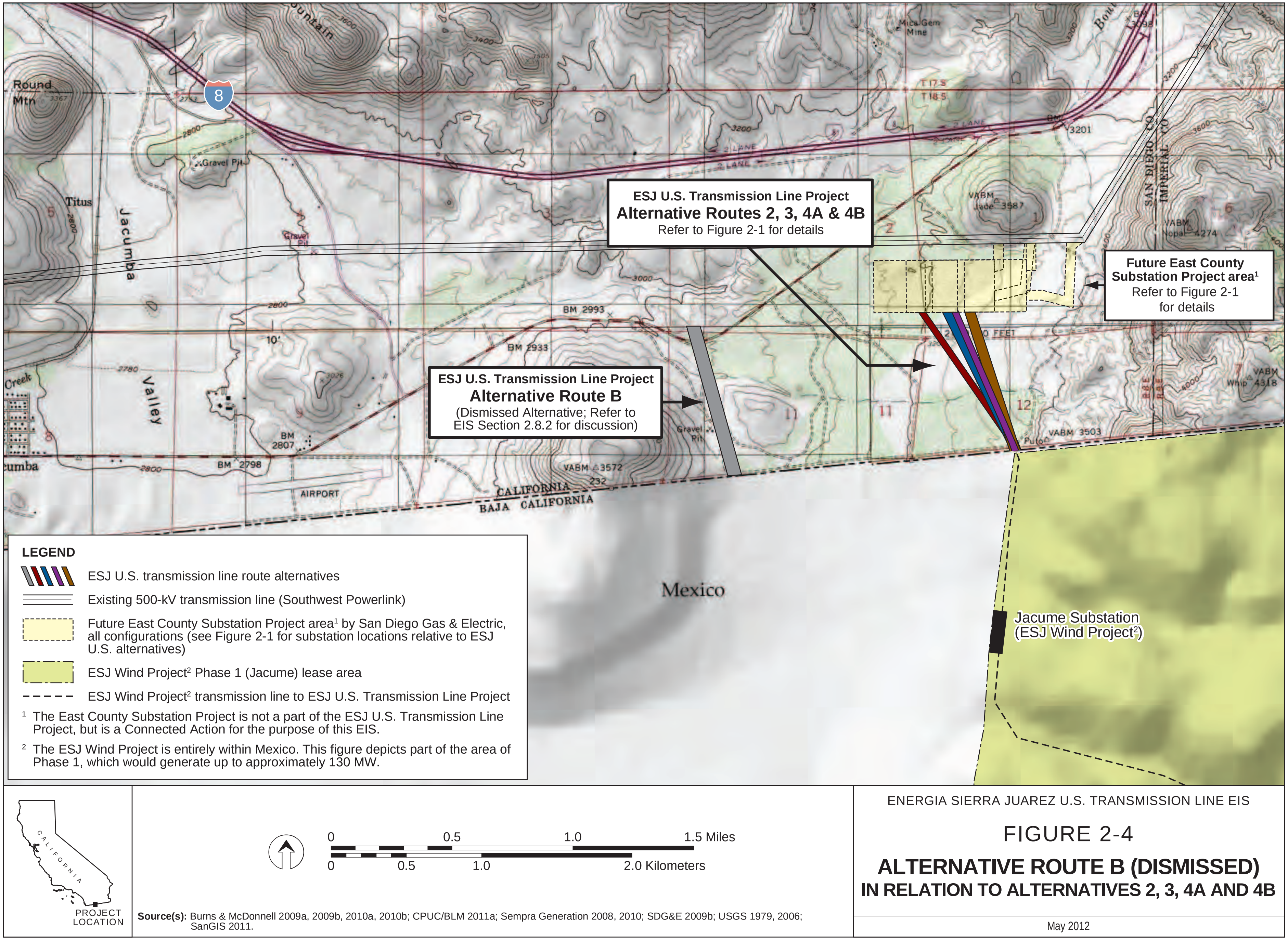

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FIGURE 2-4

ALTERNATIVE ROUTE B (DISMISSED) IN RELATION TO ALTERNATIVES 2, 3, 4A AND 4B

May 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_2-4_AltRouteB_11x8_v10.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy

Largely because underground transmission lines are substantially more expensive than aboveground lines, underground transmission lines are primarily used in dense urban areas where overhead routes may not be feasible. In addition to the cost, utility experience with underground transmission lines is limited, particularly at higher voltages. Dissipation of heat from the conductors is a particular challenge in building and maintaining underground transmission lines (CH2M Hill & Power Engineers 2006). The ECO Substation EIR/EIS (CPUC/BLM 2011a) dismissed the alternative of underground installation of a 500-kV transmission line, stating that this is not a commercially viable option using current technology. Where underground installation of high-voltage alternating current transmission lines is seriously considered, including lines of 500-kV, it is typically only for relatively short distances in locations where there are major constraints on aboveground transmission (CH2M Hill & Power Engineers 2006). For instance the Sunrise Powerlink EIR/EIS (CPUC/BLM 2008a) considered a two-mile, 500-kV line feasible for a site where aboveground lines could conflict with current land uses.

An underground transmission line would avoid most of the potential visual resource impacts associated with an overhead line that used either the lattice tower or monopole designs. An underground line also would be more reliable, e.g., less susceptible to weather-related outages. However, this benefit is offset to some extent by the fact that a failure underground is relatively more difficult to locate and repair.

Construction of an underground transmission line would involve significantly greater ground disturbance and associated environmental impacts than the proposed aboveground line, as underground construction would require trenching throughout the entire length of the transmission line route. Trenching along the entire length of the line would result in more disturbance to biological resources, soils, and cultural resources during construction than an overhead transmission line and would afford less opportunity to avoid sensitive resources. During operation, fire and fuel management would be less a concern for an underground transmission line than for an overhead line, but the land above and in the vicinity of the line would have to be kept free of shrubs to avoid direct interference by roots, and access roads would be needed along the entire length of the line in order to provide access to repair outages.

Placing the transmission line underground may reduce public exposure to electric and magnetic fields (EMF). Studies indicate that underground alternating current (AC) cables produce no aboveground electric field (ICF Consulting 2003); however, magnetic field strengths from AC power lines buried underground are similar to magnetic strengths for power lines above ground (ICF Consulting 2003, CH2M Hill & Power Engineers 2006; Georgia Transmission Corporation 2011b). Magnetic field strengths above underground AC lines depend on the details of the installation. Because underground transmission lines are typically 4 feet below ground, at the ground surface the magnetic fields from individual conductors tend to be higher than for aboveground lines. However, because underground conductors are typically spaced much closer together than aboveground conductors, the fields of the individual conductors partially cancel each other to produce a combined magnetic field that is smaller than the fields of the individual conductors (CH2M Hill & Power Engineers 2006, Cable Consulting International, Ltd 2010). Therefore, magnetic field exposure under this alternative could be greater or smaller than exposure from aboveground transmission lines.

A potential undergrounding approach to minimize ground disturbance in installation of an underground line is to use horizontal directional drilling techniques. Horizontal directional drilling uses a directional boring technique over relatively long distances compared to conventional boring techniques. Horizontal directional drilling minimizes the total ground disturbance required. However, due to its high cost, this method is typically used only at major infrastructure or sensitive resource crossings where trenching and conventional boring techniques are not feasible (e.g., to cross under highways or major streams).

The cost of undergrounding has been shown to be substantially higher than placing aboveground wires, generally between 5 and 10 times the cost of aboveground transmission lines (Georgia Transmission Corporation, 2011a). According to ESJ, undergrounding of the ESJ U.S. Transmission Line is estimated to cost $20.3 million, while the same stretch of overhead line is projected to cost less than $2 million.

Based on these considerations, DOE does not consider the construction of an underground transmission line to be a reasonable alternative, and no further analysis is provided.

2.9 EAST COUNTY SUBSTATION (CONNECTED ACTION)

The construction and operation of the proposed ECO Substation switchyards and SWPL Loop-In are connected actions for the ESJ U.S. Transmission Line.

On August 11, 2009, SDG&E filed an application with the CPUC for a Permit to Construct the ECO Substation (CPUC Application A.09-08-003). In December 2011, the CPUC completed its evaluation of the SDG&E ECO Substation Project under the California Environmental Quality Act (CEQA). Additionally, because of the potential involvement of federal BLM lands, that agency is collaborating with CPUC in the environmental evaluation process. A Draft EIR/EIS for the project was published in December 2010 (CPUC/BLM 2010). EPA published a Notice of Availability of the Draft EIR/EIS for the SDG&E ECO Substation Project on December 23, 2010 (75 FR 80807). The Environmental Protection Agency published a notice regarding the Final EIR/EIS for the project (CPUC/BLM 2011a) in the *Federal Regis*ter on October 14, 2011 (76 FR 63922, available online: http://www.gpo.gov/fdsys/pkg/FR-2011-10-14/pdf/2011-26610.pdf).

According to SDG&E, the purpose of the ECO Substation Project is to “provide an economical interconnection platform for renewable energy projects and to improve reliability to electric customers in southeastern San Diego County” (SDG&E 2009a).[16] As noted in Section 1 (Introduction), the SDG&E ECO Substation Project is not a part of the ESJ U.S. Transmission Line project, but two components of the project (ECO Substation switchyards and SWPL loop-in) are considered “connected actions” under NEPA (40 C.F.R. 1508.25(a)(1)) for the purpose of this EIS. As such, the potential impacts of these components are evaluated in Section 4 (Connected Actions) of this EIS.

[16] The ECO Substation Project documents, including the Proponent’s Environmental Assessment (PEA), and EIR/EIS, are available online at:

http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/ECOSUB.htm

The following project description information was obtained from the SDG&E ECO Substation Project application documents. SDG&E's application to the CPUC includes infrastructure beyond the perimeter of the ECO Substation switchyard facilities and the SWPL loop-in described below that would be constructed as a part of their overall ECO Substation Project. These project components include a 13.3-mile (21.4 km) long 138-kV transmission line to the Boulevard Substation (located approximately 12 miles [19.3 km] northwest of the proposed ECO Substation site in the unincorporated community of Boulevard), and upgrades to the Boulevard Substation (SDG&E 2009b). These components of the SDG&E ECO Substation Project are described further in Section 5 (Cumulative Impacts) and shown in Figure 5-1 in that section. These project components are not connected actions for the purposes of the EIS, but are briefly mentioned here for the sake of completeness. Detailed descriptions of these additional components of the ECO Substation Project are provided in SDG&E's application documents (SDG&E 2009a; 2009b).

2.9.1 ECO Substation Switchyard and SWPL Loop-In Location

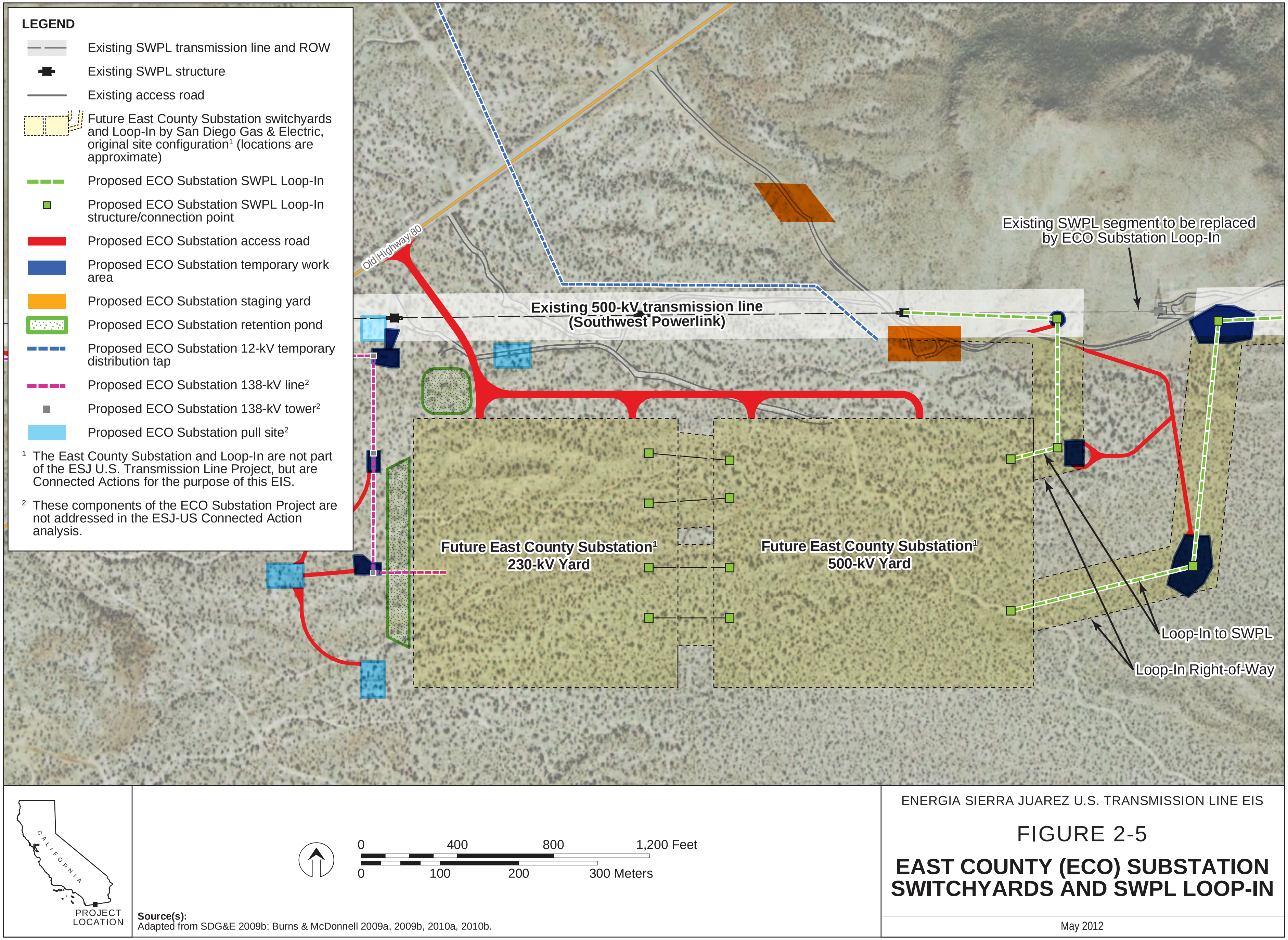
The proposed ECO Substation switchyards and SWPL loop-in would be located on the south side of I-8, approximately 3.8 miles (6 km) east of the town of Jacumba, on the west side of the Jacumba Mountain range (an extension of the Sierra Juarez range) within the In-Ko-Pah Gorge U.S. Geological Survey (USGS) quadrangle.[17] Old U.S. Highway 80 is located just north of the site and the U.S.-Mexico border is located to the south. The proposed location of the ECO Substation switchyards and SWPL loop-in are shown in Figure 2-1, and the site arrangement and layout are shown in Figures 2-5 and 2-6.

The ECO Substation switchyards would be located entirely on privately-owned, undeveloped land. SDG&E would acquire up to six parcels to construct the ECO Substation switchyards, totaling approximately 498 acres (202 ha) of land, of which the fenced-in portion of the switchyards would encompass approximately 58 acres (23.5 ha). Privately-owned, undeveloped land borders the western and southern sides of the site, and undeveloped land managed by BLM is located to the east. The site would be accessed by traveling east from San Diego on I-8, exiting at In-Ko-Pah Park Road, and heading west on Old U.S. Highway 80 until it intersects the SWPL.

2.9.2 ECO Substation Switchyard Design

As proposed, the ECO Substation switchyards would occupy approximately 58 acres (23.5 ha), which would be enclosed by a 10-foot (3-m) tall chain-link fence topped with barbed wire around the perimeter of the substation. All entrance gates would be locked and monitored remotely to limit access to only qualified personnel. Warning signs, in English and Spanish, would be posted on the substation fence in accordance with federal, state, and local safety regulations. A substation ground grid would also be installed in accordance with applicable safety guidelines. In addition, a 20-foot (6-m) buffer around the perimeter of the substation pads would be maintained.

[17] For more information, see, for example, http://www.recreationparks.net/search/in-ko-pah%20gorge



Source(s):
Adapted from SDG&E 2009b; Burns & McDonnell 2009a, 2009b, 2010a, 2010b.

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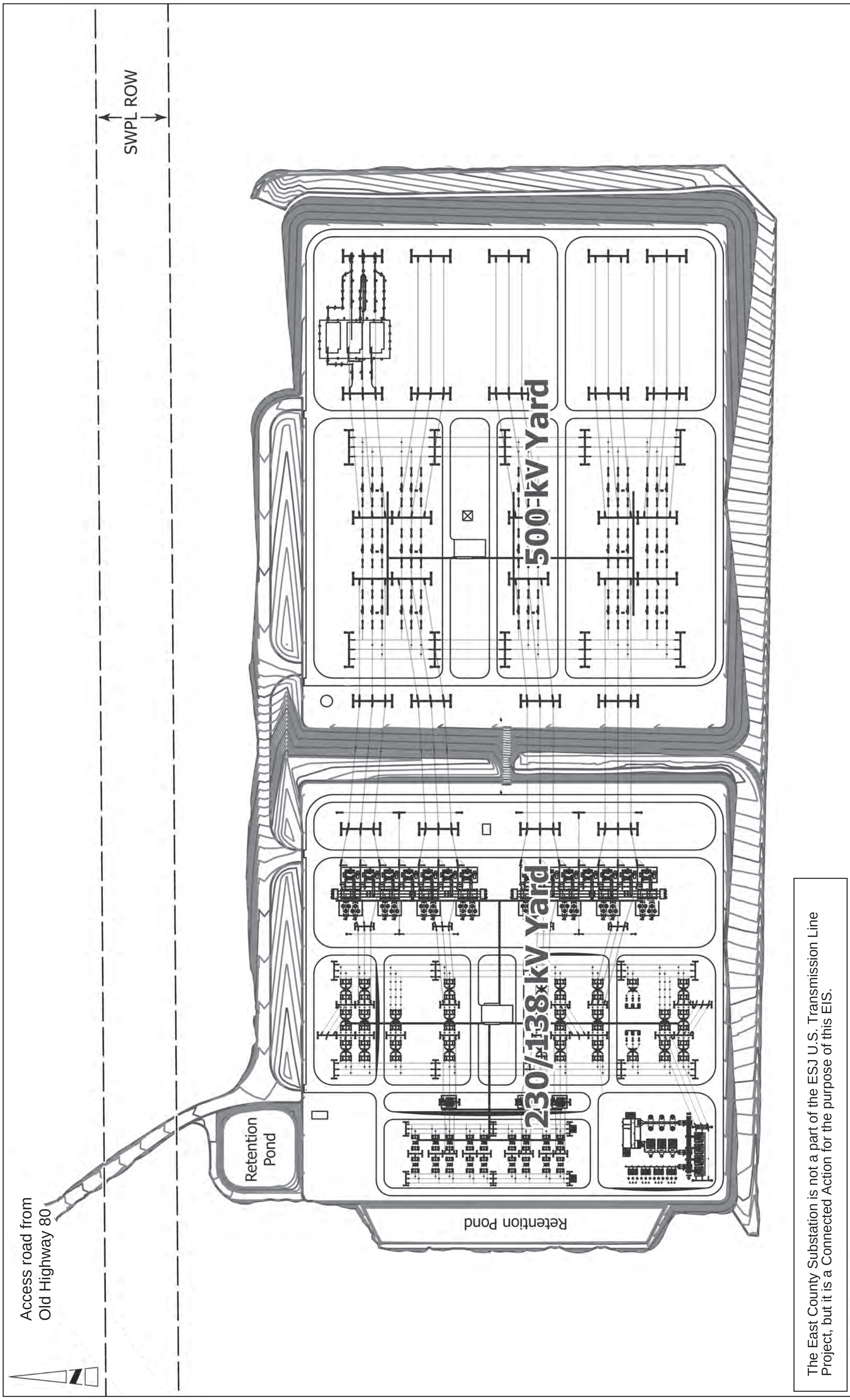
FIGURE 2-5

EAST COUNTY (ECO) SUBSTATION SWITCHYARDS AND SWPL LOOP-IN

May 2012



ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 2-6

EAST COUNTY (ECO) SUBSTATION SWITCHYARDS LAYOUT

May 2012

0 250 500 1,000 Feet

0 100 200 300 Meters

SCALE IS APPROXIMATE

Source(s): SDG&E 2009b.

PROJECT LOCATION

CALIFORNIA

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_2-6_EastCountySubstationLayout_11x8_v6.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy

Construction would require permanent cut and fill slopes in the area surrounding the substation that may occupy an additional 25 acres (10.1 ha), resulting in a total disturbed area of up to 83 acres (33.6 ha). A new permanent access road, drainage facilities for the site, and a design/construction buffer of approximately 100 to 150 feet (30.5 to 45.7 m) around the substation would be included in the project design. The substation would be split into two separate switchyards consisting of one 500-kV yard and one 230/138-kV yard, each of which would be fenced-in separately[18]. The chain link fenced area of the 500-kV yard would occupy roughly 32 acres (approximately 1,290 feet by 1,080 feet) (12.9 ha). The fenced area of the 230/138-kV yard would occupy roughly 26 acres (approximately 1,060 feet by 1,080 feet) (10.5 ha) (SDG&E 2009b).

An approximately 2,900-foot (884-m) long paved asphalt access road would be constructed from Old Highway 80 to the ECO Substation switchyards. The access road would extend southeast off of Old Highway 80 before turning east and running along the north side of the pads. Four asphalt-paved driveways, approximately 100 feet (30 m) in length, would be constructed off of the access road into the four gated entrances of the substation. The access road would be approximately 30 feet (9 m) wide, requiring approximately 2.2 acres (0.9 ha) of land. Substation communication would be facilitated via a microwave and “T1” communication cable system that would include the construction of a new communication tower at the ECO Substation. A 135-foot (41-m) tall microwave tower with a six-foot (1.8-m) diameter microwave antenna, associated ground systems, control structure, and cable bridge from the communication tower to the control structure would be installed within the ECO Substation fence. The microwave dish would be attached to the tower approximately 50 feet (15 m) off the ground.

Electrical facilities that would be installed include 500-kV, 230-kV, and 138-kV insulated electrical buses, steel support structures, transformers, capacitors, reactors, circuit breakers, disconnect switches, communication equipment, control equipment, and protective relays.

The initial arrangement of the substation would consist of:

- Two 500-kV bays in a ring bus configuration;
- One 500/230-kV transformer bank (three single-phase units with one operational spare);
- Three 230-kV bays in a breaker-and-a-half bus configuration;
- One 230-kV shunt capacitor;
- One 230/138-kV transformer bank;
- Two 138-kV bays in a double-bus/double-breaker bus configuration;
- One 12-kV, 180 megavolt ampere reactive shunt reactor bank; and
- One microwave communication tower.

Other facilities would include metering, Supervisory Control and Data Acquisition, security, and communications equipment. In addition, two single-story relay/control buildings, a single-story

[18] The SDG&E ECO Substation Project design would include both the 500-kV and 230/138-kV switchyards regardless of the final route selected for the ESJ U.S. transmission line.

storage building, and a fire-suppression system with associated hydrants and an approximately 120,000 gallon (436,000 liter) water tank would be installed. The water tank would be approximately 15 feet (4.6 m) in height and 30 feet (9.1 m) in diameter and would also be utilized for landscape irrigation. Water would be either provided by a well installed at the ECO Substation site, or purchased from the City of El Centro or the Imperial Irrigation District. A stationary standby generator would also be installed for use as a backup to the station lights and power transformers. The anticipated substation equipment would be fully contained within the fenced area of the ECO Substation switchyards. In addition, a retention basin would be constructed near the northwestern corner of the 230/138-kV yard, adjacent to the northern side of the substation. After construction, the basin would be used for stormwater retention for the 500-kV yard. A second retention basin would be constructed along the western side of the ECO Substation switchyards for collection of drainage from the 230/138-kV yard. The retention basins are anticipated to be approximately 1.2 acres (0.5 ha) and 1.9 acres (0.8 ha) in size, respectively; however, the final design of the retention basins would be determined after consultation with the County of San Diego to ensure adequate sizing to accommodate storm water flows.

The substation would be designed to allow for future expansion and inclusion of the following components:

- Five 500-kV bays in a breaker-and-a-half bus configuration;
- Nine 230-kV bays in a breaker-and-a-half bus configuration;
- Nine 138-kV bays in a double-bus/double-breaker configuration;
- Four 500/230-kV, 1,100 megavolt ampere transformer banks with two single-phase operational spares;
- Three 230/138-kV, 224 megavolt ampere transformer banks;
- One or more 500-kV series capacitors;
- Two 230-kV, 63 megavolt ampere reactive shunt capacitors;
- Four 12-kV, 180 megavolt ampere reactive shunt reactor banks; and
- One 230-kV static megavolt ampere reactive compensator.

A maximum of approximately 569,800 gallons (2.2 million liters) of insulating oil[19] would be required for the transformers at the ECO Substation. The 500-kV line and transformer dead-end structures and the new communication tower would be the tallest structures in the substation, reaching a maximum height of approximately 135 feet (41 m). Substation lighting would be provided by approximately fifty 300-watt tungsten-quartz lamps placed near major electrical equipment. The yard lights would only be used during nighttime for security and safety reasons and would be turned off during the day. In addition, approximately ten 100-watt yellow

[19] Transformer oil, or insulating oil, is usually a highly-refined mineral oil that is stable at high temperatures and has excellent electrical insulating properties. It is used in oil-filled transformers, some types of high voltage capacitors, fluorescent lamp ballasts, and some types of high voltage switches and circuit breakers. Its functions are to insulate, suppress corona and arcing, and to serve as a coolant.

floodlights would be mounted near the substation gates and building entrances to allow for nighttime emergency repair and routine maintenance access. The lights would be oriented downward to minimize glare onto surrounding property and habitat.

To offset the auxiliary power use at the ECO Substation, SDG&E is evaluating the installation of solar panels on the two control structures and storage structure. The installation of these solar panels would generate approximately 111,000 kilowatt hours of electric energy annually. Because these solar panels were not yet fully evaluated or designed at the time of the application filing, impacts associated with their installation (although anticipated to be minor) had not been evaluated by SDG&E at the time of this writing.

The loop-in to SWPL would connect the ECO Substation switchyards into the existing 500-kV SWPL transmission line. This would require installation of transmission structures outside of the fenced area at the ECO Substation, but within the newly acquired SDG&E property. The loop-in construction would begin along the existing SWPL right-of-way, traverse south for approximately 1,200 feet (366 m), then would turn west for 250 feet (76 m), and enter at the east side of the new substation. The existing SWPL transmission line and new substation are shown in Figure 2-5. Structures associated with this loop would be located on land acquired for the new substation and within SDG&E's existing SWPL right-of-way.

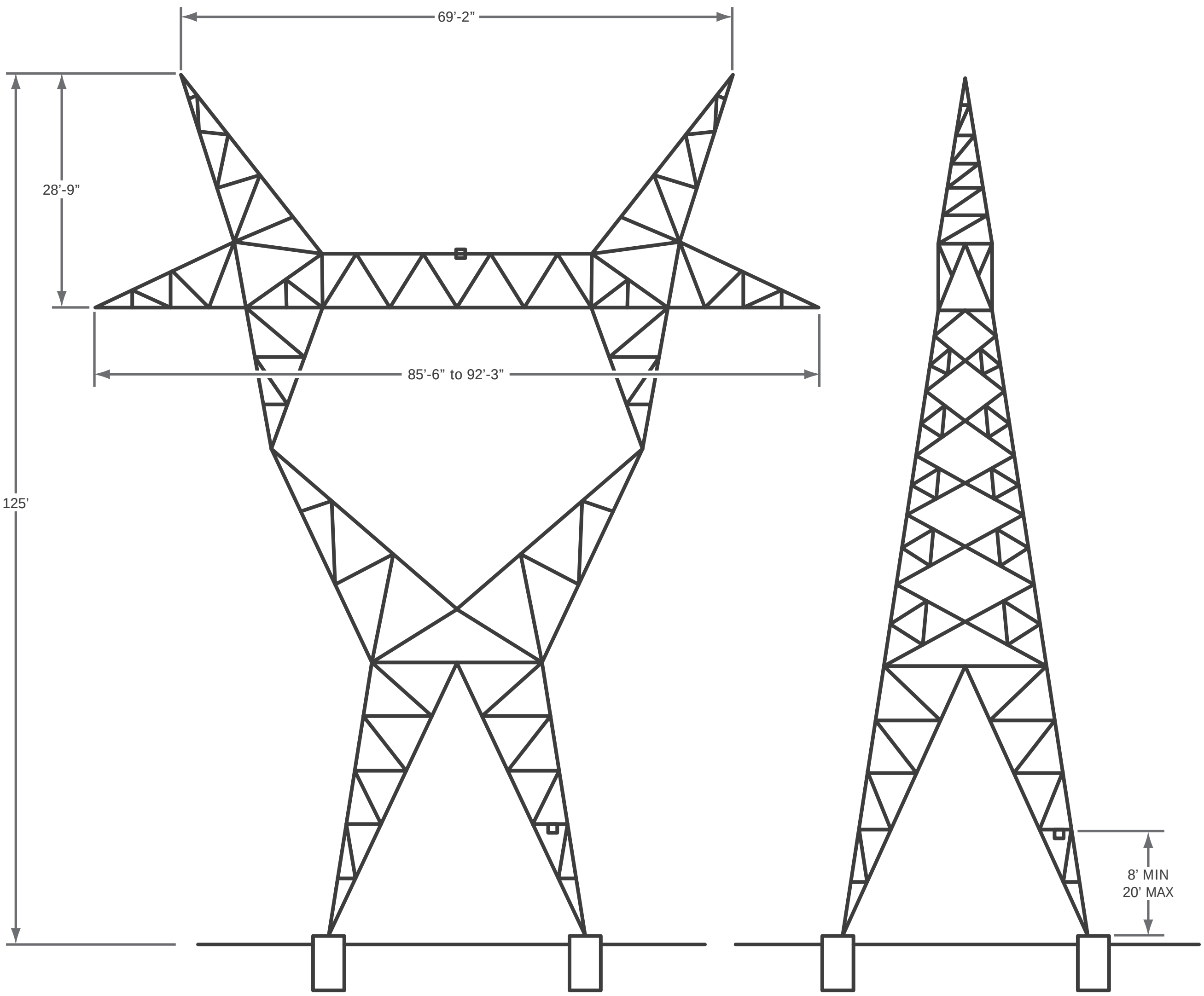
This installation would require the removal of one existing 125-foot (38-m) SWPL 500-kV transmission line tower and the installation of four new steel transmission line towers east of the fence. Depending on the final design, the anticipated maximum height of these structures would be approximately 125 feet (38 m). The approximate locations of these structures are shown in Figures 2-5 and 2-6.[20] A drawing of the typical lattice structure design to be installed is provided in Figure 2-7.

The distance from the ground to the lowest conductor would be at least 35 feet (10.7 m). The approximate distance between phases would be 35 feet (10.7 m) horizontally. The span lengths between the transmission structures would be approximately 1,200 feet (366 m).

Looping of the SWPL into the ECO Substation switchyard would require approximately 7 acres (2.8 ha) of land, approximately 200 feet (61 m) wide and 2,285 feet (696 m) long, for placement of the four new transmission structures and the associated permanent right-of-way.

Figure 4.2-1 in Section 4 (Connected Action - ECO Substation and SWPL Loop-In) provides a simulated view of the ECO Substation after construction, as viewed from eastbound I-8. Additional design and construction details for the ECO Substation and loop-in to SWPL are available in SDG&E's application documents (SDG&E 2009b).

[20] Figures 2-5 and 2-6 are adapted from SDG&E as proposed in their filing with CPUC (PEA, Figure 3-7: ECO Substation and SWPL Loop-In Vicinity Map). The figure depicts different types of disturbed land areas, including new permanent access roads; temporary transmission line pull sites; temporary construction work areas; and temporary staging yards.



Source(s):
SDG&E 2009b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 2-7

SWPL LOOP-IN TYPICAL STRUCTURE

May 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_2-7_EastCountySubstationLoopInTypicalStructure_8x11_v4.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy

2.9.3 Potential Revised ECO Substation Switchyard and SWPL Loop-In Location

As discussed above under Alternative 4, subsequent to the publication of the Draft EIS, SDG&E proposed an "ECO Substation Alternative" that was shifted about 700 feet (213 m) east of the originally proposed ECO Substation location (Figure 2-1b). The purpose of the revised location was to avoid potential impacts to cultural resources that were identified in the initially proposed location. This alternative would also change the configuration of the SWPL loop-in (two additional structures required). In addition, the northwest corner of the western ECO Substation pad would be removed to reduce permanent impacts to waters of the U.S. (SDG&E 2011). Figure 2-6 depicts the ECO Substation Alternative Site improvements as proposed. This alternative includes the following additional changes from the ECO Substation design described above:

- One additional staging area measuring 100 x 150 feet (30.5 m x 45.7 m) for the 12-kV tap.
- Three additional pull sites (pull sites would be located to the east of the ECO Substation footprint).
- The addition of 0.13 acres (0.05 ha) for new access roads and 0.09 acres (0.04 ha) for permanent maintenance pads.
- The two retention basins in the initial design would be joined to form one basin. The single retention basin would measure approximately 1.46 acres (0.59 ha) at its base; the basin has sloped sides and would measure approximately 3.95 acres (1.6 ha) from the edge of the pad to the top of the slopes.
- The access road to the ECO Substation would go along the west and southern side of the substation site, rather than along the north.
- The location of several steel poles along the 138-kV transmission line would be shifted to avoid impacts to cultural resources.

All other elements of the ECO Substation design would remain as described in Section 2.9.1 and 2.9.2 above. Site conditions at this alternative site and in the surrounding undeveloped open space are very similar in topography and vegetation type as the initial proposed site.

2.10 ESJ WIND PROJECT IN MEXICO

The ESJ Wind project in Mexico would be constructed in phases, with up to 52 wind turbines constructed in Phase 1. Power output from Phase 1 would be 130 MW assuming nominally 2.5 MW per turbine, and potentially up to 156 MW if the output reaches 3 MW per turbine (the wind turbines have not been selected by ESJ, so actual generating capacity may vary, depending on the selected manufacturer and specific model). Phase 1 would be constructed on the furthest north land leased by ESJ (an area referred to as the Jacume lease area), north of the town of La Rumorosa, Mexico. Figure 1-1 depicts the general location of the project in eastern San Diego County and Baja California. Figure 1-2 provides a more detailed map of Phase 1 of the ESJ Wind project and proposed project locations. The wind turbine locations shown in Figure 1-2 are preliminary and subject to refinement based on ongoing siting studies. The preliminary wind turbine locations are in areas that have been determined to be optimal for wind generation, taking into consideration available meteorological information, site access, and other site constraints. As shown in Figure 1-2, the wind turbines nearest to the U.S. would be located no closer than approximately 0.7 mile (1.1 km) south of the U.S. border.

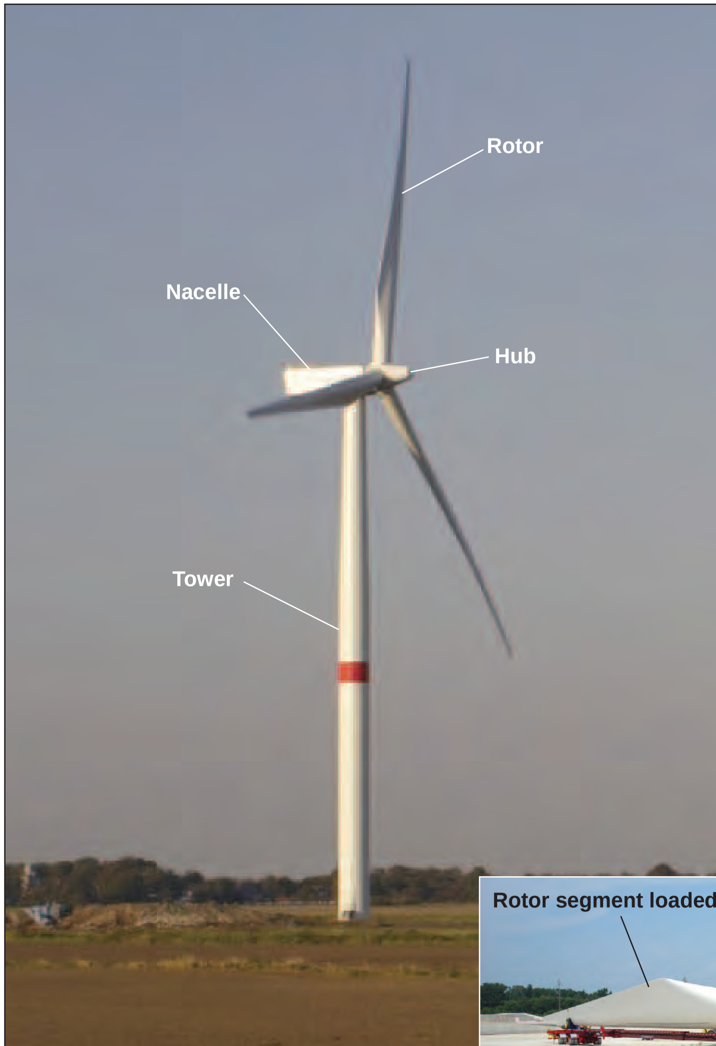
Subsequent expansion of the ESJ Wind project in Mexico would consist of additional phases of wind generation, up to a maximum build-out of 1,250 MW. According to ESJ, the timing and location for installation of subsequent phases have not been determined, but their current leaseholds would place the location of those subsequent phases south of the town of La Rumorosa (Figure 1-1), and thus farther from the border than Phase 1[21].

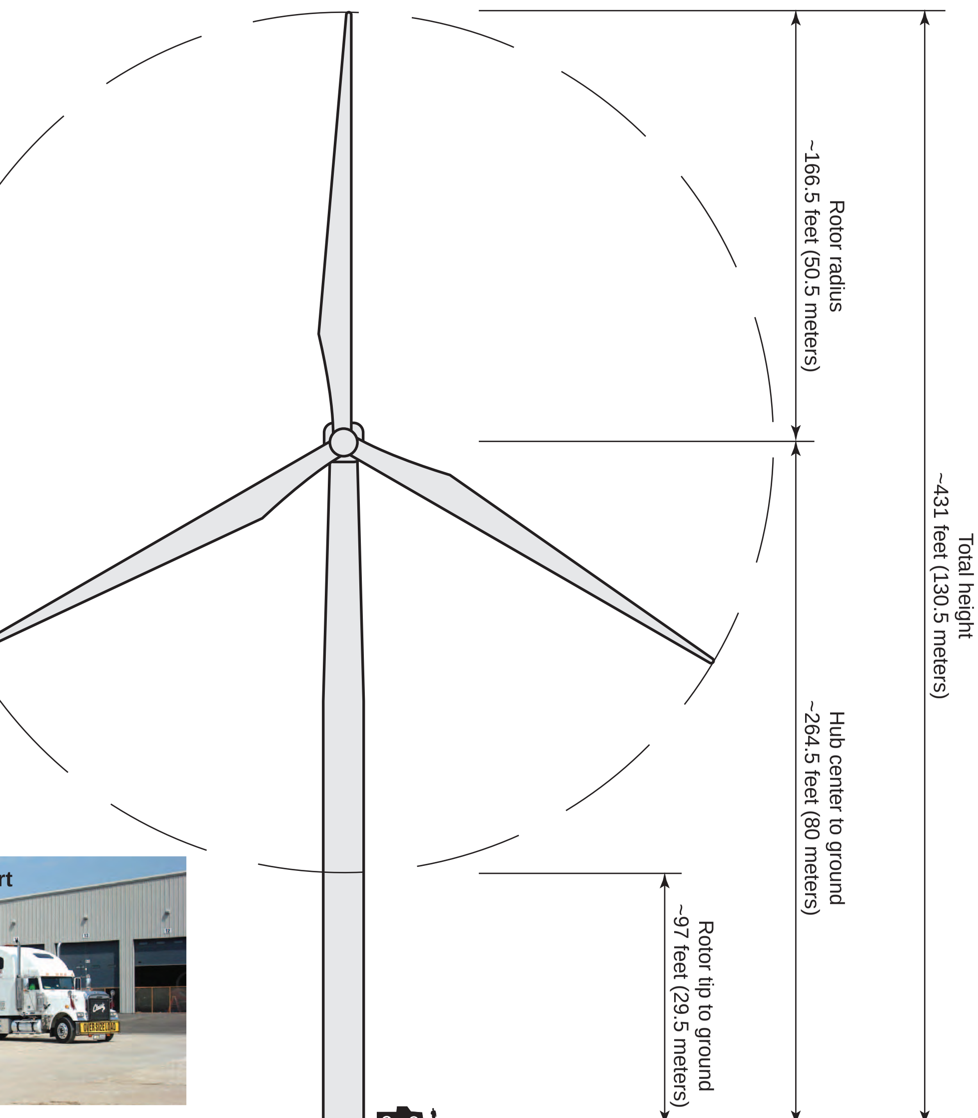
The turbine vendor selection process is still in progress as of the time of publication of this final EIS. A typical turbine design that may be used for this project is shown in Figure 2-8, and is similar to Siemens Power Generation's SWT-2.3-101 Wind Turbine (this is a 2.3 MW machine). The maximum rotational speed of turbine rotor blades averages between 6 and 16 revolutions per minute for a 2.5 MW turbine. As shown in Figure 2-8, the total height of the combined tower structure and rotor blades would likely be up to 431 feet (130.5 m), depending on the tower height and the turbine rotor blade diameters. The rotor diameter for the Siemens SWT-2.3-101 is approximately 333 feet (101 m). The total distance from blade tip at the six o'clock position to the ground surface would be at least 97 feet (29.5 m). The wind turbine blades and tower would likely be light grey in color with a semi-matte finish, although final color selection would be based on Mexican regulatory requirements.

According to ESJ, up to approximately 30 percent of the wind turbine units would be lighted (actual percentage would be dictated by Mexican regulatory requirements). It is anticipated that lighting would generally follow FAA guidelines listed in Advisory Circular 70/7460-1K, Obstruction Marking and Lighting (2007), or equivalent Mexican guidelines. The FAA guidelines propose that lighting for wind turbine farms should include the following parameters:

- The majority of the lights should be positioned on the outer perimeter of the wind turbine farm. Lighting of the turbines inside the perimeter is not required unless the turbines stand higher than the perimeter turbines.
- Any array of flashing or pulsed lighting should be synchronized or flashed simultaneously.
- Nighttime wind turbine lighting should consist of the preferred FAA L-864 aviation red-colored flashing lights, which emit approximately 20-40 flashes per minute.
- Each light within a group of wind turbines should be spaced no more than one-half statute mile (2,640 feet [800 m]) from each other if the integrity of the group appearance is to be maintained.
- If the wind turbines would be painted white or light grey, no daytime illumination of the turbines would be required; however, the color treatment of the turbines would be within the purview of Mexican permitting authorities.

[21] This reflects the latest information provided to DOE by the applicant as of the date of publication.





Photographs depict a Siemens Power Generation SWT-2.3-101 Wind Turbine and rotor segment. Schematic is as provided by ESJ, LLC.

Source(s):
Siemens Energy 2009.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 2-8

TYPICAL WIND TURBINE

May 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_2-8_TypicalWindTurbine_11x8_v6.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy

Actual lighting specifications could vary based on Mexican regulations. For the purpose of this EIS, the visual impacts assessment in Section 3.2 (Visual Resources) considers these parameters as being implemented in the evaluation of nighttime visual impacts from the ESJ Wind project on U.S. receptors.

Other infrastructure to support the wind turbines would include access roads, electrical substations, and transmission lines from the substations to the U.S.-Mexico border, where the lines would link to the ESJ U.S. Transmission Line, as shown in Figures 1-2 and 2-1.

As noted in Section 1 (Introduction), if the interconnecting line is rated at 230-kV, the 230/500-kV transformation would occur at a new substation that would be built in the U.S. by SDG&E as part of its ECO Substation Project. However, if the interconnecting line is set at 500-kV, then a substation would also be required in Mexico.

ESJ has obtained an environmental permit from the Mexican government for the ESJ Wind project. DOE reviewed a partial translation of the Mexican MIA permit (or La Manifestacion de Impacto Ambiental, modalidad regional [MIA-R]). The permit requires various mitigations including a baseline study (at least one year) of potential impacts to birds (including migratory species) and bats prior to the operation of the proposed wind farm. If the baseline study shows that birds and bats could be adversely impacted, the permit requires future mitigation to protect or minimize adverse impacts on these bird and bat populations.

2.11 COMPARISON OF IMPACTS OF ALTERNATIVES

A complete discussion and analysis of potential impacts of the alternatives is provided in Section 3 (Environmental Setting, Impacts, and Mitigation Measures). The following discussion summarizes the environmental implications of the action alternatives, organized by resource area. Both temporary impacts during construction and long-term impacts during operation of the proposed transmission line are considered. The APMs described in Section 2.7, which are designed to avoid or minimize potential impacts, were considered as part of the project in determining the potential for impacts. Additional mitigation measures that could be implemented to further reduce potential impacts of the action alternatives and, which could be considered for adoption in DOE's Record of Decision, are also discussed.[22] Under the No-Action Alternative, the transmission line would not be built, and there would be no changes to existing conditions in the various resource areas.

Following this discussion is Table 2-4, which is organized by resource area and compares the potential impacts for all alternatives and lists potential additional mitigation measures for the two action alternatives.

2.11.1 Biological Resources

All action alternatives (Alternatives 2, 3, and 4) would result in permanent disturbance to approximately 10 acres (4 ha) of natural vegetation and wildlife habitat. The areas that would be affected are classified in two habitat types: Sonoran Mixed Woody Scrub and Peninsular Juniper

[22] ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Woodland and Scrub. These habitats support a wide range of plants and wildlife, including special status wildlife that has been observed onsite or that has the potential to occur onsite. Due to fire safety concerns, there would be no revegetation or restoration of areas disturbed by the proposed project. The proposed groundwater well access road construction would be about 2 miles west of the transmission line construction, and would impact approximately 0.038 acre (0.02 ha) of desert saltbrush and 0.042 acre (0.02 ha) of southern cottonwood willow riparian habitat (AECOM 2011a). Under Alternative 2, construction of the double-circuit 230-kV transmission line would result in the loss of up to 9.72 acres (3.9 ha) of vegetation and wildlife habitat. These permanent impacts would be offset by a proposed conservation easement (in accordance with County of San Diego Guidelines), described above. Construction of the transmission line would also potentially result in minor temporary disturbances to wildlife and breeding birds due to traffic and increased noise along the right-of-way. Construction activities would also increase the potential for introduction of non-native invasive species, which is a known concern in the desert region.

Following completion of construction activities, the presence of the transmission line could result in a minor potential increase in avian collisions, but would also result in a long-term minor beneficial impact to raptors by providing additional roosting area on structures. The design specifications of the proposed ESJ transmission line would follow industry standards for avian protection on power lines (APLIC 2006), in order to minimize the risk of avian electrocution. Operation of the transmission line would also result in long-term and major impacts to vegetation and wildlife habitat in the event of a transmission line-caused wildfire.

The analysis of special-status species addressed potential impacts to plant and wildlife species that meet one or more of the following criteria: listed or proposed for listing as threatened or endangered under the federal Endangered Species Act or the California Endangered Species Act; protected under the federal Migratory Bird Treaty Act (MBTA) or Bald and Golden Eagle Protection Act (BGEPA); listed on the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California; considered by the County of San Diego to be rare, endangered, or threatened or sensitive; included on the County of San Diego's lists of sensitive animal species; or designated by California Department of Fish and Game as a Species of Special Concern, Watch List, Specially Protected Mammal, or a California Fully Protected species.

No special-status plants were observed in the survey area during rare plant surveys. Therefore, no impacts to special status plant species are anticipated. Four special-status wildlife species were observed during the project surveys or have a high potential to occur: northern red diamond rattlesnake, California horned lark, loggerhead shrike, and San Diego black-tailed jack rabbit. Vegetation clearance would remove potential foraging and nesting habitat for nesting birds, including California horned lark and loggerhead shrike. Construction is not expected to affect the northern red diamond rattlesnake population. Construction would remove cover and foraging habitat for the San Diego black-tailed jackrabbit and could destroy active burrows if present.

Five other federally-listed wildlife species were identified by USFWS as potentially occurring in the vicinity of the project: Quino checkerspot butterfly, arroyo toad, southwestern willow flycatcher, California condor, least Bell's vireo, and Peninsular bighorn sheep. The project site lacks suitable riparian and woodland habitat for arroyo toad, southwestern willow flycatcher, and least Bell's vireo; therefore, these species are considered to have a low potential to occur onsite and no impacts are expected to occur as a result of construction activities. Designated critical habitat for the Quino checkerspot butterfly is approximately 3.6 miles (5.8 km) west of the most westerly portion of the proposed project and would not be affected by project construction. Project site surveys did not document the presence of any Quino checkerspot butterfly or populations of host plants used at the larval stage by the species. As a result, the species is not expected to occur in the project area and would not be impacted by the project.

The project site is within the range of the California condor, which has been reintroduced into the region in an ongoing effort to re-establish the population within its historic range. This species is considered to have a very low probability of occurring in the project area based on limited distribution within its historic range and the absence of recent sightings in the project vicinity (with the exception of a 2007 sighting near Jacumba). Transmission structures are expected to have a long life span, thus if populations are reestablished, collision or electrocution would be more likely. The applicant's design (see drawings provided in Appendix B) provides for a minimum horizontal separation of 13 ft (132 inches, 4 m) and a minimum vertical separation of 9 ft (108 inches, 2.7 m) between conductors and structures, with larger separations between conductors. These separations should avoid electrocution of large avian species including condors, should any condors pass through the project area.

The designated critical habitat and known populations of the Peninsular bighorn sheep are approximately 2 miles (3.2 km) from the project site; thus, project construction would not affect the designated critical habitat for this species. However, vegetation clearing within the right-of-way and the main access road would result in permanent impacts to potential forage material for this species.

Under Alternative 3, construction of the single-circuit 500-kV transmission line would result in the loss of up to 10.77 acres (4.4 ha) of vegetation and wildlife habitat which would be offset by the proposed conservation easement. All other impacts would be as described for the 230-kV Route.

Biological resource studies conducted for the project encompassed the Alternative 4 routes. The Alternative 4 routes are very similar to the Alternative 2 and 3 routes in the type and density of vegetation types, local site topography and drainage, the potential for sensitive species, and overall acreage of disturbance. Operation and maintenance activities for the revised 230-kV or 500-kV Routes would be the same as described above for the Alternative 2 and 3 Routes. The conservation easement discussed for Alternatives 2 and 3 would also be applied under the Alternative 4, with the required size of the easement determined from the acreages of different vegetation types affected. All other impacts would be the same as the 230-kV Route and 500-kV Route.

The proposed access road for the groundwater extraction well would result in permanent impacts to 0.038 acre (0.02 ha) of desert saltbrush and 0.042 acre (0.02 ha) of southern cottonwood willow riparian habitat. In accordance with San Diego County guidelines, impacts to desert saltbush scrub would be replaced at a 2:1 ratio and impacts to southern cottonwood willow riparian forest habitat would be replaced at a ratio of 3:1. Furthermore, a survey determined that the construction of the access road would not fragment undeveloped lands or disrupt wildlife corridors, because the areas to the north, east and west of the well will remain undeveloped. No sensitive plant or wildlife species were detected on-site (AECOM 2011a).

Under all action alternatives, impacts to biological resources also in the U.S. would occur if construction or operation of the proposed ESJ Wind project and the associated transmission lines in Mexico impeded the cross-border movement of wildlife, destroyed or fragmented habitat for wildlife that move or migrate between Mexico and the U.S., or resulted in “take” of those animals (e.g., migratory birds) afforded international protection under international treaties. Cross-border movement of certain terrestrial wildlife species (particularly large mammals) is already impeded by the U.S.-Mexico Border Fence where present. The ESJ Wind project would consist of numerous wind turbines dispersed over a large geographic area, and the development area would not be fenced. However, construction and operation of the wind facilities and associated access roads and support facilities, coupled with loss/alteration of vegetative cover and elevated levels of human activity from workers and visitors to the wind farm, could result in wildlife avoidance of the area.

Neither the proposed transmission line segment in Mexico nor the ESJ Wind project Phase 1 turbines would be located within known major migration corridors or habitats such as major wetlands and riparian areas that would support large concentrations of birds. Nonetheless, cross-border migratory birds will traverse the border in the project area to various degrees (e.g., raptors often follow ridgelines), and thus the potential exists for Phase 1 and future phase operation of the ESJ Wind project to result in direct mortality of cross-border migratory birds due to collisions with transmission lines and wind turbines. Construction of the Phase 1 wind turbines could impact up to 5,200 acres (2,104 ha) of chaparral, pine forest, and possibly some desert communities in Mexico that may support migratory birds that move between Mexico and the United States and that are protected under international treaties. Future phases would increase this development footprint and thus potentially increase the impact to migratory birds protected under the MBTA.

Construction of the ESJ Wind project and operation of the turbines could result in the loss of migratory birds that collide with the turbine blades. Raptors, in particular, may be vulnerable to collisions with wind turbines when hunting prey, depending on the ground-to-rotor clearance and siting of turbines in relation to rim edges. Other birds, which migrate at night, could collide with towers. If aviation safety lighting is installed on the transmission towers/poles in Mexico, this could impact migratory birds, whose flight patterns may be disturbed by artificial lighting.

ESJ has obtained an environmental permit from the Mexican government for the ESJ Wind project. DOE reviewed a partial translation of the Mexican MIA permit (or La Manifestacion de Impacto Ambiental, modalidad regional (MIA-R)). The permit requires a baseline study (at least one year) of potential impacts to birds (including migratory species) and bats prior to the operation of the proposed wind farm. If the baseline study shows that birds and bats could be adversely impacted, the permit requires future mitigation to protect or minimize adverse impacts on these bird and bat populations.

There is limited empirical data regarding the extent to which golden eagles that move across the U.S.-Mexico border could be impacted by the ESJ Wind Project. The San Diego Zoo’s Institute for Conservation Research (ICR) has been conducting golden eagle and California condor studies in the ESJ Wind project region in Mexico. This multiyear research effort's principal goals are to evaluate populations of golden eagles in the area, determine movement patterns of condors and resident golden eagles, assess risks to the population from wind turbine installations, and develop recommendations on project design, construction, and operation to avoid golden eagle and California condor mortality as a result of the project.

These research efforts were started in 2009 and are still in process. The research has included helicopter and ground surveys for golden eagles and their nests. ICR reports that the nearest active golden eagle nest in Mexico is located over 40 miles (64 km) southeast of the property boundary for the Phase 1 portion of the ESJ Wind project. The Condor population in Mexico is concentrated in an area over 100 miles (160 km) south of the border, and there are no Condors in the wild in San Diego County. Among other items, the ICR report concludes and recommends:

1. With only one incursion in nine years by California condors into the ESJ Phase 1 area it appears that the risk of impact to the California condors reintroduced in Mexico is relatively small, although this may change as the population continues to grow.

2. The limited sightings of golden eagles in the ESJ Phase 1 area and lack of suitable nesting habitat appears to indicate a limited potential risk of impact.

ESJ has indicated that it intends to continue this study effort in order to obtain further understanding of golden eagle populations and their territories as well as to monitor condor movements.

This ongoing study indicates that there is low potential for eagle and condor mortality impact however, population impacts could still occur due to the wind turbines' contribution to cumulative effects.

For these reasons, to the extent that information is available, indications are that the potential for impact on the U.S. environment as a result of operation of the ESJ Wind Project is not significant and is appropriately analyzed in the DEIS.

The USFWS is responsible for enforcing the MBTA and BGEPA; however, the USFWS does not have responsibility for enforcement of these regulations outside of the United States (USFWS March 24, 2010 letter to DOE; see Appendix C.9). Migratory birds, including golden eagles, are protected by international treaties, including the 1937 Convention for the Protection of Migratory Birds and Game Mammals (50 Stat. 1311; TS 912, as amended in 1972). The Mexican government is a signatory to this treaty and is responsible for addressing impacts to this species within Mexico. The U.S. government as a signatory to this treaty also has an interest in potential impacts to "…birds denominated as migratory, whatever may be their origin, which in their movements live temporarily in the United States of America and the United Mexican States…"

APMs that are intended to minimize impacts to biological resources and are considered in assessing impacts of both transmission line alternatives are listed in Section 2.7. Potential mitigation measures in addition to the APMs described above as having the potential to further minimize potential impacts to biological resources are:

- Worker training for contractor personnel to ensure that construction workers are aware of the sensitive biological resources that potentially occur in the construction areas and the protection measures that should be followed within these areas;
- Measures to prevent wildlife entrapment, including covering of excavations at the end of each work day; and
- Development and implementation of a weed control plan to minimize the potential for weed introduction during construction, and to address post-construction maintenance and weed control procedures during the operational life of the project.

2.11.2 Visual Resources

Under Alternatives 2 and 3, construction of the transmission line would result in permanent potentially moderate-to-major adverse visual impacts due to land scarring. In addition, views of construction equipment and activity from surrounding recreational areas and highways are considered a temporary moderate adverse impact. Following completion of construction activities, the presence of the transmission line would result in long-term moderate adverse impacts to visual resources. Wind turbines constructed in Mexico as part of the EJS Wind project would be visible from several U.S. locations, including locations in or on the communities of Jacumba and Boulevard, Interstate 8, Old Highway 80, Table Mountain Area of Critical Environmental Concern (ACEC), Anza-Borrego Desert State Park, Jacumba Wilderness, and BLM-administered lands in the Yuba Desert. The numerous wind turbines would appear as an assemblage of light-colored vertical forms in a landscape predominantly natural in appearance. Predicted visual impacts from wind turbines would be moderate-to-high for viewers at observation points in Jacumba and Table Mountain ACEC and low-to-moderate for viewers at an observation point on Interstate 8. During clear weather, aviation safety lighting on wind turbines (if lighting is required by Mexican agencies) would also be visible from viewing points in the U.S. Construction of the groundwater well access road along Old Highway 80 would not result in visual impacts due to the small land area that would be disturbed.

Under the revised 230-kV Route (Alternative 4A) or the revised 500-kV Route (Alternative 4B), construction of the transmission line would result in essentially the same total disturbed acreage as for the Alternative 2 Route or Alternative 3 Route. Under Alternative 4, the transmission lines would begin at the same border crossing location as Alternatives 2 and 3, and the lines would terminate at a location 700 feet (213 m) to the east of the original routes. Given the relatively consistent topography in this area, this change in the alignment would result in the same visual impacts as described for the 230-kV Route and 500-kV Route.

Potential mitigation measures not proposed as APMs that could reduce potential visual impacts from the transmission line are: (1) reducing the reflectivity and visual contrast of construction equipment and towers and (2) reducing the color contrast and views of land scars by avoiding landform alteration and implementing measures such as contour grading to blend graded surfaces with existing terrain. These measures could reduce potential impacts to minor levels.

2.11.3 Land Use

No adverse land use impacts are anticipated under any of the alternatives. Construction and operation of the proposed transmission line is a permitted use under the County's General Plan designation, and under the existing zoning (with a Major Use Permit). The construction of the groundwater well access road for dust control purposes during construction is permitted under the the jurisdiction of the Jacumba Community Services District. The County General Plan Update was approved by the County Board of Supervisors on August 3, 2011, after a series of public hearings. The updated plan has been reviewed for relevant policy changes since the publication of the Draft EIS. The proposed project would be compatible with the newly adopted County General Plan.

No mitigation measures are indicated. The County of San Diego would make the final determination of consistency with the General Plan, the Mountain Empire Subregional Plan, and Zoning Ordinance. Additional mitigation measures may be imposed by the County during their review.

2.11.4 Recreation

Because all alternatives are on private land and are not adjacent to state or federal wilderness or recreation areas, there would be no direct effects on recreation. However, users of public recreation areas in the vicinity could be affected indirectly by increased traffic, noise, and visual changes. Construction of the transmission line would result in minor temporary increases in vehicle traffic and travel times to and from nearby recreation areas. However, roadways have enough capacity to accommodate the increased traffic without affecting level of service, so recreational users would not experience adverse effects. Following completion of construction activities, the presence of the transmission line would result in long-term minor indirect impacts to recreational areas due to alterations to existing scenic vistas and increases in ambient noise levels during foul weather (due to corona noise). Although the transmission line would encroach upon the views and compromise the integrity of the largely intact desert setting, the overall change to the views from recreation areas would be low (ICF Jones and Stokes 2010a; 2010b). Similarly, based on the distances from the transmission line, no increases in ambient noise levels are anticipated to occur at any other nearby recreational facilities due to corona effect during foul weather. Construction of the groundwater well access road along Old Highway 80 would not result in impacts to recreation due to the location of this well relative to recreational areas, and the small land area that would be disturbed. No mitigation measures are indicated.

2.11.5 Cultural Resources

ESJ commissioned the preparation of an Archaeological and Historical Investigations Report to investigate the potential presence of significant resources within the project area and vicinity. There are 11 known prehistoric archaeological sites in the area potentially affected by project construction. ESJ has incorporated measures into its project design to eliminate potential impacts to these sites. Under all action alternatives, construction of the transmission line would result in the potential for minor impacts to currently unknown cultural resources and/or human remains. ESJ would comply with legal requirements related to protection of these resources and has committed to several APMs to reduce or avoid potential impacts. If human remains are discovered, ESJ would stop work within 50 feet (15 m) of the discovery; ESJ would also contact the County of San Diego coroner and a professional archaeologist to determine the significance of the discovery. Depending on the recommendations of the coroner and/or archaeologist, ESJ would consult with the County of San Diego to establish additional feasible and appropriate mitigation measures to be implemented into the project.

The revised 230-kV Route would result in impacts to one known site (CA-SDI-19492; see Table 3.5-4). However, site CA-SDI-19492 was incorporated into site CA-SDI-19490 and was tested during sub-surface investigations in 2010, and the site was determined not eligible for inclusion on the NRHP (EDAW, Inc. 2010a). Therefore, no impacts to cultural resources are anticipated to result from construction and operation of the revised 230-kV Route. There are two known sites within the alignment of the revised 500-kV Route (CA-SDI-19486 and CA-SDI-19489) and which have not been tested. A potential mitigation measure not proposed as an APM that would further minimize the potential for cultural resources impacts during construction is a sub-surface investigation of potential impacts to cultural resources in the revised 500-kV Route, if this route is selected for construction.

Construction of the well access road would also potentially result in impacts to an archaeological site. Subsurface testing at this site has been identified as a mitigation measure to reduce potential impacts to this site. With the implementation of this mitigation measure, impacts would be considered minor. The proposed construction water well access road would also represent a permanent change in the viewshed for motorists along the historically significant Old Highway 80 segment in this area. (The road would remain following the end of construction activity). However, this road would be very short and would be similar in design to other roadways off Old Highway 80 in the Jacumba area. Therefore, no impacts to the historic significance of Old Highway are indicated.

APMs intended to avoid potential impacts to cultural resources are listed in Section 2.7. A potential mitigation measure not proposed as an APM that would further minimize the potential for cultural resources impacts during construction is worker training of contractor personnel to ensure that construction workers are aware of the potential for archaeological discoveries during construction. To achieve its goals, the employee training session should be conducted by a qualified archaeologist and should include a description of the kinds of cultural resources that may be encountered during construction and the steps to be taken if such finds are unearthed.

Operation of a transmission line under either alternative would not involve ground disturbance; therefore, no impacts to cultural resources are anticipated during operation.

2.11.6 Noise

All of the action alternatives would introduce new sources of sound into a rural environment where sound is generated by wind and other natural sources, traffic on nearby roadways, occasional air traffic, and activities at a shooting range approximately 1 mile to the west. Average sound levels generally are below 50 dBA during daytime hours and below 40 dBA at night.

Under the 230-kV Route alternative (Alternative 2), construction of the double-circuit transmission line would result in minor temporary increases in ambient noise levels; however, construction would occur during the hours of the day allowed by the County of San Diego ordinance and, thus, would be consistent with the County's requirements. The nearest noise-sensitive receptor is a residence (unoccupied) located approximately 1,600 feet (490 m) west of the construction area. During construction, the sound level at this location would be approximately 60 dBA (CPUC/BLM 2008a; DOE 2004), which is well below the County's 75-dBA threshold for daytime construction noise impacts. Construction-related truck traffic along existing roadways would also generate increases in sound levels. However, because of the existing high traffic levels on Interstate-8, the increase in sound levels from trucks accessing the project in the vicinity of that roadway would not be perceptible. Construction and use of the groundwater well access road along Old Highway 80 would not result in noise impacts due to the location of this well relative to sensitive noise receptors, and the small land area that would be disturbed.

Once operational, increased sound levels from transmission lines are due primarily to corona discharge, which is a small electrical discharge along the wire that produces crackling and hissing sounds as well as small amounts of light. These discharges result from electrical energy passing over surface irregularities that occur along the transmission lines, such as scratches, nicks, dust, or water drops that can affect a conductor's electrical surface gradient. The resulting noise caused by corona discharge varies depending on conductor size and configuration. Minor temporary increases in ambient noise level caused by corona noise during infrequent foul weather events are anticipated during operation of the transmission line. A noise analysis conducted for the project determined that both of the possible configuration options for conductors on a 230-kV line would meet the County of San Diego's nighttime property line sound level limit of 45 dBA (the model results indicate a maximum 8.8 dBA at the property line for the 230-kV configuration options). Therefore, the impact of corona-generated sound during operation of the project would be minor, but would occur sporadically for the life of the project. No mitigation measures are indicated.

Under the 500-kV Route alternative (Alternative 3), construction impacts would be as described for the 230-kV Route. However, the corona effect increases with voltage, and analysis of potential corona noise determined that only two of the four possible configuration options for conductors on a 500-kV line would meet the County of San Diego's nighttime property line sound level limit of 45 dBA (the model results indicate a maximum 35.4 and 38.8 dBA at the property line for the two 500-kV configuration options that would meet the County's noise standard). ESJ has committed to choosing only those options which would meet the criterion; therefore, the level of corona-generated sound would be somewhat larger than described for the 230-kV Route, but would meet the county criteria. No additional mitigation measures are indicated.

The revised Routes under Alternative 4 are located slightly farther from the nearest sensitive receptor (an unoccupied mobile home). Impacts of sound generated by the corona effect would be the same for the revised 230-kV and 500-kV Routes as for Alternatives 2 and 3, respectively.

2.11.7 Transportation and Traffic

Construction of the transmission line under any of the alternatives would result in a minor temporary increase in traffic on local roadways, a minor potential for adverse impacts to traffic safety at the project's ingress/egress, and a short-term minor potential for roadway damage. These minor impacts would be avoided with the implementation of a traffic control plan, as required by the County of San Diego prior to issuance of a MUP for transmission line construction and prior to approval of construction or grading permits. ESJ is working with the County of San Diego to develop road improvements at the site entrance in accordance with the County's traffic safety design standards.

Construction of the groundwater well access road and use of Old Highway 80 to transport dust control water to the transmission line construction site would result in a minor temporary increase in traffic on Old Highway 80 through the community of Jacumba. This is considered a temporary and minor impact to transportation and traffic due to the small land area to be disturbed for access road constuction; the short-term nature of construction (both for the access road and the transmission lines); the low existing traffic volume along this segment of Old Highway 80; and the implementation of a construction traffic control plan.

Under all action alternatives, operation of the transmission line would result in a minor potential for adverse impacts to air traffic safety with U.S. Border Patrol's aircraft patrol along the U.S.-Mexico border and California Department of Forestry and Fire Protection (CAL FIRE) aerial fire-fighting efforts. Consultation with the U.S. Border Patrol and CAL FIRE prior to starting construction is a potential mitigation measure (not proposed by the applicant) that could minimize this impact.

Under all action alternatives, transport of wind turbine components for construction of the ESJ Wind project in Mexico could result in temporary impacts to U.S. roadways, including increased congestion, roadway damage and an increased potential for traffic accidents due to the increased number of oversized trucks traveling on major highways.

2.11.8 Public Health and Safety

There would be little potential to expose the public to hazardous materials or contaminated soil as a result of project construction for either the 230-kV Route or the 500-kV Route alternatives (or construction of the revised route alternatives [Alternatives 4A and 4B]). However, construction would require the routine transport, handling and onsite storage of petroleum products such as fuel and lubricating oil and hazardous materials such as paints, as well as waste products with these constituents. As described in Section 2.7, a Spill Prevention and Control Plan implemented as an APM would outline measures to prevent, control, and minimize impacts from a spill of petroleum substances, hazardous materials, or wastes during construction of the transmission lines and associated activities, including construction of the groundwater well access road. Construction materials that pose a potential contamination risk to storm water would be managed to minimize potential storm water contact. Solid and liquid waste would be reused and/or recycled to the extent practicable, or disposed of properly if deemed not reusable or recyclable. The small amounts of hazardous waste (primarily vehicle fuels and lubricants) that could be produced as byproducts of construction would be disposed of in accordance with local, state, and federal regulations. The hazardous materials would also be stored aboveground and in secondary containment to prevent offsite discharges. Portable sanitary facilities would be used by all construction personnel, would be located on non-paved areas, 50 feet (15 m) away from drain inlets, and would be serviced regularly.

No contaminated soils or potential areas of contamination have been identified in areas that would be disturbed by construction. However, a potential mitigation measure (not proposed by the applicant) to reduce the possibility of public exposure to previously unidentified contaminated soils is training of construction personnel to identify potential contamination prior to beginning work (e.g., through odor detection and visual observation of discolored soils or oil sheens) and testing any imported soil prior to using it as backfill.

During operation of the transmission line under both the 230-kV Route and 500-kV Route alternatives, there would be a minor potential for public exposure to induced currents and electrical field interference. To reduce the potential impact, ESJ would incorporate grounding features into the project design in accordance with industry design standards for electrical transmission structures. Maintenance workers and members of the public who are present in the immediate vicinity of the line would be temporarily exposed to the EMF generated by the transmission line, but because there are no public trails, recreational areas, or other developments to cause visitors to linger near the line, there would be little public exposure to EMF. EMF levels would be higher for the 500-kV Route alternative than for the 230-kV Route alternative because electric fields increase in strength as voltage increases. At the nearest residence (an unoccupied mobile home about 1,600 feet [490 m] west of the 230-kV Route and about 2,000 feet [610 m] west of the 500-kV Route), EMF levels from the line under either alternative would be below typical household levels. EMF levels from the line under the revised route alternatives (Alternatives 4A and 4B) would be slightly less than under Alternatives 2 and 3 due to the shift in the alignment to the east, which would place the transmission line farther from residences.

DOE considered the potential for impacts from intentionally destructive acts. The aboveground electrical transmission lines and supporting structures would be located within an unfenced utility right-of-way and would, therefore, be accessible to those desiring to damage the system. The transmission line support structures would be constructed on footings in the ground and would be difficult to dislodge. In general, the proposed transmission line would present no greater target for intentional destructive acts than any other high-voltage transmission line in the U.S. Past experience along the thousands of miles of electrical transmission lines in the country suggests that intentional destructive acts against the proposed structures would be unlikely. If such an act were to occur and succeed in destroying towers or other project-related equipment, the main consequence for the public would be disruption of electrical service.

2.11.9 Fire and Fuel Management

All of the action alternatives would result in major increases in wildfire hazards during construction and operation of the transmission line. Factors leading to increased wildfire hazard would include introduction of new ignition sources; potential introduction of invasive nonnative plants that can change wildfire frequency, timing, and spread; and creation of a potential obstacle to firefighting. Impacts from operation of the transmission line would be reduced to some extent by the implementation of an APM, the project’s Fire Protection Plan (Hunt Research Corporation 2009). The Fire Protection Plan (developed in coordination with the San Diego Rural Fire Protection District) specifies measures to prevent fires caused by operation of the transmission line. For example, to reduce potential fuel, there would be no revegetation of the right-of-way.

Potential mitigation measures in addition to the APM described above that would further reduce potential fire impacts are:

- Development and implementation of a Construction Fire Prevention Plan specifying measures to be implemented during project construction. (The applicant has agreed to this measure as a result of their discussions with the Rural Fire Protection District).
- Coordination of ESJ activities with emergency fire suppression activities. To help minimize impacts on fire-fighting ability associated with construction and operation of

the transmission line, ESJ could coordinate fire suppression activities with appropriate fire agencies, and implement routine maintenance and inspections of the towers and conductors to remove any potential fire hazards.

- Removal of hazards (brush and dead or decaying vegetation) from work areas prior to starting construction or maintenance work.

Another potential mitigation measure, noted above in Section 2.11.1, is the development and implementation of a weed control plan to minimize the potential for weed introduction during construction, and to address post-construction maintenance and weed control procedures during the operational life of the project. Construction and use of the groundwater well access road along Old Highway 80 would result in minor potential for ignitions and introduction of non-native invasive species. Implementation of the mitigation measures above, as well as the short-term nature of construction; the availability of water at the groundwater well site; and the close proximity of the water well to existing fire fighting services in Jacumba would ensure impacts are minor.

Impacts could occur in the U.S. due to activities associated with the ESJ Wind project if a wildfire were to originate in Mexico and travel north across the U.S.-Mexico border. This situation could result from an incident associated with the ESJ Wind project transmission lines in the vicinity of the border (similar to the operational risks identified for the ESJ transmission line), or as a result of a fire that originates in the wind turbine development area. Wind turbine fire protection systems including low-flammability materials, maintenance, training, and automatic detection, as well as nacelle suppression and warning systems are currently available and widely used in wind turbines. It is not known whether the ESJ Wind project plans to incorporate these or other specific fire prevention and control measures. DOE reviewed a partial translation of the Mexican MIA permit. The permit requires a Fire Protection Plan to be prepared prior to construction in coordination with relevant agencies. The purpose of the plan would be to evaluate the likelihood of fire sources, identify preventive measures, and develop site-specific action plans in the event of a fire in the ESJ Wind project area. Burning is not permitted for land clearing.

2.11.10 Air Quality and Climate Change

Under all action alternatives, construction of the transmission line would result in minor increases in several criteria pollutants or their precursors (reactive organic gases that contribute to ozone formation; carbon monoxide; nitrogen oxides; sulfur oxides; and particulate matter [PM_{10}] due to fugitive dust) and greenhouse gases. Most of San Diego County is currently designated a federal attainment or unclassifiable area for all criteria pollutants except ozone (8-hour), for which the project area is classified as nonattainment. With regard to state criteria, the project area is currently classified as a “serious” ozone nonattainment area and a nonattainment area for particulates measured as PM_{10} and $PM_{2.5}$. Maximum construction emissions of criteria pollutants are estimated to be well below applicable thresholds, including general conformity thresholds. The temporary increase in fugitive dust from construction activity would be minimized by complying with the San Diego Air Pollution Control District’s Rule 55 – Fugitive Dust Control. This rule requires development and implementation of a Dust Control Plan. The Plan would specify several dust control measures including: use of water or non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas with sufficient frequency to maintain an effective level of soil moisture or cohesion; suspension of construction grading on days when the wind gusts exceed 25 mph (40 kilometers per hour [kph]); use of rattle plates (grizzlies) to minimize mud and dust from being transported onto paved roadway surfaces from dirt or gravel roads; covering all trucks hauling soil and other loose material; limiting vehicle speeds to 15 mph (24 kph) on unpaved roads; street sweeping and vehicle washing; and covering or stabilizing exposed stockpiles. The Dust Control Plan would emphasize water conservation by limiting water application strictly to necessary quantities. Construction and use of the groundwater well access road along Old Highway 80 would not result in air quality impacts due to the small land area that would be disturbed and the short-term nature of road construction. The water obtained from the well would be used for dust control at the transmision line construction site, and would also be available for use at the water well access road construction site itself. Because it would transmit electricity from wind turbines, operation of the transmission line would potentially result in a long-term reduction of greenhouse gas emissions. This electricity transmission would aid in reducing the need to generate electricity within the U.S. using fossil fuel, which could indirectly lead to reduced emissions from fossil fuel-fired power plants.

The minor impacts from air emissions during construction and operation could be further minimized by implementing additional potential mitigation measures (not identified by the applicant); these potential mitigations include: using low-emission construction equipment, minimizing vehicle idling, and encouraging carpooling among construction personnel.

2.11.11 Water Resources

Water resources impacts would be the same for all action alternatives. Construction of the proposed transmission line would result in temporary minor impacts to groundwater supply due to use of groundwater for dust abatement, cleaning construction equipment, and concrete production for tower foundations. Because the total water requirement of 2.4 acre-feet (2,950 cubic m) would be less than 0.1 percent of the estimated annual groundwater recharge of 2,700 acre-feet/year (3.3 million cubic m/year), project water use would not impact the locally available water supply. Since water resources are generally scarce in the project area, this short-term minor impact could be further reduced by the potential mitigation measure (not identified by the applicant) of preferentially selecting non-potable water sources for project-related uses to the extent practicable.

The applicant proposes to obtain water for dust control from an existing non-potable groundwater well (JCSD Well #6). The County of San Diego analyzed the potential use of groundwater on the project area and regional groundwater resources in accordance with the County's guidelines. The results of that analysis are provided in a March 4, 2010, memorandum from the County Groundwater Geologist to the County Project Planner (Bennett 2010; provided in Appendix B). According to the County of San Diego's groundwater analysis, the use of this well for construction dust control would not impair the local or regional groundwater resources (Bennett 2010).

Surface water resources in the vicinity of the corridors consist of ephemeral creeks and washes that flow only in response to rainfall events. Onsite investigations identified three minor ephemeral drainage features in the area of the alternative corridors. Land disturbance for the project would have minimal impact on surface water flows in and near the right-of-way.

An APM that would contribute to minimizing the potential water quality impacts of construction is the implementation of the SWMP that ESJ has prepared for the project. The SWMP is designed to manage the quality of stormwater runoff from the land disturbance activities associated with the project in accordance with the requirements of the Clean Water Act (CWA) and County of San Diego's guidelines. The BMPs outlined in the SWMP would be implemented prior to commencement of field construction activities. BMPs would be maintained during and after construction and until final stabilization of the soil is accomplished at the site. Specific measures included in the SWMP are described in Section 2.7. A final site cleanup and inspection would be conducted by ESJ, in coordination with local agencies, at the completion of construction. Post-construction erosion and sediment control BMPs, as well as final soil stabilization and cleanup BMPs, would be implemented.

No impacts to surface water or groundwater are anticipated during the operation of the transmission line.

2.11.12 Geology and Soils

Under all action alternatives construction of the transmission line and associated facilities, including the proposed groundwater well access road adjacent to Old Highway 80, would result in a minor temporary increase in soil disturbance and erosion, which would be minimized by implementation of the project's SWMP. There is a potential for erosion impacts after completion of construction due to improperly controlled site runoff; these impacts would be minor provided that the control measures outlined in the SWMP are left in place, inspected, and maintained until final stabilization has occurred. The potential for soil erosion could be further reduced by limiting modifications to the access road to the extent practical in areas that are sensitive to disturbance and that have a high erosion potential. This additional potential mitigation measure (not identified by the applicant) would reduce potential erosion both during and after construction.

Onsite soils have a high potential to corrode steel, but potential impacts of corrosion on operation of the transmission line would be largely avoided by not placing uncoated steel in contact with onsite soils and by a proposed inspection, maintenance, and repair program that would be planned to identify and remedy corrosion problems before they result in a structural failure. During operations there would a minor potential for structure failure/damage of project facilities due to seismic ground-shaking from earthquakes associated with one of the major faults in the region (such as the magnitude 7.2 earthquake that occurred on a fault located 54 miles [87 km] southeast of the corridor on April 4, 2010). Although such seismically induced groundshaking could damage project facilities, the overhead transmission lines and their support structures would be designed for dynamic loading under variable wind conditions that exceed earthquake loads. This design feature minimizes the potential for seismically-induced groundshaking to cause significant damage. No impacts related to soil liquefaction are anticipated. No impacts related to slope instability are anticipated.

2.11.13 Socioeconomics

Under all action alternatives, construction of the transmission line and associated facilities, including the proposed groundwater well access road adjacent to Old Highway 80, would result in minor temporary beneficial impacts to local businesses through increased expenditure of wages for goods and services. During operation of the transmission line, minor short-term adverse impacts to property values due to visual impacts are anticipated. Research indicates that while there is some evidence that overhead transmission lines have the potential to reduce the value of nearby property, any effects are usually smaller than anticipated and difficult to quantify due to the individuality of properties/neighborhoods, differences in personal preferences of individual buyers/sellers, and the weight of other factors that contribute to a person's decision to purchase a property (CPUC/BLM 2008b). Other factors (e.g., neighborhood factors, square footage, size of lot, irrigation potential) are more likely than overhead transmission lines to be major determinants of the sales price of property (Knoll and Priestly 1992; CPUC/BLM 2008b). There is insufficient evidence to determine the likely impact of transmission lines on tourism, but any impact from the proposed transmission lines would likely be short-term and minor. No mitigation measures are indicated.

2.11.14 Environmental Justice

No disproportionately high or adverse impacts to low-income or minority populations are anticipated under any of the alternatives. More than 50 percent of the residents in the areas surrounding the alternative corridors are classified as minorities, indicating the presence of a minority population. In addition, the poverty level in some areas surrounding the alternative corridors is greater than in the county as a whole, indicating the presence of a low-income population.

Construction and operation of the proposed transmission line would not expose the minority or low-income population to disproportionately high and adverse impacts. These activities would not result in major adverse health and safety, air quality, noise, socioeconomic, or other impacts on local communities. The distance between the right-of-way and the nearest residents (2 miles to the nearest occupied residence) means that the identified minor impacts would not disproportionately affect nearby minority populations in comparison to the general public. Additionally, no information suggests that there are differential patterns of consumption of natural resources that would cause minority or low-income populations to experience substantially different impacts than the general population. Therefore, there is no potential for the operation of the transmission line to cause disproportionately high or adverse impacts to minority or low-income populations in comparison to the general population. No mitigation measures are indicated.

2.11.15 Services and Utilities

Under all action alternatives, construction of the transmission line and associated facilities, including the proposed groundwater well access road adjacent to Old Highway 80, would result in temporary minor increased demand for solid waste utilities and for law enforcement at the U.S.-Mexico border. The temporary minor increased demand for solid waste utilities during construction would be minimized by complying with the County of San Diego construction and demolition debris ordinance. The effect of increased demand for border law enforcement could be minimized by the additional mitigation measure of coordinating with the U.S. Border Patrol and local law enforcement to ensure the construction site is secure and to identify site-specific security measures.

A permit is required from the International Boundary and Water Commission (IBWC) before construction commences. The IBWC will review project component locations in relation to the international boundary and the monuments, and all structures must be off-set from the international boundary by a minimum of 3 feet and allow a clear line-of-sight between any affected monuments.

Operation of the transmission line would not result in added population; therefore, it would not result in an increased demand for public services or utilities. See Section 3.9 (Fire and Fuels Management) for information on increased demand for fire protection.

2.12 DOE'S PREFERRED ALTERNATIVE

In accordance with 40 CFR 1502.14, and based on the analysis of alternatives, DOE has identified the preferred alternative as the revised 230-kV transmission line on lattice towers, Alternative 4A, because (1) in either location, the 230-kV route results in less permanent physical disturbance than the 500-kV route options (see Tables 2-1 and 2-2); and (2) the revised route would is more practical than Alternative 2 because it would align with the revised ECO Substation site. (As discussed in Section 2.9, SDG&E has proposed an "ECO Substation Alternative" that was shifted about 700 feet [213 m] east of the originally proposed ECO Substation location. The purpose of the revised substation location is to avoid potential impacts to cultural resources. ESJ's revised 230-kV route would conform to the revised ECO Substation location, as shown in Figure 2-1b.)

Table 2-4
Summary of Impacts by Resource Area

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Biological Resources	No impacts to habitat/vegetation, sensitive species or breeding birds would occur	Permanent removal of up to 9.78 acres of Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub habitat/vegetation (would be offset by conservation easement) Potential for long-term major impacts to habitat in the event of a fire Minor temporary disturbances to wildlife and breeding birds during construction (noise and traffic increases) Minor potential for introduction of non-native invasive species during construction Potential for avian collisions Minor beneficial impact to raptors (potential for roosting on structures)	Permanent removal of up to 10.83 acres of Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub habitat/vegetation (offset by conservation easement) All other impacts would be the same as described for the 230-kV Route	Permanent removal of up to 9.78 acres of Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub habitat/vegetation (would be offset by conservation easement) All other impacts would be the same as described for Alternative 2 (230-kV Route)	Permanent removal of up to 10.83 acres of Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub habitat/vegetation (offset by conservation easement) All other impacts would be the same as described for Alternative 3 (500-kV Route)	Worker training Measures to prevent wildlife entrapment Weed Control Plan Habitat replacement at groundwater well access site

[23] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table 2-4
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Visual Resources	No impacts to visual resources would occur	Permanent moderate to major adverse impacts due to land scarring from excavation Temporary moderate adverse impacts due to views of construction equipment and activity Moderate long-term adverse impacts to visual resources during operation of transmission line Wind turbines constructed in Mexico as part of the EJS Wind project, including any associated safety lighting, would be visible from several viewing points in the U.S.	Impacts would be essentially the same as described for Alternative 2 (230-kV Route) except that there would be potential for larger land scar and monopoles, if erected, would be slightly more visible	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 3 (500-kV Route)	Reduce color contrast and views of land scars Reduce visual contrast of towers and conductors
Land Use	No impacts to land use would occur	No adverse impacts are anticipated	No adverse impacts are anticipated	No adverse impacts are anticipated	No adverse impacts are anticipated	None indicated

[23] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table 2-4
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Recreation	No impacts to recreation would occur	Minor temporary indirect impacts during construction from increased traffic Minor long-term indirect impacts during operation from changes to views from recreational areas	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated
Cultural Resources	No impacts to cultural resources would occur	No adverse impacts to known cultural resources along alignment are anticipated Potential for adverse impacts to archaeological site along well access road Minor potential for impacts to unknown cultural resources	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Worker training to reduce potential for impacts to unknown cultural resources Subsurface investigation of cultural resources at the groundwater well access site, and at the revised 500-kV route (if constructed)

[23] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table 2-4
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Noise	No changes in the noise environment	Minor temporary increases in ambient noise levels during construction (about 60 dBA at the nearest dwelling unit) but below County of San Diego thresholds Minor temporary increases in ambient noise level during operation, caused by corona noise during foul weather but below County of San Diego thresholds (45 dBA at the property line)	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated

[23] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table 2-4
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Transportation and Traffic	No impacts to transportation and traffic would occur	Minor temporary increase in traffic on local roadways during construction Minor potential for adverse impacts to traffic safety at ingress/egress during construction Short-term minor potential for roadway damage during construction Long-term minor potential for adverse impacts to air traffic safety during operation Temporary impacts to U.S. roadways from increased oversized trucks traffic to transport wind turbines for ESJ Wind project in Mexico	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Consult with and inform U.S. Border Patrol and CAL FIRE to avoid adverse impacts to air traffic safety for their activities

[23] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table 2-4
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Public Health and Safety	No impacts to public health and safety would occur	Minor long-term potential for public exposure to induced currents and electrical field interference during operation	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated for public exposure to induced currents and electrical field interference Evaluate unanticipated contamination sites to prevent exposure to contaminated soils during construction Sample imported backfill soil to ensure it is free of contamination

23 Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table 2-4
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Fire and Fuels Management	No impacts to fire and fuels management would occur	Major temporary increase in fire hazards during construction Major permanent increase in unavoidable ignition source and fire hazards during operation Major permanent adverse impacts to fire-fighting ability during operation Minor potential for introduction of non-native invasive species during construction or during long-term in the fuel management control areas Some potential for impacts in the U.S. due to the ESJ Wind project if a wildfire orginating in Mexico were to spread across the U.S.-Mexico border	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Develop and implement Construction Fire Prevention Plan Coordinate with emergency fire suppression activities Remove hazards from work area Weed Control Plan

23 Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table 2-4
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Air Quality and Climate Change	No impacts to air quality or climate change would occur	Minor temporary increase in criteria pollutants (reactive organic gases, carbon monoxide, nitrogen oxides, sulfur oxides, and fugitive dust) and greenhouse gases during construction Minor short-term increase in criteria pollutants during operation Potential long-term reduction in greenhouse gas emissions during operation (beneficial)	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Use low-emission construction equipment Minimize vehicle idling Encourage carpooling
Water Resources	No impacts to water resources would occur	Temporary minor impacts to water supply due to water use during construction	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Use non-potable water

[23] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table 2-4
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Geology and Soils	No impacts to geology and soils would occur	Minor temporary increase in soil disturbance and erosion during construction Minor long-term potential for erosion during operation Minor long-term potential for adverse impacts to structures due to corrosive soils Minor long-term potential for structure failure/damage due to seismic ground-shaking	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Limit modifications of access road in areas which are very sensitive to disturbance
Socioeconomics	No socioeconomic impacts would occur	Minor temporary beneficial impacts to local businesses during construction Minor long-term beneficial impacts to county revenue (property taxes) Minor short-term adverse impacts to property values due to visual impacts	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated

[23] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

Table 2-4
Summary of Impacts by Resource Area, continued

Resource Area	Alternative 1 No Action	Alternative 2 Double-Circuit 230-kV Route	Alternative 3 Single-Circuit 500-kV Route	Alternative 4A Revised Double-Circuit 230-kV Route	Alternative 4B Revised Single-Circuit 500-kV Route	Potential Mitigation Measures[23]
Environmental Justice	No changes in impacts to low-income or minority populations would occur	No disproportionately high or adverse impacts to low-income or minority populations are anticipated	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	None indicated
Services and Utilities	No impacts to services and utilities would occur	Temporary minor increased demand for law enforcement services during construction Temporary minor increased demand for solid waste utilities during construction	Impacts would be the same as described for the 230-kV Route	Impacts would be the same as described for Alternative 2 (230-kV Route)	Impacts would be the same as described for Alternative 2 (230-kV Route)	Coordinate with local enforcement agencies and secure construction site

[23] Applicant-proposed measures are considered part of the project description and are accounted for in the analysis of potential impacts within each resource area. Potential mitigation measures are additional measures not identified by the applicant that could further reduce or avoid potential impacts. ESJ has indicated that they are in agreement with the additional potential mitigation measures identified in this EIS (April 6, 2012 correspondence from ESJ to DOE); accordingly, DOE understands that the applicant would agree to inclusion of these measures in the Presidential permit, should the permit be issued.

SECTION 3

AFFECTED ENVIRONMENT, IMPACTS, AND MITIGATION

This section provides a discussion of the potential environmental effects of implementing the ESJ U.S. Transmission Line project. The section is organized by environmental resource area (Sections 3.1 through 3.16). Each resource area section also includes a discussion of potential impacts in the U.S. due to related activities in Mexico associated with the ESJ Wind project. Where applicable, potential mitigation measures are indicated to avoid or reduce identified potential impacts.

Available information and reports are used in preparation of the impact assessment presented in this EIS. Information sources include project description information provided in Section 2 (Proposed Action and Alternatives), including measures proposed by ESJ to avoid or reduce impacts); and previous environmental documents including the Sunrise Powerlink Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) prepared jointly by the California Public Utilities Commission (CPUC) and the U.S. Bureau of Land Management (BLM) (CPUC/BLM 2008b). The ESJ U.S. Transmission Line project was analyzed in the RDEIR/SDEIS as a connected action to the Sunrise Powerlink project and was adopted as part of the Final EIR/EIS in October 2008. The BLM issued a ROD for the project in January 2009.[1] The U.S. Forest Service issued a ROD for that project in July 2010 to allow construction through 19 miles (30.6 km) of the Cleveland National Forest.[2] The RDEIR/SDEIS was reviewed and it was determined that much of the impact assessment presented in it regarding the ESJ U.S. Transmission Line project is still relevant. Therefore, throughout this assessment, certain portions of the RDEIR/SDEIS are summarized and incorporated by reference.

The impact assessment presented in this EIS was developed based on independent analyses of the above documents, site visits by various specialists, and additional research to update and confirm previous studies. DOE also reviewed translations of relevant portions of the Mexican permit and the Mexican evaluation of the environmental impacts for the ESJ Wind Project and incorporated relevant information in this EIS.

Impacts related to the connected actions are discussed in Section 4.0.

[1] The BLM ROD for the Sunrise Powerlink Project can be found at the following website: http://www.cpuc.ca.gov/environment/info/aspen/sunrise/rod.pdf

[2] The USFS ROD for the Sunrise Powerlink Project can be found at the following website: http://www.fs.fed.us/r5/cleveland/projects/sunrise-powerlink/fs-rod-july-09-2010.pdf

Cumulative impacts are discussed in Section 5.0. Irretrievable commitments of resources and the relationship between short-term uses and long-term productivity are discussed in Sections 6.0 and 7.0, respectively. Applicable federal laws and regulations are listed in Section 8.0.

3.0 LEVELS OF SIGNIFICANCE

The potential environmental consequences of implementing the ESJ U.S. Transmission Line project would vary in duration among the environmental resource areas analyzed. Four levels of impact duration are considered: temporary, short-term, long-term, and permanent. An impact is considered temporary if the impact would generally occur during construction, with the resource returning to preconstruction conditions almost immediately afterward. An impact is considered short-term if the impact would last beyond the end of construction, generally from two to five years depending on the resource. An impact is considered long-term if the impact would last for the life of the project but the resource would recover following decommissioning and removal of the project components. An impact is considered permanent if it would continue indefinitely.

Quantitative thresholds are applied, where appropriate, to evaluate the significance of impacts (for example, quantitative thresholds are commonly used in the areas of noise and air quality). When quantitative measures are not available, the context and intensity of impacts are addressed qualitatively. In either case, the basis for the impact analysis is provided in the context of the individual resource areas.

DOE is aware that the County of San Diego, which is a cooperating agency in this EIS, has adopted standardized assessment protocols (County of San Diego 2011a; available online at: http://www.sdcounty.ca.gov/dplu/procguid.html) that sometimes differ from DOE’s approach to impact assessment under NEPA. DOE reviewed the County's Guidelines for Determining Significance for each applicable resource and confirmed that there are no material differences in the impact assessment methods of the county that would lead to different conclusions. Additional discussion of county guidance is provided, as appropriate, in the methodology subsection of each resource section. A summary of unavoidable adverse impacts is provided in Section 3.16 following the analyses of individual resources.

3.1 BIOLOGICAL RESOURCES

This section provides an assessment of the potential impacts of the project alternatives on biological resources including vegetation communities, special-status plant and wildlife species, sensitive natural communities and habitat, wetlands, and wildlife movement corridors either known to occur or potentially occurring along the alternative corridors or in the vicinity of the corridors. For the purposes of this analysis, plant species were considered special-status (or rare) if they are:

1. Listed or proposed for listing as threatened or endangered under the federal Endangered Species Act or the California Endangered Species Act (CDFG 2010a);

2. Included on List 1B (considered endangered throughout its range) or List 2 (considered endangered in California but more common elsewhere) of the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California (CNPS 2009); or

3. Considered rare, endangered, or threatened or sensitive by the County of San Diego (County of San Diego 2010a).

In addition, noteworthy plant species are considered to be those on List 3 (more information about the plant distribution and rarity needed) and List 4 (plants of limited distribution) of the CNPS Inventory.

Wildlife species were considered special-status if they are:

1. Listed or proposed for listing under the federal Endangered Species Act or California Endangered Species Act (CDFG 2010a);

2. Protected under the federal Migratory Bird Treaty Act (MBTA) or Bald and Golden Eagle Protection Act (BGEPA);

3. Designated as a Species of Special Concern, Watch List, Specially Protected Mammal, or a California Fully Protected species by CDFG; or

4. Included on the County of San Diego's Group 1 or 2 lists of sensitive animal species[3] (County of San Diego 2010a).

3.1.1 Affected Environment

The information provided in the following sections is based upon biological surveys conducted along and in the vicinity of the alternative corridors and the main access road during 2008 and 2009 by Ecology & Environment, Rocks Biological Consulting and EDAW, Inc., and the

[3] Group 1 animals are species with a high level of sensitivity, either because they are threatened or endangered or because they have very specific natural history requirements that must be met. Group 2 animals are species that are becoming less common but are not yet so rare that extirpation or extinction is imminent without immediate action.

summary report of the findings of those surveys prepared by EDAW, Inc. (EDAW, Inc. 2010b). As required by County of San Diego Guidelines in effect at the time of the survey (2008), the combined biological survey areas included the disturbance footprints of transmission line Alternative routes 2, 3, 4A and 4B; the 100-foot (30.5-m) buffer surrounding the transmission line route alternatives; the access route alternative disturbance footprints; and the 100-foot buffers surrounding the access routes (EDAW 2010b). Alternatives 2 and 4A (230 kV design) would be constructed within a 130-foot wide right-of-way; Alternatives 3 and 4B (500 kV design) would be constructed within a 214-foot wide right-of-way. Permanent construction impacts would be limited to a 28-foot wide property access road (within a 40-foot easement) a vehicle turnaround, a 12-foot wide access road and three to five tower bases.

Ecology & Environment and Rocks Biological Consulting conducted special-status plant and wildlife surveys and habitat assessments of the survey area in 2008 and 2009 (RBC 2008 and 2009; E&E 2009b). The surveys conducted by Rocks Biological Consulting included protocol-level surveys for the federally-listed endangered Quino checkerspot butterfly (*Euphydryas editha quino*). To confirm the assessment conducted by Ecology & Environment, EDAW, Inc. conducted additional wildlife surveys in 2009. The results of these studies are summarized below. Appendix C.1 presents additional details on the study methods and the results of the surveys. Cardno ENTRIX biologists (as DOE’s third-party contractor for the preparation of this EIS) inspected the survey area to verify EDAW, Inc.’s findings.

Other data sources used in the preparation of this section to obtain information regarding biological resources along the alternative corridors and regionally (i.e., southeastern San Diego County) included the California Natural Diversity Database (CNDDB), CNPS database, California Wildlife Habitat Relationships (CWHR) System database, and information provided by the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), U.S. Bureau of Land Management (BLM), and County of San Diego DPLU. DOE, in compliance with its responsibilities under Section 7 of the Endangered Species Act, requested and received from the USFWS a list of federally-listed, proposed, and candidate species that may occur in the vicinity of the project.

3.1.1.1 Regional Setting

The alternative corridors are within the area covered by County of San Diego’s proposed East County Multiple Species Conservation Program (Conservation Program), which is currently in development (County of San Diego 2009a). The Conservation Program, as proposed, would cover nearly 1.6 million acres (648,000 hectares [ha]) of unincorporated communities that make up the eastern portion of the county. The Conservation Program currently proposes to cover up to 254 species. As of October 2009, the DPLU is considering entering into a joint Planning Agreement with the USFWS for both the North and East County subarea plans under the Natural Community Conservation Program (NCCP). Based on a draft map of the Conservation Program, the alternative corridors are located in an “Agriculture or Natural Upland” area, which is outside of a Focused Conservation Area of the plan (County of San Diego 2008).

The BLM owns two tracts of land within close proximity of the alternative corridors: Jacumba National Cooperative Land and Wildlife Management Area to the north, and the 31,237-acre (12,640-ha) Jacumba Wilderness about 2 miles (3.2 km) to the east. Approximately 3 miles (4.8 km) to the north is the southern boundary of Anza Borrego State Park, which at

600,000 acres (243,000 ha) is the largest state park in California. These lands preserve a significant amount of desert habitat in eastern San Diego County, providing forage, cover, water resources, and travel routes and linkage corridors for resident and transitory wildlife. In addition, two County of San Diego parks, In-Ko-Pah and Mountain Springs, lie within close proximity, along the southeastern boundary of the Anza Borrego (Figure 3.1-1).

3.1.1.2 Project Setting

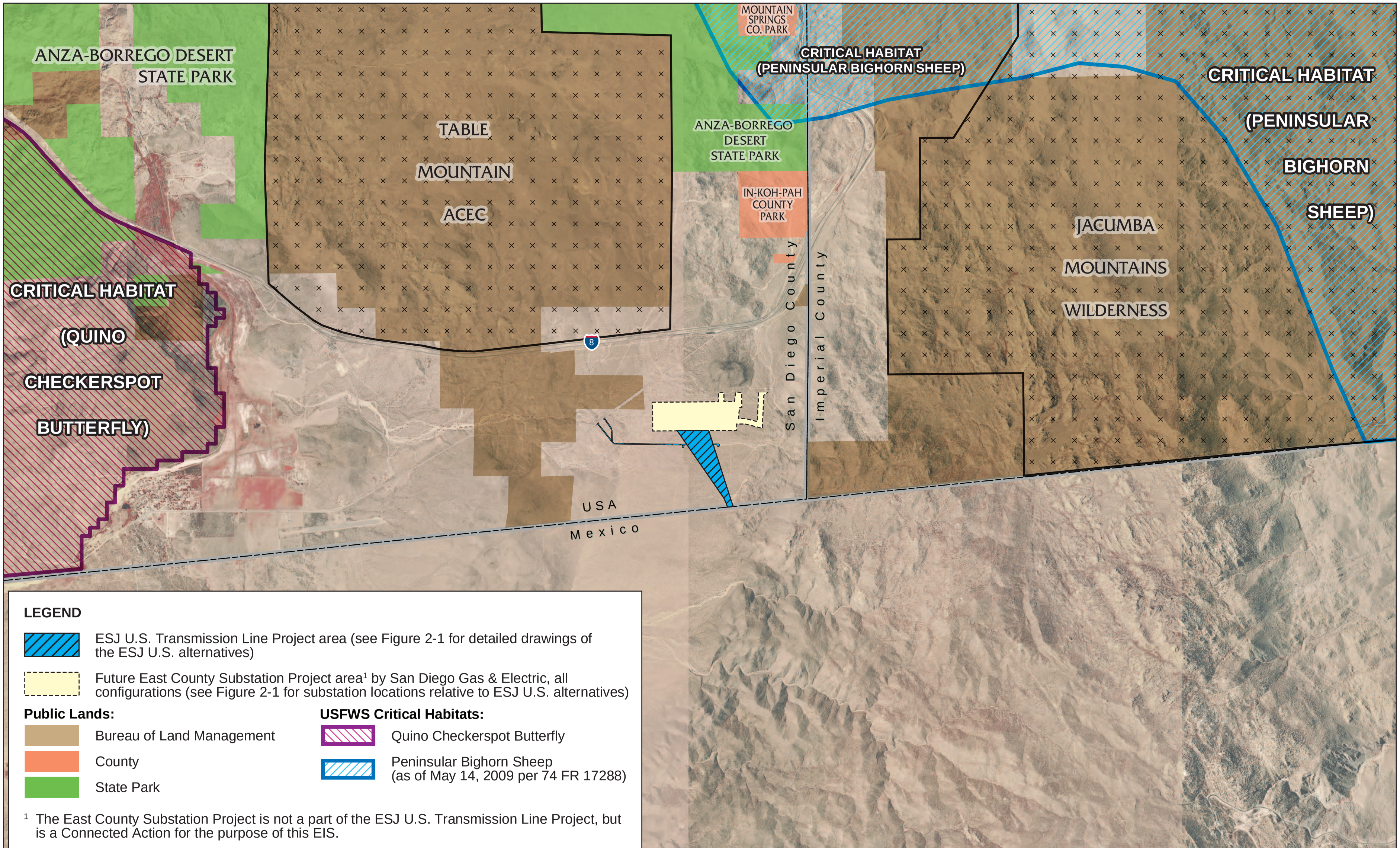
The alternative corridors lie within the Jacumba mountain range in the southeastern corner of San Diego County, adjacent to the U.S.-Mexico international border (Figure 3.1-1). The range is characterized by granite ridges, separated by scrubby desert-like valleys. The elevation descends from west to east towards the Sonoran Desert. The corridors are at an elevation of approximately 3,300 to 3,400 feet (1,005 to 1,036 meters [m]) above mean sea level, with a gentle slope from east to west. This high-elevation, desert-like environment, is generally warmer than coastal areas to the west, but cooler than lower deserts to the east.

The land in the vicinity of the alternative corridors supports Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub. Species within the survey area include creosote bush (*Larrea tridentata*), jojoba (*Simmondsia chinensis*), lotebush (*Ziziphus parryi*), ephedra (*Ephedra californica*), yucca (*Yucca schidigera*), Gander's cholla (*Cylindropuntia gander*), and California juniper (Juniperus californica). These species uniformly covered the survey area. Annuals are more common in the southern portion of the site and include common goldfields (*Lasthenia gracilis*), filaree (*Erodium cicutarium*), wild heliotrope (*Phacelia distans*), hydra stick-leaf (*Mentzelia affinis*), and Rancher's fiddleneck (*Amsinckia menziesii* var. *intermedia*). Two sensitive vegetation communities, Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub, occur within and adjacent to the alternative corridors (EDAW Inc. 2010b).

Although the alternative corridors are within a relatively undeveloped area in the extreme southeastern portion of the county, existing linear development features including I-8 and Old Highway 80 to the north, and the U.S.-Mexico international border fence to the south, have the potential to inhibit the north-south movement of terrestrial wildlife species through the area. However, there are suitable, unconstrained open space areas to the east and west of the alternative corridors that provide local and regional travel routes and linkage corridors for resident and transitory wildlife through the area.

3.1.1.3 Habitat Types/Vegetation Communities

As stated above, there are two vegetation communities in the survey area: Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub. In addition to these vegetation communities, disturbed habitat characterizes the dirt roads and immediate adjoining areas. The biological study area is depicted in Figure 3.1-2a (Alternatives 2 and 3) and Figure 3.1-2b (Alternatives 4A and 4B). The vegetation communities and disturbed areas are described below, summarized in Table 3.1-1 and depicted in Figure 3.1-3a (Alternatives 2 and 3) and Figure 3.1-3b (Alternatives 4A and 4B).



LEGEND

ESJ U.S. Transmission Line Project area (see Figure 2-1 for detailed drawings of the ESJ U.S. alternatives)

Future East County Substation Project area[1] by San Diego Gas & Electric, all configurations (see Figure 2-1 for substation locations relative to ESJ U.S. alternatives)

Public Lands:
- Bureau of Land Management
- County
- State Park

USFWS Critical Habitats:
- Quino Checkerspot Butterfly
- Peninsular Bighorn Sheep (as of May 14, 2009 per 74 FR 17288)

[1] The East County Substation Project is not a part of the ESJ U.S. Transmission Line Project, but is a Connected Action for the purpose of this EIS.

0 2,000 4,000 6,000 8,000 Feet
0 600 1,200 1,800 2,400 Meters

Source(s):
BLM 2011c; SanGIS 2011; USFWS 2009a, 2009c; Base image adapted from EDAW 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.1-1

DESIGNATED CRITICAL HABITAT AND REGIONAL CONSERVATION AREAS

May 2012

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_1-1_CriticalHabitatRegionalConservationLands_11x8_v5.ai (04/05/2012, 04:20 pm) R. Wurgler/T. Murphy

Sonoran Mixed Woody Scrub (Holland Code 33210)

Sonoran Mixed Woody Scrub is characterized by a mixture of three or more woody species. Characteristic species include creosote bush, burro weed (*Ambrosia dumosa*), and brittlebush (*Encelia farinosa*). The community typically occurs on rocky, well-drained slopes and alluvial fans, often at the base of mountains. This vegetation community is classified by CDFG as a "vulnerable" natural plant community (CDFG 2010b). In addition, Sonoran Mixed Woody Scrub is listed by the County of San Diego as sensitive or naturalized habitat that would warrant mitigation if affected by project activities (County of San Diego 2010a).

Table 3.1-1
Vegetation Communities and Habitat Types

Vegetation Communities and Cover Types (Holland Code[1])	Focused Survey Area[2] (Acres)	500-kV Route (Acres)	230-kV Route (Acres)	100-foot Buffer to Transmission Line Route Corridors (Acres)	Property Access Route Option A (Acres)	Property Access Route Option B (Acres)	100-foot Buffer to Property Access Road (Acres)
Sonoran mixed woody scrub	46.38	6.07	5.06	32.48	0.55	1.14	2.77
Peninsular Juniper Woodland and Scrub	14.85	–	–	–	2.29	2.60	12.29
Disturbed	3.97	0.16	0.12	1.82	1.56	0.80	1.15
Total =	**65.20**	**6.23**	**5.18**	**34.30**	**4.40**	**4.54**	**16.21**

[1] Based on Holland (1986) and Oberbauer (1996) as revised by the County of San Diego (2010a).

[2] The survey area includes the 500-kV and 230-kV transmission line corridors, main access road, and the County-required 100-foot-wide buffer surrounding the perimeter of those areas. The survey area acreage is smaller than the sum of the component parts of Table 3.1-1, due to an approximately 0.48-acre (0.19 ha) overlap of features associated with the 500-kV and 230-kV transmission line corridors.

Source: EDAW, Inc. 2010b

Approximately 71 percent of the survey area (46.38 acres [18.77 ha]) is covered by Sonoran Mixed Woody Scrub, including 5.06 acres (2.05 ha) along the 500-kV Route and 6.07 acres (2.46 ha) along the 230-kV Route. This community is also present along both options for the property access road (Figure 3.1-4a [Alternatives 2 and 3] and Figure 3.1-4b [Alternatives 4A and 4B]). Along the corridors, this community is characterized by 15 to 75 percent shrub cover, with the low end applying to washes that are essentially devoid of vegetation. The common shrub species observed include creosote bush, ephedra, jojoba, Gander's cholla, yucca, and lotebush, with an herbaceous layer of forbs that includes wild heliotrope, common goldfields, fiddleneck, filaree, and hydra stick-leaf.

Peninsular Juniper Woodland and Scrub (Holland Code 72320)

A total of 14.85 acres (6.01 ha) (23 percent) of the surveyed area consists of this vegetation community. Approximately 2.29 acres (0.9 ha) of Peninsular Juniper Woodland and Scrub is present along the proposed footprint of Option A for property access road and 2.60 acres (1.05 ha) of the footprint for Option B (Figure 3.1-4a [Alternatives 2 and 3] and Figure 3.1-4b [Alternatives 4A and 4B]). In addition to California juniper, commonly occurring plant species within this community include Parry's nolina (*Nolina parryi*), Parry piñon pine (*Pinus quadrifolia*), grey oak (*Quercus turbinella*) and big sagebrush (*Artemisia tridentata*). This vegetation community is classified by CDFG as a "vulnerable" natural plant community (CDFG 2010b). As a woodland plant community, it is listed by the County of San Diego as sensitive or naturalized habitat that would warrant mitigation if affected by project activities (County of San Diego 2010a).

Disturbed Habitat (Holland Code 11300)

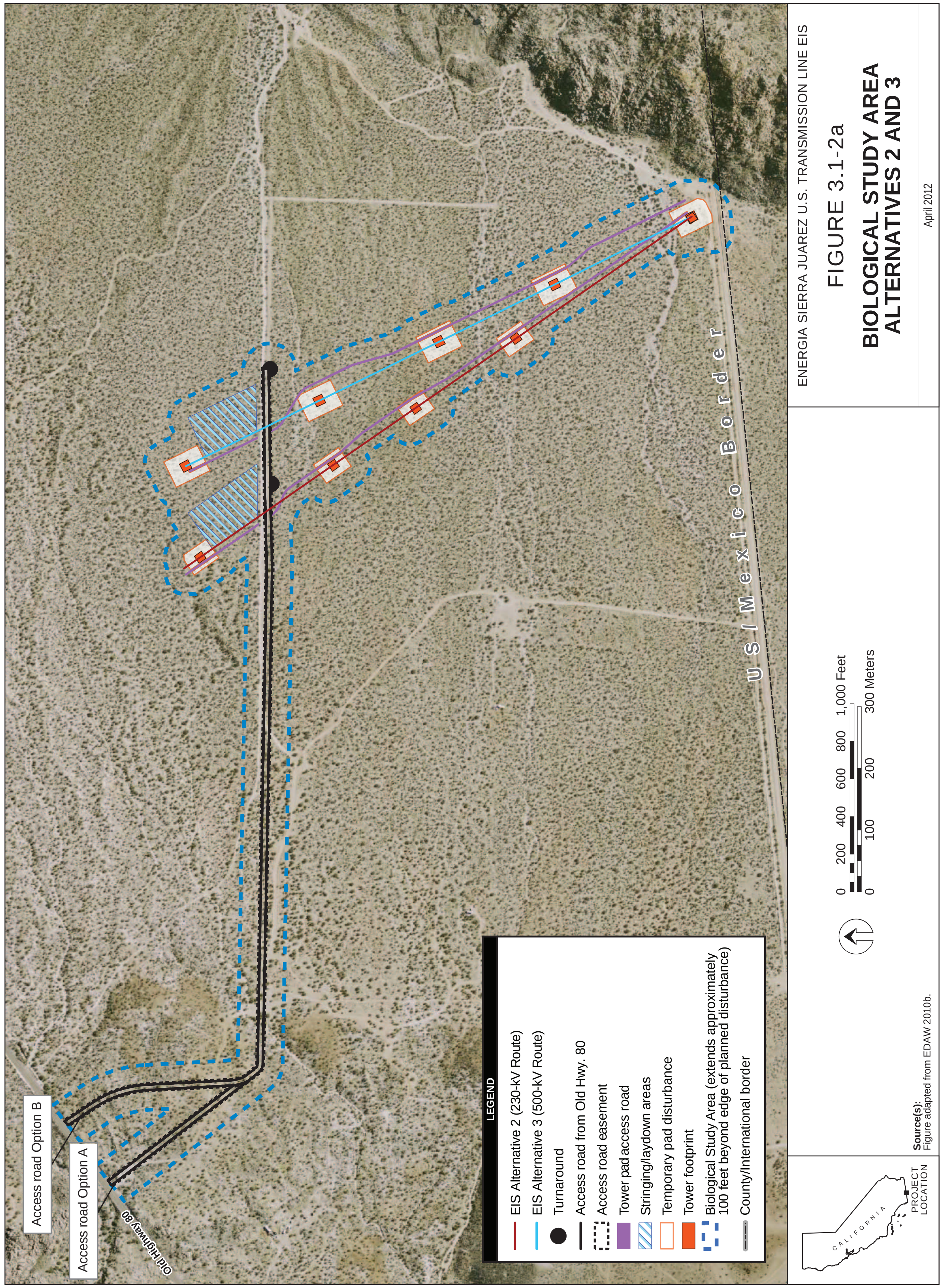
Disturbed habitat is generally defined as any land where the native vegetation has been significantly altered by agriculture, grazing, construction, or other land-clearing activities, resulting in species composition and site conditions that favor invasive species. Such land typically is found in vacant lots, dirt roads, roadsides, construction staging areas, or abandoned fields and is dominated by bare ground and/or nonnative annual species and perennial broad-leafed species. The level of soil disturbance is such that only plants species successful in such environments would be expected to be present; these species include Russian thistle (*Salsola* sp.), sweet fennel (*Foeniculum vulgare*), horseweed (*Conyza* spp.), black mustard (*Brassica nigra*), lamb's quarters (*Chenopodium album*), fountain grass (*Pennisetum setaceum*), and/or castor bean (*Ricinus communis*).

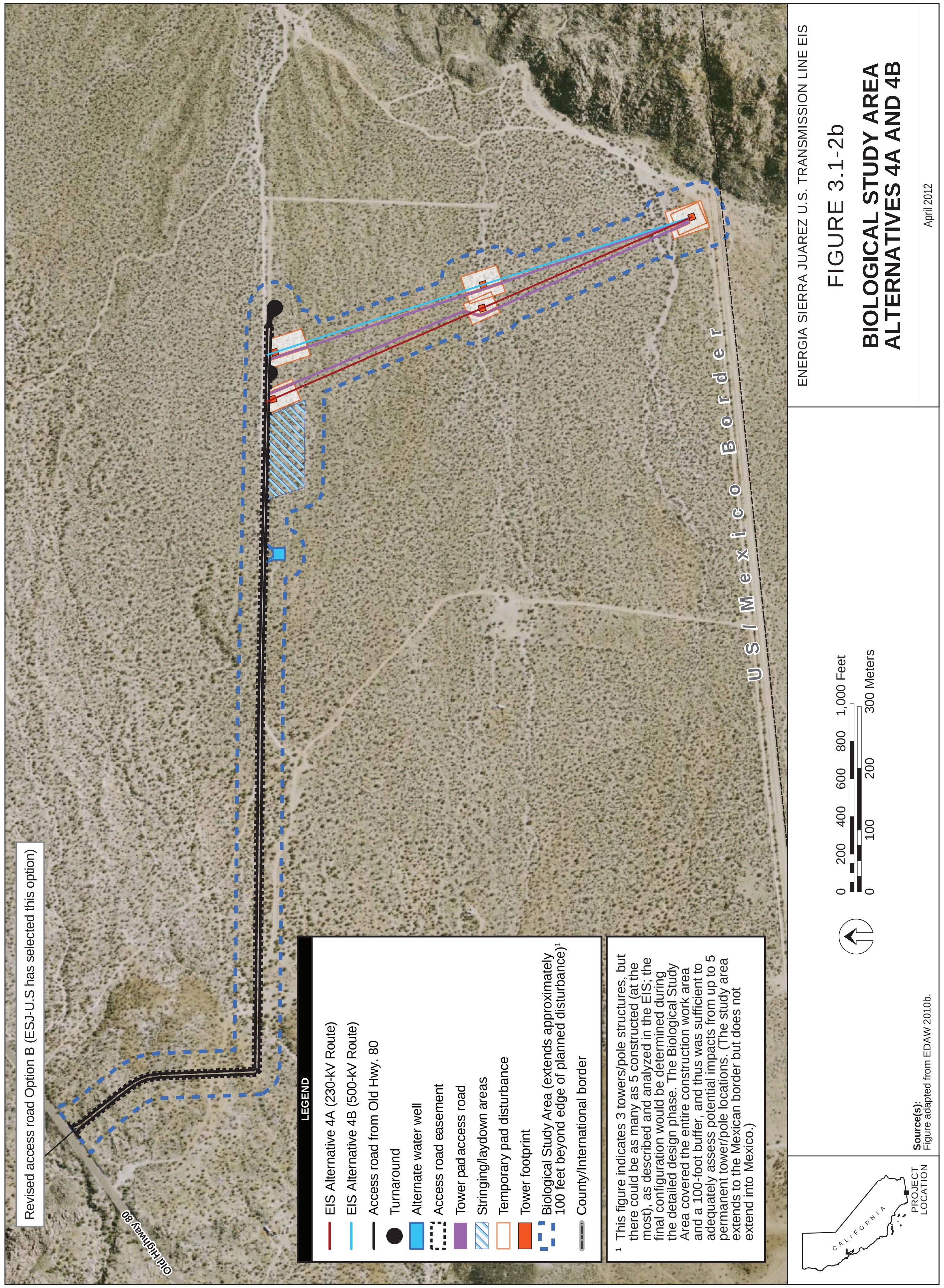
Approximately 3.97 acres (1.61 ha) of the survey area (6 percent) includes disturbed habitat; this includes 0.16 acre (0.06 ha) along the 500-kV corridor and 0.12 acre (0.04 ha) along the 230-kV corridor (Figure 3.1-4a [Alternatives 2 and 3] and Figure 3.1-4b [Alternatives 4A and 4B]). All disturbed habitat within the survey area is associated with dirt roads.

3.1.1.4 Special-Status Plant Species

Appendix C.3 summarizes all special-status (rare) plant species that have the potential to occur within or adjacent to the alternative corridors and the main access road. This appendix also includes species that are known historically from the region but are not expected to occur within the alternative corridors or the area of the main access road based on a lack of suitable habitat. According to CNDDB historical occurrence data (queried March 2009; CDFG 2009a), there are no known occurrences of plants listed as federally threatened or endangered along the alternative corridors or adjacent to the main access road and no special-status plant species were detected during the rare plant surveys (EDAW Inc. 2010b).[4] Moreover, no plants were included in the official USFWS list of federally listed, proposed, or candidate species with potential to occur in the project vicinity (Appendix C.8).

[4] The CNDDB query included six USGS quadrangles centered on the alternative corridors. These quadrangles included Jacumba, In-Ko-Pah Gorge, Sweeney Pass, Painted Gorge, Coyote Wells, and Carrizo Mountain.





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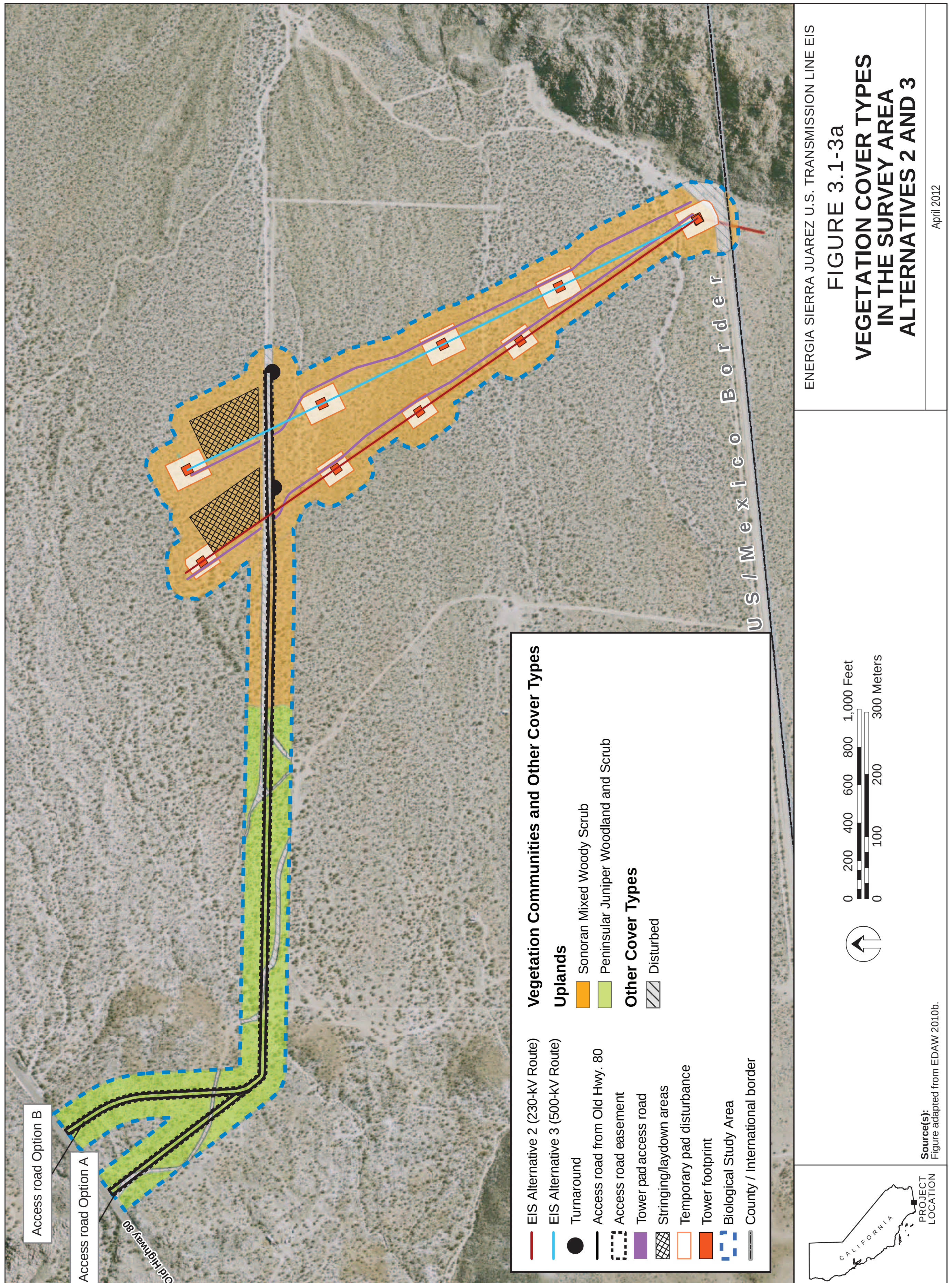
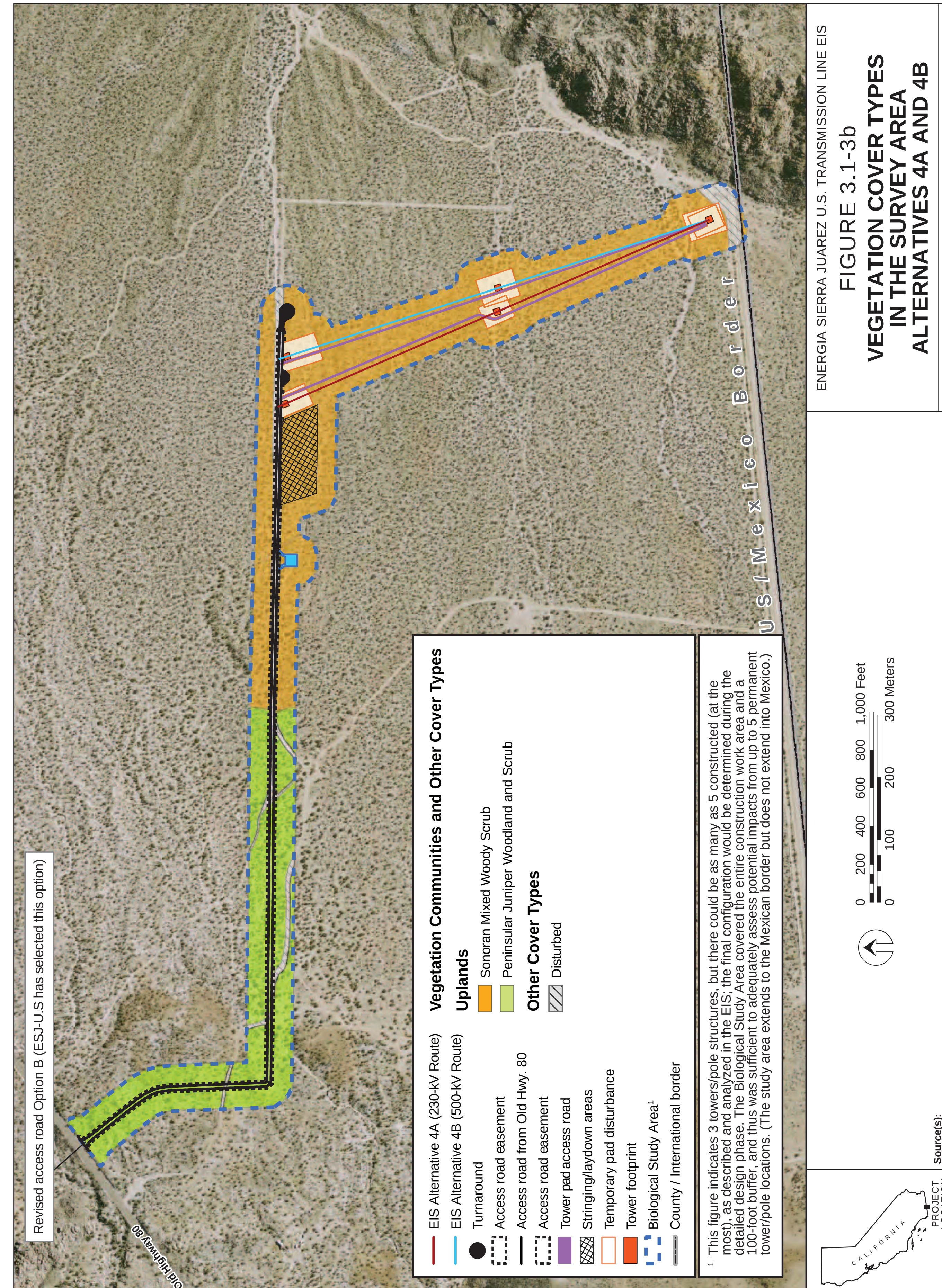
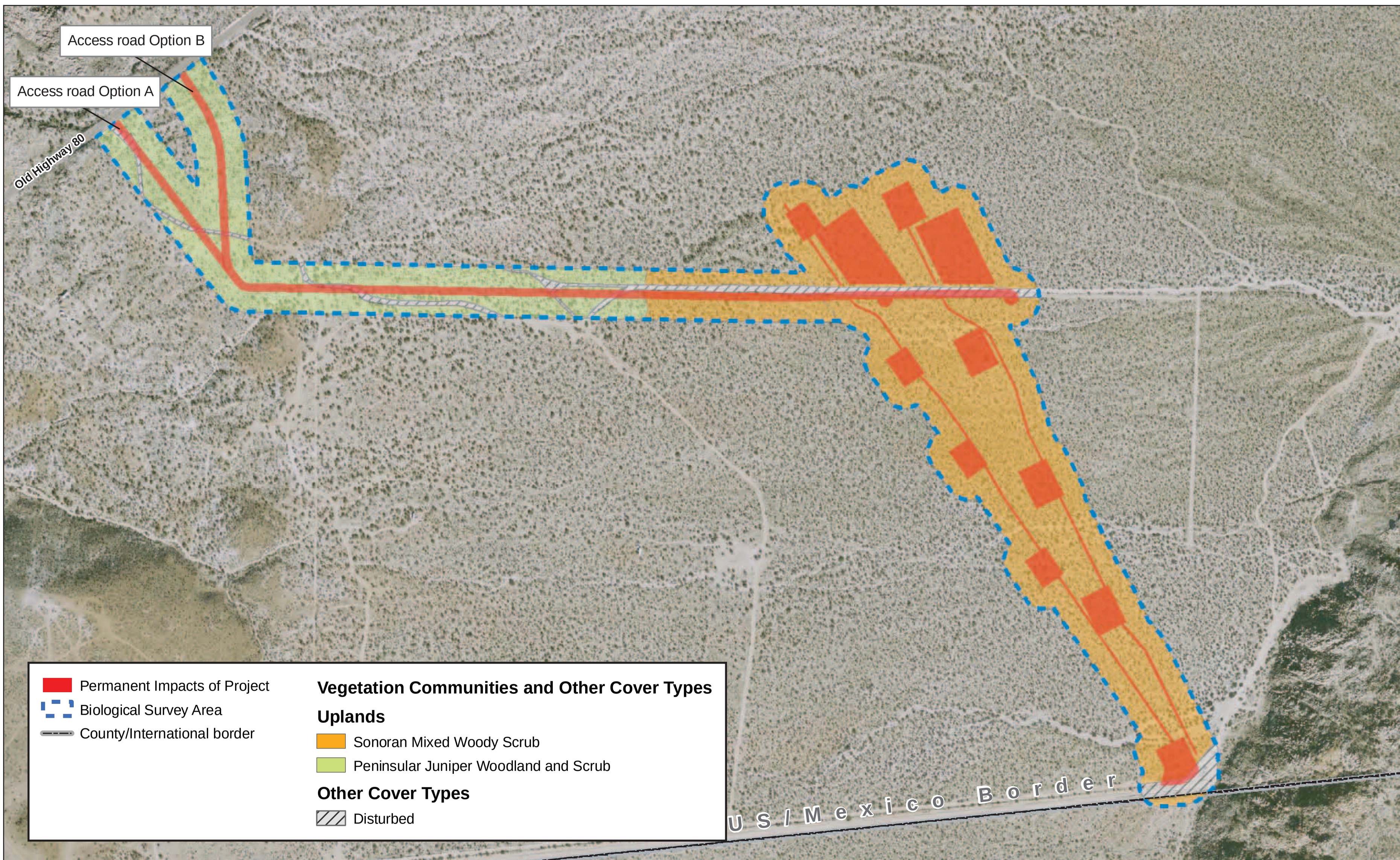


ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS
FIGURE 3.1-3a
VEGETATION COVER TYPES IN THE SURVEY AREA ALTERNATIVES 2 AND 3
April 2012
Vegetation Communities and Other Cover Types
Uplands
Sonoran Mixed Woody Scrub
Peninsular Juniper Woodland and Scrub
Other Cover Types
Disturbed
EIS Alternative 2 (230-kV Route)
EIS Alternative 3 (500-kV Route)
Turnaround
Access road from Old Hwy. 80
Access road easement
Tower pad access road
Stringing/laydown areas
Temporary pad disturbance
Tower footprint
Biological Study Area
County / International border
Access road Option B
Access road Option A
Old Highway 80
U S / M e x i c o B o r d e r
0 200 400 600 800 1,000 Feet
0 100 200 300 Meters
Source(s): Figure adapted from EDAW 2010b.
PROJECT LOCATION
CALIFORNIA
(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\
Figure_3_1-3a&b_VegetationCoverTypes_2up_11x17_v1.ai (04/05/2012, 04:19 pm) R. Wurgler/T. Murphy



ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS
FIGURE 3.1-3b
VEGETATION COVER TYPES IN THE SURVEY AREA ALTERNATIVES 4A AND 4B
April 2012
Vegetation Communities and Other Cover Types
Uplands
Sonoran Mixed Woody Scrub
Peninsular Juniper Woodland and Scrub
Other Cover Types
Disturbed
EIS Alternative 4A (230-kV Route)
EIS Alternative 4B (500-kV Route)
Turnaround
Access road easement
Access road from Old Hwy. 80
Access road easement
Tower pad access road
Stringing/laydown areas
Temporary pad disturbance
Tower footprint
Biological Study Area[1]
County / International border
[1] This figure indicates 3 towers/pole structures, but there could be as many as 5 constructed (at the most), as described and analyzed in the EIS; the final configuration would be determined during the detailed design phase. The Biological Study Area covered the entire construction work area and a 100-foot buffer, and thus was sufficient to adequately assess potential impacts from up to 5 permanent tower/pole locations. (The study area extends to the Mexican border but does not extend into Mexico.)
Revised access road Option B (ESJ-U.S has selected this option)
Old Highway 80
U S / M e x i c o B o r d e r
0 200 400 600 800 1,000 Feet
0 100 200 300 Meters
Source(s): Figure adapted from EDAW 2010b.
PROJECT LOCATION
CALIFORNIA
(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\
Figure_3_1-3a&b_VegetationCoverTypes_2up_11x17_v1.ai (04/05/2012, 04:19 pm) R. Wurgler/T. Murphy



CALIFORNIA
PROJECT LOCATION

0 200 400 600 800 1,000 Feet
0 100 200 300 Meters

Source(s):
Figure adapted from EDAW 2010b.

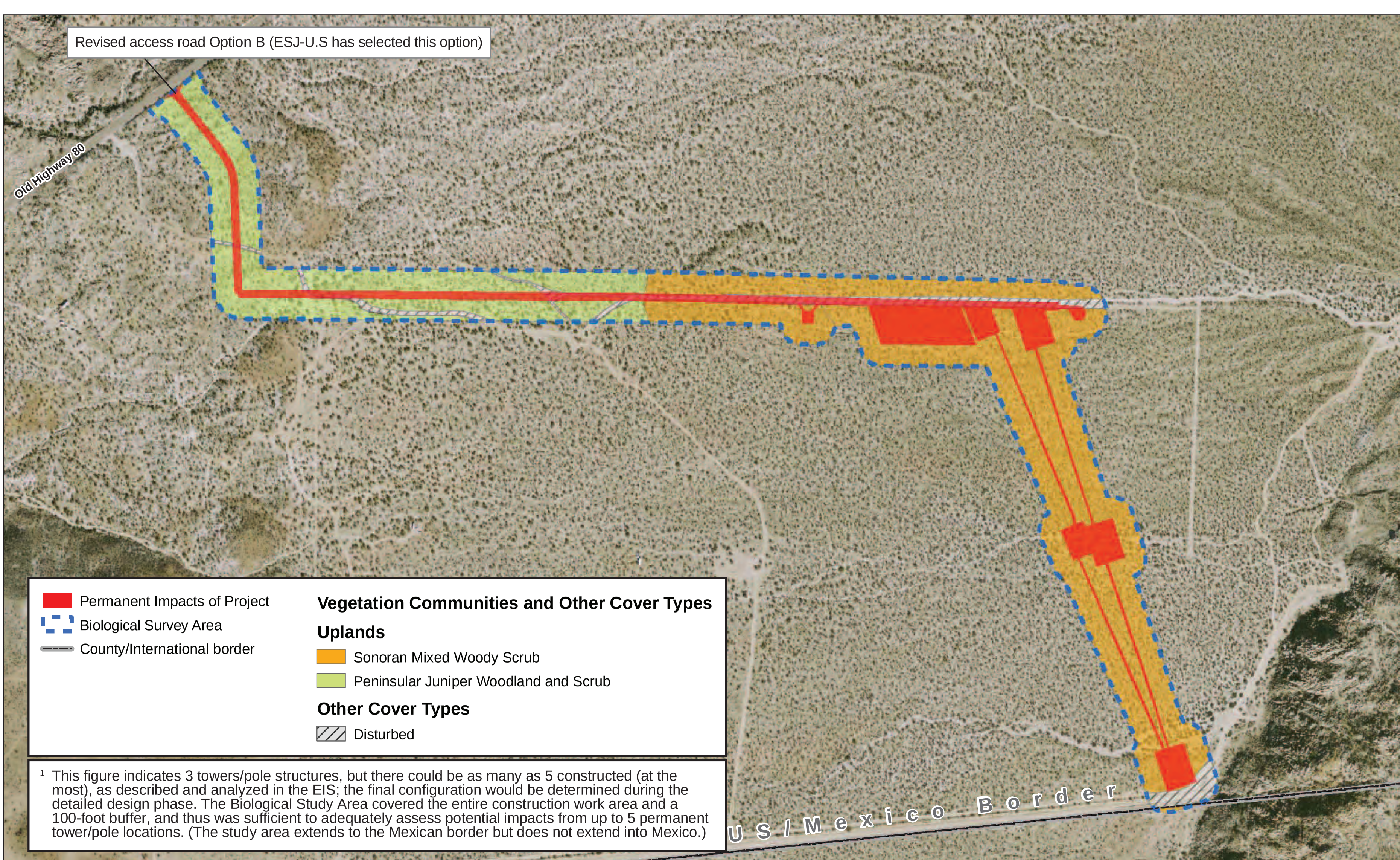
ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.1-4a

PERMANENT IMPACTS TO VEGETATION COMMUNITIES AND OTHER COVER TYPES ALTERNATIVES 2 AND 3

April 2012

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_1-4a&b_ImpactsToVegetationCommunities_2up_11x17_v1.ai (04/05/2012, 04:19 pm) R. Wurgler/T. Murphy



[1] This figure indicates 3 towers/pole structures, but there could be as many as 5 constructed (at the most), as described and analyzed in the EIS; the final configuration would be determined during the detailed design phase. The Biological Study Area covered the entire construction work area and a 100-foot buffer, and thus was sufficient to adequately assess potential impacts from up to 5 permanent tower/pole locations. (The study area extends to the Mexican border but does not extend into Mexico.)

CALIFORNIA
PROJECT LOCATION

0 200 400 600 800 1,000 Feet
0 100 200 300 Meters

Source(s):
Figure adapted from EDAW 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.1-4b

PERMANENT IMPACTS TO VEGETATION COMMUNITIES AND OTHER COVER TYPES ALTERNATIVES 4A AND 4B

April 2012

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_1-4a&b_ImpactsToVegetationCommunities_2up_11x17_v1.ai (04/05/2012, 04:19 pm) R. Wurgler/T. Murphy

CNDDB (CDFG 2009a) reported the known locations of special-status plant species in the vicinity of the alternative corridors and the main access road; one known occurrence is about 700 feet (213 m) east of the most easterly corridor, and the next closest is about 1,700 feet (549 m) west of the intersection of Old Highway 80 and the main access road. Four federally- and/or state-listed plant species were recorded by the CNDDB to have the potential to occur in the vicinity of the alternative corridors (Appendix C.3); none of these species were observed during the rare plant surveys conducted during the blooming period for these plants. The state-listed endangered and federally-listed threatened Pierson's milk-vetch (*Astragalus magdalenae* var. *peirsonii*) is not expected to occur since the alternative corridors are out of this plant's known elevation range. The federally- and state-listed endangered San Diego button-celery (Eryngium aristulatum ssp. parishii) is not expected to occur in the corridors due to lack of suitable habitat. There is suitable habitat for the federally-listed endangered variegated dudleya (*Helianthus niveus*); however, CNDDB records do not record instances of the species in the vicinity of the alternative corridors. One state-listed threatened species shown on the figure, woven-spored lichen (*Texosporium sancti-jacobi*), has a moderate potential to occur within the alternative corridors; however, no specimens were listed in the CNDDB.

In addition to federally- and state-listed species, the CNPS lists other rare plants in California that are typically also afforded protection. The CNPS list identified 26 rare plants (CNPS Lists 1B or 2) with the potential to occur in the vicinity of the alternative corridors. Of those, six have a moderate potential to occur and are described below, five have a low potential to occur and the remaining 15 species are unlikely to occur due to a lack of suitable habitat; there were no observations of any of these species during the rare plant surveys.

Jacumba milk-vetch (*Astragalus douglasii* var. *perstrictus*) has a moderate potential to occur along the alternative corridors; a known occurrence was recorded in the CNDDB within 1 mile (1.6 km) of the corridors (CDFG 2009a). No individuals were detected during the rare plant surveys, although the surveys were conducted during the blooming period for this species and there is a lack of suitable habitat onsite. The five other plant species with a moderate potential to occur in the vicinity of the corridors are the elephant tree (*Bursera microphylla*), curly herissania (*Herissantia crispa*), hairy stickleaf (*Mentzelia hirsutissima*), Cove's cassia (*Senna covesii*), and desert spikemoss (*Selaginella eremophila*). Suitable habitat for elephant tree, curly herissantia, hairy stickleleaf, and desert spikemoss occurs along the alternative corridors; however the corridors are out of the species' known elevation range. There is suitable habitat for Cove's cassia near the corridors as well; however, no individuals were observed during the rare plant survey and there are no CNDDB records for this species along the alternative corridors.

In addition to the List 1B and 2 plant species, the CNPS list identified three List 4 plant species with a moderate potential to occur in the vicinity of the corridors: Utah vine milkweed (*Cynanchum utahense*), Colorado Desert larkspur (*Delphinium parishii* ssp. *subglobosum*) and Thurber's beardtongue (*Penstemon thurberi*). Suitable habitat for all three occurs along the corridors and the main access road, although rare plant surveys conducted during the blooming period of the milkweed, larkspur and, perennial beardtongue did not document any instances of these three species. The results of CNDDB record searches for these species did not include a record of observation of these species in the vicinity of the corridors (EDAW, Inc. 2010b).

The CNPS also identified one species with low-moderate potential to occur in the vicinity of the corridors (Payson's jewelflower [*Caulanthus simulans*]); however, only limited suitable habitat for this species is present along the corridors and the main access road. Marginal habitat does occur onsite for two other species identified as having a low potential to occur in the vicinity of the corridors (Palmer's grappling hook [*Harpagonella palmeri*] and low bush monkeyflower [*Mimulus aridus*]). Although all of these species may not have been in bloom at the time rare plant surveys were conducted and a presence/absence determination could not be confirmed following the special-status plant surveys, there were no recorded observations in the CNDDB of observations of any of these species in the vicinity of the corridors (EDAW, Inc. 2010b).

3.1.1.5 Wildlife

The majority of the area along and near the alternative corridors and the main access road is of moderate value for wildlife species. Vegetation within this area provides suitable protective cover, foraging, migration, and breeding habitat for a variety of animals. Burrows observed along the corridors are suitable for a variety of small mammals and reptiles. Amphibian species are not expected to occur along the alternative corridors or access roads due to the arid conditions within the region and the limited availability of suitable vegetation, leaf litter, and perennial water sources. Similarly, the area does not contain any waterways that would support fish.

A complete list of the wildlife species detected during the 2008 and 2009 reconnaissance surveys is provided in Appendix C.4.

Invertebrates

Eleven butterfly species were documented within and adjacent to the 2008 and 2009 Quino checkerspot butterfly survey area, including painted lady (*Vanessa cardui*), red admiral (*Vanessa atalanta rubria*), ceraunus blue (*Hemiargus ceraunus*), and Chalcedon checkerspot (*Euphydryas chalcedona*) (RBC 2008, 2009). The 2009 survey conducted by EDAW, Inc., documented the presence of the black harvester ant (*Pogonomyrex californicus*), the preferred food item of the San Diego horned lizard (*Phrynosoma coronatum blainvillei*).

Reptiles

Most reptile species in open areas use rodent burrows for cover and protection from predators and extreme weather conditions. Rock outcroppings provide cover and foraging opportunities for reptiles. The desert scrub vegetation along the corridors and the main access road, as well as the rock outcroppings immediately to the east of the site, has the potential to support a variety of reptiles. Two reptile species were observed within the survey area: side-blotched lizard (*Uta stansburiana*), and tiger whiptail (*Aspidoscelis tigris*). Other reptiles with potential to occur along the alternative corridors or on nearby rock outcroppings include rattlesnake (*Crotalus* spp.), gopher snake (*Pituophis melanoleucus*), western banded gecko (*Coleonyx variegatus*), and barefoot banded gecko (*Coleonyx switaki*).

Birds

The low diversity of vegetation communities within the alternative corridors and both options for the main access road has a corresponding limiting effect on bird species diversity. However, the rock outcroppings immediately to the east of the site offer cover and foraging habitat for an increased diversity of birds. The desert scrub vegetation community provides important habitat for various resident and migratory bird species such as black-throated sparrow (*Amphispiza bilineata*), western scrub-jay (*Aphelocoma californica*), ash-throated flycatcher (*Myiarchus cinerascens*), and western kingbird (*Tyrannus verticalis*). The corridors also provide foraging habitat for raptors such as the red-tailed hawk (*Buteo jamaicensis*), which could also perch on adjacent rock outcroppings.

During the surveys, 11 bird species were detected along and adjacent to the alternative corridors (Appendix C.4) including northern mockingbird (*Mimus polyglottos*), black-throated sparrow, and California horned lark (*Eremophilia alpestris actia*). Two bird species common to the region, red-tailed hawk and common raven (*Corvus corax*), were observed flying over the alternative corridors during surveys (EDAW, Inc. 2010b).

Mammals

The desert scrub vegetation community of the alternative corridors provides protective cover and foraging opportunities for a variety of small mammal species. In addition, adjacent rock outcroppings provide cover, breeding, denning, and foraging habitat for mammals. White-tailed antelope ground squirrel (*Ammospermophilus leucurus*), black-tailed jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), and bobcat (*Felis rufus*), or signs of these species, were observed in the survey area. The ground squirrel and jackrabbit were confirmed through direct observation, and the coyote was detected through documentation of tracks and four medium-sized burrows (approximately 1 foot [0.3 m] in diameter). The bobcat was detected by observation of tracks.

Bats occur throughout most of southern California and may use any portion of the alternative corridor area as foraging habitat. Bat species with potential to occur along the alternative corridors include the Mexican long-tongued bat (*Choeronycteris mexicana*), Mexican free-tailed bat (*Tadarida brasiliensis*), spotted bat (*Euderma maculatum*), western mastiff bat (*Eumops perotis californicus*), and pocketed free-tailed bat (*Nyctinomops femorosacca*).

3.1.1.6 Special-Status Wildlife Species

Special-status wildlife species potentially occurring within the alternative corridors or along the access road are discussed below. A list of special-status wildlife species that have the potential to occur along the alternative corridors and main access road (both options) based on available habitat and historic occurrence data, is provided in Appendix C.5. Of those special-status species potentially present, only two, the California horned lark (*Eremophila alpestris actia*) and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), were observed during the surveys. Four other species, Quino checkerspot butterfly (*Euphydryas editha quino*), northern red diamond rattlesnake (*Crotalus ruber ruber*), loggerhead shrike (*Lanius ludovicianus*), and Peninsular bighorn sheep (Ovis Canadensis nelsoni) are considered to have high potential for occurring in the survey area. These four species are discussed in more detail below. The remaining species listed in Appendix C.5 have either a moderate or low potential to occur in the survey area (EDAW, Inc. 2010b).

In addition to the list provided in Appendix C.5, on February 23, 2010, DOE initiated informal consultation under Section 7 of the federal Endangered Species Act and requested that USFWS provide a current list of federally-listed, proposed, and candidate species within the action area. USFWS responded to DOE's request on March 24, 2010. These letters are included in Appendices C.7 and C.8. The species listed by USFWS are Quino checkerspot butterfly, arroyo toad (*Bufo californicus*), southwestern willow flycatcher (*Empidonax traillii extimus*), California condor (*Gymnogyps californianus*), and least Bell's vireo (*Vireo bellii pusillis*). These species, along with other special-status species with potential to occur in the project vicinity, are described briefly below. DOE concluded its consultation with USFWS in March 2011. A letter from DOE to USFWS summarizing the results of informal consultation is provided in Appendix C.9, and the EIS discussion below reflects the consultation input from USFWS.

Quino Checkerspot Butterfly (*Euphydryas editha quino*)

In its comment letter on the project NOI, the USFWS stated that "Quino Checkerspot Butterfly are known to occur within or near the project area" and noted that federally-designated critical habitat for this species is "within or immediately adjacent to the proposed alternative alignments" (presented in Appendix C.6 of this EIS); however, since the project NOI was issued, the location of the alternative corridors has been confirmed to be located 3.6 miles (5.8 km) east of the Quino checkerspot butterfly critical habitat, although still within the survey area recommended by the USFWS. Therefore, surveys for Quino checkerspot butterfly were conducted by Rocks Biological Consulting in 2008 and 2009 according to USFWS protocol (USFWS 2002). Neither Quino checkerspot butterfly nor the host plants used during the species' larval stage were observed during the surveys, although nectar sites for butterflies were identified throughout the survey area (Rocks Biological Consulting 2008, 2009; survey reports are provided in Appendix C.1).

Arroyo toad (*Bufo californicus*)

The arroyo toad is federally-listed as endangered. The range of the arroyo toad extends from the Salinas River Basin in Monterey County to Arroyo San Simon in northern Baja California, Mexico. The toad prefers riparian habitats with sandy streambeds, shallow pools, and cottonwood, sycamore, and willow trees (San Diego Natural History Museum 2010). This species was not observed or detected during any of the surveys conducted along the alternative corridors. Further, due to the lack of surface waters and riparian habitat onsite (as detailed in the Jurisdictional Waters Report, Appendix B), the arroyo toad is considered to have a low probability of occurring in the survey area.

Northern Red Diamond Rattlesnake (*Crotalus ruber ruber*)

The northern red diamond rattlesnake is a CDFG species of special concern (CDFG 2009b), and is also included in Group 2 of the County of San Diego's list of sensitive animals. This species is restricted to southern California and Baja California from Banning Pass to the tip of the Baja Peninsula, with the majority of its California range occurring in San Diego County, where it occurs from sea level to 3,000 feet (915 m) (Stebbins 2003). It is often present in chaparral, along creek banks, and in granite rock outcrops or piles of debris. When inactive, the northern red diamond rattlesnake occurs in rock crevices, animal burrows, brush piles, or similar micro-habitats. The survey area does not contain sage brush, chaparral, or rocky habitat preferred by this species; however, the ridge immediately adjacent and to the east of the survey area does provide suitable habitat.

Barefoot Banded Gecko (*Coleonyx switaki*)

The barefoot banded gecko is a state-listed threatened species, as well as a BLM-designated sensitive species. This species is secretive and is not easily detected; however, it is known from the eastern edge of the Peninsular Ranges from Palms to Pines Highway State Route 74 to the Baja California, Mexico border.

California condor (*Gymnogyps californianus*)

The California condor is federally-listed as endangered. The habitat of the condor includes rocky, open-country scrubland, coniferous forest, and oak savanna. Cliffs, rocky outcrops or large trees are used as nest sites. In California, the birds have been known to occur in Los Angeles, San Bernardino, Ventura, Kern, Santa Barbara, Monterey, San Benito, and Santa Cruz counties. There is also a Baja California population that is largely confined to Sierra de San Pedro Martir (Birdlife International 2010). This species was not observed or detected during any of the surveys conducted along the alternative corridors; however, in April 2007, one California condor was documented flying in the skies above San Diego County. The bird flew from a release site in Sierra San Pedro de Martir, north along the Sierra Juarez mountain ridge and into the U.S. near the town of Jacumba. This was the first siting of a condor in San Diego County in nearly a century (San Diego Union Tribune 2007). Although the alternative corridors are within the range of the California condor, the limited distribution of condors within the historic range and the absence of confirmed recent sightings in the project vicinity (other the one mentioned above near Jacumba) indicate that the species has a very low probability of occurring in the project area.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher is state and federally-listed as endangered. It is a small bird that occurs in riparian habitats along rivers and streams where there are dense growths of willows, coyote brush, tamarisk, and Russian olive. In San Diego County, this species is known to breed along the San Luis Rey River and within Camp Pendleton (Craig and Williams 1998). This species was not observed or detected during any of the surveys conducted along the alternative corridors. Further, due to the lack of surface waters and riparian habitat onsite (as detailed in the Jurisdictional Waters Report, Appendix B), the southwestern willow flycatcher is considered to have a low probability of occurring in the survey area.

California Horned Lark (*Eremophila alpestris actia*)

The California horned lark is on CDFG List of Species to Watch (CDFG 2009b) and is also included in Group 2 of the County of San Diego's list of sensitive animals. Its range is limited to the coastal slopes of California, from Sonoma County to San Diego County, and includes most of the San Joaquin Valley. In San Diego County, the species typically inhabits areas with sparse vegetation, including sandy shores, grasslands, mesas, and agricultural lands. Breeding occurs from March through July with peak activity occurring in May. California horned larks forage by walking and running on the ground and consume a diet of spiders, insects and insect larvae, snails, buds, berries, waste grains, and seeds from grasses, weeds, and forbs. California horned larks usually forage in flocks except during nesting. The population of this species has declined due to loss of habitat, urbanization, and human disturbance. California horned lark were observed foraging in the open areas between shrubs in the survey area, during the 2008 and 2009 surveys.

Loggerhead Shrike (*Lanius ludovicianus*)

The loggerhead shrike is a CDFG species of special concern (CDFG 2009b). This species is also included in Group 1 of the County of San Diego's list of sensitive animals. It is a common resident and winter visitor in lowlands and foothills throughout California. Within San Diego County, this is a fairly common breeding species that occurs throughout the County, except for mountainous areas. The species occupies a variety of habitats, primarily wherever bushes or trees are scattered on open ground. This species was not observed or detected during any of the surveys; however, due to the presence of suitable habitat and the relatively common occurrence of the species throughout the County, the loggerhead shrike has a high probability of occurring in the survey area.

Least Bell's Vireo (*Vireo bellii pusillis*)

The least Bell's vireo is state and federally-listed as endangered. The least Bell's vireo is typically found in woodlands in riparian areas with dense cover for nesting and foraging. In San Diego County, this species is known to occur along drainages within Camp Pendleton, and along the San Diego, Sweetwater, and Otay Rivers (Kus 2002). This species was not observed or detected during any of the surveys conducted along the alternative corridors. Further, due to the lack of surface waters and riparian habitat onsite (as detailed in the Jurisdictional Waters Report, Appendix B), the least Bell's vireo is considered to have a low probability of occurring in the survey area.

San Diego Black-tailed Jackrabbit (*Lepus californicus bennettii*)

The San Diego black-tailed jackrabbit is a CDFG species of special concern (CDFG 2009b). This species is also included in Group 2 of the County of San Diego's list of sensitive animals. It ranges from near Mt. Pinos (at the Kern-Ventura County line) southward and west of the Peninsular Range into Baja California, Mexico (Hall 1981). This species, which occupies open or semi-open scrub habitats, occurs throughout southern California, with the exception of high-altitude mountains. This species breeds throughout the year, with the greatest number of births occurring from April through May. The black-tailed jackrabbit is strictly herbivorous, preferring habitat with ample forage such as grasses and forbs. Declines in San Diego black-tailed jackrabbit populations are due to a decline in suitable habitat as a result of urban development (EDAW, Inc. 2010b). A single San Diego black-tailed jackrabbit was observed onsite during the 2008 survey.

Peninsular Bighorn Sheep (*Ovis canadensis nelsoni*)

The federally-listed endangered and state-listed threatened/fully protected, Peninsular bighorn sheep is known to exist in the region; the nearest boundary for critical habitat for the species is approximately 2.3 miles (3.7 km) northeast of the Project area. The USFWS (2009a) documented the presence of bighorn sheep in the critical habitat that extends to the U.S.-Mexico border approximately 4.7 miles (7.6 km) east of the alternative corridors (see Figure 3.1-1). Discussions with the USFWS (EDAW, Inc. 2010b) indicated that based on tracked sheep locations there is a very low probability of the species using the Project area and surveys were not recommended by the USFWS. Although the alternative corridors and surrounding area includes some of the key foraging habitat requirements (e.g. valley bottoms and washes) identified as primary constituent elements for bighorn sheep recovery (USFWS 2009a), evidence of bighorn sheep use was not observed in the survey area. The most recent documented sighting of bighorn sheep in the general vicinity was of a small group of individuals that was more than 4.5 miles (7.2 km) northeast of the alternative corridors (Geller 2009). Local residents of the area have reported incidental observations of Peninsular bighorn sheep. However, the locations of the sightings from these sources are anecdotal and not rigorously documented.

Golden Eagle (*Aquila chrysaetos*)

The golden eagle is a CDFG Watch List species and state Fully Protected species, USFWS Birds of Conservation Concern species, BLM sensitive species, and is protected under the federal MBTA and BGEPA. Protections afforded golden eagle as a state Fully Protected species and under the MBTA and BGEPA, prohibit the "take," and in the case of the BGEPA, disturbance of the species. The golden eagle is known to occur in the region.

Eagle Ecology and Population Trends. The following discussion of golden eagle ecology and population trends is adapted from Pagel et al (2010), Good et al (2004), Kochert and Steenhof (2002), and Unitt (2004). The golden eagle is a diurnally active permanent resident and migrant throughout California. The species is sparsely distributed throughout California and it is found in southern California occupying primarily mountain, foothill, and desert habitats. Golden eagles are more common in northeast California and the Coast Ranges than in southern California and the deserts. Foraging habitat for this species is very broad and in California includes open habitats with scrub, grasslands, desert communities, and agricultural areas. Golden eagles prey on small to midsized reptiles, birds, and mammals up to the size of mule deer fawns and coyote pups, and they are known to scavenge and utilize carrion (Kochert and Steenhof 2002). This species nests on cliffs, in large trees, and occasionally on man-made structures (e.g., transmission towers). It generally occurs in open habitats and rugged, mountainous country (Kochert and Steenhof 2002). Nest locations tend to be more closely associated with topographic heterogeneity than with a particular vegetation type. They can be found from the tundra, through grasslands, woodland-brushlands, and forested habitat, south to arid deserts, including Death Valley, California (Kochert and Steenhof 2002).

Nest building can occur almost any time during the year, often varying by latitude, elevation, and weather. Breeding typically begins in January with nest building and egg laying occurring from February through March. Pairs may build more than one nest and attend to them prior to laying eggs (Kochert and Steenhof 2002). Each pair can have up to 10 nests, but only 2 to 3 are generally used in rotation from one year to the next. Some pairs use the same nest each year, while others use alternate nests year after year, and still others apparently nest only every other year. Succeeding generations of eagles may even use the same nest. Golden eagles lay 1 to 4 eggs, with 4 egg clutches rare. Most nests have 2 eggs. The laying interval between eggs ranges between 3 to 5 days. Incubation commences as soon as the first egg is laid, and hatching is asynchronous and can begin as early as late January in southern California.

Hatching and feeding of nestlings generally occur from April through June. After fledging[5], the adult eagles continue to feed the young birds until late November. Because of the long breeding cycle, some pairs breed every other year even when food is abundant. Other environmental conditions may also affect the breeding of eagles including drought conditions that may affect the prey populations. For example, drought conditions in southern California have resulted in a reduced population size of jackrabbits, a primary prey source for golden eagles in this region. As a correlate to the lower prey population size, researchers have confirmed unusually low reproductive levels of golden eagles in other regions of southern California.

Golden eagles that breed in the Canadian provinces and northern tier and northeastern states generally migrate to areas that are milder in the winter and/or may have less snow cover. Wintering golden eagles have been noted in all states in the continental U.S. Some segments of the population can be found near their nest sites throughout the year.

Golden eagles have been noted to be sensitive to some forms of human activity including recreationists and researchers, with resulting loss of the eggs or juveniles due to nest abandonment, exposure of juveniles or eggs to the elements, collapse of the nest, eggs being knocked from the nest by startled adults, or juveniles fledging prematurely. General indicators of disturbance include agitation behavior (displacement, avoidance, and defense); increased vigilance at nest sites; change in forage and feeding behavior, and/or nest site abandonment (Pagel et al 2010). Of the preceding behaviors, nest-site abandonment constitutes "take" under the Eagle Act, as it is specifically cited in the definition of "disturb." The other behaviors, when considered cumulatively, may be evidence that activities are interfering with normal breeding behavior and could lead to "take." Human intrusions near golden eagle nest sites have resulted in the abandonment of the nest; high nestling mortality due to overheating, chilling or desiccation when young are left unattended; premature fledging; and ejection of eggs or young from the nest. In some cases, raptors, including golden eagles have been observed to habituate rapidly to human activity and have been known to nest successfully near areas with relatively high levels of human presence. APLIC (2006) notes that in habitats where natural nest substrates are scarce, utility structures can provide nesting sites for raptors and other birds.

Golden eagle population data in the U.S. are limited. Kochert and Steenhof (2002) summarized existing population studies and found only four long-term studies of nesting golden eagles in the U.S. These studies were scattered across the western U.S. in Alaska, Idaho, California and Colorado. Populations evaluated in Colorado, California and Idaho were described as declining, presumably because of habitat loss and prey populations. Small but steady declines in the intermountain West have been associated with shrub loss and declining jackrabbit populations; and declines in southern California have been attributed to urbanization. Occupancy data from San Diego County, California, span more than 100 years and were collected by several investigators. Nesting eagles in San Diego County decreased dramatically from an estimated 85 pairs in 1900 to 40 occupied territories in 1999. Large-scale declines occurred between 1956 and 1980, and subtle declines occurred through 1999. These declines were related to extensive residential development (Kochert and Steenhof 2002). The four long-term population studies cited in Kochert and Steenhof (2002) represent only a small proportion of the total golden eagle

[5] Fledging refers to the care of a young bird until it is ready to fly.

population in the U.S., and more data are needed before conclusions can be made regarding the golden eagle population in the western U.S. (Good et al 2004; Unitt 2004).

Eagle Observations in the ESJ U.S. Transmission Line Project Area. This species is not expected to nest in the ESJ U.S. Transmission Line project area due to lack of habitat; however, there could be territories located within the vicinity and eagles (and other raptors) have been observed nesting on steel lattice transmission towers, depending on the configuration (APLIC 2006). This species was not observed during the applicant's 2008 surveys (EDAW 2009) and there are no CNDDB records within the In-Ko-Pah Gorge quadrangle.

Golden eagles have high potential to forage within the ESJ U.S. Transmission Line project region based on suitable habitat and prey availability in the project area. Suitable foraging habitat includes all vegetation communities and land cover on site (i.e., agriculture, big sagebrush scrub, chamise chaparral, coast live oak woodland, disturbed habitat, field/pasture, emergent wetland, montane buckwheat scrub mulefat scrub, non-native grassland, northern mixed chaparral, semi-desert chaparral, southern north slope chaparral, scrub oak chaparral, Peninsular juniper woodland and scrub, redshank chaparral, shadscale scrub, Sonoran mixed woody succulent scrub, southern riparian woodland, upper Sonoran manzanita chaparral, upper Sonoran subshrub scrub, and southern willow scrub). Typically, the denser forms of chaparral habitat are not suitable for foraging of golden eagle (CPUC/BLM 2011a).

In spring 2010, the Wildlife Research Institute[6] conducted ground and helicopter surveys in order to identify, map, and determine the status of golden eagle nests in the vicinity of the Tule Wind Project proposed to be located northwest of the ESJ U.S. Transmission Line project site. Additional data were collected on golden eagles beyond the USFWS protocol nest surveys. In 2011, focused eagle observations at local nests and non-nest watch spots were conducted weekly during the breeding season and five juvenile golden eagles were fitted with satellite transmitters and data on their movements post-fledging have been compiled. The 10-mile (16-km) survey area encompassed the ESJ U.S. Transmission Line project area. Within 10 miles (16 km) of the ESJ U.S. Transmission Line project area, the survey found three golden eagle territories. No active nesting was observed in these territories in 2011. The territories are generally located at Table Mountain with five nests, Carrizo Gorge with four nests, and Boundary Peak, which, as a historical territory, had no nests. The Table Mountain territory is approximately 3 miles (4.8 km) north of the ESJ U.S. Transmission Line project, and based on observations in 2011, is considered occupied, but not actively used for nesting. The Carrizo Gorge territory is approximately 8 miles (12.9 km) north of the ESJ U.S. Transmission Line project. The Boundary Peak territory is approximately 10 miles (16 km) west of the western portion of the project. All of these territories, except Boundary Peak, were documented to be active within the past 2 to 3 years. Because the survey was conducted at the end of March, some of the eagle pairs may have already attempted and failed at nesting for the 2010 breeding season, but this is speculative. (CPUC/BLM 2011a).

Eagle Observations in the ESJ Wind Project Area in Mexico. With funding from Sempra, the San Diego Zoo's Institute for Conservation Research (ICR) has been conducting golden eagle

[6] http://www.wildlife-research.org/

and California condor studies in the ESJ Wind project region in Mexico (San Diego Zoo 2012). This multiyear research effort's principal goals are to investigate the spatial ecology and habitat utilization of the California condor reintroduced to Baja California, Mexico and the golden eagle. The main objectives of this ongoing research are to identify the relative importance of the project area to golden eagles and California condors, to identify risks to their populations, and to support project design and operations to avoid or minimize potential impacts from wind energy development. By evaluating the movements of golden eagles and condors while identifying the conditions associated with high use, ICR hopes to pinpoint areas of increased risk of mortality posed by wind turbines in order to provide a more precise risk assessment (San Diego Zoo 2012).

These research efforts were started in 2009 and are still in process. The research has included nest searches and activity monitoring; capture of eagles and application of transmitters; biotelemetry of eagle and condor movement behavior; and modeling of territories and habitats to delineate high use areas. Both aerial surveys and on-the-ground observations have been used to identify and map golden eagle nest sites and territories throughout the study area. Preliminary findings from two years of data collection are summarized below.

According to the January 2012 study summary (San Diego Zoo 2012), both condor and eagle activity in the ESJ Wind project Phase 1 site have been minimal through the Fall of 2011. Golden eagles utilized the middle to southern ESJ Wind Project area for both foraging and breeding, but at low densities. Observations noted an abundance of suitable nesting sites, but relatively few historic nests (<20) and even fewer active nests (1 in 2009, 1 in 2010, and none found in 2011). No golden eagle nests have been found within the ESJ Wind Project Phase 1 site.

Although only one nest was confirmed active in the southern Sierra Juarez by aerial nest search in 2010, the presence of an immature eagle with an adult pair in the central Sierra Juarez (approximately 38 miles [62 km] away from the ESJ Wind project Phase 1 area, but within the larger ESJ Wind project area) suggests the potential for possible breeding in the area.

As of late 2011, at least two and potentially three eagle territories had been identified by the ICR: an adult pair and one juvenile in the central Sierra Juarez, where there was an active nest site in 2009; a breeding pair and a juvenile in the southern Sierra Juarez where there was an active nest site in 2010, and two adult eagles in the northern Sierra Juarez where historic nest sites were found. Due to large home ranges in the wind project area, it is currently unknown whether these represent unique territories.

In the Spring of 2011, researchers attached Global Positioning System (GPS) transmitters on an adult pair of eagles (one male and one female) captured within the ESJ Wind project area. In October 2011 a second adult female was captured and fitted with a GPS transmitter, which has provided data showing that this bird crossed the U.S.-Mexico border at least seven times and has flown to within 18 miles (29 km) of the ESJ Wind project Phase 1 site. The data collected to date suggest that the ESJ Wind project Phase 1 site does not contain suitable nesting habitat for golden eagles.

According to ICR, the continued findings from this research will lead to recommendations on project design, construction, and operation of the proposed ESJ Wind project, some of which are presented in this section, to minimize and/or eliminate mortality of golden eagles and condors.

3.1.1.7 Habitat Connectivity, Wildlife Corridors, and Migration Routes

The alternative corridors are bordered to the south by the U.S.-Mexico international border fence and to the north by Old Highway 80 and I-8. There is open space to the east and west of the corridors. Therefore, there are existing deterrents to regional wildlife movement, including that of large mammals, in the area. These existing features have the potential to fragment this portion of the landscape and inhibit wildlife movement through the alternative corridor area in a direct north-south orientation. However, because the corridors are adjacent to undeveloped, natural areas to the east and west (e.g., Jacumba Wilderness Area), and because there are relatively large areas of protected open space that are used for local and regional wildlife movement to the north of the highways (e.g., Jacumba National Cooperative Land and Wildlife Management Area, Anza Borrego State Park), wildlife is expected to use the alternative corridors for forage and cover, as well as a connection to adjacent local and regional movement corridors.

Because of the comparatively low elevation of San Diego County's mountains (lower than the San Bernardino and San Jacinto mountains to the north), many birds migrating to/from a winter range in western mainland Mexico to/from breeding range in northern California, the Pacific Northwest, or Alaska use San Diego County as a corridor for crossing from the desert to the coastal slope. This migration occurs all along the east side of the San Diego County mountains but is most concentrated in the canyons and valleys that lead from northwest to southeast, such as Grapevine Canyon in Anza Borrego Desert State Park (located about 39 miles [62.8 km] northwest of the alternative corridors) and San Felipe Valley (located about 37 miles [59.5 km] northwest of the alternative corridors) west of Anza Borrego Desert State Park near the town of Julian. San Felipe Valley is the most heavily used corridor (Skagen et al. 2004; Unitt 2007). No known avian migration routes or major flight corridors or riparian corridors are associated with proposed location of the alternative corridors or the surrounding vicinity.

3.1.2 Environmental Impacts

3.1.2.1 Methodology

The impact analysis considers direct and indirect impacts to biological resources due to construction and operation of the alternatives as well as impacts in the U.S. from the ESJ Wind project in Mexico. Resources considered include habitat/sensitive vegetation communities and sensitive biological resources (including special-status species, species on the County Rare Plant and Sensitive Animal lists, and wildlife movement corridors).

The County of San Diego has guidelines for determining significance for biological resources (County of San Diego 2010a). These guidelines were reviewed by DOE in considering project impacts to biological resources and are referenced in the discussion below as appropriate. ESJ, in consultation with County of San Diego staff, has proposed to incorporate measures into the Project that are designed to avoid and minimize impacts to biological resources. Those measures are included as design features and were considered in the analysis of impacts.

3.1.2.2 Alternative 1 – No Action

Under the No Action alternative, the proposed transmission line would not be constructed and the existing biological resources would remain as described in Section 3.1.1. No impacts to habitat/sensitive vegetation communities or to sensitive biological resources would occur.

3.1.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Vegetation and Wildlife

Construction of the 230-kV Route would result in both direct and indirect impacts to biological resources. Direct impacts would result primarily from clearing vegetation along the proposed access roads and grading required for the tower/pole pads and the construction staging and wire stringing site. In addition, due to fire safety considerations at the site, ESJ's Fire Protection Plan (discussed in greater detail in Section 3.9 [Fire and Fuels Management]) requires a cleared space of 30 feet (9.1 m) on all sides of each tower. These disturbance areas would not be revegetated and are considered direct, permanent impact areas (Figure 3.1-4a [Alternatives 2 and 3] and Figure 3.1-4b [Alternatives 4A and 4B]). Additional disturbance would include excavation or drilling to construct foundations for the transmission line structures. The maximum area of disturbance at each tower site would be approximately 0.4 acre (0.2 ha); there would be a total of 2.2 acres (0.9 ha) affected if 5 structures are installed. In addition, approximately 1.98 acres (0.8 ha) would be disturbed during use of the construction staging and wire stringing site, and this area would not be revegetated.

Table 3.1-2 lists the habitat types that would be directly impacted as a result of construction. The tower pads and associated adjacent fire protection zones cleared of vegetation (including the ground disturbance associated with the proposed laydown/parking/stringing area), and the transmission line access road would permanently impact a total of 5.18 acres (2.1 ha) for the life of the project, including 5.06 acres (2.05 ha) of impacts to Sonoran Mixed Woody Scrub. The total amount of permanent disturbance would vary slightly depending on the option chosen for the property legal access road. Construction of Option A would permanently impact 0.55 acre (0.22 ha) of Sonoran Mixed Woody Scrub and 2.29 acres (0.9 ha) of Peninsular Juniper Woodland. Construction of Option B would permanently impact 1.14 acres (0.46 ha) of Sonoran Mixed Woody Scrub and 2.60 acres (1.1 ha) of Peninsular Juniper Woodland.

County of San Diego Guidelines require mitigation of any impacts to the Sonoran Mixed Woody Scrub habitat type at a ratio of 1:1 and mitigation of impacts to Peninsular Juniper Woodland and Scrub habitat type at a 3:1 ratio (County of San Diego 2010a). The County's guidelines allow for mitigation of habitat through either the purchase mitigation within an established mitigation bank, onsite preservation, and/or offsite preservation with financial and legal agreements for long-term management of the resource in perpetuity.

Table 3.1-2
Impacts to Vegetation Communities and Habitat Types

Vegetation Communities and Habitat (Cover) Types	Survey Area (Acres)	Area Affected in 230-kV Route, Main Access Road and Groundwater Well Access Road (acres)		
		230-kV Transmission Line	Property Access Option A	Property Access Option B
Sonoran Mixed Woody Scrub	46.38	5.06	0.55	1.14
Peninsular Juniper Woodland and Scrub	14.85	–	2.29	2.60
Desert Saltbush Scrub	0.58	0.02[1]	–	–
Southern Cottonwood Willow Riparian Forest	0.42	0.01[1]	–	–
Disturbed Habitat	3.97	0.12	1.56	0.80
Total Cover	66.20	5.21	4.40	4.54

Notes

[1] The proposed offsite groundwater well access road would result in permanent impacts to 0.019 acre (0.01 ha) of desert saltbush and 0.014 acre (0.01 ha) of southern cottonwood willow riparian habitat. These groundwater well access road impacts will need to be mitigated through the purchase of mitigation credits from a County-approved mitigation bank in the amount of 0.038 acre (0.02 ha) of desert saltbush scrub and 0.042 acre (0.02 ha) of southern cottonwood willow riparian forest. These areas are included in the affected area calculations provided in Tables 2-2 and 2-3. Remaining impact areas are for the transmission line construction area, which will be mitigated through an onsite conservation easement.

Source: EDAW, Inc. 2010b, AECOM 2011a.

Accordingly, ESJ is working with the County of San Diego to provide a conservation easement to preserve habitat that is functionally similar to that impacted by project construction. ESJ has proposed that either 12.48 acres (5.1 ha; if Option A is constructed) or 14.0 acres (4.72 ha; if Option B is constructed) on the eastern section of the parcels where the transmission line would be installed be placed in a conservation easement. This proposed area contains sparse Sonoran Mixed Woody Scrub vegetation along a rocky ridge and adjoins a large open space tract of land to the east owned by BLM (Figure 3.1-5a [Alternatives 2 and 3] and Figure 3.1-5b [Alternatives 4A and 4B]). Placement of an easement in this portion of the undeveloped property would provide direct continuity with this large preserved tract of land. It would help to preserve a ridgeline travel route and wildlife corridor/landscape linkage between protected BLM land to the east and the proposed corridor. It would also be a sufficient distance from the transmission line right-of-way and the main access road to avoid or minimize effects of the project on the conservation site. No physical changes or improvements are anticipated at the conservation easement site.

Final selection of the conservation easement site is subject to further discussion between ESJ and the County of San Diego. If the County of San Diego indicates that a different location is preferable (e.g., a site with closer habitat similarity to the impacted area), then ESJ has sufficient land holdings in the project area to effect this change. Alternatively, ESJ could purchase mitigation within an established mitigation bank or establish offsite preservation with financial and legal agreements for long-term management of the resource in perpetuity. ESJ has developed a Conceptual Resource Management Plan to provide a framework for the interim and long-term management of the conservation easement site. According to this plan, ESJ would work with the County to designate a Resource Manager for the site, although it is anticipated the ESJ would ultimately convey the property to the BLM for long-term, in perpetuity management. To the extent that there are existing recreational trails on the designated easement, those trails would remain accessible and signs would be installed to direct users to remain on trails and thus avoid disrupting the biological function and value of the area (EDAW, Inc. 2010b).

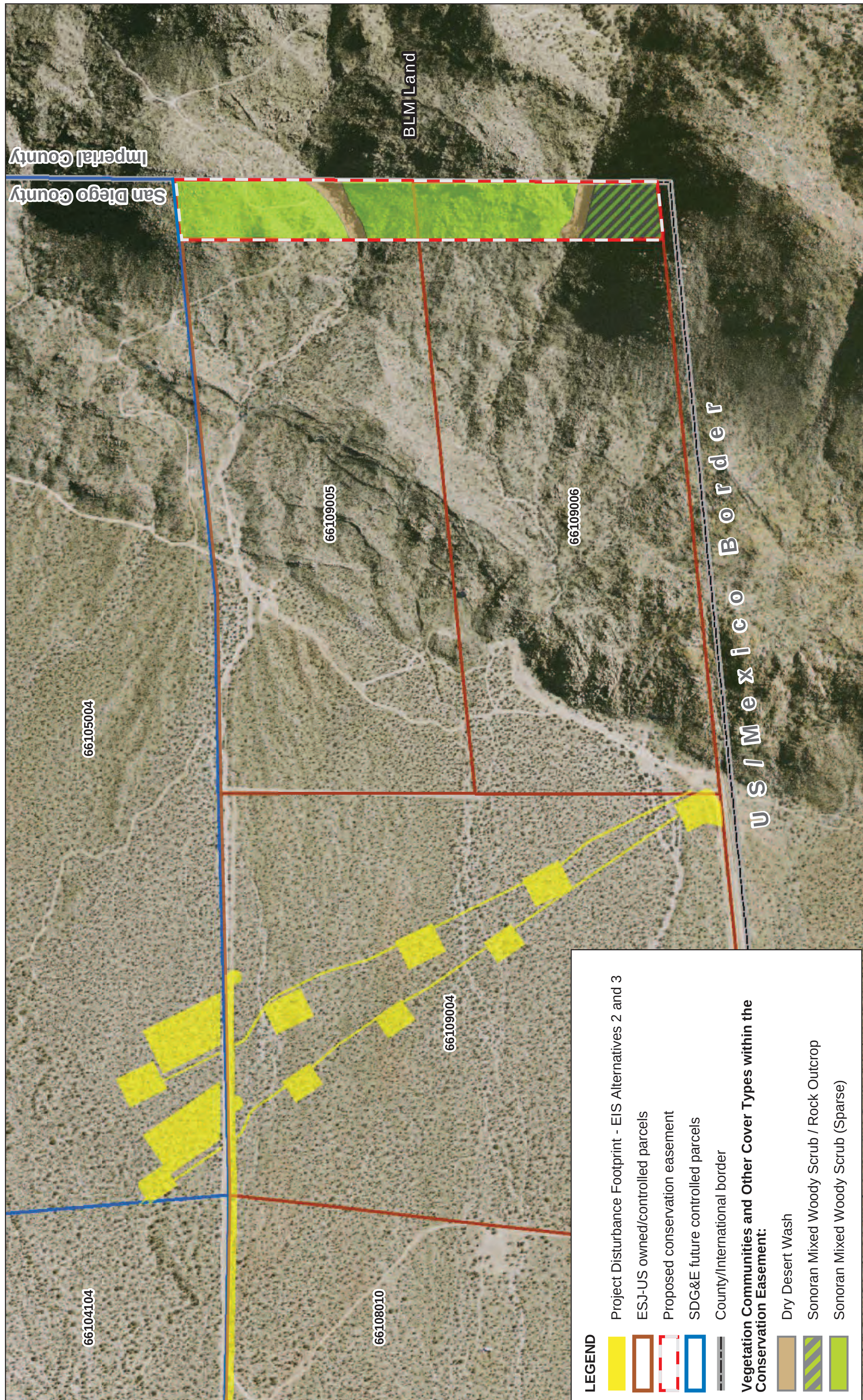
Vegetation clearing during construction activities would permanently impact 10 acres (4 ha) of foraging habitat with a corresponding impact to the resident San Diego black-tailed jackrabbit populations, the principal prey of the eagles. This reduction in habitat is considered a minor impact because the acreage is small relative to the surrounding available undeveloped foraging area, and because the applicant has committed to a long-term conservation easement of similar or better habitat value.

Vegetation clearance along and adjacent to the transmission line right-of-way and the main access road could directly impact nesting birds by removing suitable nesting areas or active nests. Increased noise, dust, construction activities, and the presence of humans in the area could also alter the behavior and success of nesting birds and foraging raptors. Impacts from transportation and construction noise on wildlife, and birds in particular, has been documented in a number of studies (see, for example studies cited by Noise Pollution Clearinghouse [undated] at http://www.nonoise.org/library/fctsheet/wildlife.htm). The County of San Diego Guidelines indicate a sound level of 60 dBA as the threshold for noise impacts to wildlife. This threshold is based on studies conducted at UC Davis (Bioacoustics Research Team 1997); these studies concluded that 60 dBA, averaged over a time period such as one hour or 24 hours, is a single, simple criterion to use as a starting point for passerine impacts until more specific research is done. These studies evaluated impacts on various species, including bird species that are known to occur at the project site, and found that continuous increases in ambient noise level as well as impulse noises from construction activity can cause hearing loss, changes in population behavior, and masking of calls when loud enough (Bioacoustics Research Team 1997; Dooling and Pepper 2007). The 60 dBA threshold is the accepted criterion for determining if impacts may occur, although these studies suggest that 50 or 55 dBA may be more appropriate.

To minimize such impacts, ESJ would incorporate the following APMs into the project:

Prior to construction or vegetation clearing, suitable nesting habitat within 500 feet (152 m) of the edge of ground disturbance would be surveyed for breeding activity to determine if raptors or special-status bird species are nesting. If nesting is confirmed, the following measures would be implemented to reduce noise levels below 60 dBA hourly Leq and minimize disturbance to those adjacent birds:

- Noise analyses would be performed during construction activities adjacent to sensitive habitats or active nests of special-status species.
- If necessary, temporary noise attenuation barriers would be erected to reduce construction-related noise to below 60 dBA hourly $L_{eq.}$



ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

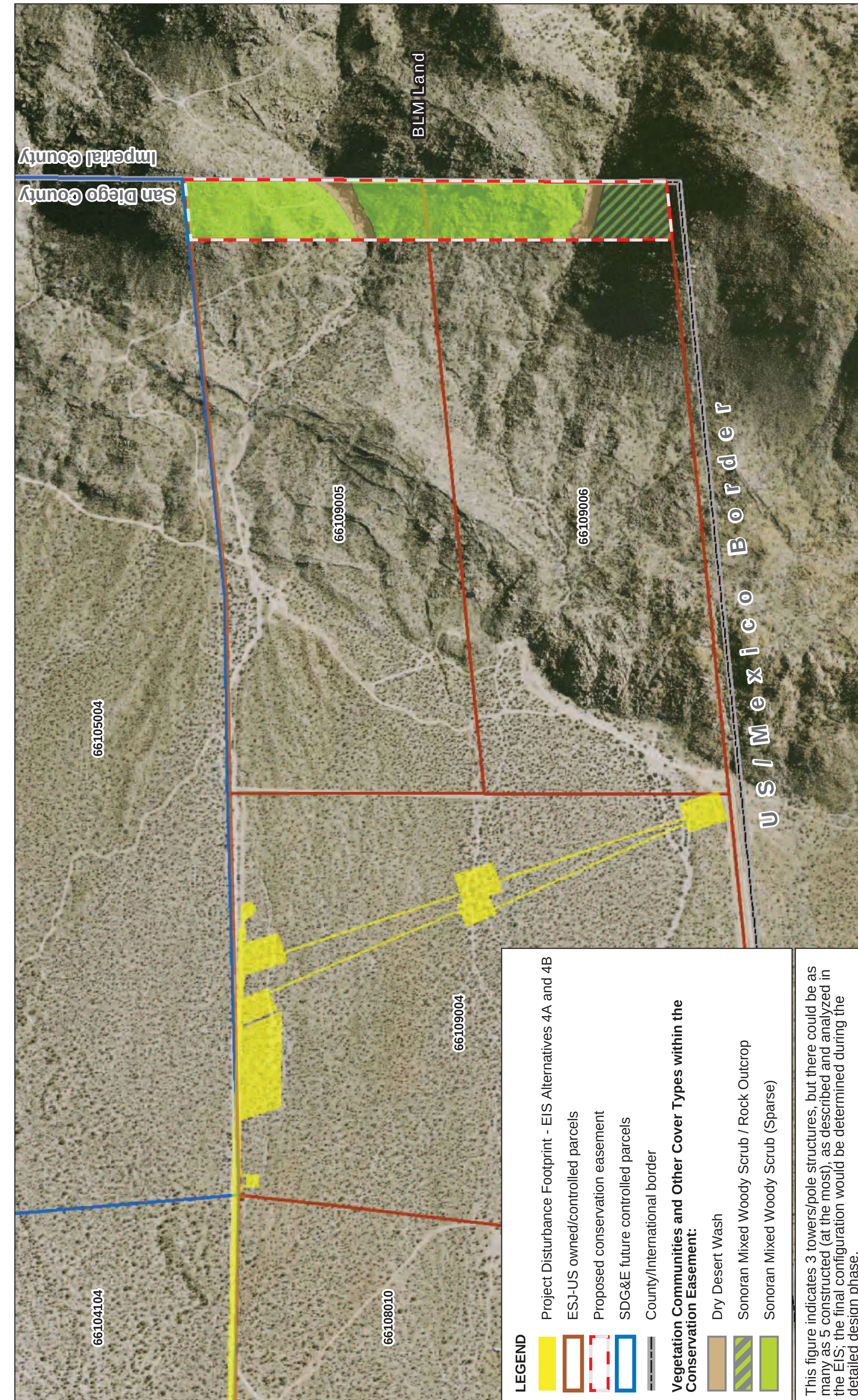
FIGURE 3.1-5a

PROPERTY BOUNDARIES AND PROPOSED CONSERVATION EASEMENT AREA ALTERNATIVES 2 AND 3

April 2012

Source(s): SanGIS 2011; Figure adapted from EDAW 2010b.

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_1-5a&b_ConservationEasements_2up_11x17_v1.ai (04/05/2012, 04:19 pm) R. Wurgler/T. Murphy



ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.1-5b

PROPERTY BOUNDARIES AND PROPOSED CONSERVATION EASEMENT AREA ALTERNATIVES 4A AND 4B

April 2012

Source(s): SanGIS 2011; Figure adapted from EDAW 2010b.

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_1-5a&b_ConservationEasements_2up_11x17_v1.ai (04/05/2012, 04:19 pm) R. Wurgler/T. Murphy

- Heavy equipment would be repaired as far away as practical from habitats where nesting birds may be present.
- Construction equipment, including generators and compressors, would be equipped with manufacturers' standard noise control devices or better (e.g., mufflers, acoustical lagging, and/or engine enclosures).
- The construction contractor would maintain all construction vehicles and equipment in proper operating condition and provide mufflers on all equipment.
- Noise monitoring would be conducted to determine that measures are effective to reduce noise to below 60 dBA hourly L_{eq}.
- Vegetation clearing and construction activities within potential nesting habitat for special-status bird species, as determined by a qualified biologist, would occur outside of the bird breeding season (generally February 1 to September 15). If clearing or construction activities must occur in potential nesting habitat during the breeding season, a qualified biologist would conduct preconstruction surveys within two weeks of the start of the construction activity to identify and avoid active nests (e.g., occupied nests with eggs or young) that would otherwise be impacted. In addition, for any construction activities that coincide with the raptor breeding season (liberally defined as February 1 to September 30), a qualified biologist would monitor foraging raptors onsite during construction activities to determine if construction activities adversely affect such behaviors. If construction adversely affects raptor foraging the monitoring biologist would make recommendations to modify construction activities to avoid the adverse effects.

Potential indirect impacts to other biological resources include noise, temporary increases in dust, construction activity, human presence in the area, and the introduction of exotic species (invasive non-native plant species, pests, and/or domestic animals). To minimize those temporary impacts, ESJ would incorporate the following measures into the project:

- The contractor(s) would be informed, prior to the bidding process, about the biological constraints of this project.
- The construction limits would be clearly marked on project maps provided to the contractor(s) and areas outside of the construction limits would be designated as "no construction" zones.
- ESJ would establish equipment staging and refueling areas and no such activities would be permitted outside of the designated areas. Staging/storage areas for construction equipment and materials would be located away from sensitive biological resources.
- Soils from construction grading would be stockpiled either on an area within the right-of-way or at a site approved by the County of San Diego and other agencies, as appropriate.
- Construction areas would be kept clean of debris and construction materials that might be ingested or otherwise pose a risk to wildlife. Excavated materials, trash, and debris would be removed from the right-of-way and disposed of at an approved disposal facility.

- Construction fencing/flagging would be installed along the entire construction right-of-way to prevent construction equipment or workers from entering open space areas.

Potential mitigation measures in addition to the APMs described above as having the potential to further minimize potential impacts to biological resources are: Biology-1 (Worker Training) and Biology-2 (Wildlife Entrapment). These potential mitigation measures, which are described in Section 3.1.3, are intended to ensure that all construction workers are aware of and know how to deal with sensitive biological resources in or near the construction areas; and to ensure that wildlife do not become trapped in construction excavations or monopole segments (if used) stored onsite.

Construction could also indirectly result in the introduction of exotic plant species in the area along access roads or the transmission line right-of-way and the surrounding properties due to an increase in disturbance from construction and transport of seeds or other plant matter into the area. In particular, non-native weed species could establish in the cleared areas and in adjacent undisturbed areas after construction. The introduction of exotic species is particularly problematic in sensitive vegetation communities where non-native plants could potentially result in increased competition with native species, thereby altering the biological diversity and species composition of the community. The survival of special-status species could be adversely affected by the success of an introduced plant species. In addition, landscapes dominated by exotic plant species are prone to ignite more easily and spread fires quickly (see Section 3.9 [Fire and Fuels Management]). To reduce the potential for introduction and establishment/spread of non-native species, ESJ would install flagging or construction fencing between work sites and adjacent open space areas to prohibit access into non-project areas. A potential mitigation measure in addition to the APM described above as having the potential to further minimize potential impacts to biological resources from invasive weeds is a Weed Control Plan (Biology-3). This plan would describe further measures of control for any identified weed populations in or near construction areas; to minimize the potential for weed introduction during construction; and to address post-construction maintenance and weed control procedures during the operational life of the project.

Special-Status Species

Although vegetation clearing activities would directly impact plants within and near construction areas, no special-status plants were observed in the survey area during rare plant surveys. Therefore, no impacts to such species are anticipated.

Four special-status wildlife species have a high potential to occur or were observed during the project surveys: northern red diamond rattlesnake, California horned lark, loggerhead shrike, and San Diego black-tailed jackrabbit. In addition, scoping comment letters received from the USFWS indicated that the transmission line corridor and access roads are in the vicinity of designated critical habitat for the Quino checkerspot butterfly and Peninsular bighorn sheep. In its March 24, 2010, letter to DOE, USFWS identified the following five federally-listed wildlife species as potentially occurring in the vicinity of the project: Quino checkerspot butterfly, arroyo toad, southwestern willow flycatcher, California condor, and least Bell's vireo. As discussed above in Section 3.1.1.6, the project site lacks suitable riparian and woodland habitat for arroyo toad, southwestern willow flycatcher, and least Bell's vireo; therefore, these species are considered to have a low potential to occur onsite and no impacts are expected to occur as a result of construction activities. Potential impacts of construction to the remaining two federally-listed species, along with other special-status species, are discussed below.

Quino Checkerspot Butterfly. Designated critical habitat for the Quino checkerspot butterfly is approximately 3.6 miles (5.8 km) west of the most westerly portion of the proposed project and would not be affected by construction of the project. As discussed in Section 3.1.1, surveys of the 230-kV Route did not document the presence of any Quino checkerspot butterfly or populations of host plants used at the larval stage by the species. As a result, the species is not expected to occur in the project area and would not be impacted by the project.

Northern Red Diamond Rattlesnake. Boulders and rocky outcrops on the ridge approximately 500 feet (152 m) east of the right-of-way (at its closest point) provide potential habitat where this species could occur. However, the transmission line right-of-way and the area affected by construction of the main access road do not contain the preferred habitat of the rattlesnake. Therefore, construction is not expected to affect the northern red diamond rattlesnake population.

California Condor. Although the 230-kV Route is within the range of the California condor, this species is considered to have a very low probability of occurring in the project area based on limited distribution within its historic range and the absence of recent sightings in the project vicinity (with the exception of the 2007 siting near Jacumba). Therefore, construction of the project is not expected to result in adverse effects on California condors.

California Horned Lark. The California horned lark was observed foraging along the proposed transmission corridor and access road and the species could nest in vegetation in this area. Although vegetation clearance would remove available foraging and nesting habitat, environmental protection measures included in project design (e.g., nesting surveys and avoidance of active nests) would ensure the avoidance of direct impacts and minimize any indirect impact to breeding horned larks. In addition, the loss of habitat would be offset by establishment of the conservation easement, which is preliminarily proposed to be located on the eastern portion of the property (Figure 3.1-5a [Alternatives 2 and 3] and Figure 3.1-5b [Alternatives 4A and 4B]).

Loggerhead Shrike. The loggerhead shrike typically forages in areas near scattered bushes and low trees. Although not observed or detected during any of the project surveys, based on the presence of suitable habitat and the relatively common occurrence of the species throughout the county, the loggerhead shrike has a high probability of occasionally using the habitats of the proposed right-of-way. Although vegetation clearance would remove potential foraging and nesting habitat, environmental protection measures included in the project design (e.g. nesting surveys and avoidance of active nests) would ensure the avoidance of direct impacts and minimize any indirect impact to the shrike. The loss of habitat would be offset by establishment of the conservation easement, which is preliminarily proposed to be located on the eastern portion of the property (Figure 3.1-5a [Alternatives 2 and 3] and Figure 3.1-5b [Alternatives 4A and 4B]). As a result, the impacts of construction on loggerhead shrike are expected to be minor but would last for the life of the project.

San Diego Black-tailed Jackrabbit. Construction would remove cover and foraging habitat for the San Diego black-tailed jackrabbit and could destroy active burrows if present. This loss of habitat would be offset by the conservation easement set aside on the eastern portion of the property (Figure 3.1-5a [Alternatives 2 and 3] and Figure 3.1-5b [Alternatives 4A and 4B]).

Jackrabbits may also be trapped in excavation areas for the towers/poles if they are left open after workers leave for the day. Implementation of mitigation measures Biology-1 (Worker Training) and Biology-2 (Wildlife Entrapment) would minimize the potential for such impacts by educating construction personnel and covering open excavations at the end of a work day (see Section 3.1.3). Overall, the impact of construction on the black-tailed jackrabbit would be minor.

Peninsular Bighorn Sheep. As noted in Section 3.1.1, the Peninsular bighorn sheep is not likely to occur in the transmission line right-of-way. Although there was no evidence of bighorn sheep on or adjacent to the site during any of the project surveys, increased human activity and disturbance adjacent to and within bighorn sheep habitat may threaten populations by altering their normal behavior (USFWS 2009a). The ESJ U.S. Transmission Line project area includes some of the key foraging habitat requirements (e.g., valley bottoms and washes) identified as primary constituent elements for bighorn sheep recovery, as demonstrated by anecdotal reports of sheep occurrences in the Project vicinity. Vegetation clearing within the right-of-way and the main access road would result in permanent impacts to potential forage material for this species. This habitat loss represents a very small portion of the foraging habitat available to bighorn sheep in the region, and is not likely to adversely affect the sheep population.

In its comment letter on the project NOI, the USFWS stated that the Peninsular bighorn sheep critical habitat is “immediately adjacent to the proposed alternative alignments” and bighorn sheep are “known to occur within or near the [transmission corridor]” (included in Appendix C.6 of this EIS); however, since the project NOI was issued on August 4, 2008, the location of the alternative corridors has been confirmed to be located approximately 2 miles (3.2 km) south of the designated critical habitat. Thus, the ESJ U.S. Transmission Line project would not result in the direct destruction or adverse modification of designated critical habitat. Nonetheless, the species can utilize habitats outside the critical habitat areas.

With regard to the potential for the Project to create a barrier to sheep movement and result in habitat fragmentation, there are limited empirical data pertaining to bighorn sheep avoidance of transmission lines. The FWS, in its Certificate of Right-of-Way Compatibility7 issued to Southern California Edison for the Devers-Palo Verde No. 1 500 kV transmission line, stated that “data currently available do not indicate any discernable impact on movement of bighorn sheep across the existing single transmission line right-of-way.” This finding suggests that the ESJ transmission line by itself would not serve as a deterrent to sheep movement through the area following construction.

Although helicopter use during construction is not anticipated based on the available site access for heavy equipment, ESJ could nonetheless elect to use of helicopters for transmission tower/monopole construction. Helicopter use has the potential to disturb wildlife such as Peninsular bighorn sheep due to localized dust, and noise that is audible at substantial distances. Helicopter use would be very short-term (an estimated 3 days), and the existing use of aircraft

[7] U.S. Fish and Wildlife Service, Certificate of Right-of-Way Compatibility, Kofa National Wildlife Refuge, March 1, 1989.

(e.g., for Border Patrol aerial operations) is not uncommon to the project area. Therefore, any impacts to wildlife from helicopter use would be minor. In summary, construction of the proposed transmission line would not affect the designated critical habitat and the potential for impacts to bighorn sheep is minor.

Mountain Lion. The mountain lion (*Felis concolor*) is legally classified as "specially protected species" in California (CDFG http://www.dfg.ca.gov/news/issues/lion/lion_faq.html) and listed by the County of San Diego (2010a) as a Group 2 species. This species was not observed during the surveys, but it has the potential to occur in the project area. Individual mountain lions have very large home ranges, reported by the San Diego Zoo (2011b) as 30 to 125 square miles (78 to 324 km^2); the Nature Conservancy reports that one male mountain lion that was trapped in San Diego County and fitted with a tracking collar ranged over a 200-square-mile (518 km^2) area of California and Baja California (The Nature Conservancy 2011). Under County of San Diego guidelines (2010a), direct and indirect impacts to Group 2 species are considered significant if they impact the long-term survival of the species. Based on the large range and high mobility of the mountain lion, the potential for the proposed project to lead to direct loss of these species is low. In addition, indirect effects on this species due to of noise and increased human presence on this species are expected to be minimal.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 under the Groundwater Extraction Major Use Permit would not affect biological resources. JCSD's Well #6 is an existing well from which water would be withdrawn and trucked to the ESJ site during construction. ESJ performed a site-specific biological survey in accordance with County of San Diego Guidelines (2010a) to analyze the impacts of the proposed access road that would be constructed to access JCSD Well #6. (AECOM 2011a)[8]. The potential access road and a 100-foot buffer zone on either side of the road were surveyed. Vegetation types within the survey area consist of desert saltbush scrub and southern cottonwood-willow riparian forest. The proposed access road would result in permanent impacts to 0.038 acre (0.02 ha) of desert saltbush and 0.042 acre (0.02 ha) of southern cottonwood willow riparian habitat (AECOM 2011a). San Diego County guidelines require that desert saltbush scrub be replaced at a 2:1 ratio and that southern cottonwood willow riparian forest habitat be replaced at a ratio of 3:1.

Furthermore, the survey determined that the construction of the access road would not fragment undeveloped lands or disrupt wildlife corridors, because the areas to the north, east, and west of the well would remain undeveloped. No sensitive plant or wildlife species were detected onsite. In accordance with the report recommendations, ESJ would implement the following APMs to minimize impacts to biological species during project construction:

- Mark project areas with fences and flags.

[8] The full report is available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/B/02STALOC_03.04.11_County%20of%20SD%20Attach%20G-ESJWaterpermBio.pdf

- Avoid removal of any avian habitats during breeding seasons, or perform preconstruction surveys.
- Avoid sound levels in excess of 60 dBA near nests, and mitigate the affected habitat acreages.

The applicant's biological technical report does not explicitly specify that the affected habitats would be replaced in accordance with San Diego County guidelines. Therefore, DOE has identified a potential mitigation measure (Mitigation Biology-4), in addition to the APMs, to replace desert saltbush scrub at a 2:1 ratio replace southern cottonwood willow riparian forest habitat at a ratio of 3:1, with the option to purchase mitigation within an established mitigation bank, onsite preservation, and/or offsite preservation with financial and legal agreements for long-term management of the resource in perpetuity. With these APMs and the additional mitigation measure Biology-4, the groundwater well access road construction would not contribute to the cumulative loss of habitats within the region. However, if Mitigation Biology-4 is not implemented, cumulative impacts to habitats in the region would be somewhat greater than described.

Another consideration is the effect of groundwater extraction on naturally occurring seepage and other natural extraction sources, and the related impacts to natural habitat. The County of San Diego considered these parameters in its cumulative groundwater evaluation, and waived a detailed analysis for the ESJ U.S. Transmission Line project due to the small amount of groundwater proposed for use (Bennett 2010). Based on the County's review and conclusions with regard to groundwater use for the ESJ U.S. Transmission Line project, DOE also concludes that there would be no impact to natural seepage and associated habitat values.

Operation Impacts

Vegetation and Wildlife

The transmission line structures would be widely spaced and would not interfere with wildlife movements. Clearing of vegetation in accordance with the Fire Protection Plan may inhibit, but is unlikely to preclude, movement by small animals with limited mobility and/or small home ranges, and is unlikely to affect the movement of large animals.

Bird collisions with transmission lines generally occur when: 1) birds cross power lines in daily use areas (e.g., when moving between foraging and roosting habitat); and 2) migrants encounter lines while traveling at reduced altitudes (most species fly well above transmission lines and, except for landing and takeoff, few migrants are below 500-600 feet above ground level). Therefore, collision risk is higher for bird species whose foraging, nesting, and/or roosting areas are geographically separated on opposite sides of a transmission line and for migrants that fly at low altitudes (CPUC/USFS 2009). Collisions are more probable near wetlands that attract large flocks of waterfowl and shorebirds, valleys that are bisected by transmission lines, and within narrow passes where power lines run perpendicular to flight paths (CPUC/USFS 2009). The 230-kV Route would not be within any known major bird migration corridors or major daily use areas. Further, high-voltage transmission lines with large conductors and transmission support structures are relatively visible to birds, which minimizes the potential for collisions.

The design specifications of the proposed ESJ U.S. transmission line would follow industry standards for avian protection on power lines (APLIC 2006), in order to minimize the risk of avian electrocution. Transmission line towers and associated structures provide elevated sites for perch-hunting, roosting, and nesting for some avian species, including raptors and the loggerhead shrike. This can be particularly beneficial to birds in open areas where elevated natural locations (e.g., trees, snags, and cliffs) are absent or limited (APLIC 2006). In some cases, transmission structures can expand the nesting and foraging range of species into previously unoccupied habitat with corresponding effects on local prey populations. However, larger avian species, such as raptors, are susceptible to electrocution from transmission lines with less than 60 inches (152 cm) of separation between energized and non-insulated phase conductors and grounded components.

The Avian Power Line Interaction Committee (APLIC) is a consortium of utility industry, wildlife resource agencies, conservation groups, and manufacturers of avian protection products. The committee works to understand the causes of bird/power line electrocutions and collisions and to develop ways of preventing bird mortalities and associated power outages (APLIC 2005). The APLIC publishes avian protection guidelines, including a "Suggested Practices" manual.[9] The most current (2006) version of the Suggested Practices manual recommends 60 inches (152 cm) of horizontal separation and 40 inches (102 cm) of vertical separation between energized and non-insulated phase conductors and grounded components for protection of birds up to the size of eagles. The applicant confirmed that its design would meet or exceed these separations.[10] However, the APLIC report indicates that, due to their larger wingspans, California condors require greater separations than eagles, but the report does not make specific recommendations on separation distances for condors. California condors have reported wingspans up to 118 inches (300 cm) (APLIC 2006). The applicant's design (see drawings provided in Appendix B) provides for a minimum horizontal separation of 13 ft (132 inches, 4 m) and a minimum vertical separation of 9 ft (108 inches, 2.7 m) between conductors and structures, with larger separations between conductors.[11] These separations should avoid electrocution of condors, should any condors pass through the project area.

Aviation safety lighting on electrical transmission structures and other sources of night lighting have the potential to impact migratory birds, whose flight patterns may be disturbed by artificial lighting. If aviation safety lighting is installed, then the addition of 3 to 5 towers or monopoles poles in the U.S. would not substantially impact migratory flight patterns. In addition, the

[9] APLIC's current (2005) guidance document and the current version of the APLIC's Suggest Practices manual (2006) are available online at: http://www.aplic.org/uploads/files/2634/APPguidelines_final-draft_Aprl2005.pdf and http://www.aplic.org/uploads/files/2643/SuggestedPractices2006(LR-2).pdf and, respectively. Additional information is available on the APLIC website, at: http://www.aplic.org/

[10] Sempra July 1, 2011 letter to DOE, available online:

http://www.esjprojecteis.org/docs/Sempra_Response_to_DOE_Questions_2011-07-01.pdf. In its letter to DOE, Sempra cites the following online reference:

http://www.aplic.org/uploads/files/2634/APPguidelines_final-draft_Aprl2005.pdf.

[11] Table 1 and Exhibits D4 and D5 of Sempra's March 19, 2008 application addendum submittal provide dimensions for the horizontal and vertical spacing between phases and horizontal and vertical spacing between the structure and each phase. These drawings are provided in Appendix B and available on the project website at http://www.esjprojecteis.org/docs/334_sup_ap.pdf.

lighting would be sufficiently separated by the spacing between towers and high enough off the ground (150 feet [46 m] in the case of 230-kV towers/poles, and 170 feet [52 m] in the case of 500-kV towers/poles) that the illumination would not materially increase the ambient light conditions at ground level, and thus would not affect wildlife forage and hunting patterns. As discussed in Section 3.2 (Visual Resources) aviation safety lighting is not currently proposed and lighting has not been requested by either the FAA or U.S. Border Patrol; therefore, no impacts associated with nightlighting of transmission structures are expected to occur.

Special-Status Species

Maintenance of the transmission line right-of-way during operation would require periodic reduction of vegetation cover to comply with the requirements of the fire plan. As noted above, no special-status plant species are known to occur in the vicinity of the project. Similarly, operation of the project would not affect Quino checkerspot butterfly or designated critical habitat of this species. Peninsular bighorn sheep are not known in the habitats of the corridor and would not be affected by operations. The following sections address the potential impacts of operation on those special-status wildlife species with potential to occur in the project area.

California Horned Lark. The California horned lark uses the right-of-way and the adjacent areas for foraging. The periodic maintenance of vegetation in the transmission line right-of-way to comply with the fire plan would reduce the amount of habitat in the area for this species. Overall, the impact on this species due to the loss of habitat during operation of the project would be minor but would last for the duration of the project. The loss of habitat would be offset by the establishment of the conservation easement (Figure 3.1-5a [Alternatives 2 and 3] and Figure 3.1-5b [Alternatives 4A and 4B]). Therefore, the impacts of construction on the lark would be minor but would last for the life of the project.

Loggerhead Shrike. As noted in Section 3.1.1, there is a high probability that the loggerhead shrike occasionally uses the habitats of the right-of-way. Although the periodic maintenance of the right-of-way to comply with the fire plan would reduce the amount of habitat for the species in the area, the loss of habitat would be offset in part by establishment of the conservation easement which is preliminarily proposed to be located on the eastern portion of the property (Figure 3.1-5a [Alternatives 2 and 3] and Figure 3.1-5b [Alternatives 4A and 4B]). This would result in a minor impact to the species that would last for the life of the project.

San Diego Black-tailed Jackrabbit. The transmission line structures would increase the number of available raptor perches and may therefore increase predation on black-tailed jackrabbits in the vicinity of the right-of-way. This increase in predation would result in a minor impact to the species but would last for the life of the project. In addition, the periodic maintenance of vegetation in the transmission line right-of-way to comply with the Fire Protection Plan would reduce the amount of habitat in the area for the jackrabbit. The loss of habitat would be offset by establishment of the conservation easement, which is preliminarily proposed to be located on the eastern portion of the property (Figure 3.1-5a [Alternatives 2 and 3] and Figure 3.1-5b [Alternatives 4A and 4B]). Overall, the impact of operation of the project on this species would be minor but would last for the duration of the project.

Impacts in the U.S. due to Related Activities in Mexico. Impacts to biological resources also in the U.S. would occur if construction or operation of the proposed ESJ Wind project and the associated transmission lines in Mexico impeded the cross-border movement of wildlife, destroyed or fragmented habitat for wildlife that move or migrate between Mexico and the U.S., or resulted in “take” of those animals (e.g., migratory birds) afforded international protection under international treaties. Cross-border movement of certain terrestrial wildlife species (particularly large mammals) is already impeded by the U.S.-Mexico border fence where present. The ESJ Wind project would consist of numerous wind turbines dispersed over a large geographic area. During Phase 1, up to 52 turbines would be dispersed over 5,200 acres (2,104 ha) in the general vicinity of La Rumorosa, Northern Baja California, Mexico. At full build out of all phases, the project facilities would be dispersed over 727,261 acres (294,312 ha). Construction and operation of the wind facilities and associated access roads and support facilities, coupled with loss/alteration of vegetative cover and elevated levels of human activity from workers and visitors to the wind farm, could result in wildlife avoidance of the area.

Because of the comparatively low elevation of San Diego County’s mountains (lower than the San Bernardino and San Jacinto mountains to the north), many birds migrating to/from a winter range in western mainland Mexico to/from breeding ranges in California, the Pacific Northwest, or Alaska, use San Diego County as a corridor for crossing from the desert to the coastal slope. This migration occurs all along the east side of the San Diego County mountains but is most concentrated in the canyons and valleys that lead from northwest to southeast, such as Grapevine Canyon in Anza Borrego Desert State Park (located about 39 miles [63 km] northwest of the alternative corridors) and San Felipe Valley (located about 37 miles [60 km] northwest of the alternative corridors) west of Anza Borrego Desert State Park near the town of Julian. San Felipe Valley is the most heavily used corridor (Skagen et al. 2004; Unitt 2007). As discussed above, the proposed ESJ U.S. Transmission Line project would not be constructed in a known major migration corridor or avian concentration zone.

Based on the general characteristics of the landforms within and near the ESJ U.S. project alternative corridors, and the contiguous landforms south of the border, it appears that the proposed transmission line segment in Mexico and the ESJ Wind project Phase 1 turbines would not be located within known major migration corridors or habitats such as extensive wetlands and riparian areas that would support large concentrations of birds. Nonetheless, cross-border migratory birds will traverse the border in the project area to various degrees (e.g., raptors often follow ridgelines), and thus the potential exists for Phase 1 and future phase operation of the ESJ Wind project to result in direct mortality of cross-border migratory birds due to collisions with transmission lines and wind turbines.

Construction of the Phase 1 wind turbines could impact pine forest and other plant communities that have significant habitat value for migratory birds (Rodriguez-Estrella 2005), including birds protected under the MBTA (CPUC/BLM 2008b). Future phases would increase this development footprint. As discussed in Section 2.10, the ESJ Wind project in Mexico would be constructed in phases, with up to 52 wind turbines constructed in Phase 1. Power output for Phase 1 would be 130 MW assuming nominally 2.5 MW per turbine, and potentially up to 156 MW if the output reaches 3 MW per turbine (the wind turbines have not been selected by ESJ, so actual generating capacity may vary, depending on the selected manufacturer and specific model). The Phase 1 turbines would be constructed on the furthest north land leased by ESJ (an area referred to as the Jacume lease area), north of the town of La Rumorosa, Mexico (Figure 1-1), and later phases would be constructed south of this area. The maximum rotational speed of turbine rotor blades averages between 6 and 16 revolutions per minute for a 2.5 MW turbine. The total height of the combined tower structure and rotor blades would likely be up to 431 feet (130.5 m), depending on the tower height and the turbine rotor blade diameters. The rotor diameter for the Siemens SWT-2.3-101 (a typical design for this type of project) is approximately 333 feet (101 m). The total distance from blade tip at the six o'clock position to the ground surface would be at least 97 feet (29.5 m). The Mexican EIS indicates that the total project would require other infrastructure to support the wind turbines, including about 560 miles (900 km) of access roads, 75 permanent meteorological towers about 490 feet (150 m) high, electrical substations, and transmission lines from the substations to the U.S.-Mexico border, as well as other support facilities. Construction of the ESJ Wind project could result in habitat loss and alteration, and possibly the destruction or abandonment of active migratory bird nests.

Operation of the turbines could result in the loss of migratory birds and bats that collide with the turbine blades or, in the case of bats, are subject to barotrauma. Raptors, in particular, may be vulnerable to collisions with wind turbines when hunting prey, depending on the ground-to-rotor clearance and siting of turbines in relation to rim edges (raptor use has been shown to be higher on the prevailing upwind sides of ridges and turbines sited away from rim edges may reduce raptor fatality rates) (CPUC/BLM 2008b). Night-lighting may serve as an attractant for birds. Night-migrating birds could collide with towers (Unitt 2007), particularly if aviation safety lighting is installed on the transmission towers/poles.

Golden Eagle and other Migratory Raptors. Construction and operation activities related to the ESJ Wind project in Mexico have the potential for reasonably foreseeable impacts to golden eagles and other migratory birds that in the course of their daily activities move across the U.S.-Mexico border. Such potential impacts include: 1) injury or death to migratory birds from collisions with wind turbines and related transmission facilities; 2) increased loss and adverse modification of habitat, particularly for the black-tailed jackrabbit, a special-status species and primary prey source for golden eagles and other migrating raptors in the area; and 3) direct disturbance of golden eagles (including nest abandonment) that may result in few nest attempts and reduce nest productivity.

Although uncertainty exists over the current population size and status of golden eagles in the U.S. and in northern Baja California, Mexico, factors that could cause population declines such as habitat loss are increasing. Invasions of exotic plant species and alteration of fire frequencies have the potential to decrease the amount of suitable habitat for preferred prey species across much of the west. Territory occupancy in Idaho declined following several fires that resulted in loss of shrub habitats and concurrent declines in jackrabbit populations. A golden eagle population in California experienced declines in territory occupancy following extensive urbanization (Good et al 2004). Kochert and Steenhof (2002) indicate that nesting eagles in San Diego County decreased dramatically from an estimated 85 pairs in 1900 to 40 occupied territories in 1999. Large-scale declines occurred between 1956 and 1980, and subtle declines occurred through 1999. These declines were related to extensive residential development. Overall, as human activity and development increases throughout the west, associated pressures on golden eagle populations are also expected to increase (Good et al 2004).

Due to the proximity of the proposed ESJ Wind project in Mexico to the U.S. border and the proposed ESJ U.S. Transmission Line project site in San Diego County, turbines and related facilities built during Phase 1 of the ESJ Wind project are considered by DOE to be within the "local area population" of golden eagles in San Diego County. The local area population is defined as the population within the average natal dispersal distance from identified (historic and/or active) nests and is a key metric to evaluating the direct, indirect, and cumulative effects of "take" under the MBTA and BGEPA. The local area population for golden eagles is 140 miles from a nest under consideration (74 FR 46845). As noted in Section 3.1.1.6, some eagle territories in the border region of southeastern San Diego County have been documented to be active within the past 2 to 3 years. Thus the local area population of golden eagles exists in a geographic area that encompasses both the proposed ESJ Wind project area in Mexico and San Diego County. DOE has therefore determined that impacts in the U.S. to migratory birds, including potential impacts to the local area golden eagle population, from the construction and operation of ESJ Wind turbines and associated facilities in Mexico are within the scope of this EIS. Because it is impractical to identify which individual birds, or what percentage of the population of golden eagles, may travel into the U.S. versus birds remaining exclusively in Mexico, this EIS discusses the potential impacts to golden eagles at the population level. The Mexican government has completed its own evaluation of environmental impacts of the ESJ Wind project and has issued a permit with conditions authorizing construction and operation of the wind project and ancillary facilities in Mexico. DOE incorporates information from the Mexican evaluation of environmental impacts and Mexican permit in this EIS.

Eagle Ecology. Golden eagle ecology is discussed above in Section 3.1.1.6. As noted, the project region that encompasses the ESJ U.S. Transmission Line project in the U.S. and the ESJ Wind project area in Mexico provides suitable habitat for golden eagle nesting and foraging. Golden eagles have been noted to be sensitive to some forms of human activity including recreationists and researchers, with resulting loss of the eggs or juveniles due to nest abandonment, exposure of juveniles or eggs to the elements, collapse of the nest, eggs being knocked from the nest by startled adults, or juveniles fledging prematurely. General indicators of disturbance include agitation behavior (displacement, avoidance, and defense); increased vigilance at nest sites; change in forage and feeding behavior, and/or nest site abandonment (Pagel et al 2010). Of the preceding behaviors, nest-site abandonment constitutes "take" under the BGEPA, as it is specifically cited in the definition of "disturb." The other behaviors, when considered cumulatively, may be evidence that activities are interfering with normal breeding behavior. Human intrusions near golden eagle nest sites have resulted in the abandonment of the nest; high nestling mortality due to overheating, chilling or desiccation when young are left unattended; premature fledging; and ejection of eggs or young from the nest. In some cases, raptors, including golden eagles have been observed to habituate rapidly to human activity and have been known to nest successfully near areas with relatively high levels of human presence.

Eagle Occurrences in the Project Region. As discussed above in Section 3.1.1.6, the golden eagle is known to occur in the ESJ project region both in the U.S. and in Mexico. The Tule Wind project surveys in southeastern San Diego County found three golden eagle nest territories located at Table Mountain, Carrizo Gorge, and Boundary Peak. The Table Mountain and Carrizo Gorge territories were documented to be active within the past 2 to 3 years (2007-2009), but were not active during the March 2010 helicopter survey (CPUC/BLM 2010). No active nesting was observed in these territories in 2011.

According to San Diego Zoo (2012), eagle activity in the ESJ Wind project Phase 1 site in Mexico has been minimal through the fall of 2011. No golden eagle nests have been found within the ESJ Wind project Phase 1 site and data collected since 2009 appear to suggest that the ESJ Wind project Phase 1 site does not contain suitable nesting habitat for resident golden eagle breeding. Golden eagles utilized the middle to southern ESJ Wind project area (south of the Phase 1 area) for both foraging and breeding, but at low densities. Observations noted an abundance of suitable nesting sites, but relatively few historic nests (<20) and even fewer active nests (1 in 2009, 1 in 2010, and none found in 2011). Although only one nest was confirmed active in the southern Sierra Juarez in 2010, the presence of an immature eagle with an adult pair in the central Sierra Juarez (approximately 38 miles [62 km] away from the ESJ Wind project Phase 1 area, but within the larger ESJ Wind project area, and potentially well within the range of the local area population of golden eagles) suggests the potential for breeding in the area.

As of late 2011, at least two and potentially three eagle territories had been identified: an adult pair and one juvenile in the central Sierra Juarez, where there was an active nest site in 2009; a breeding pair and a juvenile in the southern Sierra Juarez where there was an active nest site in 2010; and two adult eagles in the northern Sierra Juarez where historic nest sites were found. Due to large home ranges in the wind project area habitat, it is currently unknown whether these represent unique territories. In October 2011, an adult female was GPS tagged which is currently providing data showing that this bird has crossed the U.S.-Mexico border at least seven times and has flown to within 18 miles (29 km) of the ESJ Wind project Phase 1 site.

Potential impact to golden eagles from ESJ Wind project. Wind turbines for electric power generation are rapidly increasing in size, number, and worldwide distribution, appearing where wind resources are suitable. Wind turbines kill birds and bats, usually because the wind turbine blades strike birds and bats flying into the rotor zone, the portion of the sky swept by the rotor blades. Wind turbine-caused mortality of birds and bats has been estimated at some wind power sites. For example, Hunt et al (1999) and Hunt (2002) documented wind turbine-caused mortality at the Altamont wind resource area in central California. Although the turbine design and density of turbines at the Altamont site are substantially different than most modern wind farm designs, the estimates of mortality have been high enough to cause concern.

During 2005–2006 and 2007–2008, avian use and flight behavior surveys conducted for the ECO Substation/Tule Wind Project and documented in the Draft EIR/EIS, found that golden eagles had very low encounter rates (estimates of the frequency with which an eagle is observed at the elevations of the proposed turbine's rotor swept area). A low encounter rate indicates a relatively low risk of collision and low potential for mortality (CPUC/BLM 2010). The turbine design proposed for the ESJ Wind project is comparable to the design proposed for the Tule Wind project.

The San Diego Zoo ICR's current conclusions and recommendations related to eagles for Phase 1 of the ESJ Wind project are summarized below:

- The limited sightings of golden eagles in the ESJ Wind project Phase 1 area and lack of suitable nesting habitat appears to indicate a limited potential risk of impact, although further study of the species and their territories is necessary.

- Sempra should consider the development of an alert system, such as MERLIN radar or VHF detection receivers, to minimize the risk to condors and/or eagles. The Institute will work with Sempra to explore and develop various options for both alerting when collision risk is high and deterring wildlife-turbine collisions.
- Sempra is encouraged to follow the current USFWS Land-Based Wind Energy Guidelines and Eagle Conservation Plan Guidance.
- Adaptive management should be used and risk assessments updated as more data are collected for this site.

The USFWS is responsible for enforcing the MBTA and BGEPA; however, the USFWS does not have responsibility for enforcement of these regulations outside of the U.S. (USFWS March 24, 2010 letter to DOE; see Appendix C.9). Migratory birds, including golden eagles, are protected by international treaties, including the 1937 Convention for the Protection of Migratory Birds and Game Mammals (50 Stat. 1311; TS 912, as amended in 1972). The Mexican government is a signatory to this treaty and is responsible for addressing impacts to this species within Mexico. The U.S. government as a signatory to this treaty also has an interest in potential impacts to “birds denominated as migratory, whatever may be their origin, which in their movements live temporarily in the United States of America and the United Mexican States”.[12]

ESJ has obtained an environmental permit from the Mexican government for the ESJ Wind project. DOE reviewed a partial translation of the Mexican MIA permit (or La Manifestacion de Impacto Ambiental, modalidad regional [MIA-R]). The permit requires various mitigations including a baseline study (at least one year) of potential impacts to birds (including migratory species) and bats prior to the operation of the proposed wind farm. If the baseline study shows that birds and bats could be adversely impacted, the permit requires future mitigation to protect or minimize adverse impacts on these bird and bat populations.

Although the Mexican permit does not identify specific potential future mitigations that could be required to address avian impacts from the ESJ Wind project, such measures could be similar to those developed by resource agencies for wind projects in the U.S. For example, potential avian impacts associated with the proposed Tule Wind project in southern San Diego County were identified in the EIR/EIS for that project, and several CPUC/BLM identified mitigation measures have been proposed to minimize avian impacts. These measures include preparing and implementing an Avian Protection Plan; avoiding the use of guy wires; appropriate turbine layout that may include placing all turbines on the ridgeline and avoiding placement of turbines on slopes and within canyons; placing power lines underground as much as feasible; reducing foraging resources near turbines; and minimizing turbine lighting and avoiding lighting that attracts birds (CPUC/BLM 2011a)[13]. It is not known whether these or other specific avian protection measures would be incorporated into the ESJ Wind project.

[12] Treaty information is available online at: http://www.fws.gov/laws/lawsdigest/treaty.html

[13] Refer to Section D.2 of the Final EIR/EIS for the East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects. October. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/ECO_Final_EIR-EIS.htm. Mitigation measures BIO-10c through BIO-10i focus on reducing potential avian impacts from the Tule Wind project wind turbines.

Bats. In addition to birds, migratory bat species could be adversely affected by the ESJ Wind project turbines. Bat mortality occurs at wind farms due to collisions with turbine blades and barotrauma (Kunz et al. 2007; California Energy Commission, 2007a). Barotrauma is the tissue damage to air-containing structures (lungs) that results from the rapid air-pressure reduction near moving turbine blades (Baerwald et al. 2008). Studies to date indicate that foliage- or tree-roosting migratory bat species have experienced the highest fatality rates at wind energy facilities in North America, particularly during the late summer/early fall season (Kunz et al. 2007). Baerwald et al (2008) reported evidence that barotrauma is the cause of death in a high proportion of bats found at wind energy facilities. A study by Baerwald et al (2008) found that 90 percent of bat fatalities involved internal hemorrhaging consistent with barotrauma, and that direct contact with turbine blades only accounted for about half of the fatalities. Projected impact levels to migratory bats in Mexico due to turbine collisions or barotrauma are unknown and could vary based on such factors as regional migratory patterns, patterns of local movements through the ESJ Wind project area, and the response of bats (both individually and collectively) to turbines (CPUC/BLM 2008b). As with avian species, the Mexican permit requires ESJ to conduct bat monitoring studies in the project area for a period of at least one year prior to and after construction. Should the study identify impacts associated with possible collisions, ESJ would be required to propose and implement measures for bat protection or for minimization of negative impacts associated with collisions. Any incidental “take” of migratory bats in Mexico, and/or environmental protection measures to prevent incidental “take,” would be under the authority of the Mexican Environmental, Natural Resources, and Fisheries Ministry.

Quino Checkerspot Butterfly. The ESJ Wind project in Mexico would consist of numerous wind turbines dispersed over a large geographic area in the general vicinity of La Rumorosa, in the border region of Northern Baja California, Mexico. Wind development in the border region with Mexico would result in some loss of vegetation with potentially suitable habitat for this species. However, no adverse effects on the U.S. Quino checkerspot butterfly population are expected based on the substantial distances and amount of other suitable areas between the U.S. and the wind development area.

Barefoot banded gecko. Although wind development in the border region with Mexico would result in some loss of vegetation with potentially suitable habitat for this species, and the introduction of increased human activity (with potential consequences such as increased illegal collection), no adverse effects on the U.S. barefoot banded gecko population are expected based on the substantial distances and amount of other suitable areas between the U.S. and the wind development area. The wind development area would not be fenced; therefore, cross-border movement of this species would not be impeded by the ESJ Wind project.

Peninsular Bighorn Sheep. Although I-8 inhibits north–south movement of some wildlife species, Peninsular bighorn sheep are known to cross I-8 occasionally and move south into Mexico to breed with other populations (SDG&E 2009b). The closest Peninsular bighorn sheep population to the Project site is the Carrizo Canyon subpopulation, located approximately 25 km to the west of the transmission line alternative sites. (63 FR 13134–13150; USFWS 2000); also, west of the In-Ko-Pah Gorge and I-8 there are “island” areas that receive transient bighorn sheep use. Additionally, the wind development area would not be fenced, so it would not create new physical barriers to any cross-border movement of sheep that does occur.

Based on input from the wildlife agencies pertaining to bighorn sheep movement, very little or no cross-border movement of sheep currently occurs and the two sub-populations are believed to be largely independent of one another and other sub-populations in Mexico. In an April 2010 report titled “Maintaining a Landscape Linkage for Peninsular Bighorn Sheep” researchers from the Conservation Biology Institute identified habitat loss from wind farms in the Sierra Juarez mountains as a potential issue for sheep, but the study does not mention this development as a source of loss of intermixing (Conservation Biology Institute, 2010). This study assesses the distribution and habitats of bighorn sheep in the Sierra Juárez in Baja California, just south of the international border, the potential threats to bighorn sheep there, and the threats to this landscape linkage. According to this study, the current level of long-term connectivity between federally endangered bighorn sheep in Peninsular Ranges of southern California and bighorn sheep in Baja California is not well understood. Habitat modeling indicates that habitat for bighorn sheep is continuous from north of the border south through the Sierra Juárez, and observations of bighorn sheep in the Sierra Juárez have been confirmed within this predicted habitat. Findings suggest that long-term connectivity between bighorn sheep populations in the U.S. and Baja California is a realistic long-term management goal, and that increased development in the border region could result in habitat loss and fragmentation of the landscape. Based on this analysis of the information available to DOE, any adverse effects to the Mexican sub-population resulting from the construction and operation of the wind turbines are unlikely to result in impacts to the U.S. sub-population.

Mountain Lion. As discussed above, the mountain lion has the potential to occur in the project area and individual mountain lions have very large home ranges that have been shown to span the U.S.-Mexico border (San Diego Zoo 2011b; The Nature Conservancy 2011). The wind development area would not be fenced; therefore, cross-border movement of this species would not be impeded by the ESJ Wind project.

3.1.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

The biological resources in the vicinity of Alternative 3 are essentially the same as those of Alternative 2 as the routes for these alternatives are adjacent to each other and construction, operation, and maintenance activities would be substantially the same for both alternatives. Consequently, the impacts to biological resources, including special-status species that would occur with Alternative 3 would be essentially the same as those described above for the 230-kV Route.

Construction of the 500-kV Route requires clearing of vegetation over a wider right-of-way than for the 230-kV Route alternative. Table 3.1-3 lists the areas cleared by vegetation community and other cover types. The tower bases and associated adjacent fire protection zones cleared of vegetation (including the ground disturbance associated with the laydown/parking/stringing area), and the transmission line access road would permanently impact a total of 6.23 acres (2.52 ha), of which the effects to 6.07 acres (2.62 ha) of impacts to Sonoran mixed woody scrub would warrant mitigation. Permanent land disturbance for the 500-kV Route is estimated to be 6.23 acres (2.52 ha), which includes the tower bases and adjacent fire protection zones cleared of vegetation (including the ground disturbance associated with the laydown/parking/stringing area), and the transmission line access road. Within the disturbed area, the effects to 6.07 acres (2.46 ha) of Sonoran Mixed Woody Scrub would warrant mitigation (Table 3.1-3). In addition, construction of Option A for the legal access road would permanently impact 0.55 acre (0.22 ha) of Sonoran Mixed Woody scrub, and 2.29 acres (0.93 ha) of Peninsular Juniper Woodland. If Option B is constructed, permanent impacts would include 1.14 acres (0.46 ha) of Sonoran Mixed Woody scrub, and 2.60 acres (1.05 ha) of Peninsular Juniper Woodland. Based on these calculations, a total of either 13.49 acres (5.46 ha; if Option A is constructed) or 15.01 acres (6.07 ha; if Option B is constructed) would be placed in a conservation easement to offset permanent impacts of the 500-kV transmission line alternative and the main access road. This preserved area would adjoin a large open space tract of land to the east under ownership of BLM, as discussed above in Section 3.1.2.3.

Table 3.1-3
Impacts to Vegetation Communities and Habitat Types for the 500-kV Alternative (Alternative 3)

Vegetation Communities and Habitat (Cover) Types	Survey Area (Acres)	Area Affected Along the 500-kV Alternative Corridor, Main Access Road, and Groundwater Well Access (acres)		
		500-kV Alternative	Property Access Road Option A	Property Access Road Option B
Sonoran Mixed Woody Scrub	46.38	6.07	0.55	1.14
Peninsular Juniper Woodland and Scrub	14.85	–	2.29	2.60
Desert Saltbush Scrub	0.58	0.02[1]	–	–
Southern Cottonwood Willow Riparian Forest	0.42	0.01[1]	–	–
Disturbed Habitat	3.97	0.16	1.56	0.80
Total Cover	**66.20**	**6.26**	**4.40**	**4.54**

[1] The proposed offsite groundwater well access road would result in permanent impacts to 0.019 acre (0.01 ha) of desert saltbush and 0.014 acre (0.01 ha) of southern cottonwood willow riparian habitat. These impacts will be mitigated through the purchase of mitigation credits from a County-approved mitigation bank in the amount of 0.038 acre (0.02 ha) of desert saltbush scrub and 0.042 acre (0.02 ha) of southern cottonwood willow riparian forest.

Source: EDAW, Inc. 2010b, AECOM 2011a.

3.1.2.5 Alternative 4 — Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

In accordance with County of San Diego Guidelines (2008), the biological survey area included the combined disturbance footprints of transmission line Alternative routes 4A and 4B; the 100-foot buffer surrounding the transmission line routes; the access route alternative disturbance footprints; and the 100-foot buffers surrounding the access routes (EDAW 2010b). Similar to the original proposed design, Alternative 4A (230 kV design) would be constructed within a 130-foot wide right-of-way, and Alternative 4B (500 kV design) would be constructed within a 214-foot wide right-of-way. Permanent construction impacts would be limited to a 28-foot wide property access road (within a 40-foot easement) a vehicle turnaround, a 12-foot wide access road and three to five tower bases.

Biological resource studies conducted for the Alternative 4 routes indicate that the Alternative 4 routes are very similar to the Alternative 2 and 3 routes in the type and density of vegetation types, local site topography and drainage, the potential for sensitive species, and overall acreage of disturbance. The slight differences can be observed by comparing Figure 3.1-3a (Alternatives 2 and 3) to Figure 3.1-3b (Alternatives 4A and 4B); and by comparing Figure 3.1-4a (Alternatives 2 and 3) to Figure 3.1-4b (Alternatives 4A and 4B). Therefore, the above discussion of impacts and potential mitigations identified for Alternative 2 and 3 would also apply to the Alternative 4 routes. The conservation easement discussed for Alternatives 2 and 3 would also be applied under Alternative 4, with the required size of the easement determined from the acreages of different vegetation types affected (Figure 3.1-5b).

3.1.3 Mitigation Measures

The following potential mitigation measures in addition to the APMs described above would further reduce potential impacts to habitats/vegetation communities, and special-status plants and animals.

Biology-1: Worker Training

Prior to the initiation of construction or major (non-routine) maintenance and repairs during operations, ESJ should engage a qualified biologist to provide training and area-specific information to contractor personnel to ensure that construction workers are aware of: (1) the sensitive biological resources potentially occurring along and adjacent to the construction right-of-way and the main access road, and (2) protection measures for sensitive resources that should be followed within those areas. The employee training session should include a description of sensitive biological resource and special-status species concerns as well as applicable regulations. The training should address various relevant topics in an adequate level of detail, commensurate with the size of the workforce and the scale and duration of construction activities. Suggested topics to be addressed in the worker training include the following:

- Temporary and permanent habitat protection measures;
- Worker rules of conduct (e.g., no pets in or adjacent to the construction area; avoid harm or harassment of wildlife; no firearms in or adjacent to the construction area except for security personnel);
- Actions to take if previously unidentified sensitive resources are encountered; and
- Points of contact for comments and questions about the material discussed in the program.

Each participant in the training should sign a statement declaring that the individual understands and will abide by the guidelines set forth in the training materials.

Biology-2: Wildlife Entrapment

Open excavations should be covered at the end of each work day to prevent wildlife entrapment. Covers should be secured in place prior to workers leaving the site, and should be strong enough to prevent wildlife from breaching the cover and becoming entrapped. If the excavations cannot be covered, exclusion fencing (i.e., silt fencing) should be installed around the excavation. Excavations should be inspected prior to filling to ensure absence of animals.

If a dead or injured individual of a listed species is found in the construction zone or along an access road, a qualified biologist should contact appropriate resource agencies (i.e., USFWS for federally listed species or CDFG for state-listed species) within 48 hours of the finding.

If monopoles are used, and segments of the monopoles are stored in the construction area, the open segments should be temporarily capped during storage to prevent wildlife from entering them. The segments should be inspected prior to capping to ensure no animals are inside.

Biology-3: Weed Control Plan

ESJ should prepare and implement a weed control plan that describes the weed control measures during the pre-construction, construction, and long-term operations phases. The measures should be developed by qualified individuals in consultation with appropriate agencies (e.g., the County of San Diego Agriculture Commissioner's Office and the California Invasive Plant Council) and should include at least the following elements:

- A list of identified non-native invasive weed species and their locations based on the vegetation mapping previously conducted (EDAW, Inc. 2010b).
- A plan for treatment of identified weed species including: (1) timing (based on plant phenology), (2) appropriate treatment methods (chemical, mechanical, and/or manual), and (3) best management procedures for treatment methods (e.g., no herbicides should be used when wind velocities are above 5 miles per hour).
- Construction best management procedures to prevent the introduction and/or spread of weeds at work sites including, but not limited to: (1) using only County of San Diego Agricultural Commissioner certified weed-free seed, straw, gravel, and fill materials, (2) ensuring vehicles are clean and free of any weed seeds prior to arriving at the work site, and (3) no washing of vehicles at the work site.
- Conduct post-construction surveys and implement the appropriate treatment methods to control the introduction and spread of weeds along the transmission line right-of-way and main access road at appropriate frequencies over the operational life of the project.

Biology-4: Groundwater Well Habitat Replacement

Permanent impacts to native habitat at the groundwater well access road should be replaced in accordance with San Diego County guidelines (2010a). Desert saltbush scrub should be replaced at a 2:1 ratio and southern cottonwood willow riparian forest habitat should be replaced at a ratio of 3:1, with the option to purchase mitigation within an established mitigation bank, onsite preservation, and/or offsite preservation with financial and legal agreements for long-term management of the resource in perpetuity.

3.2 VISUAL RESOURCES

This section analyzes potential impacts to the existing visual setting from the ESJ U.S. Transmission Line project. The existing setting description and much of the analysis in this section is adapted from the Visual Resources Report for the Energia Sierra Juarez U.S. Transmission LLC Generation-Tie Line Project prepared for ESJ by ICF Jones and Stokes (2010b). The analysis follows the County of San Diego Guidelines for Determining Significance – Visual Resources (2007i) which were developed based on the widely used visual assessments utilized by the Federal Highway Administration (FHWA 1981), the U.S. Forest Service (USFS 1987) and the U.S. Bureau of Land Management (BLM n.d.). These guidelines provide a systematic approach to analyzing visual impacts using standard nomenclature. The approach generally begins with an inventory of the visual resources and aesthetic conditions of a particular site, and involves the following steps:

- Describe the existing visual character and visual resources of the project site/study area;
- Identify visually sensitive resources;
- Identify viewers and representative viewpoints to the project area; and
- Evaluate the impacts the proposed project would have on visual resources themselves (e.g., visual character and quality) and in regard to viewer response, and provide potential mitigation measures to avoid or reduce those impacts.

Visual character is defined by descriptive attributes in the landscape and is influenced by geologic, hydrologic, botanical, wildlife, recreational, and urban features. Visual quality is evaluated based on the relative degree of vividness, intactness, and unity, as modified by viewer sensitivity. These concepts are described below (as defined in the FHWA visual resources manual 1981):

Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.

Intactness is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements. This factor can be present in well-kept urban and rural landscapes and in natural settings.

Unity is the visual coherence and compositional harmony of the landscape considered as a whole. It frequently attests to the careful design of individual components in the landscape.

3.2.1 Affected Environment

3.2.1.1 Regional Setting and Viewshed

The alternative corridors are located in the eastern portion of San Diego County in the Jacumba Valley, in an area where the Peninsular Ranges and desert regions converge. The Jacumba Valley viewshed encompasses approximately 7.75 square miles (20 square kilometers) on the U.S. side of the international border with Mexico. The viewshed is linearly interrupted by the border fence, but the Jacumba Valley and its viewshed extends several miles south of the border into the La Rumorosa area of Mexico. The unincorporated community of Jacumba occupies the southwest corner of the viewshed and is adjacent to the international border.

Elevations in the Peninsular Ranges within the viewshed vary from 3,000 to 6,000 feet (914 to 1,829 m) above mean sea level. The ranges are characterized by steep mountain slopes that are typically covered with granite boulders and chaparral vegetation on the western slopes, evergreen and temperate forests at and near the peaks, and desert chaparral on the eastern slopes. The largely undeveloped mountain areas surround scattered rural communities. Scenic resources are plentiful and include large open spaces including Anza-Borrego Desert State Park, BLM-managed land, and smaller county reserves.

Elevations within the desert region range from sea level to approximately 3,000 feet (914 m) above mean sea level, and the terrain includes mountains, foothills, alluvial fans, and desert floor. The desert region provides expansive views characterized by dramatic landforms, native desert habitat, and low desert valleys. The In-Ko-Pah and Jacumba Mountains rise above the surrounding landscape north of the corridors. The Grey and Table Mountains are visible landforms in the northern viewshed (ICF Jones and Stokes 2010b).

3.2.1.2 Alternative Corridors Visual Setting

The alternative corridor viewshed (within the greater Jacumba Valley viewshed) extends approximately 2 miles (3.2 kilometers) from west to east. To the east, the Jacumba Mountains restrict the enclosed viewshed to less than 1 mile (1.6 kilometers). Although the viewshed extends further south into Mexico, the international border fence defines the southern viewshed limits. The alternative corridors are located in the southeast quadrant of the viewshed in a low-lying, depositional pediment that is slightly concave and flat, and gently slopes 10 degrees to the southwest. As the site extends to the west, north, and east, it converges with the surrounding topography. The primary vegetative community within the corridors is characterized as Sonoran mixed woody scrub (refer to Section 3.1 [Biological Resources] for more detail regarding dominant vegetation types). This plant community varies in height from 1 to 6 feet (0.3 to 1.8 m) and ranges in color from dark to light green, transitioning to more intense hues of yellow and brown during the dry season. The vegetation exhibits a coarse and patchy texture, as vegetative coverage varies across the alternative corridors from approximately 30 to 40 percent.

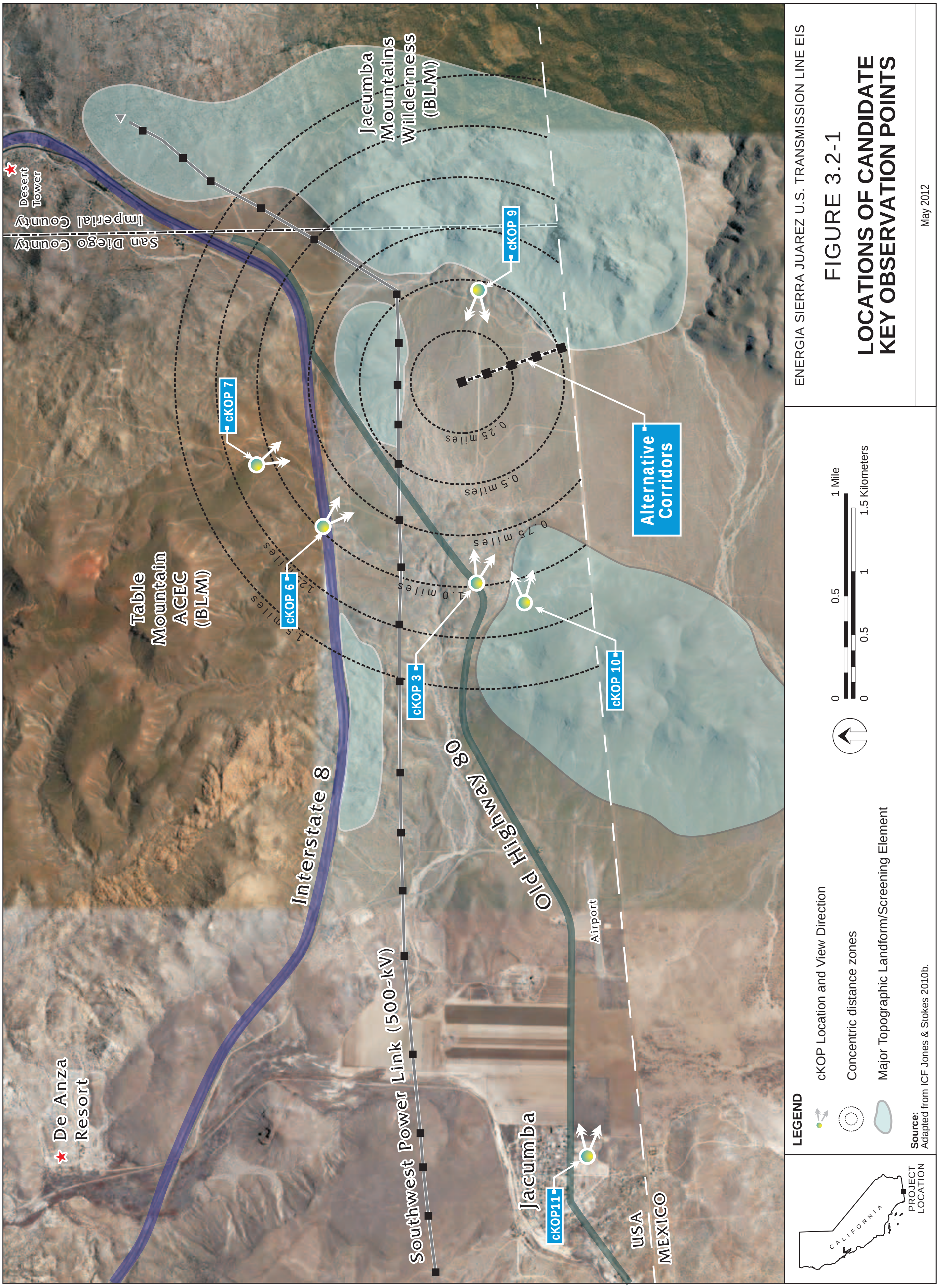
The eastern portion of the viewshed has a very coarse texture, which is a product of the rocky underlying landform and the patchy, clumped desert scrub vegetative overcover. There are numerous volcanic erosional landforms that protrude conspicuously in the landscape (e.g., Airport Mesa, Jade Peak, and Table and Round Mountains) and exhibit a unique but slightly incongruent conical form in the viewshed. Due to their geologic composition, these landforms exhibit a noticeably rusty-red hue and darker color value than the surrounding granitic rock formations. Views from the alternative corridors are mostly panoramic, although the Jacumba Mountains enclose views from the site to the east. The Jacumba Mountains are steep and rocky, and nearly devoid of vegetation. The silhouette of these grey pyramidal forms creates a dramatic jagged line on the viewshed's eastern horizon. Carrizo Creek's headwaters originate in the eastern portion of the viewshed, and it meanders westward through the valley before turning north to the Imperial Valley through the steep landscape of the Carrizo Gorge.

The alternative corridor area exhibits linear uniformity and vegetative continuity; however, various man-made modifications (e.g., border fence, existing east–west and north–south access roads, the SWPL, Old Highway 80, I-8, and a telecommunications facility on Nopal Peak in the Jacumba Mountains) located throughout the area interrupt the continuous natural landscape. Each of these features introduces distinct and, in some cases, contrasting forms, lines, and colors into the landscape that compromises the visual quality of the viewshed. For example, the dark brown international border fence, directly south of the alternative corridors, creates a strong linear disruption in the corridor's uninterrupted landscape character. Similarly, the existing, approximately 40-foot-wide (12.2-m-wide) east–west access road creates a second break in the groundcover near the northern end of the corridors by introducing a vivid sand-colored line that contrasts starkly with the predominantly grey-green vegetative cover. The SWPL lattice towers and powerlines extend within the alternative corridor viewshed from the west to the east and introduce strong vertical and horizontal elements into the viewshed. The towers are most prominent against the blue sky, but tend to blend in and disappear into the mountain background. The most prominent man-made disturbance near the alternative corridors is I-8. Both east- and west-bound traffic on I-8 introduce motion/movement into the viewshed, which draws the eye away from the site. In addition, numerous dirt roads facilitate U.S. Border Patrol enforcement activities in the area. Patrol and scouting activities by the agents in their vehicles can create transitory negative visual effects by introducing motion and creating dust clouds. There are also developed checkpoints on I-8 and Old Highway 80 in the eastern portion of the valley. The presence of each of the individual features mentioned above is industrial and utilitarian in nature, and that incongruity disrupts the intactness, unity, and, in instances, vividness of the viewshed (ICF Jones and Stokes 2010b).

Key Observation Points

To capture the baseline visual setting of the alternative corridors as viewed by area users (motorists and recreationists), eleven candidate key observation points (KOPs) along Old Highway 80, I-8, BLM-managed lands, and residential lands were identified in the Visual Resources Report (ICF Jones and Stokes 2010b) where unobstructed views to the corridors are available (Figure 3.2-1). These candidate KOPs were assessed to determine which would be the most representative of the alternative's potential effects on the viewshed. As a result of this assessment KOPs 3, 6, 9, and 10 were selected as representative viewpoints for area users.[14] In addition to motorists and recreationists, two occupied residences are located in close proximity to the alternative corridors. One residence is located approximately 0.4 mile (0.6 km) northwest of the site; the viewshed from this residence corresponds most closely with that viewed from KOP 3. The other residence is located approximately 1.4 miles (2.3 km) northeast of the site; the viewshed from KOP 9 encompasses the same views as this residence. These KOPs are described below.

[14] For the purposes of this analysis, DOE has retained the numbering of the KOPs from the technical report. Other than the two occupied residences described above, the ESJ U.S. project alternative corridors would not be visible from any residential viewpoints in Jacumba or Boulevard; therefore, these viewers are not reflected in any of the selected KOPs.


ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS
FIGURE 3.2-1
LOCATIONS OF CANDIDATE KEY OBSERVATION POINTS
May 2012
LEGEND
cKOP Location and View Direction
Concentric distance zones
Major Topographic Landform/Screening Element
Source: Adapted from ICF Jones & Stokes 2010b.
PROJECT LOCATION
CALIFORNIA
0
0.5
1 Mile
0
0.5
1
1.5 Kilometers
Jacumba Mountains Wilderness (BLM)
Table Mountain ACEC (BLM)
Desert Tower
Imperial County
San Diego County
Interstate 8
Old Highway 80
Southwest Power Link (500-kV)
Alternative Corridors
De Anza Resort
Jacumba
Airport
USA
MEXICO
cKOP 3
cKOP 6
cKOP 7
cKOP 9
cKOP 10
cKOP11
0.25 miles
0.5 miles
0.75 miles
1.0 miles
1.25 miles
1.5 miles

KOP 3

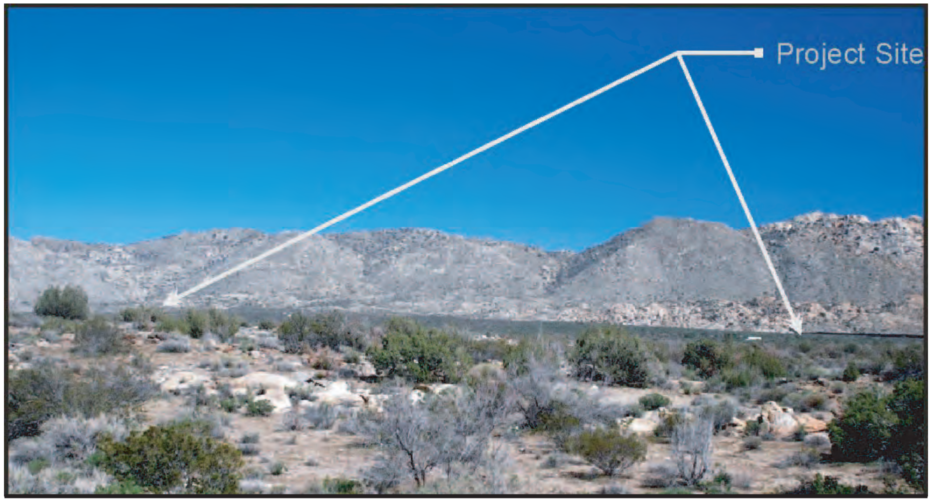
KOP 3 is located along Old Highway 80 approximately 0.25 mile (0.4 kilometer) from where the roadway curve transitions to the northeast. As shown in the photograph in Figure 3.2-2, the foreground of this KOP consists of scattered vegetation intermixed with large rock outcroppings and boulders. These elements create variety and add visual interest to the diagonally trending foreground, which is a boulder strewn transitional upland area. The view from this KOP was captured in the spring when the vegetation was green. After a summer's heat, the color of this vegetation will become brown and will contrast less with the sand-grey mountains.

A large portion of the middleground is obscured by the low hill at the distant edge of the foreground. The visible portion of the middleground includes a long expanse of scrub vegetation on the pediment surface up to the strong black horizontal line that is created by the international border fence. From this vantage point, the Jacumba Mountains are a sequential series of relatively distinct pyramidal forms. The rugged silhouette of the Jacumba Mountains contrasts strongly against the brilliant blue sky and creates a positive memorable landscape view exhibiting vividness and unity. The nearest ESJ U.S. Transmission Line project structure to this KOP would be just over 1 mile (1.6 kilometers) to the east in the middleground of the view.

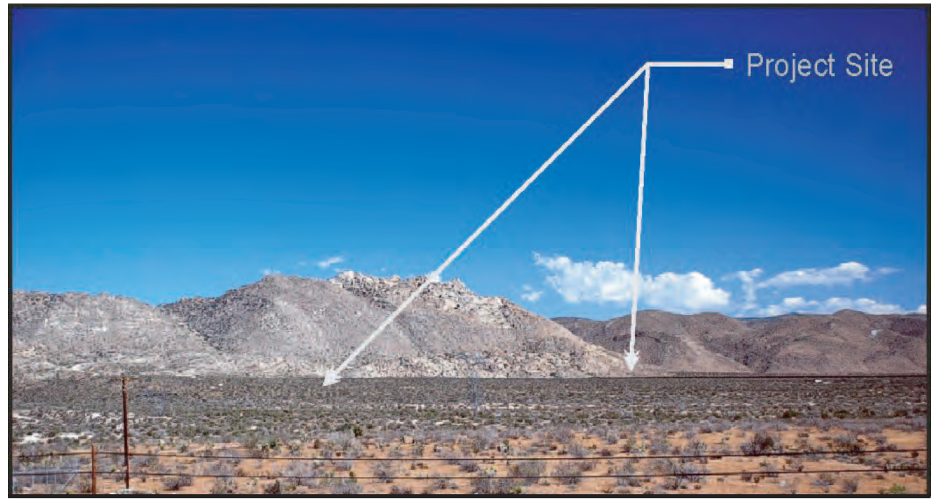
KOP 6

KOP 6 is located along eastbound I-8 near the Mica Gem Mine Undercrossing just under a mile west–northwest of the alternative corridors. It is anticipated that the nearest ESJ U.S. Transmission Line project element would be located approximately 1 mile (1.6 kilometers) to the east–southeast. This view is representative of what is afforded to motorists traveling on eastbound I-8. This viewshed's foreground consists of boulder strewn transitional uplands, which include a patchwork of green, brown, and grey-colored vegetation. Existing dirt roads create light sand-colored lines in the lower foreground, which contrast with the browner, more copper-hued dirt floor that dominates the foreground (Figure 3.2-2). Also, existing wooden pole utility lines introduce both strong vertical and horizontal elements into the foreground. The middleground is composed of an expanse of denser, coarser, multi-hued vegetative cover up to the point where the pediment meets with the strong black horizontal element created by the international border fence. Although somewhat transparent, an existing SWPL lattice tower is noticeable in the center of the near middleground.

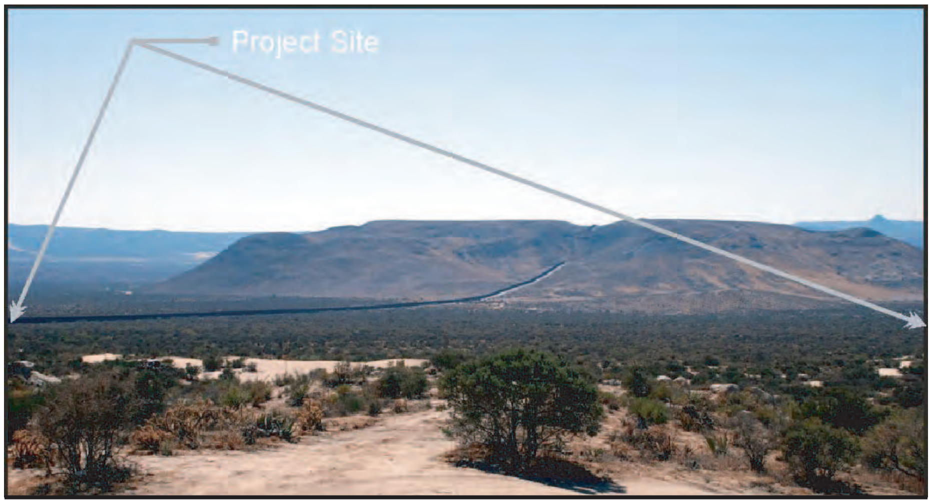
From this perspective, the interface between the pediment surface and the Jacumba Mountain foothills creates a strong horizontal line that appears to be an extension of the border fence. The distant middleground is composed of the Jacumba Mountains as they extend into Mexico. The lower background of this vantage point is blocked by the Jacumba Mountains, and the open sky comprises the upper portion of the background. The background of this view exhibits visual variety in that the Sierra de Juarez Mountains appear much smoother and browner than the Jacumba Mountains. Their ridgeline creates a pleasing silhouette along the horizon.



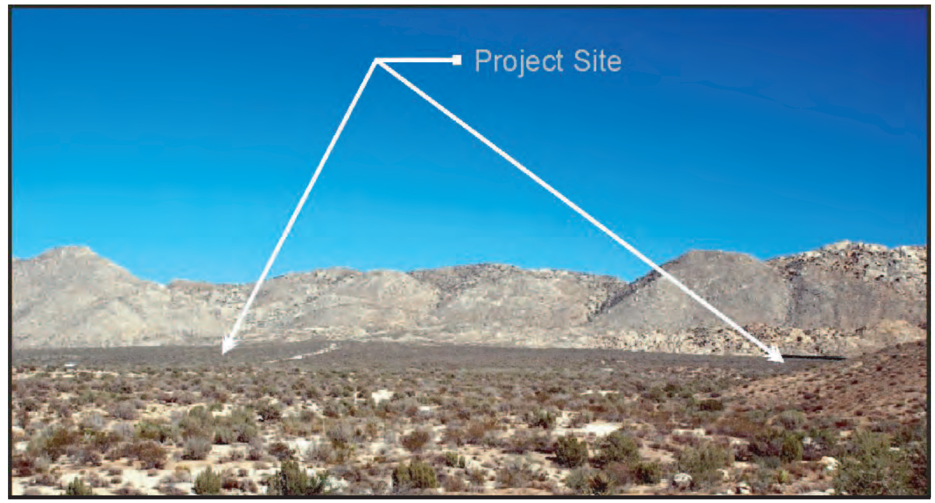
KOP 3—View towards the alternative corridors from Old Highway 80; view direction is east-southeast; project features are 1.01 miles (5,325 feet [1,623 m]) distant; camera azimuth is 97°



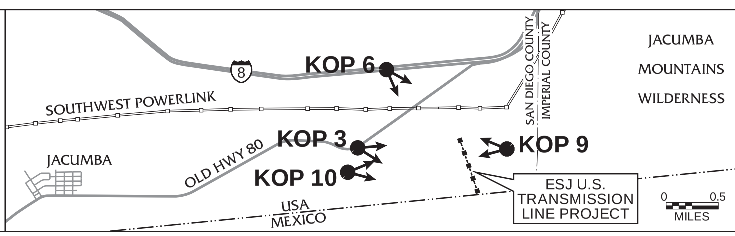
KOP 6—View towards the alternative corridors from I-8; view direction is south–southeast; project features are 0.97 mile (5,096 feet [1,553]) distant; camera azimuth is 136°



KOP 9—View towards the alternative corridors from the Foothills of the Jacumba Mountains; view direction is west–southwest; project features are 0.49 mile (2,570 feet [783 m]) distant; camera azimuth is 250°



KOP 10—View towards the alternative corridors from BLM land Airport Mesa; view direction is east; project features are 1.11 miles (5,869 feet [1,789 m]) distant; camera azimuth is 86°



Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.2-2

REPRESENTATIVE VIEWS OF THE ESJ U.S. PROJECT SITE FROM SELECTED KOPs

May 2012

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\Figure_3_2-2_KOPs3-6-9-10_RepresentativeViews_11x8_v3.ai (04/05/2012, 04:18 pm) R. Wurgler/T. Murphy

KOP 9

KOP 9 is located on the Jacumba Mountain Foothills, approximately 0.5 mile (0.8 kilometer) west–northwest of the alternative corridors. The nearest element of the ESJ U.S. Transmission Line project would be located approximately 0.5 mile (0.8 kilometer to the east–southeast. The immediate foreground is the dirt road that provides an access route to the upper reaches of the Jacumba Mountains (Figure 3.2-2). The distant foreground of this viewshed is composed of the gently sloping planar pediment, with scattered vegetation and occasional rock outcroppings located throughout the foreground. In addition, dirt roads used to access the Jacumba Mountains and the existing east–west access road create irregular patterns of light sand-colored patches of ground. The middleground is composed of an expanse of green vegetation, which exhibits a denser, coarser look and feel than in the immediate foreground. The international border fence disrupts the continuity of vegetative land-cover in the southern segment of this viewshed. Additionally, the yellow-colored herbaceous vegetation on the Airport Mesa landform juts into the middleground, blocking the majority of the distant background from this view. The background, which is visible to the north and south of the Jacumba Airport, include the skyline created by the East County and Mexican Mountains.

KOP 10

KOP 10 is located on the eastern portion of the Airport Mesa landform approximately 1.1 miles (1.7 kilometers) west of the alternative corridors. A scattered patchwork of vegetation in alternating hues of brown and green establish this viewshed’s foreground as the Airport Mesa landform transitions to pediment (Figure 3.2-2). The underlying land surface ranges from a harder textured, yellowish brown color in the immediate foreground to a sand-colored, smoother textured cover in the distant foreground. The existing east–west access road is a somewhat visible sand-colored interruption in the grey/green vegetation. A small segment of the international border fence disrupts the continuous earth-toned landscape character in the viewshed’s distant middleground in the extreme south. The rugged silhouette and sequential pyramidal forms of the Jacumba Mountains compose the background.

3.2.1.3 Designated Scenic Highways

According to the Caltrans Scenic Highway Mapping System, no segments of I-8 have been officially designated as state scenic highways (Caltrans 2007). However, the County of San Diego has designated the segment of I-8 from the El Cajon city limit east to the Imperial County Line and Old Highway 80 from State Route 79 to I-8 as County Scenic Routes in the Conservation and Open Space Element of the County of San Diego General Plan (County of San Diego 2011d). Unobstructed views of the alternative corridors are available intermittently from this segment of I-8 for approximately 0.6 mile (1 km) in the vicinity of the Mica Gem Mine Undercrossing.

3.2.2 Environmental Impacts

3.2.2.1 Methodology

The assessment of potential impacts to visual resources was adapted from the analysis provided in the report titled Visual Resources Report for the Energia Sierra Juarez U.S. Generation-Tie Line, prepared by ICF Jones and Stokes (2010b). As indicated previously, this report followed the County of San Diego Guidelines for Determining Significance for Visual Resources (2007i).

To evaluate potential changes to the existing visual setting, daytime photographic surveys of the proposed location for the alternative corridors were conducted on days in which climatic conditions yielded exceptional visibility: April 7, June 22, June 26, September 16, and September 26, 2009. After the preliminary photographic survey, Geographic Information System (GIS) software was used to identify where and to what extent the transmission towers would be visible to visual receptors from identified KOPs (described in Section 3.2-1 above). Existing setting photographs and modeled images were rated individually by a team of experts at ICF Jones and Stokes on a scale of 0 (no degree of change, not noticeable) to 5 (high degree of change, very noticeable) for visual character and elements of visual quality (vividness, intactness, unity). The scores were then averaged to obtain the final rating for each category.

The images were also analyzed using anticipated viewer response, which was based upon a combination of viewer sensitivity ratings, viewer exposure ratings, and anticipated duration of view for different viewer groups. The overall level of impact to visual resources at each KOP (minor, moderate, or major) was determined by combining the severity of adverse change in the view with the degree to which anticipated viewers would likely perceive the change.

DOE reviewed the County of San Diego's guidelines for consideration of project impacts to dark skies (County of San Diego 2007c).[15] The County's Light Pollution Code (LPC), also known as the Dark Sky Ordinance, was adopted "to minimize light pollution for the enjoyment and use of property and the night environment by the citizens of San Diego County and to protect the Palomar and Mount Laguna observatories from the effects of light pollution that have a detrimental effect on astronomical research by restricting the permitted use of outdoor light fixtures on private property" (Sec. 59.101). The LPC and other County general plan policies and zoning ordinance stipulations were established to limit harmful effects of outdoor lighting on communities and recreational areas in general, and on the Palomar and Mount Laguna Observatories in particular. The LPC designates all areas within a fifteen (15) mile (24.1 km) radius of each observatory as Zone A, with all other areas of the County designated as Zone B. Zone A has more stringent lighting restrictions, including limits on decorative lighting, so that night skies are dark enough for clear viewing through the telescopes at the observatories. The alternative corridors are located more than 15 miles from both observatories. Lighting is not proposed for the transmission towers, but aviation safety lighting could be used on the wind turbines in Mexico. Therefore, these guidelines are not addressed further in the evaluation of potential visual resource impacts from the ESJ transmission structures, but the guidelines are addressed in the context of potential visual resources impacts to the U.S. from the wind turbines in Mexico.

3.2.2.2 Alternative 1 – No Action Alternative

Under the No Action alternative, the existing visual resources would remain as described. Activities described under the action alternatives would not take place. Consequently, there would be no impacts to visual resources.

[15] County of San Diego Guidelines for Determining Significance – Darks Skies and Glare, available online at: http://www.sdcounty.ca.gov/dplu/docs/Dark_Skies_Guidelines.pdf

3.2.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line (Applicant's Preferred Alternative)

Construction Impacts

Use of staging areas and construction yards during construction of the proposed transmission line, as well as vegetation clearance around each of the proposed structures as required by the Fire Protection Plan (discussed further in Section 3.9 [Fire and Fuels Management]) would introduce unnatural vegetative lines and soil color contrast from the newly exposed soils (e.g., land scarring). As discussed further in Operations Impacts, land scarring would adversely affect the visual quality of the site as viewed by motorists and recreationists and is considered a potentially moderate permanent impact (lasting for the life of the project). However, much of the proposed access road improvements would occur on an existing roadway and the only new potential scar areas are the transmission line access road and the immediate area surrounding each of the proposed towers/monopoles. In addition, there are numerous other roadways and towers in the vicinity of the project, which would be viewed, in the same viewshed by recreationists and motorists. Mitigation measure Visual-1 (Reduce color contrast and views of land scars) is a potential mitigation measure not proposed as an APM that could reduce the long-term visibility of land scars to sensitive viewer groups and reduce impacts to moderate levels.

In addition to potential land scars, the presence and visual intrusion of construction vehicles, equipment, materials, and work force along the transmission line routes would result in temporary impacts to visual resources. Vehicles, heavy equipment, materials, and workers would be visible during access road clearing and grading, structure erection, conductor stringing, and site/right-of-way clean-up and restoration. Construction equipment and activities would be visible to various receptors in close proximity to the right-of-way, including motorists on I-8, Old Highway 80, and numerous BLM access roads, and recreationists at local recreation areas including Table Mountain ACEC, Anza-Borrego Desert State Park, and Jacumba Wilderness (although views of the construction site from recreation areas would be transected by existing views of I-8 and Old Highway 80). View durations from these vantage points would vary from intermittent (for motorists) to extended (for recreationists). Although, views of the construction site from recreation areas would be transected by existing views of I-8 and Old Highway 80, the visibility of construction activity would detract from the visual character of the viewshed. Therefore, impacts are considered temporary and minor.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 would not affect visual resources, but the new 150-foot access road to the well would be visible to motorists traveling along Old Highway 80. Although the new access road would represent a permanent change in the viewshed for motorists (the road would remain following the end of construction activity), this road would be very short and would be similar in design to other roadways off Old Highway 80 in the Jacumba area. Therefore, impacts to visual resources are considered minor.

Operations Impacts

The proposed transmission line would add industrial structures in a primarily rural, open space setting (although, as described in Section 3.2.1 (Affected Environment), the area includes a number of industrial features such as the SWPL transmission line and local electrical distribution lines). As described in detail in Section 2 (Proposed Action and Alternatives), implementation of this alternative would include up to five transmission line towers or monopoles that would rise 150 feet (46 m) above the desert floor, a service road, and five 50- x 50-foot (15.2- x 15.2-m) transmission tower pads cleared of vegetation. The effect of these elements on existing visual resources (visual quality/character) and the degree to which these elements would be noticeable (viewer response) were used to determine the level of impact. Accordingly, visual quality/character and viewer response were rated on a scale of 0 (no degree of change, not noticeable) to 5 (high degree of change, very noticeable) at each of the four representative KOPs described in Section 3.2.1 (Tables 3.2-1 and 3.2-2). Evaluations of visual quality/character and viewer response are described in detail by KOP below.

KOP 3

Visual Quality/Character — Vividness

Existing Conditions. As shown in Figure 3.2-3a, the change in patterns of texture, color, form, and line that define distance zones makes this a memorable view. Unique in the landscape is the rock ridgeline to the observer's right and its likeness in the tumbled mountain base below. The convergence of the linear border fence with the angular lines and steep eroding slopes of the mountain face provides an interesting contrast between temporal man-made modifications and natural landforms.

Table 3.2-1
Summary of the Visual Quality Assessment at Each KOP
Based on Design With Transmission Towers

Visual Quality	KOP 3			KOP 6			KOP 9			KOP 10		
	Existing	With 230-kV	Change	Existing	With 230-kV	Change	Existing	With 230-kV	Change	Existing	With 230-kV	Change
Vividness	4	3.75	0.25	3.17	2.75	0.42	2.58	2.25	0.33	3.75	3.17	0.58
Intactness	3.42	2.92	0.50	2.25	1.42	0.83	1.75	1.08	0.67	3.67	2.83	0.84
Unity	4.08	3.33	0.75	2.42	1.67	0.75	1.75	0.92	0.83	3.67	3.00	0.67
Combined Rating	11.5	10	1.5	7.84	5.84	2.0	6.08	4.25	1.83	11.09	9	2.09
Viewer Response		2.4			2.4			3.2			3.1	

Rating: 0 = None, 1 = Low, 2 = Moderately Low, 3 = Moderate, 4 = Moderately High, 5 = High
Source: ICF Jones and Stokes 2010b

Table 3.2-2
Summary of the Visual Quality Assessment at Each KOP Based on Design With Monopoles

Visual Quality	KOP 3			KOP 6			KOP 9			KOP 10		
	Existing	With 230-kV	Change	Existing	With 230-kV	Change	Existing	With 230-kV	Change	Existing	With 230-kV	Change
Vividness	4	3.06	0.94	3.17	2.5	0.67	2.58	1.9	0.68	3.75	2.95	0.80
Intactness	3.42	2.56	0.86	2.25	1.3	0.95	1.75	1	0.75	3.67	2.78	0.89
Unity	4.08	2.9	1.18	2.42	1.56	0.86	1.75	0.87	0.88	3.67	2.66	1.01
Combined Rating	11.5	8.52	2.98	7.84	5.36	2.48	6.08	3.77	2.31	11.09	8.39	2.7
Viewer Response		2.4			2.4			3.2			3.1	

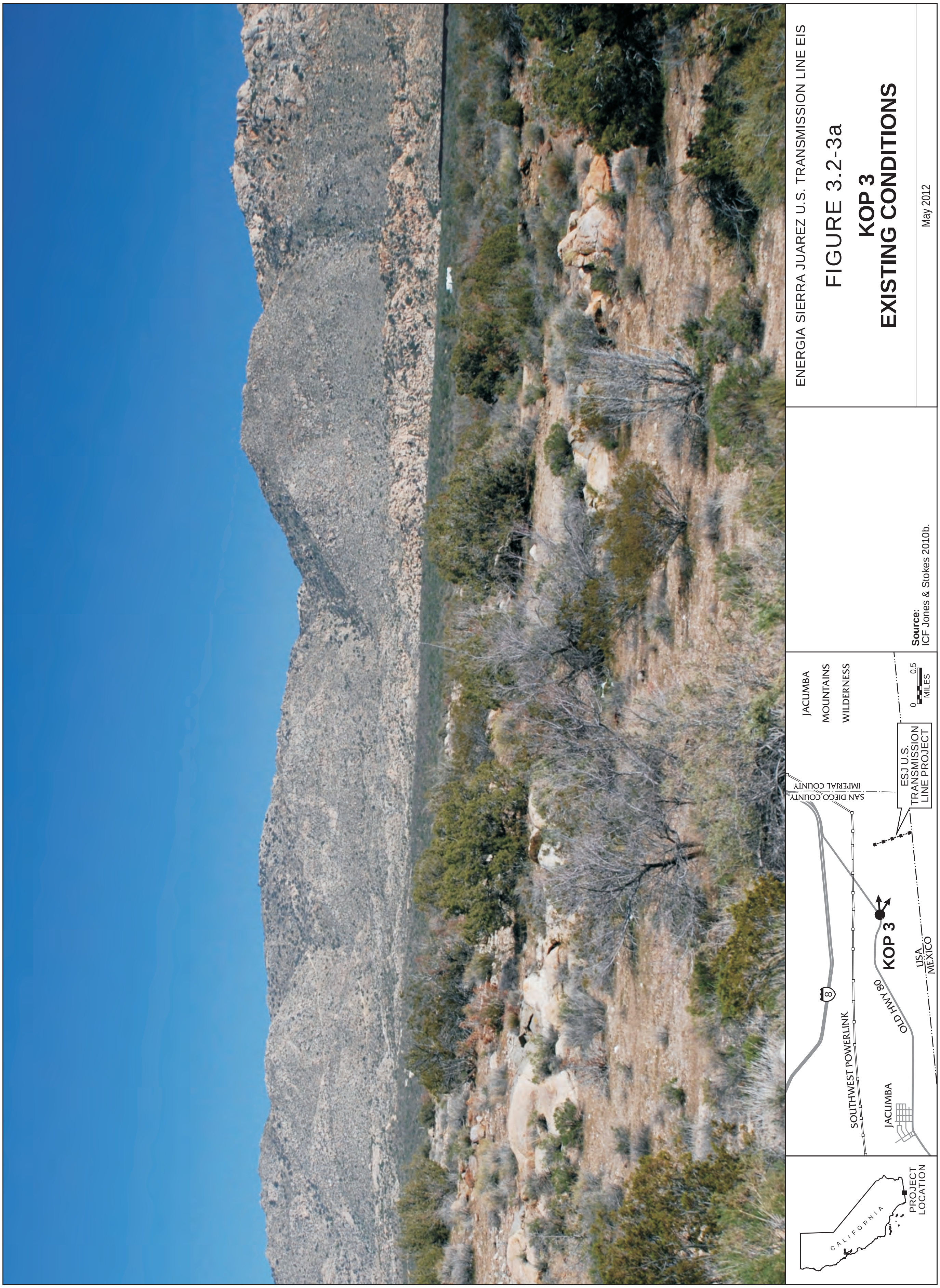
Rating: 0 = None, 1 = Low, 2 = Moderately Low, 3 = Moderate, 4 = Moderately High, 5 = High
Source: ICF Jones and Stokes 2010b

With Double-Circuit 230-kV Transmission Line. The transmission line would not adversely affect the essential components that contribute to the vividness of the view. If towers are constructed, the structures would not penetrate the visual breaks in distance zones and any changes to texture, color, form, and line that define these zones would be indistinguishable (Figure 3.2-3b). Although the lattice towers would be somewhat discernable, the transmission line would not block or detract from views to the jumbled rock mountain slopes. The patterns and elements that make this a distinctive view would remain visually dominant, and the transmission line with erected lattice towers would have only minor influence on the vividness of the site.

In contrast, if monopoles are erected, the poles would introduce distinct vertical elements into the view, which would contrast with the angular and curving lines of the Jacumba Mountains in the background (Figure 3.2-2b). The monopoles would create a series of new landscape focal points that would have a moderate influence on the vividness of the site.

Visual Quality/Character — Intactness

Existing Conditions. The site appears to be a natural, undisturbed setting. The border fence penetrates the site from the south; however, it tends to visually recede in the overall context of the expansive view.



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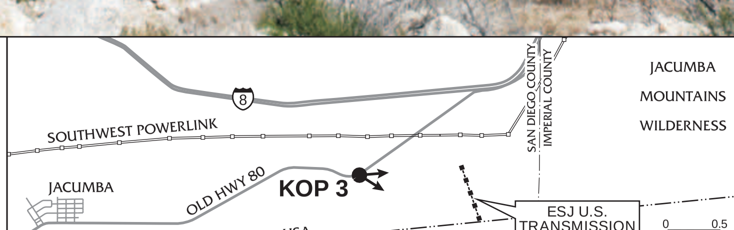

Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.2-3b

KOP 3 VISUAL SIMULATIONS WITH TRANSMISSION LINE

April 2012

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With Double-Circuit 230-kV Transmission Line. The transmission line would be partially hidden from view by the foreground topography, and the textured and grey-toned mountains would visually absorb the lattice towers (if constructed), reducing their contrast in the landscape. Likewise, the cleared pads and service road would appear diminished and somewhat blurred by the intervening vegetation. In contrast, if monopoles are erected, the poles would introduce prominent vertical lines and repeating patterns that would disrupt the intactness of the view and contrast with the textured and grey-toned mountains in the background. The transmission line corridor would introduce an incongruent engineered element, decreasing the visual integrity of the natural viewscape.

Visual Quality/Character — Unity

Existing Conditions. KOP 3 offers a high quality view made memorable by the power of the composition. The view naturally divides into three distance zones defined by inherent landscape features. In the foreground is the coarse-textured, low-profile ground plane, stippled with randomly spaced vegetation, rock out crops, and boulders. Colors include the sandy and earth-toned ground plane, and the olive, grey, and brown-green vegetation. There is a slight break in topography that differentiates the foreground from the middleground, which comprises a continuous strip of more finely textured grey green. The middleground plane forms a front with the background Jacumba Mountains, the third element of the composition. Visual coherence is reinforced by the repetition of colors. Middleground greens are repeated in the foreground, and the foreground beiges circle to the background to become the sand-colored tones of the mountains.

With Double-Circuit 230-kV Transmission Line. The transmission line would be located in the middleground zone and would adversely affect the compositional harmony of the view. Although a subdominant zone, the fluid plane of color and texture that comprise the middleground functions to visually separate foreground from background zones, and provide depth to the view; although it comprises a small percentage of the view, its contrasting features are an important component of the composition. Any visible change to the texture, color, and height of the middleground would have an adverse effect on the composition. The transmission line would introduce incongruent elements into the composition that would diminish the aesthetic coherence of the view.

Viewer Response

With Double-Circuit 230-kV Transmission Line. The anticipated viewers at this KOP are recreational motorists traveling along Old Highway 80. It is anticipated that motorists have chosen this slower road to enjoy its scenic surroundings and would be sensitive to any change in the view. However, based on viewer response to visual quality, the aesthetic coherence of the view would diminish by a greater amount if the monopoles were erected rather than the lattice towers (Tables 3.2-1 and 3.2-2).

KOP 6

Visual Character/Quality — Vividness

Existing Conditions. The transitional uplands area and barren Jacumba Mountains are distinct and commanding features in the view (Figure 3.2-4a). Combined with the gently sloping pediment, they form an intact representation of eroding mountain slopes and sediment deposition over geologic time. In contrast are the much more recent service corridors and man-made features that dominate the foreground and detract from the quality of the view. The uniform ground plane and sparse vegetation lacks visual interest.

With Double-Circuit 230-kV Transmission Line. The steep slopes of the Jacumba Mountains and the jagged ridgeline in the center of the frame are memorable components of the view. Although the ridgeline and mountain face would be unaffected by the transmission line, the transitional uplands area would be partially blocked by the somewhat transparent lattice towers (if constructed). Low in contrast, the lattice towers would interfere with the view of these uplands, which appear as the tumbled reflection of the ridgeline above (Figure 3.2-4b).

Similarly, if monopoles are constructed, the strong, opaque vertical and horizontal forms of the monopoles and monopole arms would interrupt the view of the Jacumba Mountains. The vertical lines would appear to slice through the background and would be incongruent with the light color and angular lines of the transitional uplands area. Furthermore, visual quality at KOP 6 would diminish more if monopoles were erected rather than lattice towers (Tables 3.2-1 and 3.2-2). The service road, angling down towards the viewer, would be a visible scar in the landscape and detract from the solid interface of the mountain front and pediment floor.

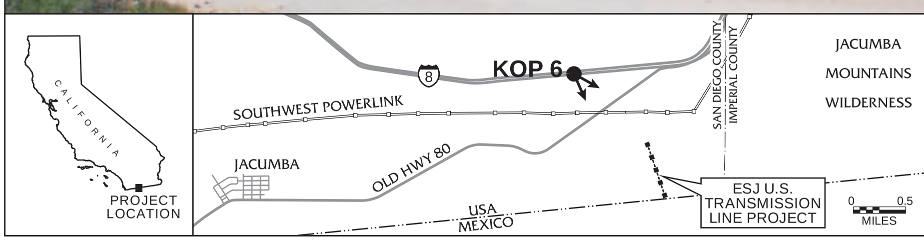
Visual Character/Quality — Intactness

Existing Conditions. Man-made features are a prominent component of the foreground; roads, fence lines, wood utility poles, and a metal lattice transmission tower introduce vertical and horizontal lines that contrast with the stippled and textured ground plane and rugged edges of the mountain backdrop. These modifications are highly visible on the desert floor.

With Double-Circuit 230-kV Transmission Line. The transmission line would introduce man-made elements in the middleground view, extending the zone of the built environment horizontally and vertically and encroaching on the relatively undeveloped pediment. Consequently, the transmission line would compromise the integrity of the view as represented by this KOP.

Visual Character/Quality — Unity

Existing Conditions. The visual composition is a combination of the natural forms of the mountains and desert pediment in the middle to background views and foreground views that have been altered by features of rural development and service. Middleground views are clearly demarcated by a change in color on the ground plane, as vegetation becomes less distinct and colors merge. The middleground vegetative cover forms a coarsely textured tapestry on what appears to be a flat and slightly ramplike surface. The background massive forms, tumbled landscape, and jagged lines contribute a rugged and imposing element to the landscape setting. While the overall unity of the desert view is compromised by encroaching man-made features, there is an interesting compositional harmony. Distant horizontal lines created by the border fence and visual break where the pediment and mountain meet are repeated in the foreground by roads, utility lines, and the property fence. These horizontal lines tend to unify the composition. Overall, however, the integrity of the view is diminished by the influence of disparate man-made elements and the lack of visual attributes on the ground plane.



Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.2-4a

KOP 6
EXISTING CONDITIONS

May 2012

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With Double-Circuit 230-kV Transmission Line. From this distance, the transmission line would be noticeable, though somewhat subdued if lattice towers are constructed (more noticeable if monopoles are constructed). Both the lattice towers or monopoles would introduce elements disparate to the landscape, including geometric vertical lines and a smooth engineered steel texture that would contrast with the coarsely textured landscape; however, the lattice tower features would partially fade into the background patterns of the rocky hillslopes of the transitional uplands area. The monopoles, on the other hand, would not fade into the background patterns of the rocky slopes and the strong vertical lines would disrupt the unity of the horizontal lines of the desert floor, and existing utility lines. The tower or monopole foundations, cleared pads, and the service road would appear as permanent scars resulting from the contrast in color, density, and texture on the overlying vegetation cover.

The arbitrary relationship between the existing SWPL transmission tower and proposed transmission line confuses the middleground view; and the visible cut of the service road, in a contrary direction to the horizontal flow of the pediment, further disrupts the unity of the composition.

Viewer Response

With Double-Circuit 230-kV Transmission Line. The anticipated viewers at KOP 6 are motorists and commuters traveling along I-8. In general, motorists have a low sensitivity to visual changes in the environment because their attention is focused on the road and their destination. However, this segment of I-8 has been designated by the County of San Diego as a scenic highway and, by definition, views are highly sensitive. Viewer awareness of the transmission line from KOP 6 is likely to be moderately low due to highway speeds and short viewing duration, and minimal visual disturbance. Additionally, more dominant features in the viewshed would likely attract attention, including visual disturbance in the foreground and views of the mountains.

KOP 9

Visual Character/Quality — Vividness

Existing Conditions. Airport Mesa is a dominant and vivid element in this landscape. Although memorable, it tends to detract from the view. Visually damaged by the border fence and its concave front, the mesa lacks stature and its vividness rating is moderate low (Figure 3.2-5a). Layered mountains in the distance define the far edge of the panorama and define a memorable context for the view.

With Double-Circuit 230-kV Transmission Line. The straight line of the border fence indiscriminately bisects Airport Mesa, which is the essential component of vividness in the landscape (Figure 3.2-5b). From this viewpoint, evenly spaced transmission line towers would interrupt the expansiveness of the view by presenting a tall, implied horizontal line in the foreground view. Similarly, if monopoles are constructed, the repeating vertical lines and horizontal drape of the monopoles and transmission wires would form an implied screen that would distract the viewer from the view.

Visual Character/Quality — Intactness

Existing Conditions. The view is dominated by elements that diminish its visual integrity. Natural features are compromised by man-made alterations, which are major impositions to the view, including the straight but discontinuous line of the borderline fence that bisects Airport Mesa, the adjacent border patrol road and others that round up the mesa, and recreational roads in the foreground of the view.

With Double-Circuit 230-kV Transmission Line. The transmission line would decrease the visual integrity of the site by encroaching on the already disturbed environment. The proposed service road and pads would contribute geometric and high contrast forms on the desert pediment. Existing man-made modifications on the site, including roads and the border fence, fall horizontally on the ground plane. Both transmission line towers and monopoles would introduce vertical structures in the foreground view that would dominate the low-profile desert floor and interrupt the line of site from this elevation.

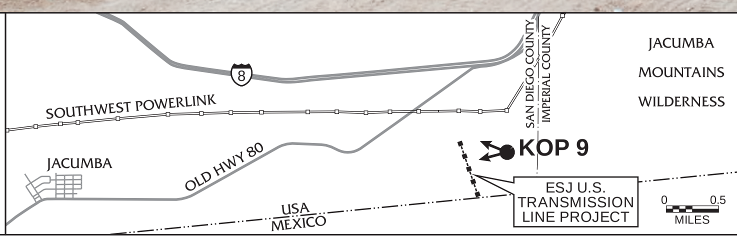
Visual Character/Quality — Unity

Existing Conditions. The view is composed of incongruous elements scattered throughout the landscape. Some visual containment is provided by the skyline of the distant mountains in East County, but for the most part, landscape components are disjointed and random and there is little visual harmony. The form of Airport Mesa dominates the middleground and is a massive visual obstruction in an otherwise uniform panoramic view.

With Double-Circuit 230-kV Transmission Line. The 230-kV Route would have a noticeably adverse impact on the composition of the view. Overall unity of the view would remain random and disjointed with the 230-kV Route in place. Based on the visualizations, the proposed towers (or monopoles) and cleared service road and pads would contribute to the compositional disarray. Because of the proximity of the transmission line and the viewer’s elevated location, physical changes resulting from this alternative would be clearly evident. The evenly spaced geometric pads and linear service road would be prominent visual scars. Additionally, the towers or monopoles would be located in the foreground; however, the steel latticework of the towers would be partially absorbed by the grey tones and rough texture of the backdrop, whereas the opaque mass of the monopoles would contrast with the existing backdrop. The details and scale of the towers would be clearly noticeable. In addition, overall visual quality at KOP 9 is expected to diminish more if monopoles are erected rather than lattice towers (Tables 3.2-1 and 3.2-2).

Viewer Response

With Double-Circuit 230-kV Transmission Line. KOP 9 is a representative viewpoint for visitors located in the multiuse BLM lands on the foothills of the Jacumba Mountains. BLM lands are heavily used by local recreationists seeking the openness of public lands for outdoor recreation including hiking, sightseeing, off-highway vehicle use, and target shooting and hunting. These viewers tend to be most sensitive to changes in the landscape that would restrict their activities; it is anticipated that viewers would have a low sensitivity to visual changes resulting from the proposed project. However, these viewers would have a slight higher sensitivity rating due to their close proximity to the project site relative to other recreational areas.



Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.2-5a

KOP 9
EXISTING CONDITIONS

May 2012

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Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.2-5b

KOP 9 VISUAL SIMULATIONS WITH TRANSMISSION LINE

April 2012

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KOP 10

Visual Character/Quality — Vividness

Existing Condition. The backdrop of the transitional uplands area and Jacumba Mountains are a striking component of the view (Figure 3.2-6a). Their rugged rock skyline and tumbled rock foothills have a commanding influence and are considered highly vivid features in this landscape.

With Double-Circuit 230-kV Transmission Line. The Jacumba Mountains are key components that contribute to the vividness of the view. Their most outstanding feature, the craggy ridgelines, would remain unobstructed by the 230-kV Route (Figure 3.2-6b). The transitional uplands area would also be unaffected because at this distance the towers or monopoles located in front of them would be barely distinguishable. As the corridor moves forward in the view, the transmission towers or monopoles would become more visible and the evenly spaced vertical grey lines and pyramidal towers (or vertical monopoles) would interrupt views to the barren mountain face that flanks the pediment and diminish the vividness of this otherwise natural appearing mountain front. Similar to the other KOPs, overall visual quality at this KOP would diminish more if monopoles were erected rather than lattice towers (Tables 3.2-1 and 3.2-2).

Visual Character/Quality — Intactness

Existing Condition. From KOP 10, the desert floor is a continuous, open, horizontal plane. As illustrated by the dirt road to the left of the view, ground plane modifications oriented downslope are clearly visible from this viewpoint. The border fence and a desert road intersect the middleground and encroach upon an otherwise intact landscape.

With Double-Circuit 230-kV Transmission Line. KOP 10 would provide an unobstructed view to the transmission line and features of the 230-kV line would be incongruent with the natural setting. While existing human-made features hug the ground, the transmission line towers or monopoles introduce structured, geometric, vertical lines that are discordant with the low-profile, horizontal pediment. The contrast of these vertical lines would be subdued by the angular lines, coarse texture, and grey tones of the mountain backdrop. Although visual disruption would be minimized, the transmission line would still encroach upon the view, compromising the integrity of this largely intact desert setting.

Visual Character/Quality — Unity

Existing Condition. The desert floor forms an extensive plane of continuous and repetitive pattern across the landscape. The coarse rigid structure of vegetation and mottled contrasting colors of exposed soils in the foreground make a gradual transition across the desert floor to merge in a fluid plane of blended colors and fine texture in the distance. Sharp contrasts in color, texture, and form separate the pediment floor from the rising mountain slopes. This contrast creates a clear break in the mountain front, creating a horizontal line that appears as distinct as the border fence to the south. When combined with the rising topography that frames the views to the right, the mountains provide enclosure, mass, scale, and diversity in the composition. The color of the sandy desert floor in the foreground view is repeated in the barren slopes of the mountain backdrop and helps unify the overall composition of the view.

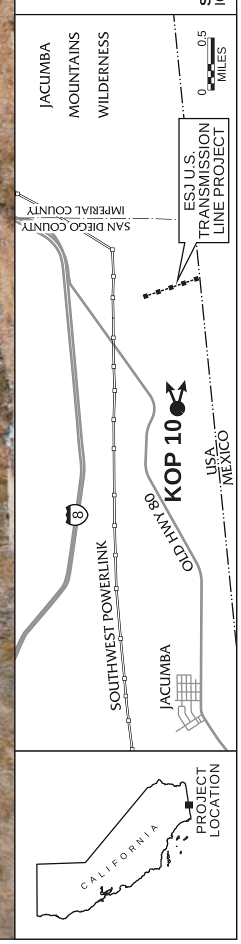
With Double-Circuit 230-kV Transmission Line. The transmission line would adversely affect the composition of the view represented by KOP 10. The mountains form a backdrop and enclose the pediment, whose ramped and low profile function as a stage in the composition. Consequently, any features of the 230-kV transmission line located on the pediment would be highlighted.

Because of distance and backdrop, the three nearest towers (or monopoles) would have the greatest influence on the view; the eye is quick to form a connection to the towers that recede toward the border and trace the transmission line's linear corridor that angles across the plane. The sequence of transmission towers or monopoles would be incongruent to the compositional harmony because of its diagonal angle through a predominantly horizontal plane, the engineered and vertical lines of the steel towers, and the symmetrical placement of the pads. The overall unity of the view would be compromised.

Although visible, the components of this alternative tend to recede into the landscape. Both the steel lattice towers and monopoles would be observed against a highly textured background that diminishes their visibility. Additionally, the rectangular pads and service road would be evident as cleared vegetation; however, just as perspective compressed the widely spaced vegetation into a fluid swath of color, the depth of the pads are also compressed and not as visible as they would be from other viewing positions. These sand-colored soils are a repetitive theme in the foreground and background of this landscape, and are not an incongruent color in the landscape, although the geometric lines that give shape to the color are unnatural in the composition.

Viewer Response

With Double-Circuit 230-kV Transmission Line. The multi-use BLM lands at KOP 10 would attract similar viewers as KOP 9. Similarly, it is anticipated that viewers would have a low sensitivity to visual changes resulting from the transmission line. However, features of this alternative would be located farther away decreasing the response rating when compared to KOP 9.



Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.2-6a

KOP 10
EXISTING CONDITIONS

May 2012

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Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.2-6b

KOP 10 VISUAL SIMULATIONS WITH TRANSMISSION LINE

April 2012

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Figure_3_2-Xb_KOP3-6-9-10_VisualSims-TransLine_11x17_v3.ai (04/05/2012, 04:18 pm) R. Wurgler/T. Murphy

Summary

Using the information presented in Tables 3.2-1 and 3.2-2, a final impact assessment at each of the representative KOPs was determined based on the change in rating for each of the visual quality/character features multiplied by the estimated viewer response rating (Table 3.2-3). As shown in the table, the most adverse visual impact would occur at KOP 10, which would experience the greatest change in visual quality as a result of the 230-kV Route. Impacts to visual resources as viewed from KOP 10 are considered moderate. Impacts to visual resources as viewed from KOPs 6 and 9 would be slightly less adverse and are considered minor to moderate if transmission towers are constructed and moderate if monopoles are constructed. The greatest impact would be to intactness of each of these views, followed by changes in compositional unity, in large part because the 230-kV Route would be located on a relatively undisturbed natural area of the view (from all KOPs). No matter what the degree of visibility, the 230-kV Route would be a noticeable man-made modification and detract from the intactness of the view. However, the overall change would not be major. Impacts to visual resources as viewed from KOP 3 would be the least adverse and are considered minor. Although impacts would not be major, mitigation measure Visual-2 (Reduce visual contrast of towers and conductors) is a potential mitigation measure not proposed as an APM that could reduce contrast and undesirable visual changes resulting from implementation of this alternative.

Table 3.2-3
Assessment of Potential Visual Resource Impacts

Visual Impact	KOP 3		KOP 6		KOP 9		KOP 10	
	Towers	Monopoles	Towers	Monopoles	Towers	Monopoles	Towers	Monopoles
Change in Visual Quality	1.5	2.98	2.0	2.48	1.8	2.31	2.1	2.7
Viewer Response Rating	2.4	2.4	2.4	2.4	3.2	3.2	3.1	3.1
Visual Impact [1]	3.6	7.15	4.8	5.95	5.8	7.39	6.5	8.37

[1] Visual Impact = Change in Visual Quality x Viewer Response Rating
Evaluation Thresholds:
1–3 = Minor visual impact
4–6 = Minor to Moderate visual impact
7–9 = Moderate visual impact
10–12 = Moderate to Major visual impact
13–15 = Major visual impact
Source: ICF Jones and Stokes 2010b

Impacts in the U.S. due to Related Activities in Mexico

The ESJ Wind project would be located near the town of La Rumorosa in northern Baja, Mexico. Several turbines that would be constructed during Phase 1 of the project would be visible to varying degrees from several U.S. locations including the communities of Jacumba and Boulevard, I-8, Old Highway 80, Table Mountain ACEC, Anza-Borrego Desert State Park, Jacumba Wilderness, and BLM administered lands in the Yuha Desert to the east. As described in Section 2.9 (ESJ Wind project), the timing and location for installation of subsequent phases have not been determined, but their current leaseholds would place the location of those subsequent phases south of the town of La Rumorosa. Therefore, turbines built in future phases would be less visible and more distant from these vantage points, if visible at all.

To assess the potential impacts to existing visual resources in the U.S., visual simulations of the ESJ Wind project were conducted using GIS and CADD modeling software. These simulations are presented in Figures 3.2-7, 3.2-8, and 3.2-9 and depict views of the ESJ Wind project from KOP 6 (I-8; described in Section 3.2-1), as well as two other KOPs, which offer views of Mexico. KOP 7 was selected because of its location in the Table Mountain ACEC, which is considered to have high viewer sensitivity. KOP 11 was also selected to represent the views of sensitive residential receptors in the community of Jacumba (refer to Figure 3.2-1 to see the location of each of these KOPs). As shown in all three simulations, the ESJ Wind project would introduce tall, highly visible vertical elements into the viewshed that would change the existing visual character. The hillside and ridgeline presence of the wind turbines would result in a substantial increase in industrial character, diminution of visual quality and increase in visual contrast, particularly as viewed from KOP 11 (community of Jacumba).

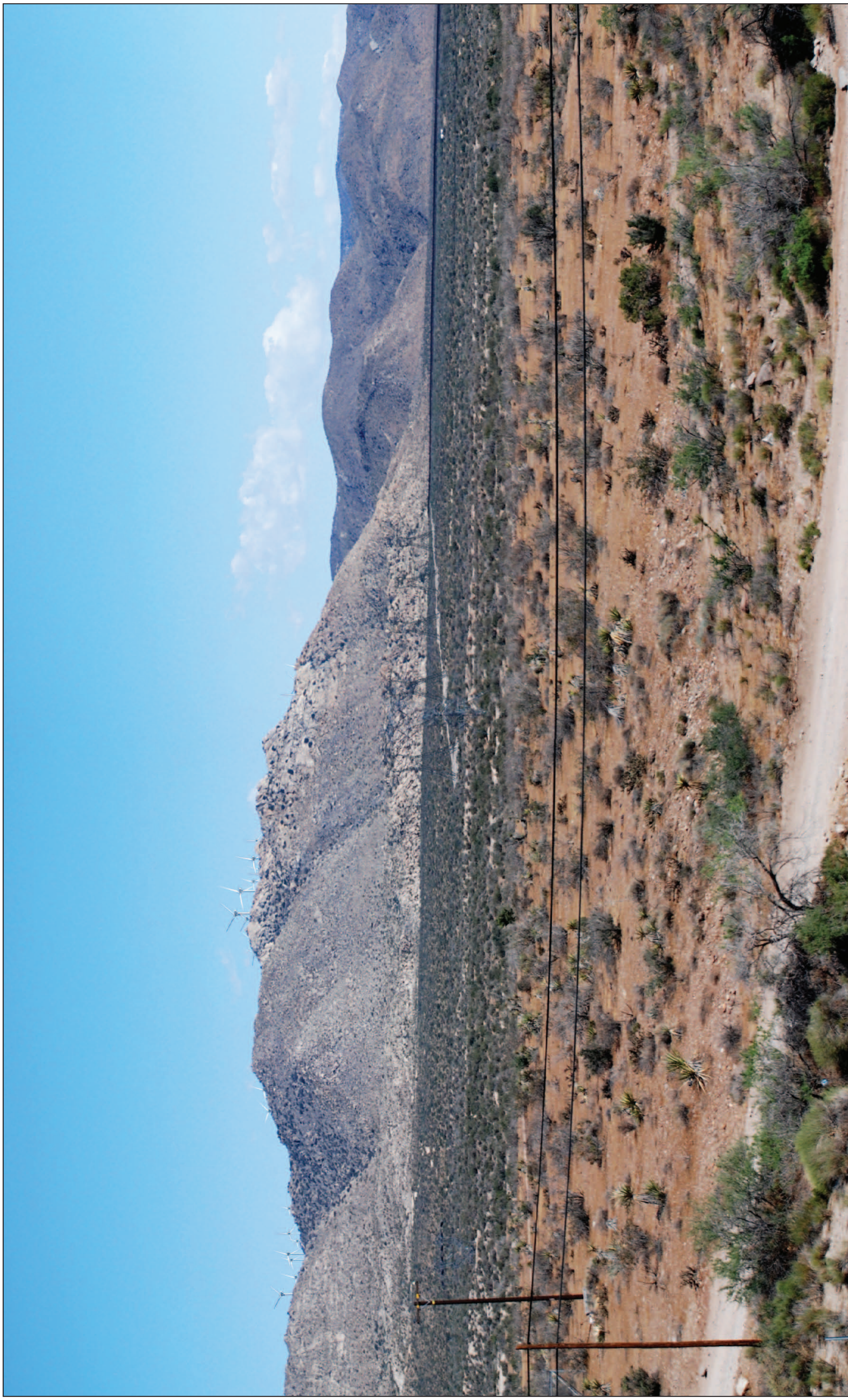
As depicted in all three simulations, the numerous wind turbines would appear as an assemblage of light-colored vertical forms in a landscape predominantly natural in appearance.[16] The resulting visual contrast would be low-to-moderate as viewed from KOP 6 (I-8); and moderate-to-high from KOPs 7 (Table Mountain ACEC) and 11 (community of Jacumba). In addition, construction of the ESJ Wind project could cause some level of land scarring. However, based on the distance between the wind turbines and visual receptors in the U.S., as well as intervening topography, any land scarring associated with the turbines would not be highly visible from the U.S. (see Figure 1-2 for a depiction of area topography and the location of the ESJ Wind project in relation to the town of Jacumba). In the context of the existing landscape's visual sensitivity, the resulting visual impacts are considered major and permanent.

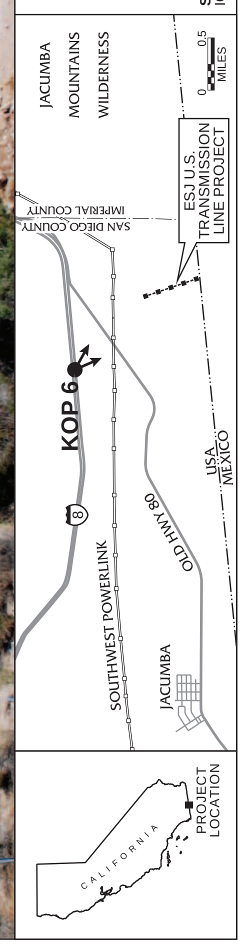
[16] In late 2009, five wind turbines of comparable size were installed in the vicinity of the ESJ Wind project area. These turbines are not related to the ESJ Wind project and they were not yet installed at the time that the simulations for this EIS were developed. The existing turbines are not shown in this EIS, but are presently visible from certain vantage points in the Jacumba area. For more information, see the following sources:

http://www.windfair.net/press/6094.html

http://www.rechargenews.com/energy/wind/article172862.ece

http://www.wind-energy-the-facts.org/fr/environment/chapter-2-environmental-impacts/





Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.2-7

KOP 6 VISUAL SIMULATION WITH WIND TURBINES

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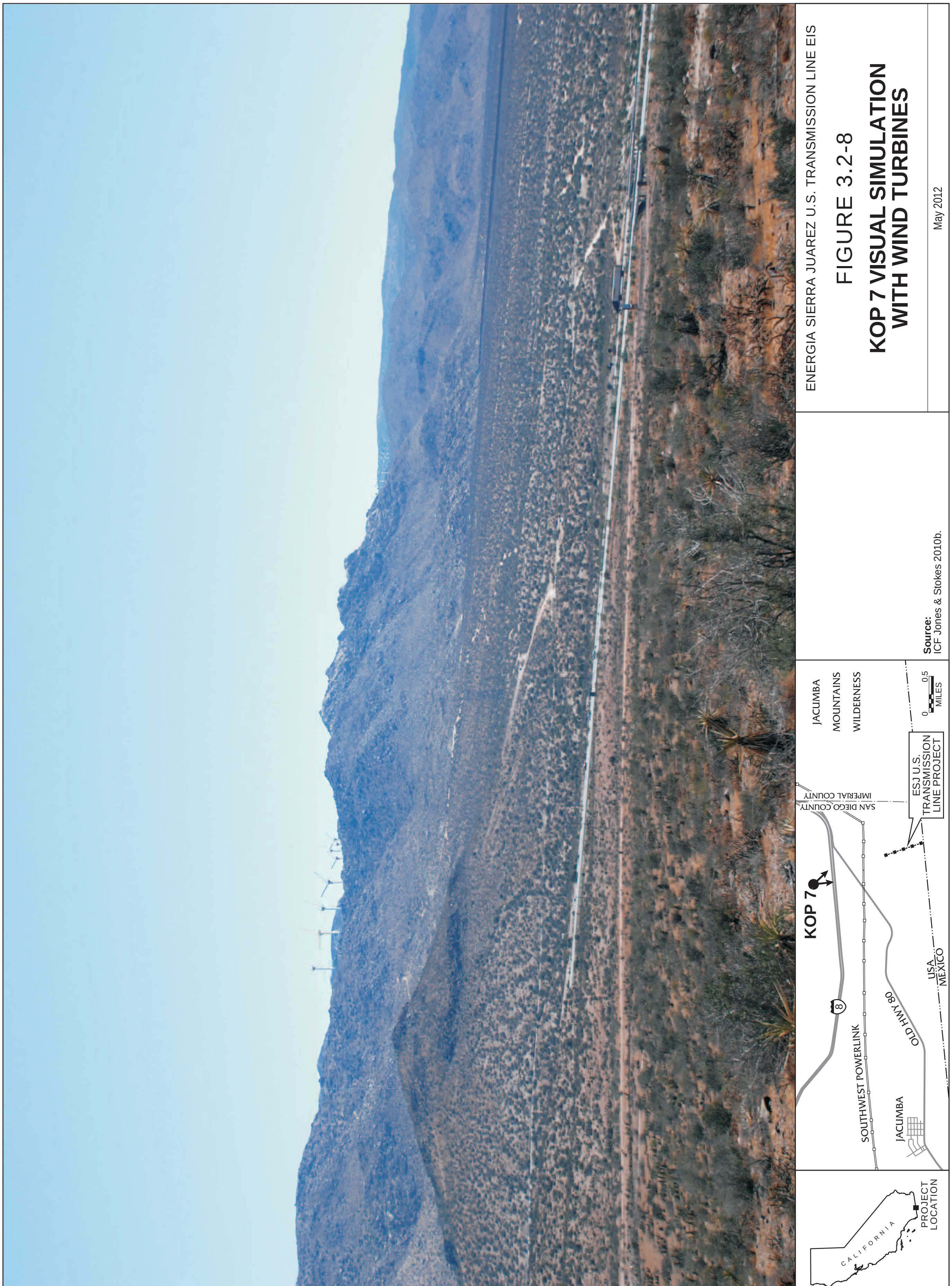
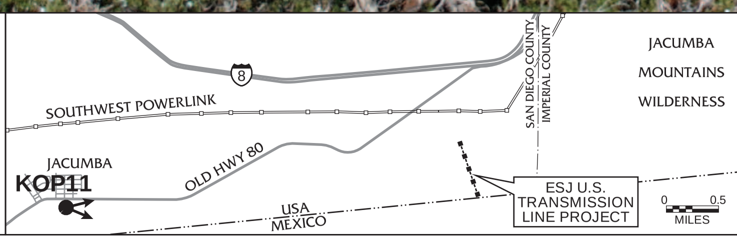


(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_2-Y_KOP6-7-11_VisualSim-Turbines_11x8_v4.ai (04/05/2012, 04:18 pm) R. Wurgler/T. Murphy



Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.2-9

KOP 11 VISUAL SIMULATION WITH WIND TURBINES

May 2012

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_2-Y_KOP6-7-11_VisualSim-Turbines_11x8_v4.ai (04/05/2012, 04:18 pm) R. Wurgler/T. Murphy

Since the time that the visual analysis for this EIS was conducted, the intactness of the Sierra Juarez landscape has been compromised by the construction of the Parque Eolico La Rumorosa I wind energy project facility in Baja California, Mexico (unrelated to the ESJ Wind project). This wind project consists of five wind turbines on approximately 256-foot (78 m) towers (similar tower heights as will be used by ESJ), on land approximately 3 miles (5 km) from the southern extent of the ESJ Wind project. Each of the five turbines has night lighting for aviation hazards. These turbines are currently visible from Old Highway 80, BLM lands, and the community of Jacumba. The presence of these turbines has introduced new focal points on the silhouette of the Sierra Juarez Mountains, thus contributing to cumulative impacts on visual resources, as discussed further in Section 5. Other potential wind projects have been announced in the Sierra Juarez Mountains of northern Baja, Mexico. These projects have the potential to further diminish the intactness of the viewshed along the Sierra Juarez Mountains, as viewed from the U.S.

During nighttime hours, aviation safety lighting would be visible from viewing points in the U.S. during clear weather. For the purpose of this EIS, it is assumed that such lighting would be required by Mexican agencies, and that the type and location of the lighting would be comparable to requirements in the U.S.; these requirements are summarized in Section 2 (Proposed Action and Alternatives). The ESJ Wind project is located in an area designated by the U.S. Air Force Defense Meteorological Satellite Program[17] as having low light pollution and a maximum 10 percent increase over natural skyglow. Night lighting of wind turbines would potentially diminish the enjoyment of the night environment by U.S. residents and visitors to San Diego County, and it could adversely affect amateur astronomical viewing from the U.S. at locations near the international border. The ESJ Wind project is more than 15 miles (24.1 km) from both the Palomar and Mount Laguna observatories, so it would be outside the "Zone A" within which the County of San Diego considers lighting to have the potential to affect these facilities.

There is no mitigation available to reduce visual impact of the ESJ Wind project to a level that would be minor. The open and highly exposed location along with numerous viewing locations do not lend the site to opportunities to either better screen the structures from view or blend them more effectively with a different background. Also, given the scale of the structures, landscape plantings would not be adequate to sufficiently screen the turbines from view. To the extent that feasible mitigations exist, such mitigations would need to be implemented in Mexico and imposed by the Mexican regulatory authorities.[18]

Future phases of the ESJ Wind project would increase the number of wind turbines in Mexico. According to ESJ, the timing and location for installation of subsequent phases have not been determined, but their current leaseholds would place the location of those subsequent phases south of the town of La Rumorosa (Figure 1-1), and thus farther from the border than Phase 1.

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[17] http://www.ngdc.noaa.gov/dmsp/

[18] The literature indicates that certain mitigation measures are possible. For examples, see the following sources:
http://teeic.anl.gov/er/wind/mitigation/visual/index.cfm
http://www.wind-works.org/articles/design.html
http://www.wind-energy-the-facts.org/fr/environment/chapter-2-environmental-impacts/

Given the distance of future phase turbine development to the U.S.-Mexico border, no additional impacts from the U.S. viewing points are expected.

Given the distance of the turbine development area to the U.S.-Mexico border, the ground-level development disturbance within the turbine development area (e.g., road scars, buildings, meteorological towers, and above-ground electrical connection system) would not be visible from the U.S. Thus, no other visual resource impacts in the U.S. are identified. Therefore, for the purpose of this EIS, no mitigation measures are indicated for the ESJ Wind project.

3.2.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

The existing visual resources site conditions for the 230-kV Route and the 500-kV Route are identical and both alternatives would entail the construction of 150-foot (46-m) tall structures. If monopoles are built, the 500-kV poles would be 170-foot (52-m), as compared to 150-foot (46-m) for the 230-kV Route. This slight increase in overall height would not materially increase the visibility of the poles; thus, the simulated views of the monopoles presented in Figures 3.2-2, 3.2-3b, 3.2-4b, and 3.2-5b are also reasonably representative of the 500-kV Route. Therefore, impacts for this alternative would be the same as described for the 230-kV Route and the same potential mitigation measures would apply.

3.2.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The revised 230-kV and 500-kV Routes presented in Alternative 4 have the same visual resources site conditions as Alternatives 2 and 3, and the transmission lines on the revised routes would be constructed in the same manner. Thus, the simulated views of the monopoles presented in Figures 3.2-2, 3.2-3b, 3.2-4b, and 3.2-5b are also representative of the revised 230-kV and 500-kV Routes. Therefore, impacts for this alternative would be the same as described for the Alternatives 2 and 3, and the same potential mitigation measures would apply.

3.2.3 Mitigation Measures

The following potential mitigation measures not proposed as APMs could reduce potential visual impacts from the transmission line.

Visual-1: Reduce Color Contrast and Views of Land Scars

Vegetation clearing within the right-of-way and ground clearing at the foot of each tower/monopole and between towers/monopoles should be limited to the clearing necessary to comply with electrical safety and fire clearance requirements. Contour grading should be used where possible to better blend graded surfaces with existing terrain. Access roads should be graded to follow the natural contours of the pediment surface to the greatest extent possible to reduce landform alteration.

Visual-2: Reduce Visual Contrast of Towers and Conductors

Measures to reduce visibility, glint, glare, and visual contrast should be included in the design. Such measures could include lattice towers that are constructed with a dulled metal finish that would not reflect sunlight and conductors, which are non-specular in design. This mitigation should be considered in light of possible safety requirements of other agencies (e.g., U.S. Border Patrol, FAA), which may be desirous of higher, rather than lower, visibility.

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3.3 LAND USE

This section addresses potential impacts to existing and planned uses at the alternative corridors site and surrounding area and evaluates the consistency of alternatives with applicable County of San Diego plans and policies.

3.3.1 Affected Environment

3.3.1.1 Land Use

The alternative corridors would be located in an unincorporated portion of southeastern San Diego County near its border with Imperial County to the east and Mexico to the south. The alternative corridors and adjacent land are primarily undeveloped except for access roads, the border fence, existing power lines (local power lines and SWPL), and other electric utility infrastructure.

No prime farmland (designated as such by the U.S. Department of Agriculture), active agricultural operations, or Williamson Act (also known as the California Land Conservation Act of 1965) lands are present within or adjacent to the alternative corridors. Residences near the alternative corridors include:

- An unoccupied mobile home located approximately 0.5 mile (0.8 km) west of the site.
- A residence located approximately 0.4 miles (0.7 km) northwest of the site, 290 feet (80 m) south of I-8.
- A residence located 1.4 miles (2.2 km) northeast of the site, in Imperial County.
- Residences located approximately 2 miles (3.2 km) west of the site, near the intersection of Carrizo Gorge Road and Old Highway 80.

Further residential development in the area has been intentionally limited by the County of San Diego General Plan due to a limited supply of water (County of San Diego 2011d). Currently, the alternative corridors are used extensively by the U.S. Border Patrol, which has created roads to monitor activity near the border fence (ESJ 2009).

Surrounding land use consists primarily of public land owned by the BLM. The nearest public lands are located about 0.5 mile (0.8 km) east of the alternative corridors in Imperial County (BLM-managed open space) and 0.8 mile (1.3 km) west and north of the alternative corridors (Table Mountain ACEC). Other surrounding land uses include a BLM-managed shooting range (Carrizo Creek Range), located approximately 1 mile (1.6 km) west, and In-Ko-Pah County Park, located approximately 2 miles (3.2 km) to the north. In addition, a fiber optic facility right-of-way on BLM land is located approximately 0.5 mile (0.8 km) northwest of the alternative corridors along Old Highway 80.

3.3.1.2 Zoning and Planning

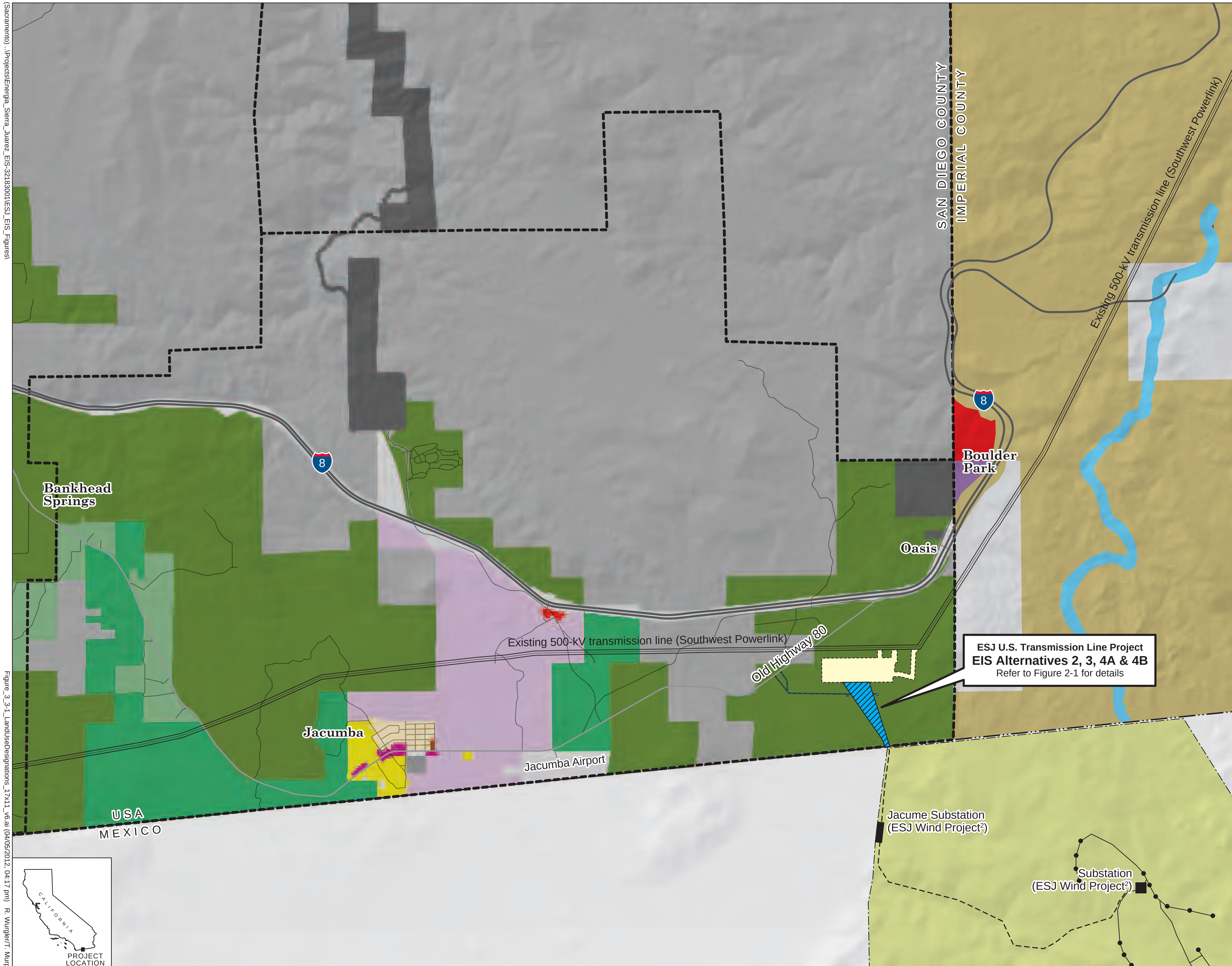
The alternative corridors are under jurisdiction of the County of San Diego[19], and land uses at the site are subject to the County of San Diego Zoning Ordinance, which regulates land uses within the unincorporated areas of the county, as well as the County of San Diego General Plan, which provides land use policies that guide both current and long-term growth and land development. The site is designated General Rural (S92) under the County of San Diego Zoning Ordinance. The use regulations for this zone are intended to provide appropriate controls for land that is defined as rugged terrain, watershed, dependent on groundwater for a water supply, desert, susceptible to fire and erosion, or subject to other environmental constraints. Utility uses are allowed within the General Rural zone subject to a minor or major use permit pursuant to Section 2926.b of the Zoning Ordinance.

The alternative corridors were formerly subject to General Plan Regional Category 1.4 Rural Development Area (RDA) and the Non-Urban Residential Land Use Designation of Multiple Rural Use. This designation was applied to lands with one or more of the following characteristics: not highly suited for intensive agriculture, rugged terrain, watershed, desert lands, lands susceptible to fires and erosion, lands that rely on groundwater for water supply, and other environmentally constrained areas (Figure 3.3-1). The Multiple Rural Use Designation was typically applied in remote areas to broad expanses of rural land with overall low population density and with an absence of most public services. Other than a single-family home on an existing lot, it was not intended that any development occur unless the proposed development has been carefully examined to assure that there will be no significant adverse environmental impacts, erosion and fire problems will be minimal, and no urban levels of service will be required.

The Updated County General Plan was approved August 3, 2011. The land use designation for the alternative corridors is changed to Rural Lands 80 (RL-80) which allows one dwelling unit per 80 acres. This land-use designation is compatible with village, semi-rural and rural land use.[20]

[19] The alternatives corridor area is also within the planning area of the Boulevard Planning Group. This community planning group consists of seven elected members who serve as representatives of the unincorporated portions of the County and advise County officials on matters of planning and land use affecting the group's area. The group is not empowered by any ordinance or policy to render a decision of any kind on behalf of San Diego County.

[20] The plan updates were approved by the County Board of Supervisors on August 3, 2011, after a series of public hearings. The General Plan Update has been reviewed for relevant policy changes since the publication of the Draft EIS. The County of San Diego is required to make the final determination of consistency with General Plan policies, and additional mitigation measures may be imposed by the County during their review, after the General Plan update is adopted.



ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.3-1

COUNTY LAND USE DESIGNATIONS IN THE PROJECT VICINITY

May 2012

A Major Impact Service Utility such as a utility line is anticipated by the Rural Lands designation and such developments are allowed with the approval of a Major Use permit. The alternative corridors are also subject to the Mountain Empire Subregional Plan of the County of San Diego General Plan (County of San Diego 2011c). The policies contained in this plan are applications of broad General Plan policies that are designed to fit the specific or unique circumstances existing in the individual communities within this subregion. The Plan requires that the County consider land use impacts associated with safety of the general public, including the potential for the project to result in unmitigated visual impacts on the rural environment; noise pollution exceeding 65 dB at the property line; and property values.

San Diego County Policy I-111 – U.S. Border Setback Policy. The ESJ U.S. Transmission Line project would traverse property located within 150 feet (46 m) to the international border. Policy I-111 contains the following requirements for discretionary permits for properties located within 150 feet from the international border:

- *Upon the receipt of such above described application, the Department of Planning and Land Use shall notify the local Office of Immigration and Naturalization (renamed the U.S. Citizenship and Immigration Services in 2003) of such pending application and of the provisions of this policy.*

Such application shall not be deemed complete until one of the following occurs:

- *A letter submitted from the INS/U.S. Citizenship and Immigration Services indicating they do not plan on entering into negotiations toward purchasing rights to the open space corridor located on the property subject to the application.*
- *Ninety days has elapsed from the date of original submittal and the INS/ U.S. Citizenship and Immigration Services has not indicated to the Department that they are interested in opening negotiations regarding an open space corridor.*
- *A letter is submitted from INS/ U.S. Citizenship and Immigration Services indicating that negotiations have been completed, or attempts to purchase have been abandoned.*
- *One hundred eighty days have elapsed from the date upon which the letter from the INS/ U.S. Citizenship and Immigration Services indicating intent to negotiate was received by the Department of Planning and Land Use.*

3.3.2 Environmental Impacts

3.3.2.1 Methodology

Direct impacts to land use were assessed by considering whether the proposed transmission line would be compatible with existing land uses and whether it would be an allowed use under the County of San Diego Zoning Ordinance and General Plan, as well as the Mountain Empire Sub-Regional Plan. The County of San Diego does not have a specific guidance document for determining significance of potential land use impacts. Indirect impacts to land use and land use character (e.g., impacts related to visual resources, noise and air quality) were assessed based on analyses provided in a Land Use and Community Character Analysis (ICF Jones and Stokes 2010a) and Visual Resources Report for the ESJ U.S. project (ICF Jones and Stokes 2010b).

3.3.2.2 Alternative 1 – No Action

Under the No Action alternative, the proposed transmission line would not be constructed; therefore, no land use impacts would occur.

3.3.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Land Use. The 230-kV Route would be constructed on undeveloped land, and no residences or other sensitive land uses are located near the alternative corridors. The transmission line would be located in close proximity to the existing SWPL transmission line, which is similar in character to the proposed transmission facilities. Construction of the 230-kV Route would require a Major Use permit but would not require a Zone Change or General Plan Amendment. The undeveloped nature of the proposed corridor and immediately surrounding area is such that there is not an existing community with a well-defined character that could be altered. Therefore, implementation of this alternative would not alter the local environmental setting or community character of the immediately surrounding area. Further, although the recently approved General Plan update changes the designation of the land near the alternative corridors to RL-80, such a change does not materially affect the viability of the ESJ U.S. Transmission Line project or alter the type and severity of impacts identified in this EIS.

With regard to specific impacts during construction, transportation and use of heavy equipment and construction worker commutes would result in temporary minor increases in ambient noise and existing traffic levels (discussed further in Sections 3.6 [Noise] and 3.7 [Transportation and Traffic], respectively). These temporary noise and traffic impacts would result in minor, temporary impacts to existing land uses along the transportation routes and in the vicinity of the construction site, but would not preclude the continued use of these areas. Therefore, construction activity would not disturb land uses at or near the alignment, and no conflicts with existing land uses would occur.

Groundwater Extraction

The proposed use of groundwater from JCSD’s Well #6 under the Groundwater Extraction Major Use Permit would not result in land use impacts. The construction of a new access road for trucking of water from the well to the construction site would not conflict with or disturb land uses at or near the proposed road. Further, the County of San Diego analyzed the potential use of JCSD’s Well #6 for the project’s water use during construction. No impacts to the groundwater basin or nearby wells were identified; therefore, no conflicts with existing or future land uses or land use policies are anticipated.

Operations Impacts

As mentioned above, the 230-kV Route would be located on undeveloped private land that is surrounded by undeveloped land; therefore, the presence of the transmission line would not directly affect existing land uses along the alternative corridors or surrounding areas.

Zoning and Planning Consistency. The consistency of the proposed action is evaluated in the contexts of San Diego County zoning designations, the County General Plan, and the County’s Mountain Empire Subregional Plan. DOE reviewed the applicable policies of the County

General Plan, as amended in August 2011 (County of San Diego 2011d), as well as the applicable policies of Mountain Empire Subregional Plan (County of San Diego 2011c), in the context of the ESJ U.S. Transmission Line project. The CPUC and BLM conducted a similar analysis, which is detailed in the Section D.4 (Land Use) and Appendix 7 of the ECO Substation project EIR/EIS (CPUC/BLM 2011a).[21]

Electrical transmission lines are a permitted use within the General Rural zone with a Major Use Permit. ESJ submitted its initial application for a Major Use permit to the County of San Diego in June 2009. At that time, development of a public utility in a Multiple Rural Use area required an analysis to ensure that:

> *…no significant adverse environmental impacts would occur, erosion and fire problems would be minimal, and no urban levels of service would be required. The County of San Diego could, however, approve the Project if the County decision-maker adopts findings that demonstrate the significant adverse environmental impacts have been mitigated to the greatest extent feasible and the Project is necessary to protect the public health and safety.*

The proposed action is proposed by a private company and is not a public utility. Therefore, under the former County General Plan, the project would have been inconsistent within the above policy. However, since publication of the Draft EIS, the County has adopted an updated General Plan that does not include this policy.

Implementation of this alternative would not require urban levels of service (e.g., potable water or sewer service or an increase in police or fire protection), and potential erosion problems would be effectively minimized by the implementation of measures described in the SWMP that has been prepared in compliance with the federal Clean Water Act (discussed in Section 3.11 [Water Resources]). Further, as is discussed in Section 3.9 (Fire and Fuels Management), although operational fire impacts are considered major and unavoidable (certain ignition sources are unavoidable), potential mitigation measures have been identified to reduce the potential for impacts to the greatest extent feasible. No other major unavoidable environmental impacts are anticipated because feasible mitigation measures have been identified that would reduce any such impacts to minor levels. Potential mitigation measures have also been identified that would further reduce adverse impacts that are not considered major.

As described above, the Mountain Empire Subregional Plan requires that the County consider land use impacts associated with safety of the general public, including the potential for the alternative to result in unmitigated visual impacts on the rural environment; noise pollution exceeding 65 dB at the property line; and property values. DOE reviewed the applicable policies of this plan in the context of the ESJ U.S. Transmission Line project, as listed and described in Section D.4 and Appendix 7 of the Final EIR/EIS for the ECO Substation project (CPUC/BLM 2011a).

[21] The ECO Substation Final EIR/EIS Land Use impact assessment is available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/Final_EIR/D.4_Land_Use.pdf. The Final EIR/EIS detailed analysis of the project's consistency with the County General Plan policies is available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/Final_EIR/Appx7_LandUseConsistency.pdf

Implementation of this alternative would not result in public safety impacts (e.g., increased public exposure to contaminants or hazardous materials, electric/magnetic fields, or induced currents; see Section 3.8 [Public Health and Safety]). With regard to visual impacts, the 230-kV line would be consistent with the bulk, scale, and density of the existing SWPL structures and, as discussed in detail in Section 3.2 (Visual Resources), the overall change to the visual environment (as viewed by motorists, recreationalists, and residents) would not be major, and potential mitigation measures would further reduce the moderate adverse impacts. Implementation would not result in noise pollution; as discussed in Section 3.6 (Noise); operational noise levels at the property line would not exceed 65 dB. Lastly, as discussed later in Section 3.13 (Socioeconomics), no adverse impacts on property values are anticipated to result from implementation of this alternative. Therefore, the 230-kV alternative would be consistent with applicable policies in the Mountain Empire Subregional Plan.

With regard to County Policy I-111 (coordination with the U.S. Citizenship and Immigration Services), a Major Use Permit application and supporting documentation was submitted to the County of San Diego on November 20, 2008 and an Environmental Initial Study was submitted in May 2010. In accordance with County Policy I-111, coordination with the U.S. Citizenship and Immigration Services is the responsibility of the County's Department of Planning and Land Use. The ESJ U.S. Transmission Line project would be consistent with this policy.

In summary, based on a review of applicable land use policies (as listed in Appendix 7 of the ECO Substation EIR/EIS), the ESJ U.S. Transmission Line project would be consistent with the policies and goals established in the following land use plans:

- County of San Diego Existing General Plan, Land Use Element (County of San Diego 2003), Conservation Element (County of San Diego 2002), Public Facility Element (County of San Diego 2005), Energy Element (County of San Diego 1977), and Seismic Element (County of San Diego 1991)
- County of San Diego Draft General Plan Update, Mobility, Conservation and Open Space, and Noise elements (County of San Diego 2010a)
- Mountain Empire Subregional Plan (2011c)
- County of San Diego Zoning Ordinance
- County of San Diego Board of Supervisors Policy I-111 (U.S. Border Setback Policy)

The County of San Diego is required to make the final determination of consistency with the Zoning Ordinance, General Plan, and Mountain Empire Subregional Plan. Additional mitigation measures may be imposed by the County during its review.

Impacts in the U.S. due to Related Activities in Mexico

Construction and operation of the ESJ Wind project in Mexico would not change land uses or preclude the use of any land in the U.S. The presence of these structures would adversely affect residential views in the town of Jacumba. This change in the viewshed would result in the introduction of an increased presence of industrialization in a primarily rural area surrounded by large tracts of open space and would noticeably alter the existing community character. Impacts to visual resources are discussed in greater detail in Section 3.2 (Visual Resources).

3.3.2.4 Alternative 3 — Single-Circuit 500-kV Transmission Line

The 500-kV Alternative would be located approximately 600 feet (183 m) east of the 230-kV Alternative and is under the same zoning and County of San Diego planning designations. The transmission line would be located slightly farther from residential land uses; the nearest potential residence (the unoccupied mobile home) would be approximately 2,600 feet (792 m) to the west. No mitigation measures are indicated.

3.3.2.5 Alternative 4 — Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The revised double-circuit 230-kV or single-circuit 500-kV transmission line routes are shifted 700 and 550 feet (213 and 177 m) east, respectively, of Alternative Routes 2 and 3. The revised Routes are located in the same general areas as Alternative Routes 2 and 3; therefore, the same zoning and County of San Diego planning designations apply. The power lines would be slightly further from residential land uses than Alternatives 2 and 3. No mitigation measures are indicated.

3.3.3 Mitigation Measures

No mitigation measures are indicated.

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3.4 RECREATION

This section describes existing recreational areas in the vicinity of the alternative corridors and the potential impacts of the alternatives on recreational resources.

3.4.1 Affected Environment

Although the alternative corridor area is included within the BLM Eastern San Diego County Resource Management Plan planning area (BLM 2007a), the corridors are located entirely on private land and there are no state or federal wilderness or recreation areas within or immediately adjacent to the alternative corridors. However, a number of regional recreational areas are located in the vicinity of the alternative corridors, including the Jacumba Mountains Wilderness Area, Anza-Borrego Desert State Park, Table Mountain ACEC, McCain Valley Resource Conservation Area, Carrizo Gorge Wilderness, and the In-Koh-Pah Mountains, as well as a number of local parks. These facilities are shown in Figure 3.4-1 and discussed further below.

The approximately 30,000-acre (12,140-ha) Jacumba Mountains Wilderness Area, located approximately 2 miles (3.2 km) east of the alternative corridors at its nearest point, provides desert recreationists opportunities for hiking, hunting, fishing, horseback riding and camping (SDG&E 2009b). There are no specific campsites, but camping is allowed within 30 feet (9 m) of designated roads and trails. Within this Wilderness Area are the popular recreation areas Valley of the Moon, Blue Angel's Peak, and Elliot Mine, which attract many outdoor enthusiasts (CPUC/BLM 2008a). According to estimates by the BLM, the Valley of the Moon, a popular area for rock climbers and offroad motorists, attracts approximately 600 to 1,200 outdoor enthusiasts per year (Johnson 2009). Blue Angel's Peak, the tallest peak in Imperial County, is used primarily by recreational hikers. The Elliot Mine area contains diverse natural and cultural resources and provides opportunities for hiking to other more remote areas of the wilderness. There are two roads used for recreational access in the southwest portion of the wilderness: one leads to Valley of the Moon, and the other road leads to Elliot Mine (CPUC/BLM 2008a; BLM 2009c). The nearest publicly accessible trails within the Jacumba Mountains Wilderness Area are located approximately 1.5 miles (2.4 km) east of the alternative corridors.

Anza-Borrego Desert State Park, located north of I-8, approximately 2 miles (3.2 km) north of the alternative corridors, is the largest State Park in California. The park contains 500 miles (805 km) of dirt roads and 12 wilderness areas that are used for camping, hiking, wildlife viewing, picnicking, and horseback riding (SDG&E 2009b). On average, the park receives approximately 600,000 visitors annually. The majority of visitors to the park come in the spring (March and April), when wildflowers are in bloom, and the least number of visitors arrive in late summer when temperatures are the highest (State Park and Recreation Commission 2005).

Table Mountain, also located north of I-8 and approximately 1 mile (1.6 km) from the alternative corridors, is managed by BLM and designated as an ACEC because of its abundant cultural resources. The Table Mountain ACEC is approximately 4,300 acres (1,740 ha) and is surrounded by Anza-Borrego Desert State Park. Two communication sites (towers) are located within the ACEC, and a joint use utility corridor is located immediately south of the ACEC which presently accommodates the single-circuit 500-kV SWPL transmission line and several buried fiber optic networks and telephone lines. Recreational activities at Table Mountain include camping, hiking, and rock hounding (BLM 2007a).

Also managed by BLM, the McCain Valley Resource Conservation Area occupies approximately 39,000 acres (15,780 ha) and is located approximately 1.5 miles (2.4 km) northwest of the alternative corridors. It provides a variety of uses, including wildlife conservation, livestock grazing, and recreation. Recreational activities include camping, hunting, hiking, horseback riding, backpacking, mountain biking, wildlife viewing, photography, and off-highway vehicle use (SDG&E 2009b; BLM 2007b).

Carrizo Gorge Wilderness is a narrow strip of land occupying approximately 15,000 acres (6,070 ha) located between the McCain Valley Resource Conservation Area and Anza-Borrego Desert State Park. The majority of the wilderness is within the In-Koh-Pah Mountains ACEC. Both areas are managed by BLM and provide opportunities for camping and hiking (BLM 2009a).

Additional surrounding recreational uses include a BLM-managed shooting range (Carrizo Creek Range) approximately 1-mile (1.6 km) to the west of the alternative corridors and south of Old Highway 80, as well as three local parks: In-Ko-Pah County Park and Mountain Springs County Park approximately 1.5 and 3 miles (2.4 and 4.8 km) to the north, respectively; and Jacumba Community Park approximately 3 miles (4.8 km) to the west.

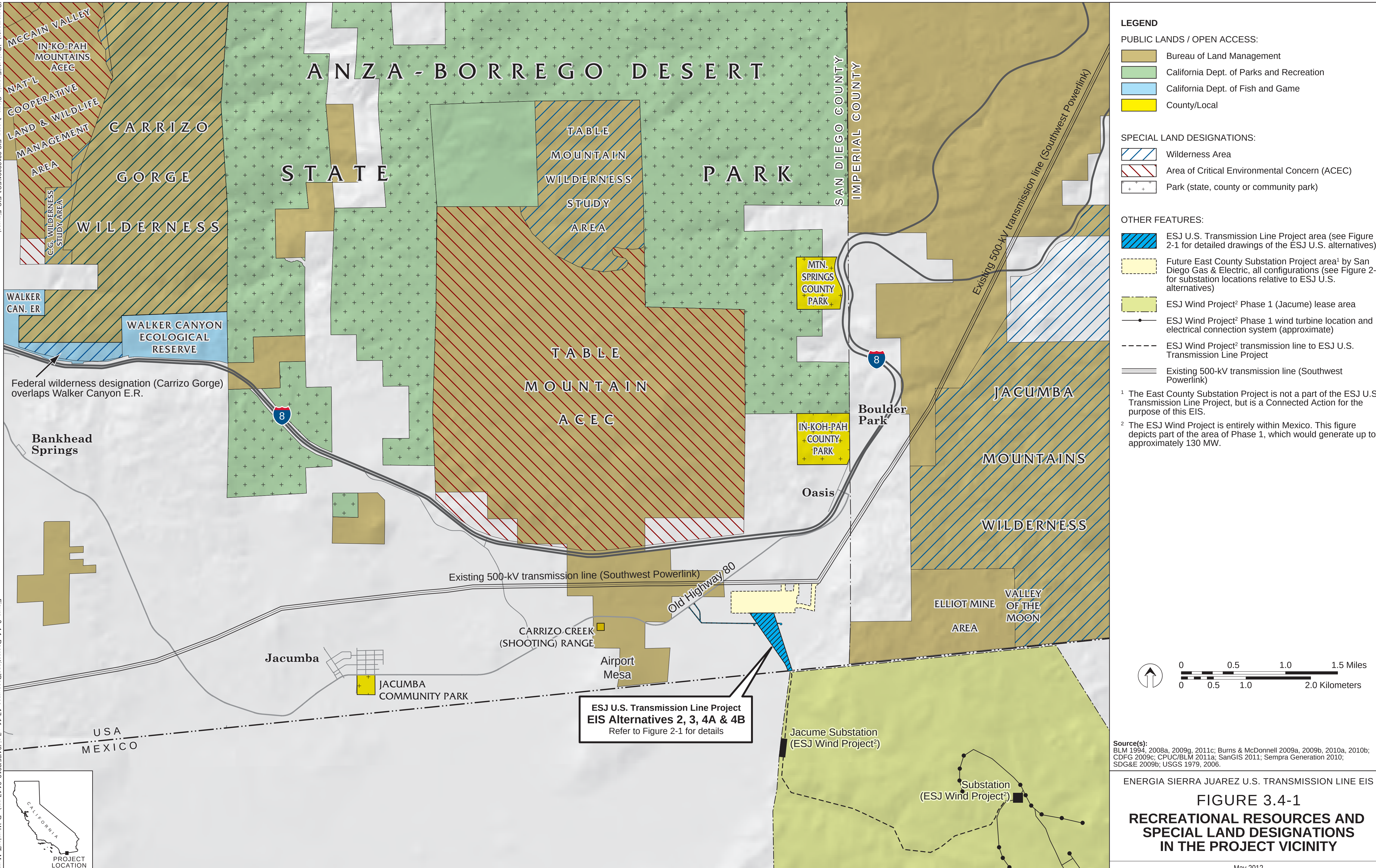
3.4.2 Environmental Impacts

3.4.2.1 Methodology

Since the alternative corridors would be sited on private land, no direct effects to recreation would occur; however, activities associated with construction and operation of the proposed transmission line have the potential to indirectly impact surrounding recreational uses through increases in traffic, noise, and alterations of existing visual environment. The County of San Diego does not have specific guidance for the determination of significance of recreational impacts. The potential for alternatives to indirectly affect recreational resources during construction and operation was analyzed qualitatively based on the timing and duration of proposed activities and the location of nearby recreational areas in relation to the alternative corridors.

3.4.2.2 Alternative 1 – No Action

Under the No Action Alternative, the proposed transmission line would not be constructed and no impacts to recreational resources would occur.



ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.4-1

RECREATIONAL RESOURCES AND SPECIAL LAND DESIGNATIONS IN THE PROJECT VICINITY

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3.4.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Construction of the 230-kV Route is expected to take several months. However, because of the short duration of the construction activity, the isolated nature of tower construction (towers are spaced every 1,500 feet [457 m] and construction activities move from one site to another), potential indirect disturbance to recreationists, if any, is expected to be temporary and minor. Minor increases in vehicle traffic associated with construction activities could potentially adversely affect the experience of visitors at nearby recreational areas and increase travel times to recreation areas; however, both I-8 and Old Highway 80 have enough capacity to accommodate the increased traffic without affecting level of service (see Section 3.7 [Transportation and Traffic]). In addition, based on the estimated noise levels of construction equipment, the distance to nearby recreational areas, and the intervening topographic features, it is not likely that noise from construction activities would be audible from publicly accessible areas within the Jacumba Mountains Wilderness Area (the nearest recreational facility), Table Mountain ACEC, or other recreation areas in the vicinity (see Section 3.6 [Noise] for further details).

Groundwater Extraction

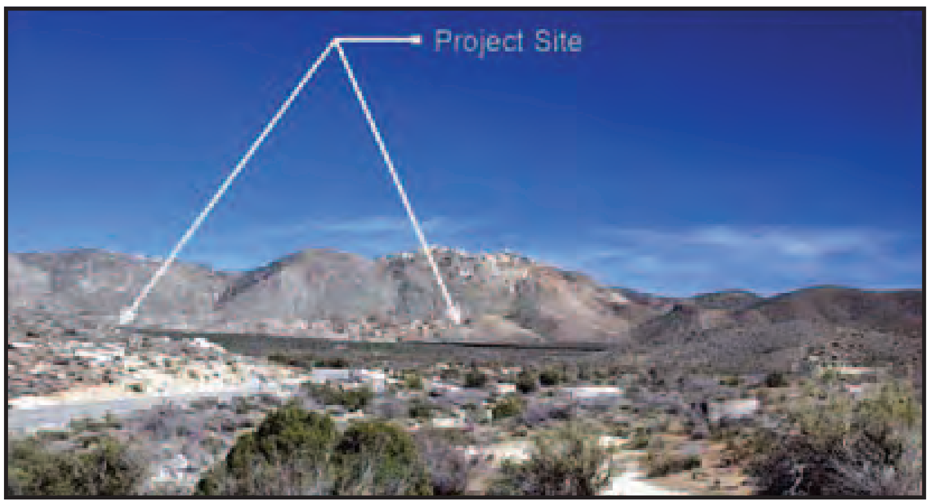
The proposed use of groundwater from JCSD's Well #6 would not impact recreation. JCSD's Well #6 is an existing well and the construction of a new access road to facilitate trucking of water from the well to the project construction site would not affect access to existing recreational areas. Although the new access road may be visible from nearby recreation areas, this road is short (about 200 feet [61 m]) and would be visually similar to other roadways off of Old Highway 80 in the Jacumba area.

Operations Impacts

As discussed above, the nearest recreational facility to the proposed transmission line is the Jacumba Mountains Wilderness Area approximately 0.5 mile (0.8 km) to the east, although the nearest publicly accessible trails are 1-mile (1.6 km) further east. Operation of the transmission line would not preclude any recreational activities or result in any direct impacts to surrounding recreational areas. However, the presence of the transmission line would potentially result in indirect adverse effects to recreational areas due to alterations to existing scenic vistas and increases in ambient noise levels during foul weather (due to corona noise).

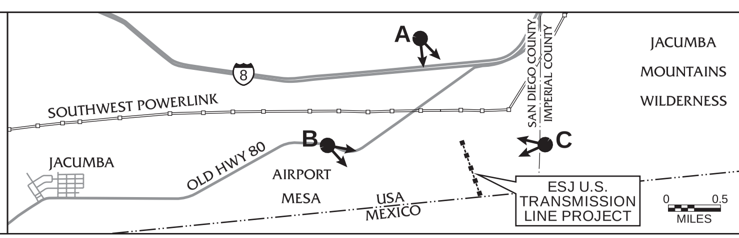
A visual assessment of the 230-kV Route was conducted to determine the extent to which the transmission line would be visible from surrounding recreation areas and the extent to which the presence of the transmission line would alter the existing aesthetics of the area (see Section 3.2, Visual Resources for greater detail). The assessment found that views of the 230-kV Route corridor from Table Mountain ACEC would be abundant and unobstructed due to the low vegetation and superior topographic position of the viewers (Figure 3.4-2; Photograph A). Likewise, views of the corridor from the eastern and northern slopes of Airport Mesa (near the Carrizo Creek Shooting Range and BLM-managed open space to the east) are open and unobstructed (Figure 3.4-2; Photograph B). Views of the corridor from Jacumba Mountains are intermittent along the western roads and trails (Figure 3.4-2; Photograph C).

Photograph A. View of the 230-kV corridor from Table Mountain ACEC. View direction is south-southeast. 230-kV features are 1.13 miles (1.82 km) distant.



Photograph B. View of the 230-kV corridor from Airport Mesa. View direction is east. 230-kV features are 1.30 (2.1 km) miles distant.

Photograph C. View of the 230-kV corridor from an elevated portion of the Jacumba Mountains. View direction is west-southwest. 230-kV features are 1.07 (1.7 km) miles distant.



Source:
ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.4-2

REPRESENTATIVE VIEWS OF THE ESJ U.S. PROJECT SITE FROM SURROUNDING RECREATIONAL AREAS

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As discussed further in Section 3.2 (Visual Resources), an evaluation of the impacts to visual resources, using visual simulations of the 230-kV Route as viewed by recreationalists, found that changes to visual quality and character (e.g., vividness, intactness, unity) would be long-term but minor. Although, the transmission line would encroach upon the views and compromise the integrity of the largely intact desert setting, the overall change to the views from recreation areas would be low (ICF Jones and Stokes 2010b). No mitigation measures are indicated.

With regard to increases in ambient noise levels during foul weather due to corona noise, a noise analysis was prepared which modeled the expected potential increases in noise in the vicinity of the 230-kV Route due to corona effect in foul weather. The study found increases in ambient noise levels as observed approximately 0.5 mile (0.8 km) from the transmission corridor would range from 1.3 to 6.9 dB) (Burns & McDonnell 2009a; see Section 3.6 [Noise]). As stated above, although the nearest recreational area to the 230-kV Route is 0.5 mile (0.8 km) east (Jacumba Mountains Wilderness Area), the nearest publicly accessible area is 1 mile (1.6 km) further east. Given an attenuation rate of 6 dB for every doubling of distance, no increases in ambient noise during foul weather would occur at publicly accessible facilities within the Jacumba Mountains Wilderness Area. Similarly, based on the distances away from the transmission line, no increases in ambient noise levels are anticipated to occur at any other nearby recreational facilities due to corona effect. Further, based on the local climate, high winds, heavy rain, and other foul weather conditions, which are conducive to corona noise, are uncommon in the area (see Section 3.10 [Air Quality]). No mitigation measures are indicated.

Impacts in the U.S. due to Related Activities in Mexico

The ESJ Wind project wind turbines would be located at distances ranging from approximately 0.75 mile (1.2 km) to 7.0 miles (11.3 km) south of the international border. No direct impacts to recreation in the U.S. would result from construction and operation of the wind turbines. Similar to the 230-kV Route, the presence of the wind turbines would indirectly affect visitor experiences at nearby recreational areas due to alterations of the existing viewshed and potential increases in ambient noise.

A simulation of the view of the wind turbines as viewed from the Jacumba Mountains Wilderness Area is provided in Section 3.2 (Visual Resources; Figure 3.2-4) and Section 5.0 (Cumulative Impacts; Figure 5-3). The presence of the wind turbines would noticeably alter the character of views from recreational areas and result in a perceived increase of industrialization of the landscape. No mitigation is available that would reduce the impact short of relocating the project to an entirely different area.

With regard to increased ambient noise levels, as discussed in Section 3.6 (Noise), based on the distance of the wind turbines from the nearest recreational area, recreationalists are unlikely to perceive any change in ambient noise levels. No impacts are anticipated.

3.4.2.4 Alternative 3 – Single Circuit 500-kV Transmission Line

The 500-kV Route would essentially be located in the same area as the 230-kV Route but would be approximately 0.25 mile (0.3 km) further east and, thus, closer to the Jacumba Mountains Wilderness Area. Since construction procedures for the 500-kV Route would be essentially the same as those for the 230-kV Route, indirect impacts with regard to noise and traffic would be the same, temporary and minor. Once operational, views of the 500-kV Route would be essentially the same when viewed from Table Mountain ACEC; however, the Route would be slightly more visible from the Jacumba Mountains Wilderness Area than the 230-kV Route.

3.4.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The revised double-circuit 230-kV or single-circuit 500-kV transmission line routes are shifted 700 and 550 feet (213 and 177 m) east, respectively, of Alternative Routes 2 and 3. This would place the power lines slightly closer to the Jacumba Mountains Wilderness Area. Since construction procedures for the revised 230-kV and 500-kV Routes would be essentially the same as alternatives 2 and 3, indirect impacts with regard to noise and traffic would be the same, i.e., temporary and minor. Once operational, views of the revised 230-kV and 500-kV Routes would be essentially the same as the Alternative 2 and 3 Routes when viewed from Table Mountain ACEC; however, the revised Routes would be slightly more visible from the Jacumba Mountains Wilderness Area than the Alternative 2 and 3 Routes.

3.4.3 Mitigation Measures

No mitigation measures are indicated.

3.5 CULTURAL RESOURCES

This section considers and evaluates the potential of alternatives to have an adverse effect on historic and cultural resources. The National Historic Preservation Act (NHPA) (16 U.S.C. 470 et seq.) and the Advisory Council on Historic Preservation's (ACHP's) regulations at 36 CFR Part 800 provide a framework for Federal agencies to take into account the effects of their actions on historic and cultural resources. DOE compliance with NHPA Section 106 consultation requirements are on-going.[22] The following terms are used specifically to discuss historic, cultural and paleonotological resources within this section of the EIS:

Undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out on behalf of the agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval.

Historic Property is a term defined by the NHPA as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places (NRHP), including artifacts, records, and material remains related to such a property.

Cultural Resource is a term used to describe several different types of properties: prehistoric and historical archaeological sites; architectural properties such as buildings, bridges, and infrastructure; and resources of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization (36 CFR §800.16(l)(1)).

Cultural Landscape is a term used to describe a geographic area, including both cultural and natural resources, associated with an historic event, activity, or person or exhibiting other cultural or aesthetic values.

Area of Potential Effect (APE) is a term defined by the NHPA as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effect is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.[23] See Figure 3.5-1 for the APE determined by DOE for the proposed ESJ U.S. Transmission Line project.

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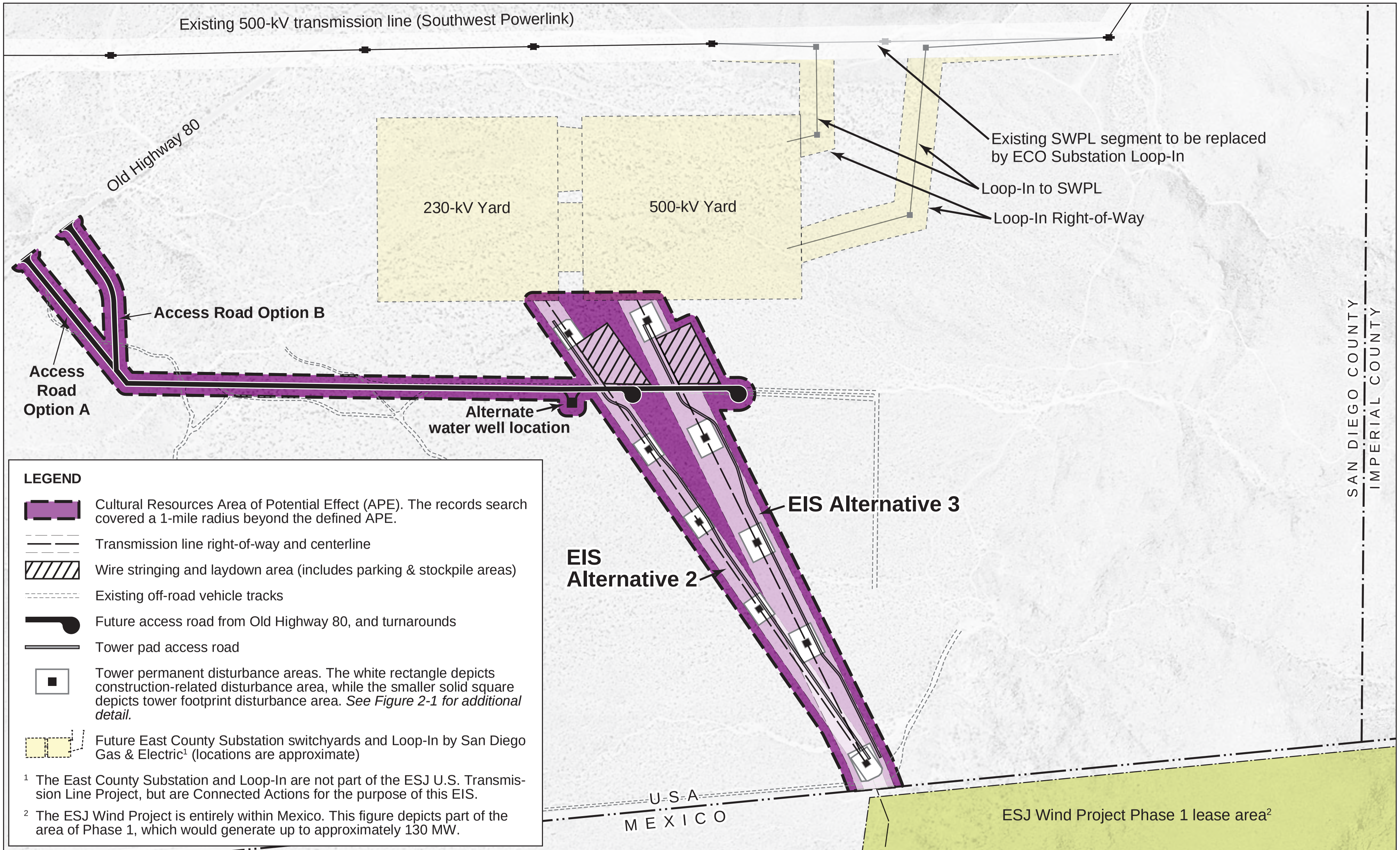
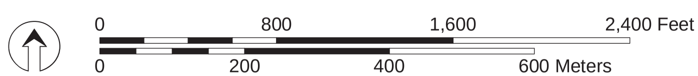
[22] DOE's April 18, 2012 correspondence to the California State Historic Preservation Officer is provided in Appendix D.

[23] Per Section 2.0 (Proposed Action and Alternatives), two options exist for the main access road. Although Option B is beyond the APE, this area was surveyed by EDAW, Inc. in 2009 and no cultural resources were identified. However, the western end of the proposed Option B access road alignment would require a pedestrian survey should this option be selected for construction.





Source(s):
Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2011a; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1998.

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FIGURE 3.5-1

CULTURAL RESOURCES AREA OF POTENTIAL EFFECT ALTERNATIVES 2 AND 3

May 2012

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3.5.1 Affected Environment

3.5.1.1 Regional Prehistory

The prehistory of eastern San Diego County is generally divided into three major periods of occupation: Paleoindian, Archaic, and Late Prehistoric. The Paleoindian period is dated from 12,000 to 10,000 years before present (B.P.) and represents the earliest archaeological evidence for Native American occupation of the region. The Archaic period is dated from 12,000 to 7,000 B.P. and represents an expansion of Native American settlement and use of the southern California region. The Late Prehistoric period is dated from 1,500 to 450 B.P. and is characterized by higher population densities and elaborations in social, political, and technological systems across the region.

3.5.1.2 Regional Ethnography

The alternative corridors are in the traditional territory of the Kumeyaay, who are also known as Kamia, Ipai, Tipai, and Diegueño (Carrico 1983; Hedges 1975; Ladastida and Caldeira 1995; Luomala 1978; and Shipek 1991). The Kumeyaay occupied the southern two-thirds of what is now San Diego County. Kumeyaay traditional territory extends east to near Yuma, Arizona, southwest to Todos Santos Bay in Baja California, west to the Pacific Ocean, and northwest to the San Luis Rey River and San Felipe Creek in northern San Diego County.

Kumeyaay were organized into autonomous tribelets under the control of a chief (kwaaypaay) who had at least one assistant (Ladastida and Caldeira 1995; Luomala 1978; and Shipek 1991). The position of chief was inherited from father to eldest son. The chief directed ceremonies and resolved differences within the group. Kroeber (1925) suggests that Tipai and Ipai populations numbered approximately 3,000 at the time of initial contact with Europeans, which occurred in the period from about 1770 to 1790. Subsequent to contact, the Native American population decreased, and the 1821 Mission San Diego records document a population of 1,711, which would have included Kumeyaay (Luomala 1978).

Kumeyaay relied on hunting and gathering, supplementing that subsistence base with floodplain horticulture along the New and Alamo rivers and at various springs (Underwood and Gregory 2006). They exploited seasonally available plant resources on valley floors and in the foothills and mountains (Ladastida and Caldeira 1995). In the spring, blossoms and buds were collected from blooming plants in the foothills. During the summer, cactus fruits, agave, and mesquite pods were collected in valleys. Small animals were hunted during both seasons. During the fall and winter months, Kumeyaay moved into the mountains seeking shelter and food. Rock shelters and overhangs provided shelter from winter rain and snow, and acorns, pinyon nuts, and small game provided food.

3.5.1.3 Regional History

Spanish exploration of Southern California dates to the 1500s. The Spanish period in California (1769 to 1821) represents a time of European exploration and settlement from San Diego to Sonoma (north of San Francisco). The San Diego Presidio and the Mission San Diego de Alcalá were established in 1769. The mission system introduced horses, cattle, and other agricultural goods and implements to the area. It also disrupted traditional native lifeways, and generally marks the beginning of the decline of traditional Native American cultural practices.

Pedro Fages initiated exploration of what is currently eastern San Diego County in 1785. The Kumeyaay were hostile to the Spanish and formed an alliance with other groups that were actively resisting Spanish rule. Fages' exploration of the area east of San Diego did not result in settlement of the region. The Spanish generally did not exhibit interest in the eastern areas of modern San Diego County, but kept their settlements relatively close to the coast.

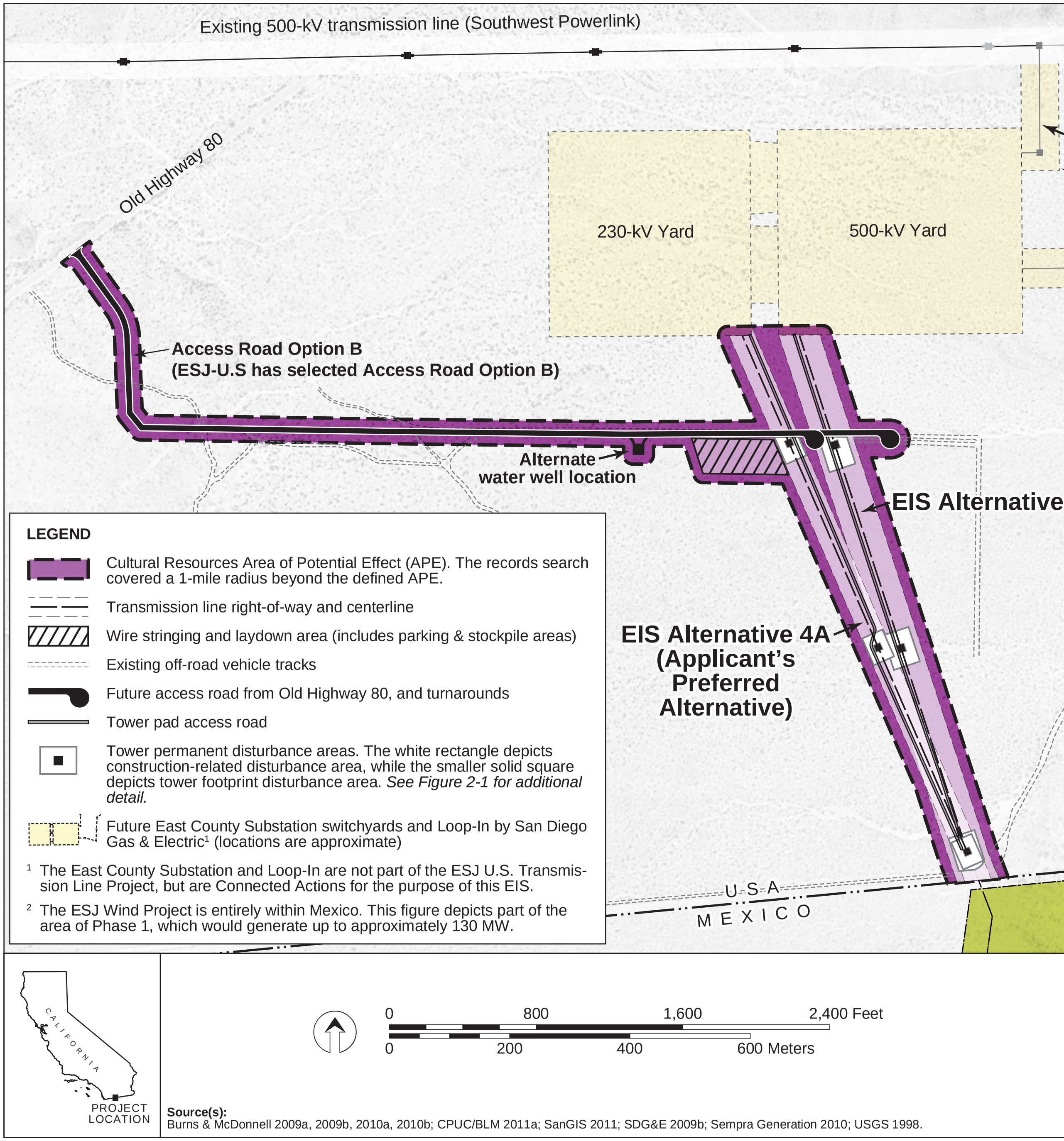
The discovery of gold in California in 1848 attracted individuals from around the world. At that time, the town of Jacumba (approximately 4 miles [6.4 km] west of the corridors) began to expand because it was located along a well-travelled road from San Diego to Fort Yuma, Arizona. In the 1880s the Kumeyaay were evicted from the Jacumba area (Cook et al. 1997). The San Diego & Arizona Railway reached Jacumba in 1919 and was soon followed by construction of Highway 80. The highway improved access to and facilitated the growth of Jacumba. Hot springs in the area attracted tourists and the development of spas and recreational facilities (e.g., a race track). However, the construction of I-8 in 1967, which bypassed Jacumba, had a negative impact on the economic development of the town (Chace 1980).

3.5.1.4 Investigations of the Alternative Corridors and Access Road

Ecology and Environment, Inc. and EDAW, Inc. conducted archaeological and historical investigations for the proposed project (EDAW, Inc. 2010a; E&E 2009a). Ecology & Environment conducted initial archaeological and historical investigations for the alternative corridors in 2007 and 2008. These investigations included records searches at the South Coastal Information Center at San Diego State University and the Southeast Information Center at the Imperial Valley College Desert Museum for all records within a one-mile radius of the alternative corridors, and a pedestrian surface survey of the alternative corridors' Area of Potential Effect (APE). As depicted in Figures 3.5-1 and 3.5-2, the 70-acre (28-ha) project APE includes the rights-of-way of the alternative corridors from the U.S.-Mexico border to the proposed site of the ECO Substation switchyard, the main access road, and an area adjacent to those areas.

EDAW, Inc. conducted additional archaeological and historical investigations in 2009 of the proposed main access road from Old Highway 80 to the alternative corridors. These investigations included a pedestrian survey of the ground surface in a 2.6-acre (1-ha) area along the alignment of the proposed main access road. The California state Native American Heritage Commission was also contacted at this time requesting a sacred lands search for the project APE, and EDAW, Inc. prepared a report documenting its archaeological and historical investigations for the project (provided in Appendix D of this EIS).

In its reply to EDAW, Inc., the Native American Heritage Commission provided a list of Native American tribes that might have knowledge of cultural resources in the project area (Appendix D). The County of San Diego contacted the Native American groups on the consultation list provided by the Native American Heritage Commission. In accordance with the regulatory guidance of Executive Order 13084, DOE also contacted the appropriate Native American groups to offer them the opportunity to consult with DOE regarding the ESJ U.S. Transmission Line project on a government-to-government basis. Initial correspondence and coordination with the Native American community regarding the ESJ U.S. Transmission Line project did not identify any significant cultural resources issues. Further information regarding consultation and coordination is provided in Section 9.0 (Consultation and Coordination), and copies of consultation letters are provided in Appendix D of this EIS.



Source(s):
Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2011a; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1998.

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FIGURE 3.5-2

CULTURAL RESOURCES AREA OF POTENTIAL EFFECT ALTERNATIVES 4A AND 4B

May 2012

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Cultural Resources Identified in the Project APE

The archaeological and historical investigations conducted by Ecology & Environment and EDAW, Inc. identified 11 prehistoric archaeological sites and six isolated prehistoric and historic artifacts within the project APE (Table 3.5-1). No human remains or any evidence to suggest the potential to discover human remains were identified during the investigations.

Table 3.5-1
Prehistoric Archaeological Sites and Isolated Artifacts in the Project APE

Site Number/Artifact Number	Type of Site/Isolate
Prehistoric Archaeological Sites	
CA-SDI-6119	Lithic scatter[1], roasting pit
CA-SDI-19480	Lithic scatter
CA-SDI-19484	Lithic scatter
CA-SDI-19485	Ceramic scatter
CA-SDI-19486	Lithic scatter
CA-SDI-19488	Lithic scatter
CA-SDI-19489	Lithic scatter
CA-SDI-19490	Lithic scatter
CA-SDI-19492	Lithic scatter
CA-SDI-19493	Lithic scatter, ceramic sherd
CA-SDI-19494	Lithic scatter
Isolated Prehistoric and Historic Artifacts	
P-37-30670	Historic lead ball isolate
P-37-30672	Lithic isolate
P-37-30673	Lithic isolate
P-37-30674	Ceramic isolate
P-37-30675	Lithic isolate
P-37-30678	Lithic isolate

[1]The remnants of stone tool manufacture.
Source: EDAW, Inc. 2010a

Groundwater Extraction

A site-specific cultural resources analysis of the groundwater well construction site was prepared on behalf of the County of San Diego Department of Planning and Land Use (AECOM 2011b).

The survey was performed in accordance with County of San Diego Guidelines for Determining Significance – Cultural Resources: Archaeological and Historical Resources.[24] Archaeological and historic surveys were conducted along a 100-foot buffer zone on either side of the new 150-foot access road extending from Old Highway 80 to JCSD Well #6. No cultural material was encountered in the study area. However, the access road is located in the site boundary for two previously recorded archaeological sites, P-37-024023 and CA-SDI-4455. Site number P-37-024023 (a segment of Old Highway 80) has been determined to be a contributing element to the resource's listing on the NRHP as a "historic property" and on the California Register of Historic Resources (CEQA Guidelines Section 15064.5) as a "historic resource" under Criterion A. The road segment is located on the southern boundary of the proposed JCSD groundwater well access road. While no artifactual material was observed within the proposed access route for the existing well, several quartz flakes were observed approximately 66 feet (20 m) north and west of the existing well, within the 100 feet (30 m) buffer area of the road. This area has not been subject to subsurface testing, so it is unknown whether any subsurface deposits are present (AECOM 2011b).

Historic Roadways

U.S. 80 (now known as Old Highway 80) was once a transcontinental highway that extended from San Diego to Tybee Island, Georgia. In California, it extended from US 101 in San Diego to the Arizona border at Yuma. It is a road of historical note because it includes sections of the first paved road to connect San Diego with points east as well as containing the plank road that took motorists over the Algodones sand dunes east of El Centro as part of its route in 1926. US 80 remained for a longer time than many other California US highways, as it existed until 1974 when the final section of I-8 was completed. Almost all of it is still intact today, looking the same as it did when it was still the only highway heading east from San Diego. U.S. 80 was officially decommissioned on July 1, 1964 in favor of I-80 to the north (Historic U.S. Highways 2005). Old Highway 80 was designated a state historic route in August 2006 (10 News.com 2006).

3.5.2 Environmental Impacts

3.5.2.1 Methodology

Impacts to cultural resources were evaluated based on the potential for project-related activity to affect known cultural resources within the project APE. This evaluation was conducted in accordance with the County of San Diego Guidelines for Determining Significance for Cultural Resources (2007b). A cultural landscape is a geographic area (1) with both cultural and natural resources that are associated with an historic event, activity, or person, or (2) that exhibits other cultural or aesthetic values (Birnbaum 1994). For this EIS, the evidence of human activity on a landscape was evaluated based on the following 11 characteristics that are presented in McClelland et al. (1999):

- **Landscape uses** such as fields, pasture, open range, cemeteries, and quarries;

[24] The full report is available online at:
http://www.cpuc.ca.gov/environment/info/dudek/ecosub/B/02STALOC_03.04.11_County%20of%20SD%20Attach%20F-%20ESJWaterPermCR.pdf

- **Patterns of spatial organization** such as circulation networks, natural features, and clusters of features or structures;
- **Responses to the natural environment** such as adaptations to climate and natural features seen in land use, orientation of clusters, construction materials, design of buildings, and methods of transportation;
- **Cultural traditions** such as land use practices, buildings and structures, ethnic or religious institutions, community organization, construction methods, technology, trades and skills, use of plants, craftsmanship, and methods of transportation;
- **Circulation networks** such as paths, roads, streams, or canals, highways, railways, and waterways;
- **Vegetation related to land use** such as ornamental trees, fields for cropping, treelines along walls and roads, native vegetation, orchards, pastures, gardens, shelter belts, forests, and grasslands that may identify land uses and cultural traditions;
- **Buildings, structures, and objects** that may identify periods of occupation of an area, land uses, and cultural traditions;
- **Clusters** are village centers, crossroads, harbors, Native American archaeological sites, and ranching or mining complexes; and
- **Small-scale elements** such as foot bridges, cow paths, gravestones, isolated vegetation, fence posts, curbstones, trail ruts, culverts, foundations, and minor ruins.

The project APE (Figure 3.5-1) extends across a relatively uniform landscape that consists of woody scrub vegetation that is crisscrossed by dirt roads. The prehistoric archaeological sites in the project APE are primarily sparse lithic scatters that consist of minimal remnants of stone tool manufacture. These sites individually or as a group do not exhibit any of the 11 landscape characteristics that are typically used to identify specific uses of a landscape. Therefore, the impact analysis addresses the potential significance of the individual sites in the project APE rather than analyzing the project APE as a cultural landscape.

Although the known sites in the project APE are associated with Native American use of the area, they do not provide data related to specific activities (e.g., subsistence) or discrete patterns of land use (e.g., settlement systems) in the area. In addition, the landscape within the project APE is disturbed (e.g., dirt roads cross the project APE and the border wall and fence are at the southern end of the project APE) and does not exhibit a sense of history or have the characteristics typically associated with prehistoric occupation of an area by Native Americans. Further, consultation with the Native American community did not identify any traditional use of the project APE.

3.5.2.2 Alternative 1 – No Action

Under implementation of the No Action alternative, the ESJ U.S. Transmission Line project would not be implemented. Therefore, no impacts to cultural resources would occur.

3.5.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Known Cultural Resources

Of the 11 known prehistoric archaeological sites in the project APE, only three (CA-SDI-6119, CA-SDI-19488, and CA-SDI-19494) could be affected by construction of the ESJ U.S. Tansmission Line project. Sites CA-SDI-6119, CA-SDI-19488 could be directly affected by construction of the project and site CA-SDI-19494, which is located immediately adjacent to a transmission line access road, could be indirectly affected by construction of the project. As indicated in Table 3.5-2, those sites would be affected by continued use of or widening of the main access road or constructing and using the access roads for the transmission line. ESJ would avoid the remaining eight sites in the project APE during construction because they are not within proposed construction areas (i.e., they are not in or near access road alignments or disturbance areas for towers/poles).

ESJ conducted subsurface excavations at the three sites listed in Tables 3.5-2 and 3.5-3 (below) in December 2009 and January 2010 to determine their potential to provide important information in regional or local prehistory and their eligibility for inclusion on the NRHP. The results of the subsurface excavations indicated that the sites had limited or no subsurface components and subsurface testing and surface collection exhausted each site's data potential (see Appendix D.2 for more information). Regardless of these findings, ESJ has incorporated the following measures into the project design:

- Avoidance of impacts to significant cultural resources that have been identified in the project APE, where feasible by redesign of project elements such as transmission line access roads and layout/staging areas to avoid cultural resources;
- Monitoring of ground-disturbing activities during construction by a qualified archaeologist. A Native American representative would be invited to participate in site monitoring;
- Avoidance of cultural resource sites by redirecting pedestrian and vehicular traffic away from the site during construction and facility operation;
- Significance testing of any incidental discoveries during construction, as outlined in applicable agency guidelines; and
- Additional field surveys for areas that may be disturbed due to project changes.

As a result, it is not anticipated that construction of the project would significantly impact any of the 11 known prehistoric archaeological sites in the project APE because the sites are either not eligible for inclusion on the NRHP and/or would be avoided during construction of the proposed project. Consequently, no additional mitigation is indicated.

Although the isolated artifacts identified during the cultural resource investigations are within the construction footprint, they were recorded to the State Historic Preservation Officer (SHPO) standards and, in accordance with the County of San Diego Resource Protection Ordinance, do not warrant any protective measures (County of San Diego 2007j). Therefore, no impacts to these isolated artifacts are anticipated.

Table 3.5-2
Known Prehistoric Archaeological Sites Affected by Construction of the 230-kV Transmission Line

Site Number	Type of Site	Potential Impact
CA-SDI-6119	Lithic scatter, roasting pit	Main Access road construction (both Option A and B)
CA-SDI-19488	Lithic scatter	Transmission Line Access road construction
CA-SDI-19494	Lithic scatter	Transmission Line Access road construction

Source: EDAW, Inc. 2010a

Table 3.5-3
Known Prehistoric Archaeological Sites Affected by Construction of the 500-kV Transmission Line

Site Number	Type of Site	Potential Impact
CA-SDI-6119	Lithic scatter, roasting pit	Main access road construction (both Option A and B)
CA-SDI-19490	Lithic scatter	Tower/Pole construction
CA-SDI-19493	Lithic scatter, ceramic sherd	Tower/Pole construction

Source: EDAW, Inc. 2010a

Unanticipated Finds

Although the cultural resources investigations conducted for the project were adequate to identify known prehistoric and historic resources in the project APE, the potential exists for the unanticipated discovery of additional cultural resources and/or human remains during construction and maintenance. If human remains are discovered, ESJ would adhere to the stipulations of Public Resources Code Section 5097.98 and Health and Safety Code 7050 and stop work within 50 feet (15 m) of the discovery; ESJ would also contact the County of San Diego coroner and a professional archaeologist (i.e., an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in archaeology and/or history) to determine the significance of the discovery. If appropriate, stipulations in the Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001 et seq. and its implementing regulations at 43 CFR 19 also shall be implemented.

Depending on the recommendations of the coroner and/or archaeologist, ESJ would consult with the County of San Diego to establish additional feasible and appropriate mitigation measures to be implemented into the project. Potential measures include avoidance, preservation in place, excavation, documentation, curation, and data recovery. A potential mitigation measure not proposed as an APM that would further minimize the potential for cultural resources impacts during construction is mitigation measure Cultural-1 (Worker Training); this measure would ensure that all construction personnel are informed of the proper steps and procedures required to comply with the above codes and regulations in the event that unknown resources are discovered (see Section 3.5.3).

Groundwater Extraction

As discussed in Section 3.5.1.4, the proposed access road for the well site is located in the site boundary for two previously recorded archaeological sites, P-37-024023 and CA-SDI-4455. Based on the study conducted on behalf of the County, the roadway would have no impact on P-37-024023, but could potentially impact CA-SDI-4455. Disturbance to an archaeological site that has the potential to contain information important to prehistory would cause a substantial adverse change in the significance of this archaeological resource pursuant County significance guidelines. Mitigation measure Cultural-2 (Sub-surface Investigation for Proposed Access Road) is identified to minimize potential impacts to this resource. With the implementation of this mitigation measure, adverse impacts could be avoided.

Eligible segments of site number P-37-024023 (a segment of Old Highway 80) include the segment adjacent to the Project APE. The site traverses the southern boundary of the proposed construction water well access road; this road segment has been determined to be a contributing element to the resource’s listing on the National Register of Historic Places as a “historic property” and on the California Register of Historic Resources as a historic resource (AECOM 2011a). Although the new access road would represent a permanent change in the viewshed for motorists (the road would remain following the end of construction activity), this road would be very short and would be similar in design to other roadways off Old Highway 80 in the Jacumba area. Therefore, no impacts to the historic significance of Old Highway are indicated.

Operations Impacts

Long-term maintenance activities would entail occasional activity within the previously disturbed footprint of development. No ground disturbances associated with operation of the transmission line outside of these areas. Therefore, no impacts to cultural resources during operation of the transmission line are anticipated.

Impacts in the U.S. due to Related Activities in Mexico

There would not be any impacts to cultural resources in the U.S. associated with construction of the ESJ Wind project. Consultation with Native American groups in the U.S. did not identify any culturally sensitive areas in Mexico that would likely be impacted by construction of the ESJ Wind project or any culturally sensitive issues related to the viewshed in the ESJ U.S. Transmission Line project area. Indeed, the landscape and viewshed in the ESJ U.S. Transmission Line project area is already compromised by several dirt roads, paved interstate highways, and other major roads, transmission lines, the U.S.-Mexico border fence, wind turbines,[25] private residences, and commercial facilities that are located within and near the project APE. In summary, construction of the ESJ Wind project would not directly impact any known culturally sensitive areas in Mexico or indirectly impact the landscape or viewshed

[25] As previously discussed in Section 3.2 (Visual Resources), there are existing wind turbines in Mexico and at the Campo Indian Reservation that are visible from the project APE as well as the Table Mountain ACEC and other high elevation prominent viewpoints surrounding the project APE.

because they are already compromised in the project area by existing facilities (i.e., roads, U.S.-Mexico border fence and wind turbines).

3.5.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

Construction Impacts

Known Cultural Resources

Construction of the 500-kV Route could result in impacts to existing known cultural resources within the project APE. Three known sites (CA-SDI-6119, CA-SDI-19490, and CA-SDI-19493) have the potential of being affected by construction of the proposed project. Site CA-SDI-6119 would also be affected by the 230-kV Route, but sites CA-SDI-19490 and CA-SDI-19493 would only be affected by the 500-kV Route. As indicated in Table 3.5-3, those sites would be affected by continued use of or widening of the main access road or constructing the access roads for the transmission line and by installation of the foundations of two of the transmission line structures. As for the 230-kV Route alternative, ESJ would avoid the remaining eight sites in the project APE during construction of the 500-kV Route because they are not within proposed construction areas (i.e., they are not in the access road alignments or disturbance areas for towers/poles) of that transmission line. Potential impacts to cultural and historic resources related to the construction water well access road would the same as those described above for Alternative 2.

ESJ conducted subsurface excavations at the three sites listed in Table 3.5-3 in December 2009 and May 2010 to determine their potential to provide important information in regional or local prehistory and their eligibility for inclusion on the NRHP. The results of the subsurface excavations indicated that the sites had limited or no subsurface components and subsurface testing and surface collection exhausted each site's data potential (see Appendix D.2 for more information). In addition, ESJ would implement all of the protection measures identified for the 230-kV Route alternative in Section 3.5.2.3. As a result, there would not be impacts to the 11 known prehistoric archaeological sites due to construction of the 500-kV Route.

Impacts to isolated artifacts would be as described for the 230-kV Route and no impacts to those resources would occur.

Unanticipated Finds

As with the 230-kV Route, unanticipated cultural resources could be discovered during construction of the 500-kV Route. However, ESJ would implement the measures described in Section 3.5.2.3 and comply with all applicable state codes and regulations as described for the 230-kV Route in Section 3.5.2.3. Potential mitigation measure Cultural-1 (Worker Training) would ensure that all construction personnel are informed of the proper steps and procedures required to comply with the above number codes and regulations in the event that unknown resources are discovered (see Section 3.5.3).

Operations Impacts

There would not be ground disturbances associated with operation of the transmission line, and therefore, there would not be any impacts to cultural resources during operation of the 500-kV Route.

3.5.2.5 Alternative 4 — Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The revised 230-kV and 500-kV Route alignments are very close to the Alternative 2 and Alternative 3 routes. Therefore, the revised routes are well within the one-mile (1.6 km) radial area surrounding the Project APE that was included in the records search for the Proposed Action (Figure 3.5-2). Based on a review of the study conducted by EDAW/AECOM, three known prehistoric archaeological sites are located beneath the revised routes (one beneath the 230-kV Route and two beneath the 500-kV Route).

Construction of the revised 230-kV Route would result in impacts to one known site (CA-SDI-19492; see Table 3.5-4). However, this site (CA-SDI-19492) was incorporated into site CA-SDI-19490 and was tested by EDAW/AECOM during their sub-surface investigations in May 2010. This site was determined not eligible for inclusion on the NRHP (EDAW, Inc. 2010a). Therefore, no impacts to cultural resources are anticipated to result from construction and operation of the revised 230-kV Route.

Table 3.5-4
Known Prehistoric Archaeological Sites Affected by Construction of the Revised Routes

Site Number	Type of Site	Potential Impact
CA-SDI-19486	Lithic scatter	Tower/Pole construction 500-kV Route
CA-SDI-19489	Lithic scatter	Tower/Pole construction 500-kV Route
CA-SDI-19492	Lithic scatter	Tower/Pole construction 230-kV Route

Source: EDAW, Inc. 2010a

Construction of the revised 500-kV Route would result in impacts to existing known cultural resources within the project APE. Two known sites (CA-SDI-19486 and CA-SDI-19489) have the potential of being affected by construction of this route. In addition, the two known sites within the alignment of the revised 500-kV Route have not been tested. Disturbance to an archaeological site that has the potential to contain information important to prehistory would cause a substantial adverse change in the significance of the archaeological resource pursuant County significance guidelines. If this route were to be constructed, mitigation measure Cultural-3 (Sub-surface Investigation for Revised 500-kV Route) is recommended to minimize potential impacts to this resource. With the implementation of this mitigation measure, the potential for impacts is considered minor.

Potential impacts to cultural and historic resources related to the construction water well access road would the same as those described above for Alternative 2.

3.5.3 Mitigation Measures

In addition to the applicant-proposed measures, the following potential mitigations were identified to further reduce potential impacts to cultural resources.

Cultural-1: Worker Training

Prior to the initiation of construction, ESJ should provide training and area-specific information to contractor personnel to ensure that construction workers are aware of the potential for archaeological discoveries during construction. The employee training session should be conducted by a qualified archaeologist and should include a description of the kinds of cultural resources that may be encountered during construction and the steps to be taken if such resources are encountered.

Each participant in the training should sign a statement declaring that the individual understands and will abide by the guidelines set forth in the training materials.

Cultural-2: Sub-Surface Investigation and Monitoring of Proposed Groundwater Well Access Road

Prior to the initiation of construction, ESJ should conduct subsurface testing of the proposed access road area associated with the use of JCSD Well #6. Testing should comply with all state and local guidelines for archaeological sites to determine whether subsurface deposits are present. If testing exhausts the data potential of the affected portion of site CA-SDI-4455, impacts would be reduced to minor levels. Evidence of findings and any other reports should be submitted to the County of San Diego for review and approval. If eligible cultural resources are encountered during subsurface testing, then a data recovery mitigation program should be conducted in accordance with County of San Diego guidelines.

Testing and construction monitoring should be conducted by a County of San Diego qualified archaeologist. A Native American representative should be invited to participate in site monitoring, before disturbance, including any excavation.

Cultural-3: Sub-Surface Investigation of Revised 500-kV Route

Prior to the initiation of construction, ESJ should conduct subsurface testing of the proposed alignment associated with the revised 500-kV Route (if this route is constructed). Testing should comply with all state and local guidelines for archaeological sites to determine whether subsurface deposits are present. If testing exhausts the data potential of the affected portion of sites CA-SDI-19486 and CA-SDI-19489, impacts would be reduced to minor levels. Evidence of findings and any other reports should be submitted to the County of San Diego for review and approval. If eligible cultural resources are encountered during subsurface testing, then a data recovery mitigation program should be conducted in accordance with County of San Diego guidelines.

3.6 NOISE

This section addresses the sound levels associated with the proposed project and alternatives and potential noise impacts on humans. The impacts to wildlife due to project-generated noise are addressed in Section 3.1 (Biological Resources).

General Noise Characteristics

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. When sound becomes excessive or unwanted, it is referred to as noise. Noise may be continuous (constant noise and decibel level), steady (constant noise with a fluctuating decibel level), impulsive (having a high peak of short duration), stationary (occurring from a fixed source), intermittent (occurring at the same rate), or transient (occurring at different rates). Sound levels are quantified using units of decibels. The A-weighted scale, reported in A-weighted decibels (dBA), most effectively approximates the human ear's response to sounds. The A-weighted decibel scale (dBA scale) measures sound levels over the entire range of audible frequencies, weighted to accommodate the fact that humans hear middle range frequencies better than high or low frequencies. Typical sound levels in a variety of settings and from representative sources are listed in Table 3.6-1.

Table 3.6-1
Typical Sound Levels

Source/Activity	dBA
Rural night-time background	20-40
Quiet bedroom	35
Wind project at 1,100 feet (335 m)	35-45
Car at 40 mph at 300 feet (91 m)	55
Busy office	60
Truck at 30 miles per hour at 300 feet (91 m)	65
Jet aircraft at 800 feet (244 m)	105

Source: DOE 2008b

Several metrics have been developed to describe sound levels. Average levels over a period of minutes or hours are usually expressed as dB L_{eq}, the equivalent sound level. The period of time average may be specified; for example, $L_{eq(3)}$ is a 3-hour average. For continuous sources, such as roadways, sound levels are often averaged over a period of 24 hours and are normally weighted to account for greater human sensitivity to noise in the evening and nighttime hours. These 24-hour metrics are the Community Noise Equivalent Level (CNEL) and the Day-Night level (L_{dn}). The L_{eq24} is the level of steady sound with the same total (equivalent) energy as the time varying sound of interest, averaged over a 24-hour period. The L_{dn} is the L_{eq24} with 10 dBA added to nighttime sound levels between the hours of 10 p.m. and 7 a.m. (Eldred 1975).

3.6.1 Affected Environment

The alternative corridors would be located in a rural environment, consisting primarily of undeveloped open space where sound is generated primarily by natural sources, such as wind. However, traffic on roadways in the area also generates sound; the primary roadways are Old Highway 80 (about 0.5 mile [0.8 km] north-northwest of the alternative corridors) and I-8 (about 0.75 mile [1.2 km] north of the alternative corridors). In addition, occasional increases in sound levels result from activities at the Carrizo Creek shooting range (about 1 mile [1.6 km] west of the project) and occasional air traffic at Jacumba Airport (about 2.5 miles [4.0 km] west of the project). Average ambient sound levels in the vicinity of the alternative corridors generally are below 50 dBA during daytime hours and below 40 dBA during nighttime hours (CPUC/BLM 2008b; SDG&E 2009b).

Noise-sensitive receptors include residences, schools, libraries, hospitals, and other similar land uses where groups of people may gather, specifically the elderly, sick, and the very young, who can be most sensitive to noise. No schools, libraries, hospitals, or other similar land uses are located at or near the alternative corridors. Based on field observations, it is believed that the mobile home located approximately 1,600 feet (490 m) west of the 230-kV alternative construction area is unoccupied; however, since the home could be occupied in the future, it is considered a noise-sensitive receptor in this EIS. Other residential receptors in proximity to the alternative corridors include a residence located approximately 0.4 mile (0.6 km) northwest of the site and approximately 290 feet (88 m) south of I-8, and a residence located approximately 1.4 miles (2.3 km) northeast of the site, approximately 280 feet (85 m) north of I-8. There are also residences located approximately 2 miles (3.2 km) west of the site, near the intersection of Carrizo Gorge Road and Old Highway 80.

Areas in which a quiet setting is a basis for recreational use of the area may also be considered noise-sensitive receptors. Two recreational areas located in the vicinity of the alternative corridors were assessed as potential noise-sensitive receptors. The Table Mountain ACEC, which is used for hiking and other recreational purposes, is located north of I-8, and approximately 0.8 mile (1.3 km) northwest of the terminus of the proposed transmission line corridor. The southwestern portion of the Jacumba Mountains Wilderness Area is located approximately 0.5 mile (0.8 km) east of the transmission corridor at its nearest point and is used by rock climbers, jeep clubs, and hikers. There are no specific campsites, but camping is allowed within 30 feet (9 m) of designated roads and trails. There are two roads used for recreational access in the southwest portion of the wilderness: one leads to Valley of the Moon, and the other road leads to Elliott Mine. There are no BLM noise standards for wilderness areas (Johnson 2009). The nearest publicly accessible trails within the Jacumba Mountains Wilderness Area are located approximately 1.5 miles (2.4 km) east of the alternative corridors. These recreational areas are described further in Section 3.4 (Recreation).

3.6.2 Environmental Impacts

Temporary increases in sound levels would be generated by construction activities. Inspection, maintenance, and repair of the project would generate periodic increases in sound levels during the life of the project, and operation of the project would result in a long-term increase in sound levels in the vicinity of the transmission lines. Increased sound levels from transmission lines are due primarily to corona discharge, which is a small electrical discharge along the wire that produces crackling and hissing sounds as well as small amounts of light. These discharges result from electrical energy passing over surface irregularities that occur along the transmission lines, such as scratches, nicks, dust, or water drops. These sounds typically occur when air is ionized around a gap, burr (i.e., raised area), irregularity, or some non-insulated component while electricity is being conducted through power lines. They are also produced when transmission lines deteriorate over time and their fastener components loosen, resulting in an air gap. The corona effect is most prominent during periods of rain, fog, or high humidity, conditions that are not common in the project area (See Section 3.10 [Air Quality] for a more detailed discussion of the climate in the vicinity of the alternative corridors). In addition, wind blowing across power lines and power poles can also generate increased sound levels in the vicinity of those facilities.

3.6.2.1 Methodology

Sound levels resulting from construction, inspection, and maintenance were determined based upon the types of equipment that would be used and the duration of their use. For the construction impact analysis, the sound levels associated with transmission line construction were estimated based on two recent studies: the Sunrise Powerlink Final Environmental Impact Report (EIR)/EIS (CPUC/BLM 2008a); and the Imperial Valley-Mexicali 230-kV Transmission Lines Project EIS (DOE 2004). Corona sound levels were estimated based on a noise analysis prepared for the ESJ U.S. Transmission Line project by Burns and McDonnell (2009a), which used the Corona Field Effects Program to predict performance. Increased sound levels generated by the ESJ Wind project in Mexico that could be audible in the U.S. were based on DOE estimates for other similar projects and a recent analysis of potential human health effects from wind turbines (Colby et al. 2009). Changes in sound levels at the property line and nearest sensitive receptors were calculated based on an attenuation rate of 6 dB for every doubling of the distance (FHWA 1996), and the resulting levels were compared to the County of San Diego noise standards as described in the County of San Diego Guidelines for Determining Significance – Noise (2009b).

The County of San Diego Code of Regulatory Ordinances, Chapter 4 (Noise Abatement) (County of San Diego 1982) provides guidance and standards for acceptable sound levels for various land uses and provides a definition for sensitive receptors. The following sections of the code are applicable to the ESJ U.S. Transmission Line project:

- Section 36.404 limits the average hourly sound level in rural areas (including the project corridor, which is on land designated General Rural) to 50 dBA between 7 a.m. and 10 p.m. and to 45 dBA between 10 p.m. and 7 a.m.
- Section 36.410 prohibits the operation of construction equipment between the hours of 7 p.m. and 7 a.m., as well as on Sundays and holidays. Construction activities may not cause average daytime noise levels that extend to properties that include a legal dwelling unit to increase above 75 dBA.
- Section 36.414 regulates general nuisance noise and defines schools, courts, churches, and hospitals as sensitive receptors.

There are no federal sound level or noise standards that directly regulate environmental noise or community noise.[26] In 1974, the U.S. Environmental Protection Agency (USEPA) published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (USEPA 1974). This document provides information for state and local governments to use in developing their ambient sound level standards. USEPA determined that the maximum sound level should be less than 55 dBA L_{dn} outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use. This standard is not a single event, or "peak" level, but represents averages of acoustic energy over periods of time, such as 8 hours or 24 hours, and over long periods of time, such as years; therefore, it is not used to assess the temporary sound level increases associated with construction.

3.6.2.2 Alternative 1 – No Action

The proposed transmission line would not be constructed under this alternative; therefore, ambient sound levels would not be affected, and no noise impacts would occur.

3.6.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

ESJ would construct the project during the hours of the day allowed by County of San Diego ordinance and, thus, would be consistent with the County's requirements. Use of heavy machinery and other equipment during construction of the proposed transmission line would temporarily increase sound levels in the immediate vicinity of the project. The nearest potential noise-sensitive receptor would be the currently unoccupied mobile home located approximately 1,600 feet (490 m) to the west of the construction area.

In its Final EIS/EIR for the Sunrise Powerlink Project, CPUC and BLM conducted an analysis of the impacts to existing sound levels due to construction of the Sunrise Powerlink project (CPUC/BLM 2008a), which would be constructed using the same methods and equipment as the proposed ESJ U.S. Transmission Line project. As a result, that impact assessment can be adapted to the proposed ESJ U.S. Transmission Line project. In summary, CPUC determined that sound levels associated with individual pieces of equipment would generally range from 70 to 90 dBA (U.S. DOT 2006, as cited by CPUC/BLM 2008a). Sound levels generated by typical pieces of construction equipment (at 50 feet [15 m]) are listed in Table 3.6-2. Maximum instantaneous construction noise levels would range from 80 to 90 dBA at 50 feet (15 m) from any work site, which equates to sound levels up to 78 dBA at a distance of 200 feet (61 m) from the noise source. Beyond 1,000 feet (305 m) from the source, sound levels from multiple pieces of equipment operating simultaneously would not exceed 70 dBA.

[26] USEPA does not have regulatory authority governing noise in local communities. In the past, USEPA coordinated all federal noise control activities through its Office of Noise Abatement and Control. In 1981, the Administration at that time concluded that noise issues were best handled at the state or local government level. As a result, USEPA phased out the Office's funding in 1982 as part of a shift in federal noise control policy to transfer the primary responsibility of regulating noise to state and local governments. The Noise Control Act of 1972 and the Quiet Communities Act of 1978, however, were not rescinded by Congress and remain in effect today, although essentially unfunded. Additional noise-related information is available online from USEPA at: http://www.epa.gov/history/topics/noise.

Table 3.6-2 Typical Sound Levels for Construction Equipment	
Equipment	**Typical Noise Levels (dBA, at 50 feet [15 m])**
Front loaders	85
Backhoes, excavators	80-85
Tractors, bulldozers	83-89
Graders, scrapers	85-89
Trucks	88
Concrete pumps, mixers	82-85
Cranes (movable)	83
Cranes (derrick)	88
Forklifts	76-82
Pumps	76
Generators	81
Compressors	83
Pneumatic tools	85
Pneumatic tools	85
Jack hammers, rock drills	98
Pavers	89
Compactors	82
Drill rigs	70-85

Source: CPUC/BLM 2008a

In the Imperial Valley-Mexicali 230-kV Transmission Lines Project EIS, DOE (2004) used a similar estimate for construction equipment sound levels associated with transmission line construction to assess noise impacts from similar construction methods. For that project, a maximum estimated construction sound level of 90 dBA at 50 feet (15 m) from the edge of the construction right-of-way was used, based on previous studies of projects using similar types of transmission line construction equipment (HMMH 1995, as cited in DOE 2004). Assuming a maximum sound level of 90 dBA at 50 feet (15 m) from the edge of the construction right-of-way, the sound level at the unoccupied mobile home located approximately 1,600 feet (490 m) west of the 230-kV transmission line corridor would be approximately 60 dBA, which is below the County of San Diego's threshold for construction noise impacts.

Since the nearest boundary of the Table Mountain ACEC is about 0.8 mile (1.3 km) from the proposed project corridor, it is not likely that sound level increases generated by construction would be audible in the ACEC. In addition, sounds from vehicular travel on I-8 would mask sound level increases from construction. Similarly, it is not likely that increased sound levels from construction would be audible from publicly accessible areas within the Jacumba Mountain Wilderness Area due to the distance involved (0.5 mile [0.8 km] from the project site) and the intervening topographic features that would attenuate sounds from the construction area.

Construction-related truck traffic would also generate increases in sound levels. Typical daily construction-related traffic would be limited to about 7 to 12 heavy vehicles and 20-25 construction worker vehicles. In addition, heavy trucks would be used to import and export earthwork materials for development of the all-weather road surfacing along the property access road.[27] Construction vehicles would travel along I-8 to Carrizo Gorge Road (Exit 73), and then use Old Highway 80 east to the project corridor. Because of the existing daytime traffic levels on I-8 (approximately 14,000 annual average daily trips, with generally lower daily volumes on weekdays than on weekends), the increase in sound levels from this number of trucks accessing the project in the vicinity of that roadway would not be perceptible during the planned daytime hours. Increased sound levels due to an increase in traffic due to construction may be noticed at the two isolated residences along Old Highway 80 between Carrizo Gorge Road and the proposed route. However, construction-related trucks would use the roadway within the hours allowed by the County of San Diego, and the increase in sound levels would not exceed the County's noise threshold for construction activities. As a result, sound level impacts at these residences would be temporary and minor.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 would not result in noise impacts. Although a new access road would be constructed to facilitate trucking of water from the well site to the project construction area, the increased sound levels would not be audible from any residences or publicly accessible areas. Once the access road is completed, use of the well would not result in any increases in existing noise levels and no impacts would occur.

Operations Impacts

Operation of the proposed transmission line would result in intermittent increases in sound levels in the immediate vicinity of the lines due to the corona effect and to a lesser extent from wind blowing across power lines and power poles; based on the climate in the vicinity of the project corridor, corona discharge from the transmission line would be infrequent. ESJ commissioned an Audible Noise Performance study to determine the predicted sound levels from corona effect at several locations along the ESJ property boundary and under different conductor configurations

[27] As described in Section 2.0 (Proposed Action and Alternatives), truck trips would be generated due to the one-time delivery of tower parts, and the import and export of earthwork materials for development of the all-weather road surfacing along the property access road (primarily decomposed granite), tower pad grading, and foundation excavation. Assuming a typical truck load of 18 cubic yards (14 cubic meters), these grading and construction activities would result in about 600 truck trips (about 540 export trips and about 55 import trips) for the 230-kV Route. Of this total, about 90 percent of truck deliveries would be associated with the property access road improvements, which are estimated to require about 9,300 cubic yards (7,110 cubic meters) of material to be delivered onsite (Burns & McDonnell 2009b; included in Appendix B of this EIS).

(Burns & McDonnell 2009a; provided in Appendix E).[28] ESJ's property lines and noise prediction locations are depicted on a map in the study, and the study results are summarized in Table 3.6-3. As shown in this table, audible noise decreases with distance from the proposed transmission line. The noise analysis determined that during wet weather conditions both of the possible configuration options for conductors on a 230-kV line would meet the County of San Diego's nighttime property line sound level limit of 45 dBA (the model results indicate a maximum 8.8 dBA at the property line for the 230-kV configuration options); therefore, the long-term impact of corona-generated sound during operation of the project would be minor but long-term.

Table 3.6-3
Foul Weather Noise Analysis for Alternative 2 (230-kV Route)

	Conductor Configuration	
	Two-Conductor "Bluebird"	Two-Conductor "Finch/ACSS"
Location	Audible Noise Level (dBA)	
On 230-kV Route Centerline	17.9	23.6
On Main Access Road (700 feet from 230-kV Route)	6.9	12.5
On Main Access Road (1,400 feet from 230-kV Route)	3.5	9.1
On East Property Line (1,500 feet from 230-kV route)	3.2	8.8
On West Property Line (2,200 feet from 230-kV Route)	1.3	6.9
Edge of 230-kV Right-of-Way (65 feet from Centerline)	16.7	22.3

Source: Burns and McDonnell 2009a.

Operational activities would include inspection of the transmission line and support structures, insulator washing, occasional repair or replacement of project facilities, and access road repair.

These activities would result in a minor, short-term increase in traffic along local roads and along the right-of-way and the occasional use of earthmoving equipment along right-of-way. The light-duty trucks that would be used during inspection would typically generate less than 75 dBA at 50 feet (15 m). Sound levels generated by equipment used for maintaining and repairing or replacing the transmission lines and maintaining the access roads would be similar to those generated during construction. As a result, sound level increases due to inspection, maintenance, and repair would be within County of San Diego guidelines. The impacts of those activities at nearby noise sensitive locations would be minor, at most, but would occur for the life of the project.

[28] Information related to the various conductor types that could be used in this project is provided in Appendix E. General information related to conductor types is also available online. See, for example: http://www.rurdev.usda.gov/SupportDocuments/UEP_Bulletin_1724E-200.pdf.

Impacts in the U.S. due to Related Activities in Mexico – Construction Phase

Impacts in the U.S. due to related activities in Mexico during the construction phase could occur if sound generated by activities associated with the ESJ Wind project in Mexico affects noise-sensitive receptors in the U.S. Construction of the transmission line in Mexico would include construction activities near the U.S.-Mexico border. Those activities would generally be similar to the construction activities described above for the ESJ U.S. Transmission Line project, although, ground conditions in Mexico may differ from those in the U.S. and could involve some construction on bedrock which may require blasting. Therefore, the sound levels generated by construction of the ESJ Wind project in Mexico could be louder than those generated in the U.S. However, construction activity in Mexico would be significantly farther from noise-sensitive receptors in the U.S. (0.7 mile [1.2 km] or more from the currently unoccupied mobile home located west of the ESJ U.S. Transmission Line project and southernmost portion of Jacumba Mountains Wilderness Area; and 2.5 miles [4 km] or more from the nearest occupied residence located east of Jacumba).

Construction in Mexico would be accomplished by a separate construction workforce that would access the construction right-of-way via roads within Mexico and would not result in sound level increases in the U.S. Wind turbine equipment may be transported to Mexico via U.S. roads, depending on the origin of the turbine equipment. Any such traffic within the U.S. would occur on established U.S. highways, would enter Mexico via established border crossings, and would result in a negligible increase in traffic. Therefore, there would not be perceptible increases in sound levels at noise sensitive locations in the U.S. due to transport of the turbine equipment, and there would be no noise impacts to sensitive receptors within the U.S.

In summary, sound level increases due to construction activities associated with the ESJ transmission line and wind turbines in Mexico would not be perceptible at noise-sensitive locations in the U.S. and would not result in noise impacts in the U.S.

Impacts in the U.S. due to Related Activities in Mexico – Operations Phase

The proposed ESJ Wind project wind turbines would be located at distances ranging from approximately 0.75 mile (1.2 km) to 7.0 miles (11.3 km) south of the U.S.-Mexico border. Increased sound levels would result from rotation of the blades of the turbines and operation of the generators. The increased sound levels are typically due to the fluctuating aerodynamic sound (swish) in the 500 to 1,000 Hertz (Hz) range that occurs from the wind turbine blades disturbing the air, modulated as the blades rotate, which changes the sound dispersion characteristics in an audible manner. This fluctuating aerodynamic sound is the cause of most sound complaints regarding wind turbines, as it is harder to become accustomed to fluctuating sound than to sound that does not fluctuate. However, this fluctuation does not always occur, and a study completed in the United Kingdom showed that it had been a problem in only 4 out of 130 United Kingdom wind farms, and had been resolved in 3 of those cases (Moorhouse et al. 2007, as cited in Colby et al. 2009).

It is possible that sounds generated by the northernmost turbines would be audible from the extreme southern portions of the Jacumba Mountain Wilderness Area under certain wind conditions. However, based on the distance involved (minimum 0.75-mile [1.2-km] separation from the nearest turbine to the border) and the attenuation of sound levels over distance, the resultant sound levels would be well below acceptable standards. As shown in Table 3.6-1, the sound levels generated by a typical wind turbine range from 35 to 45 dBA at 1,100 feet (335 m) from the source (DOE 2004). Colby et al. (2009) indicate that 50 dBA at a distance of 1,500 feet (457 m) would be a conservative estimate for today's turbines. Assuming the standard attenuation of 6 dB for every doubling of the distance, sound level increases from the closest turbines could be as much as approximately 26 to 36 dBA at the U.S.-Mexico border using the DOE (2004) estimate, or as high as 45 to 46 dBA using the more conservative estimate. These sound levels would be well below the County of San Diego's thresholds for sensitive receptors.

Sounds generated by the turbines would not be perceptible at the Table Mountain ACEC due to the intervening distance (0.8 mile [1.3 km]); in addition, the existing sound levels generated by traffic along from I-8 would mask minor increases in sound levels. Sound levels during operation of the turbines would not be distinguishable from ambient sound levels at the nearest noise-sensitive receptor in the U.S. (the currently unoccupied mobile home, which is approximately 2.5 miles [4.0 km] from the nearest turbine).

Wind turbines also produce low levels of infrasound[29] and low frequency sound that may or may not be audible. Recent studies have been conducted to determine whether these sounds may affect human health. In a recent study, Colby et al. (2009) concluded that there is no credible scientific evidence that low levels of infrasound and low frequency sound levels from wind turbines are harmful.

Increases in sound levels due to inspection, maintenance, and repair of the transmission line in Mexico near the international border would be temporary and minor and would not be noticeable at the nearest noise-sensitive receptors in the U.S. Roads in the U.S. would not be used to access the transmission line right-of-way in Mexico, and there would not be an increase in traffic in the U.S. associated with inspection, maintenance, and repair of the transmission line in Mexico.

In summary, sound level increases associated with operation, inspection, maintenance, and repair of the ESJ Wind project components in Mexico would not be perceptible at noise-sensitive locations in the U.S. and would not result in noise impacts in the U.S.

3.6.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

The 500-kV Route would begin at the same border crossing location as the 230-kV Route, extend 0.65 mile (1.1 km) northwest, and end approximately 600 feet (183 m) east of the terminus of the 230-kV Route. Therefore, the site terrain, vegetation, and topographic features along the 500-kV Route are essentially the same as those of the 230-kV Route. Construction of this alternative would be similar to the scale and duration of construction of the 230-kV Route, including truck traffic associated with construction. Consequently, the increases in sound levels associated with construction of the 500-kV single-circuit transmission line would be essentially the same as those of the 230-kV double-circuit transmission line. As for the 230-kV Route, the

[29] The following definition of infrasound is provided in Colby et al. (2009): According to the International Electrotechnical Commission (IEC 1994), infrasound is defined as acoustic oscillations whose frequency is below the low frequency limit of audible sound (about 16 Hz). However, this definition is incomplete as infrasound at high enough levels is audible at frequencies below 16 Hz (IEC 1994).

increases in sound levels would be consistent with County of San Diego's construction noise impact guidelines.

The nearest noise-sensitive receptor to the proposed route (an unoccupied mobile home) is slightly farther from this alternative, about 2,000 feet (610 m), as compared to about 1,600 feet (490 m) from the 230-kV Route. Therefore, increases in sound levels resulting from construction would be slightly less at this receptor location (a maximum of approximately 57 dBA from construction of the 500-kV Route compared to a maximum of 60 dBA from construction of the 230-kV Route). This level would be below the County of San Diego's threshold for construction noise. As for the 230-kV Route, there would not be perceptible increases in sound levels at the Table Mountain ACEC or in the Jacumba Mountains Wilderness Area due to construction of the 500-kV Route.

Sound generated by the corona effect of the 500-kV single-circuit transmission line would be greater than that of the 230-kV double-circuit transmission line because the corona effect increases with voltage. According to the Audible Noise Performance study prepared for this project (Burns & McDonnell 2009a; provided as Appendix E), modeling indicates that for the 500-kV configuration options, conductor selection is a factor in the audible noise level limit (Table 3.6-4). ESJ has indicated that, if the 500-kV Route were selected, they would select a conductor configuration that conforms to the County of San Diego property line Noise Ordinance standards. For example, the study results indicate that either a 2-conductor 2,156 kcmil[30] (two-conductor "Bluebird") configuration or a 3-conductor 795 kcmil (three-conductor "Drake") configuration would meet the county nighttime property line sound level limit of 45 dBA.

Table 3.6-4
Foul Weather Noise Analysis for Alternative 3 (500-kV Route)

Location	Conductor Configuration			
	Two-Conductor "Bluebird"	One-Conductor "Bluebird"	Two-Conductor "Cardinal"	Three-Conductor "Drake"
	Audible Noise Level (dBA)			
On 500-kV Centerline	52.8	69.1	60.1	49.4
On Main Access Road (1,300 feet from 500-kV Route)	38.0	54.3	45.2	34.6
On Main Access Road (1,100 feet from 500-kV Route)	35.8	52.1	43.1	32.4
On East Property Line (1,100 feet from 500-kV Route)	38.8	55.1	46.0	35.4
On West Property Line (3,000 feet from 500-kV Route)	33.8	50.1	41.1	30.4
Edge of 500-kV Right-of-Way (107 feet from Centerline)	49.7	66.0	57.0	46.3

Source: Burns and McDonnell 2009a.

[30] A circular mil is a unit of area, equal to the area of a circle with a diameter of one millimeter (a millimeter is approximately 0.001 inch). A circular mil is a unit for referring to the area of the cross section of a wire or cable with a circular cross section; 1 kcmil = 1,000 cmils.

In general, the increased sound level due to implementation of this alternative would be indistinguishable from the ambient sound level at the nearest noise-sensitive receptors (the unoccupied mobile home and Table Mountain ACEC). Also, as noted earlier, the corona effect is most prominent during periods of rain, fog, or high humidity, conditions that are not common in the corridor area because of the arid climate. Due to the distance of noise-sensitive receptors from the right-of-way, the impact of corona-generated sound during operation of this alternative would be minor but would occur for the life of the project.

Sound level increases due to inspection, maintenance, and repair of the 500-kV Route would be essentially the same as those for the 230-kV Route, and thus, would be within the County of San Diego guidelines. The impacts of those activities at nearby noise-sensitive locations would be minor, at most, but would occur for the life of the project.

3.6.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

Both Alternative 4 routes would cross the U.S.-Mexico border at the same location as described for Alternatives 2 and 3. Therefore, the site terrain, vegetation, and topographic features along the revised Routes are essentially the same as the Alternative 2 and 3 Routes. Construction of the revised alternative would be similar to the scale and duration of construction of the Alternative 2 and 3 Routes, including truck traffic associated with construction. Consequently, the increases in sound levels associated with construction of the revised routes would be essentially the same as those of the Alternative 2 and 3 routes. The increases in sound levels would be consistent with County of San Diego's construction noise impact guidelines.

The revised Routes are located slightly farther from the nearest sensitive receptor (an unoccupied mobile home). The revised 500 kV alternative route is about 2,550 feet (777 m) from the receptor, as compared to about 2,000 feet (610 m) for Alternative 3, and the 230-kV alternative is about 2,300 feet (701 m), as compared to about 1,600 feet (490 m) for Alternative 2. Therefore, increases in sound levels resulting from construction of the revised routes would be slightly less at this receptor location. Like Alternatives 2 and 3, the level would be below the County of San Diego's threshold for construction noise. As with Alternatives 2 and 3, there would not be perceptible increases in sound levels at the Table Mountain ACEC or in the Jacumba Mountains Wilderness Area due to construction of the relocated Routes.

Impacts of sound generated by the corona effect would be the same for the revised 230-kV and 500-kV Routes as for Alternatives 2 and 3, respectively. For the 500-kV Route, a two-conductor "Bluebird" configuration and a three-conductor "Drake" configuration both meet the County of San Diego standards. Either of the configuration options for the 230-kV Route meet the County standards (Table 3.6-5).

Table 3.6-5
Foul Weather Noise Analysis for Alternative 4A (Revised 230-kV Route) and Alternative 4B (Revised Route)

Location	Line Description and Conductor Configuration					
	500-kV Single-Circuit, Two-Conductor "Bluebird"	500-kV Single-Circuit, One-Conductor "Bluebird"	500-kV Single-Circuit, Two-Conductor "Cardinal"	500-kV Single-Circuit, Three-Conductor "Drake"	230-kV Double-Circuit, Two-Conductor "Bluebird"	230-kV Double-Circuit, Two-Conductor "Finch/ ACSS"
	Audible Noise Level (dBA)					
Alt. 4A Revised 230-kV Route Centerline	--	--	--	--	17.9	23.6
Alt. 4B Revised 500-kV Centerline	52.8	69.1	60.1	49.4	--	--
On Access Road (375 ft from Alt. 4A Revised 230-kV Route; 625 ft from Alt. 4B Revised 500-kV Route)	42.3	58.6	49.5	38.9	9.8	15.1
On Access Road (800 ft from Alt. 4A Revised 230-kV Route; 1,050 ft from Alt. 4B Revised 500-kV Route)	39.0	55.4	46.2	35.6	6.6	12.2
On East Property Line (1,000 ft from Alt. 4A Revised 230-kV Route; 775 from Alt. 4B Revised 500-kV Route)	41.0	57.3	48.2	37.6	5.2	10.6
On West Property Line (1,100 ft from Alt. 4A Revised 230-kV Route; 1,300 ft from Alt. 4B Revised 500-kV Route)	38.0	54.3	45.2	34.6	4.7	10.3
Edge of Alt. 4A Revised 230-kV Route	--	--	--	--	16.7	22.3
Edge of Alt. 4B Revised 500-kV Route	49.7	66.0	57.0	46.3	--	--
On West Property Line (1,750 ft from Alt. 4A Revised 230-kV Route; 1,850 from Alt. 4B Revised 500-kV Route)	36.4	52.7	43.8	33.1	2.5	8.1

Source: Burns and McDonnell 2010a.

Sound level increases due to inspection, maintenance, and repair of the revised Routes would be the same as those for the Alternative 2 and 3 Routes, and thus, would be within the County of San Diego guidelines. The impacts of those activities at nearby noise-sensitive locations would be minor, but would occur for the life of the project.

3.6.3 Mitigation Measures

No mitigation measures are indicated.

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3.7 TRANSPORTATION AND TRAFFIC

This section describes existing roadway and intersection operations, as well as traffic congestion, and addresses the potential for traffic incidents resulting from the implementation of the alternatives. The section also addresses the potential impacts of the alternatives on transportation systems on surrounding roadways in southeastern San Diego County. In addition, the potential impacts of the alternatives on local air traffic, including the potential for interference with radio signals, are discussed. Given the location of the alternative corridors on private land, the distance from any populated area, and the lack of urban development along the corridors, no impacts to pedestrians or public transportation are expected; therefore, these issues are not discussed further.

3.7.1 Affected Environment

3.7.1.1 Area Roadways and Circulation

The alternative corridors are located in southeastern San Diego County. The principal east-west route in the vicinity of the corridors is I-8, the primary highway between San Diego, California, and Yuma, Arizona. Access to the alternative corridors is via I-8 to the Jacumba Exit (Exit 73) onto Carrizo Gorge Road south, and from there to Old Highway 80 east (Figure 3.7-1). From Old Highway 80, access to the corridors is from an existing unpaved turnoff along the eastbound (southerly) shoulder of the highway. From that access road, the corridors are accessed via a network of unpaved access roads, including an approximately 20- to 30-foot- (6- to 9-meter-) wide dirt road that extends east-west through the northern portion of the alternative corridors.

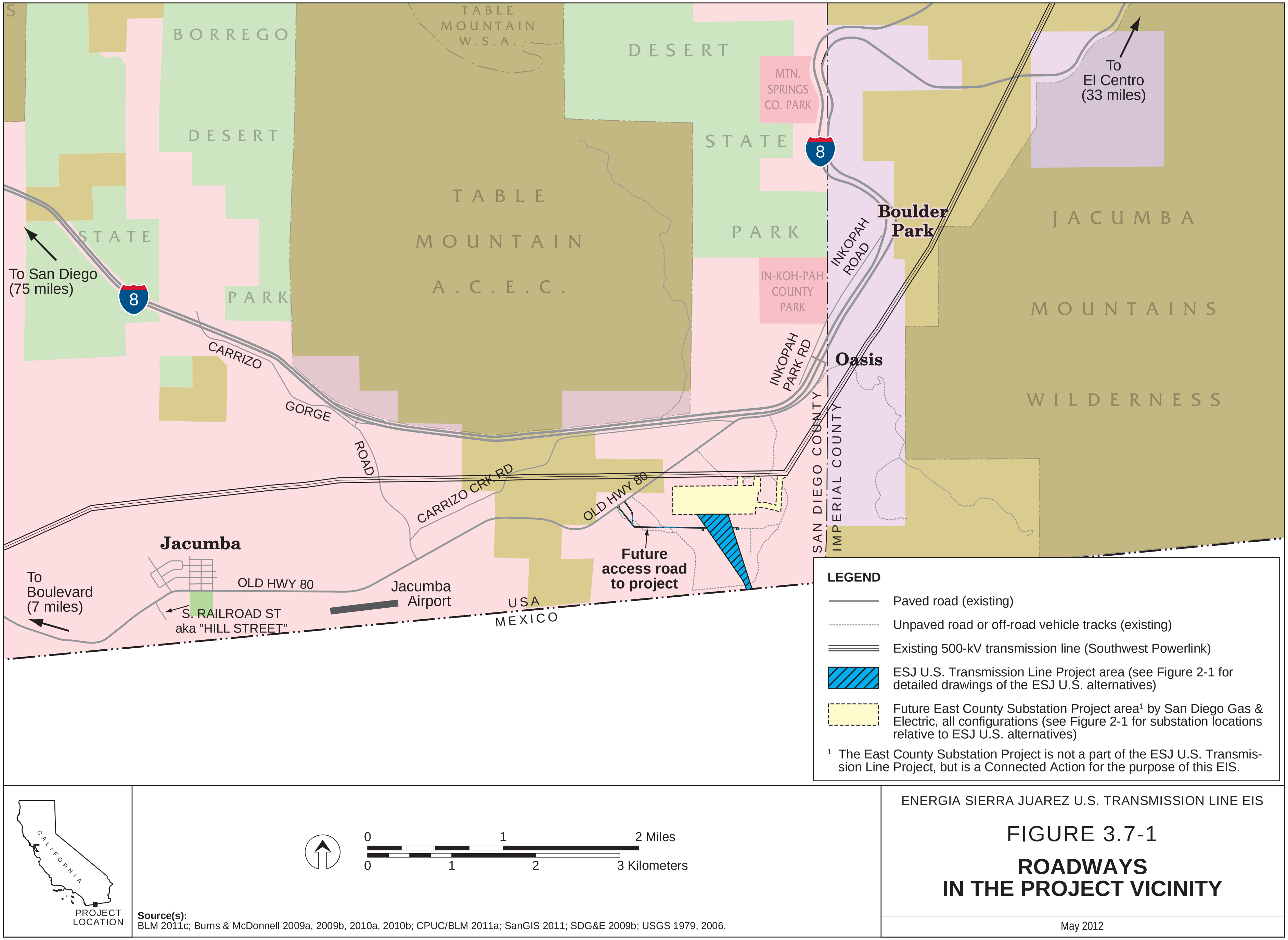
Other existing roads in the vicinity of the corridors consist of dirt trails that extend generally in a north-south direction. Some of the existing dirt roads provide access to residential trailers, and some roads are maintained by the U.S. Border Patrol, including an approximately 30-foot- (9-meter-) wide dirt road that extends across the southern perimeter of the corridors and parallels the U.S.-Mexico border.

3.7.1.2 Traffic Volumes

Traffic volume data for roadway segments in the vicinity of the alternative corridors are provided in Table 3.7-1. Traffic volumes for I-8 in the vicinity of the alternative corridors were compiled from 2008 Caltrans peak hour and annual average daily traffic counts (Caltrans 2008a).[31] The most recent data for Old Highway 80 and other roadways in the area were compiled from the 2006 San Diego Association of Governments (SANDAG) Average Weekday Traffic Volume statistics (2-way, 24-hour daily volumes) for San Diego County (SANDAG 2007a).

[31] Caltrans data are expressed as annual average daily traffic counts which are the total volume for the year divided by 365 days. Very few locations in California are actually counted continuously. Traffic counting is generally performed by electronic counting instruments moved from location throughout the State in a program of continuous traffic count sampling. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation and other variables which may be present. Therefore, it is possible that many days of the year, particularly weekdays, experience fewer daily vehicle trips, while weekend and holiday traffic may be higher. See

http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2009all/2009TrafficVolumes.htm for more information.



Source(s):
BLM 2011c; Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2011a; SanGIS 2011; SDG&E 2009b; USGS 1979, 2006.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.7-1

ROADWAYS IN THE PROJECT VICINITY

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Table 3.7-1
Traffic Volumes in the Vicinity of the Alternative Corridors

Roadway	Segment	Annual Average Daily Traffic (No. of Vehicles)	Peak Hour Traffic (No. of Vehicles)
I-8	In-Ko-Pah to Imperial County border	14,000	1,450
I-8	Carrizo Gorge to In-Ko-Pah	14,000	1,900
Old Highway 80	Carrizo Gorge Road to I-8	6,400	N/A
Carrizo Gorge Road	I-8 to Old Highway 80	300	N/A

N/A = not available
Source: Caltrans 2008a; SANDAG 2007a

The 2008 Caltrans State Highway Congestion Monitoring Program (the most recent data available) indicates areas within the San Diego area that experience morning and afternoon peak hour congestion. No congestion is indicated along I-8, Old Highway 80, or other roadways within the vicinity of the alternative corridors (Caltrans 2008b). Large truck traffic (two or more axles) accounts for approximately 14 percent of average daily traffic on I-8 east and west of the alternative corridors. Approximately 50 percent of the large trucks in this segment have four or more axles (Caltrans 2008c).

Congestion on roads under the jurisdiction of the County of San Diego is assessed in terms of level of service (LOS). Table 3.7-2 describes the Public Road Standards as developed by the County of San Diego Department of Public Works and Table 3.7-3 provides descriptions of each LOS as defined by the Caltrans Highway Capacity Manual. According to the former County of San Diego General Plan Mobility Element, Old Highway 80 was designated a "Major Road," and Carrizo Gorge Road was designated a "Rural Collector" (County of San Diego 1999). Based on the Annual Average Daily Traffic (Table 3.7-1), both Old Highway 80 and Carrizo Gorge Road are classified LOS A. The General Plan mobility element update re-designated the portions of Old Highway 80 and Carrizo Gorge Road near the alternative corridors as "Light Collector" roads. The light collector series are roads that are designed for a lower speed and have a wider parkway. They are used in rural areas with medium physical constraints.[32]

[32] See the County of San Diego General Plan Mobility Elements for additional information at: http://www.sdcounty.ca.gov/dplu/gpupdate/docs/bos_oct2010/B1_03_mobility.pdf and the appendix at: http://www.sdcounty.ca.gov/dplu/gpupdate/docs/bos_oct2010/B1_10_app_mobility.pdf

Table 3.7-2
Level of Service Guidelines for San Diego County Public Roads

Class	Level of Service (Annual Average Daily Traffic in Number of Vehicles)				
	A	B	C	D	E
Expressway	<36,000	<54,000	<70,000	<86,000	<108,000
Prime Arterial	<22,200	<37,000	<44,600	<50,000	<57,000
Major Road	<14,800	<24,700	<29,600	<33,400	<37,000
Collector	<13,700	<22,800	<27,400	<30,800	<34,200
Town Collector	<3,000	<6,000	<9,500	<13,500	<19,000
Light Collector/Rural Collector/Rural Light Collector/Recreational Parkway/Rural Mountain	<1,900	<4,100	<7,100	<10,900	<16,200

Source: County of San Diego 1999

Table 3.7-3
Level of Service Descriptions

LOS	Description
A	This LOS represents completely free-flow conditions, where the operation of vehicles is virtually unaffected by the presence of other vehicles and only constrained by the geometric features of the highway and by driver preferences.
B	This LOS represents relatively free-flow conditions, although the presence of other vehicles becomes noticeable. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver.
C	At this LOS the influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream is clearly affected by other vehicles.
D	At this LOS, the ability to maneuver is notably restricted due to traffic congestion, and only minor disruptions can be absorbed without extensive queues forming and the service deteriorating.
E	This LOS represents operation at or near capacity. LOS E is an unstable level, with vehicles operating with minimum spacing for maintaining uniform flow. At LOS E, disruptions can not be dissipated readily thus causing deterioration down to LOS F.

Source: Transportation Research Board 2000

3.7.1.3 Accident Statistics

Accident data for roadways in the vicinity of the alternative corridors are presented in Table 3.7-4. Caltrans (Gray 2009) provided the most recent accident data available for I-8 (2007) for the two segments listed in the table.

Table 3.7-4
Accident Data in the Project Vicinity (2007)

Segment	Total Number of Accidents Involving Truck/Tractor with 2 or More Trailers	Total Number of Accidents Involving Any Vehicle Type	Actual Total Accident Rate (Accidents/Million Vehicle Miles [Kilometers])	Statewide Average Total Accident Rate (Accidents/Million Vehicle Miles [Kilometers])[1]
Segment 1[2]	28	502	0.54 (0.34)	0.59 (0.37)
Segment 2[3]	0	5	0.51 (0.32)	0.40 (0.25)

[1] Data based on statewide average total accident rate for similar type roadway segments (i.e., Segment 1 includes various segments with different number of lanes whereas Segment 2 involves a short segment with 2 lanes only).

[2] Segment 1 – Eastbound I-8 between Milepost 0.127 (southbound I-5/eastbound I-8) and Milepost 77.626 (just west of the San Diego County/Imperial County line).

[3] Segment 2 – Eastbound I-8 between Milepost 74.076 (Carrizo Gorge Road eastbound entrance ramp merge point) and Milepost 77.626 (just west of the San Diego County/Imperial County line).

Source: Gray 2009

3.7.1.4 Airports

The nearest airport to the alternative corridors is the Jacumba Airport, approximately 3 miles (4.8 km) due west of the corridors. The airport has a single gravel runway, approximately 2,500 feet (760 m) in length and 100 feet (30 m) wide. The runway is unmanned and unlighted. The airport had an estimated total of 2,500 aircraft operations in 2004 and is mainly used as a glider facility by single-engine aircraft and sailplanes operating in U.S. air space. No aircraft are based at the airport, and the no international travel is authorized. After take-off, which is most frequently to the west, the only traffic pattern is to the north due to the airport's proximity to Mexico on the south (San Diego County Regional Airport Authority 2006).

3.7.2 Environmental Impacts

3.7.2.1 Methodology

Project impacts on the local transportation network were evaluated through consideration of existing traffic conditions, planned transportation projects, and project-related traffic along specific road segments as outlined in the County of San Diego Guidelines for Determining Significance – Transportation and Traffic (2011b). Project impacts to air traffic safety were evaluated through consultations with the FAA and the U.S. Border Patrol.

3.7.2.2 Alternative 1 – No Action

Under the No Action Alternative, the proposed transmission line would not be constructed, and existing traffic conditions would continue without alternation as described above.

3.7.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

A review of the 2030 Regional Transportation Plan indicates that no major capital projects or other projects are planned to be implemented on I-8 or other county roads within San Diego County east of El Cajon (approximately 50 miles [80 km] west of the project right-of-way) while the project is under construction (SANDAG 2007b); therefore, vehicle traffic associated with construction activity is not anticipated to conflict with planned transportation projects.

Typical daily construction-related traffic would be limited to about 7 to 12 heavy vehicles and 20 to 25 construction worker vehicles. Construction vehicles would travel along I-8 to Carrizo Gorge Road (Exit 73), and then use Old Highway 80 east to the project site. As described in Section 2.0 (Proposed Action and Alternatives), additional heavy truck trips would be generated due to the one-time delivery of tower parts, and the import and export of earthwork materials for development of the all-weather road surfacing along the property access road (primarily decomposed granite), tower pad grading, and foundation excavation. Assuming a typical truck load of 18 cubic yards (14 cubic meters), these grading and construction activities would result in about 600 truck trips (about 540 export trips and about 55 import trips) for the 230-kV Route during the construction period.[33] The total number of round trips could be somewhat reduced, if practical, by having import trucks leave the site with an export load rather than empty. The sources of the imported material and the destinations of export material have not yet been identified by ESJ; therefore, it is assumed that vehicles carrying earthwork material could travel to the project corridor from either the east or west along I-8.

As shown in Tables 3.7-1 and 3.7-2, Old Highway 80 or Carrizo Gorge Road have ample capacity to accommodate the additional vehicle trips associated with construction personnel and delivery of equipment and materials without reducing the existing LOS. In addition, no temporary road or lane closures would be required for transportation of heavy equipment and materials associated with construction of the transmission line. Vehicle traffic entering and leaving the access road is not anticipated to disrupt traffic flow on I-8, Carrizo Creek Road, or Carrizo Gorge Road. In addition, ESJ has agreed to develop and implement a traffic control plan, as required by the County of San Diego prior to issuance of a Major Use Permit for transmission line construction (see Section 2.7 for a description of APMs). Therefore, impacts to traffic flow would be temporary and negligible.

The proposed project would involve improvements to the existing property access road and use of the access road for construction vehicles and heavy equipment. As discussed in Section 2 (Proposed Action and Alternatives), the project has two options for the property access road. A key safety design criterion at this location is the corner sight distance from the new access road along Old Highway 80. Based on the assumed speed of traffic on Old Highway 80 in the vicinity of the project (60 mph; 97 kph), the County of San Diego Standard Corner Sight Distance for the intersection of the access road and Old Highway 80 is 600 feet (183 m). The selected property access road option would be designed to meet or exceed this design criterion for safe entry and

[33] Of this total, about 90 percent of truck deliveries would be associated with the property access road improvements, which are estimated to require about 9,300 cubic yards (7,110 cubic meters) of material to be delivered onsite (Burns & McDonnell 2009b; included in Appendix B of this EIS).

exit from the access road and all road improvements would be constructed according to the County of San Diego Public and Private Road Standards.

Transport of transmission line construction equipment could result in damage to roadways in the project vicinity due to the weight of the vehicles and their loads. A traffic control plan would be required by the County of San Diego prior to approval of construction or grading permits. This plan would require that ESJ repair those portions of the routes that may be damaged by the heavy weight that loaded trucks place on the route. If required by the County of San Diego Department of Public Works, ESJ would enter into an agreement that would include: (1) a cash deposit for emergency traffic safety repairs; (2) long-term security for expected increased maintenance on Old Highway 80; and (3) possible future asphaltic overlay requirements on Old Highway 80 (Vidales 2009). These requirements would be included as a condition of the County Major Use Permit.[34] With the implementation of the traffic control plan and agreement (if required), impacts to roadway conditions would be short-term.

Groundwater Extraction

The proposed use of groundwater from JCSD’s Well #6 would not result in transportation and traffic impacts. The well is located on the western edge of the town of Jacumba. An estimated 2,500 gallons (9,615 liters) of water a day would be supplied, 6 days a week, for approximately 6 months. This volume of water would require one or two truck trips per day on average. Water trucks would use Old Highway 80, an existing paved roadway, between the well site and the construction site. As discussed in Section 3.7.1.2, Old Highway 80 currently has an LOS designation of A. The addition of up to two trucks per day on the road would not result in any change of LOS. Therefore, impacts would be short-term and are considered minor.

Operation Impacts

Vehicle Traffic

Upon completion of construction activity, typical monitoring and maintenance of the transmission line would require the use of two utility maintenance vehicles along the right-of-way on a weekly basis. Additional vehicles would occasionally access the right-of-way for major maintenance and repairs. Based on the current transportation and traffic levels in the vicinity of the project, the addition of two vehicles per week for and the use of vehicles for occasional maintenance and repair activities would result in a negligible increase in traffic on the roadways used to access the right-of-way and would not result in impacts on traffic or to local roadway structure. As discussed above, the proposed improvements to the project access road at its intersection with Old Highway 80 would ensure that traffic hazards are avoided during transit along Old Highway 80.

Air Traffic Safety

The airport nearest the proposed project is the Jacumba Airport. According to the Jacumba Airport Land Use Compatibility Plan, structures such as cell phone towers, wind turbines and transmission lines are compatible land uses (i.e., they would not interfere with aircraft) when located at least 1,500 feet (457 m) beyond either end of the runway (San Diego County Regional

[34] The Major Use Permit is discussed in greater detail in Section 3.3, Land Use.

Airport Authority 2006). The proposed project would be located approximately 3 miles (4.8 km) east of the Jacumba Airport; therefore, the project would not interfere with aircraft activity. Further, on May 2009, the FAA made a determination of "No Hazard to Air Navigation" and stated that no marking or lighting is necessary on the transmission towers or poles for air navigation based on the coordinate positions and height of the proposed towers (the FAA determination is included in Appendix B). Although air traffic associated with the Jacumba Airport would not be affected, scoping comments received from the U.S. Border Patrol indicate that their aircraft patrol the U.S.-Mexico border in the vicinity of the proposed project. Based on discussions with Border Patrol representatives during preparation of this EIS, Border Patrol has indicated no concerns or issues regarding tower lighting related to Border Patrol air operations, and the agency will not require lighting of the towers (Soule 2011; included in Appendix G [Agency Consultations]). Based on these discussions and the FAA's determination that the towers do not require lighting, it has been determined that there would be no need to light the towers.

According to the Sunrise Powerlink RDEIR/SDEIS (CPUC/BLM 2008b), two incidents involving aircraft flying into the existing Southwest Powerlink transmission line have occurred. Both of these incidents occurred shortly after the transmission line was built. Since that time, SDG&E has established procedures to minimize the potential for such incidents to occur.

Aerial firefighting efforts could also be compromised by the presence of the transmission lines. Transmission lines create a hazard for low-flying spotter aircraft and aircraft that apply aerial retardant. Visibility of the transmission lines could be obstructed due to smoke, thus limiting the ability of pilots to work safely in the project area.

The ESJ U.S. Transmission Line project would introduce about 0.65 mile (1 km) of new transmission line in a north-south orientation immediately north of the international border; thus, the new line would present an obstacle to be avoided and would require additional attention from pilots. Based on the FAA determination of no hazard to aviation, and the short distance of this line relative to the existing SWPL loop-in, any potential hazard to aviation safety is considered minor, but the impact would last for the life of the project. Implementation of potential Mitigation Measure Transportation-1 (coordination with U.S. Border Patrol and the California Department of Forestry and Fire Protection [CAL FIRE]) could reduce the project's potential for conflicts with Border Patrol and firefighting aerial operations. As described in Section 3.7.3, under potential Mitigation Measure Transportation-1, ESJ would provide written notification to all U.S. Border Patrol and CAL FIRE aircraft working in the county stating when and where the new transmission lines and towers are to be erected; provide project location and design details; and resolve any potential issues related to their ground and aerial operations.

Impacts in the U.S. from Related Activities in Mexico

Transmission Line Construction and Operations

During construction of the transmission line in the U.S.-Mexico border area, a separate construction crew would access the Mexican side of transmission corridor via existing roads in Mexico, such that there would be minimal cross-border activity during stringing of the transmission line between towers in Mexico and the U.S. During operations, maintenance, and operations, crews would access the Mexican side of the transmission corridor via existing roads in Mexico; access to the U.S. facilities would be from U.S. roads. Therefore, there would be no need for vehicles to cross the border in the project area, and no impacts in the U.S. are anticipated to result from transportation and traffic associated with ESJ Wind project transmission line construction and operations in Mexico. As discussed in Section 3.15 (Services and Utilities), under potential Mitigation Measure Services-1, ESJ could further reduce the potential for impacts by coordinating with the U.S. Border Patrol to ensure minimal disruption to their operations in the project area and to prevent unauthorized use of the project access road during construction (e.g., by issuing construction vehicle and personnel identifications; and by use of private security).

Turbine Equipment Transport

Vehicle use for the ESJ Wind project would be localized within the wind turbine development area in Mexico. ESJ has indicated that the wind turbines and associated equipment would originate in the U.S. and be transported to the ESJ Wind project sites within Mexico via the Otay Mesa border crossing in San Diego County. However, as of this writing, the origination point of the turbines, and thus the transportation route for the wind turbine components in the U.S. has not yet been determined. For the purpose of this discussion, the following two potential truck routing scenarios have been identified for transport of wind turbines on U.S. roads:

- **Scenario 1.** Wind turbine components would be shipped to a southern California port (e.g., Port of Los Angeles, Port of Long Beach, or Port of San Diego) from another U.S. port. Trucks would then transport the turbine equipment to the Otay Mesa crossing, located approximately 16 miles (26 km) southeast of the Port of San Diego's commercial cargo handling facilities in National City. Therefore, under Scenario 1, trucks traveling from a southern California port would be required to travel south on I-5 and then east on State Highway 905 to the border crossing at Otay Mesa (Figure 3.7-2).
- **Scenario 2.** Wind turbine components would be shipped from a manufacturer on the east coast to a port in the Gulf of Mexico (e.g., Port of Houston). Turbines would then be transported overland by truck into Mexico via U.S. highways and one of the various border crossings between Texas and California. It is not feasible to determine which border crossing would be used in this scenario. However, based on the project location in northern Baja, it is likely that the turbines would remain on U.S. highways through Texas, New Mexico, Arizona, and California and enter Mexico at the Otay Mesa crossing described above.
- The turbines would be transported as three separate components and assembled onsite; however, the weight and size of modern wind turbines would require special transportation equipment. Onroad transport of one complete turbine may require up to 15 individual specialized (i.e., oversized) trucks. Transport of the oversize components by rail is feasible but can be limited by tunnel and overpass width and heights (DOE 2008b; a good discussion is also available in the article Trains, Trucks, and Ships Make Wind Energy Possible [http://www.go-explore-trans.org/go/gonew/?/main/articles/trains-trucks-and-ships-make-wind-energy-possible]).

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_7-2_TransportationRoutes_11x8_v4.ai (04/05/2012, 04:17 pm) R. Wurgler/T. Murphy

Transport of wind turbine components via Scenarios 1 or 2 could result in temporary impacts to U.S. roadways, including increased congestion, roadway damage and an increased potential for traffic accidents due to the increased number of oversized trucks traveling on major highways. Trucks would use established truck hauling routes on major U.S. highways to transport the turbines, and the increased volume of traffic would be a small percentage of overall shipping activity. Therefore, roadway damage due to the transport of the turbines on U.S. roadways would be negligible.

Regardless of the final transport route selected, the contracted hauling company would be required to follow each state's regulations for oversize vehicles and obtain the necessary permits from all applicable jurisdictions located between the origination point within the U.S. and the U.S.-Mexico border. This would minimize the potential for impacts along U.S. roadways. An analysis of air pollutant and greenhouse gas emissions associated with turbine transport on U.S. roads is provided in Section 3.10 (Air Quality and Climate Change).

3.7.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

Because of the proximity of the two alternative routes, the existing transportation routes and traffic volumes in the vicinity of the 500-kV Route are the same as those for the 230-kV Route. Construction, operation, and maintenance activities would be essentially the same for the two alternatives, and the benefits of implementing Mitigation Measure T-1 (Consult with and inform U.S. Border Patrol and CAL FIRE) would be applicable to this alternative, as well. Although the 500-kV Route would require the same improvements to the existing property access road from Old Highway 80 as the 230-kV Route, there would be a 25 percent greater volume of associated truck trips with this alternative due to the greater length of access road needed to reach the 500-kV Route corridor as compared to the 230-kV Route. As a result, impacts to traffic and transportation that would occur with implementation of the 500-kV Route would be slightly greater than those described for the 230-kV Route.

The potential for impacts in the U.S. due to related activities in Mexico would be the same as for the 230-kV Route.

3.7.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

Because of the proximity of the revised routes to the routes included in Alternatives 2 and 3, the existing transportation routes and traffic volumes in the vicinity of the Alternative 4 Routes are the same as those for Alternatives 2 and 3. Construction, operation, and maintenance activities would be essentially the same for the revised routes. Mitigation Measure T-1 (Consult with and inform U.S. Border Patrol and CAL FIRE) would be applicable to Alternative 4 as well. Road design and location for access to the revised 230-kV and 500-kV Routes would be the same as for Alternatives 2 and 3 except that the east-west access road would be slightly longer for each alternative (about 700 feet [213 m] longer for the revised 230-kV Route, and about 550 feet [168 m] longer for the revised 500-kV Route). Because the access road would be slightly longer for the revised routes, a proportionately larger volume of road construction material and number of associated truck deliveries would be required, compared to the Alternatives 2 and 3. As a result, impacts to traffic and transportation that would occur with implementation of Alternative 4 would be slightly greater than those described for Alternatives 2 and 3.

The potential for impacts in the U.S. due to related activities in Mexico would be the same as for Alternatives 2 and 3.

3.7.3 Mitigation Measures

Implementation of the following potential mitigation measure, not proposed by the applicant, would reduce potential impacts related to U.S. Border Patrol ground and air traffic operations.

Transportation-1: Consult With and Inform U.S. Border Patrol and CAL FIRE

Prior to construction, ESJ should provide written notification to all U.S. Border Patrol and CAL FIRE aircraft working in the county stating when and where the new transmission lines and towers are to be erected, and coordinate with U.S. Border Patrol and CAL FIRE to resolve any potential issues related to their ground and aerial operations. Appropriate location and design details, including aerial photos or topographic maps clearly showing the new transmission lines and towers in the U.S. in relation to the U.S.-Mexico border should be provided.

3.8 PUBLIC HEALTH AND SAFETY

This section addresses the potential impacts to public health and safety from exposure to hazardous materials, contaminated soils, electric and magnetic fields (EMF), transmission tower failure, and acts of vandalism or terrorism. Public health and safety impacts related specifically to fire are addressed in Section 3.9 (Fire and Fuels Management).

3.8.1 Affected Environment

3.8.1.1 Hazardous Materials and Contaminated Soils

In a study conducted for the Sunrise Powerlink RDEIR/SDEIS, Environmental Data Resources, Inc. conducted a database search of hazardous materials that included 30 federal agency databases; 29 state, county, and city records; and three tribal databases (CPUC/BLM 2008b). The search included the area traversed by the alternative corridors. The database search did not identify any leaking underground storage tanks, active underground storage tanks, or other hazardous material sites in the vicinity of the corridors. In addition, the State Water Resources Control Board (2009) database does not identify any such sites or hazardous material storage facilities within 1 mile (1.6 km) of the corridors. USEPA now includes some border contamination sites in its database, and its Border 2012 Program (available at http://www.epa.gov/usmexicoborder/) focuses on environmental challenges along the U.S.-Mexico border region. As of November 2009, the program did not list any hazardous material sites adjacent to the proposed border crossing in Mexico.

AECOM, on behalf of ESJ, conducted a Phase I Environmental Site Assessment of the alternative corridors area. The assessment included the entire 360-acre (146-ha) parcel area on which the alternative corridors and access roads are proposed. Based on a site visit; review of governmental databases and historical records; and interviews with selected individuals, no recognized environmental conditions or potential areas of contamination were identified (AECOM 2009). The Phase I Environmental Site Assessment is provided in Appendix B. DOE reviewed this document, which includes recent and historical land use information and photographs, and conducted site visits during which the visual observations indicated in the assessment were confirmed during preparation of this EIS. In addition, SDG&E conducted a Phase I Environmental Site Assessment at two alternative sites for the ECO Substation; the sites are at the northern ends of the ESJ alternative corridors (see Figure 2-1). Information on the presence of hazardous materials on those sites and an assessment of potential impacts to human health are addressed in Section 4.0 (Connected Actions).

3.8.1.2 Electric and Magnetic Fields

Description of Electric and Magnetic Fields

EMF are separate phenomena that occur both naturally and as a result of human activity. Naturally occurring EMF is generated by electrical currents flowing deep in the earth and by air turbulence and other atmospheric activity. Human-induced fields are generated by communications equipment, appliances, and the generation, transmission, and local distribution of electricity. Information on EMF in the environment presented below without citations were obtained from the World Health Organization (WHO 2002), the National Institute of Environmental Health Sciences (NIEHS 2002), and DOE (2005).

In addition to EMF, electrical transmission lines generate sound due primarily to corona discharge, which is a small electrical discharge along the wire that produces crackling and hissing sounds as well as small amounts of light; this generation of sound is termed the corona effect and is addressed in Section 3.6 (Noise).

Electric fields are created by voltage and increase in strength as voltage increases. An electric field is present even if there is not an electrical current. Electric field strength is measured in volts per meter (V/m) or in kilovolts per meter (kV/m).

Magnetic fields are created when electric current flows; the greater the current, the stronger the magnetic field. In the U.S., magnetic field strength is most commonly measured in “gauss” units. Magnetic field strengths associated with transmission lines and electrical appliances are generally in the milligauss range.

Both electric and magnetic fields are produced when transmission lines are energized. However, both field strengths attenuate rapidly with distance from the source. The EMF strength is inversely proportional to the square of the distance from the transmission line. For example, at a distance of 300 feet (91 m) from the transmission line, the EMF strength would be one-ninth the strength at a distance of 100 feet (30 m) from the line. In addition, electric fields associated with transmission lines are dampened by most objects, such as trees or houses, which shield receptors; however, magnetic fields are not easily shielded by objects or materials. As a result, the primary concern regarding potential health effects associated with EMF from transmission lines is related to magnetic fields.

Typical Magnetic Field Strength

NIEHS (2002) provided information on household levels of magnetic fields. Most people in the U.S. are exposed to magnetic field strengths that average less than 2 milligauss. At a distance of 4 feet (1.2 m) from the source, the magnetic field strength of most household appliances ranges from 1 to 4 milligauss, and at 2 feet (1.1 m) ranges from about 1 to 40 milligauss. NIEHS (2002) also reported the results of a study by the Electric Power Research Institute found that the average “all-room” magnetic field for 992 houses studied in the U.S. was 0.9 milligauss; the “all-room” measurements were made away from electrical appliances and primarily reflected the magnetic fields from household wiring and outside power lines.

NIEHS (2002) also reported typical magnetic field strength at a height of 3.3 feet (1 m) above the ground in the vicinity of electrical transmission lines as reported by the Bonneville Power Administration. Those values are listed in Table 3.8-1. As noted in Table 3.8-1, at a distance of 300 feet (91 m) from the transmission lines and at times of average electricity demand, the magnetic field strength is at the same level as typical background levels in most homes. During peak loads (about 1 percent of the time), magnetic fields are about twice as strong as the mean levels reported in Table 3.8-1.

Table 3.8-1
Typical Magnetic Field Levels for Electrical Transmission Lines

	Mean Magnetic Field (milligauss) by Transmission Line Voltage		
Distance from Transmission Line	**115-kV[1]**	**230-kV**	**500-kV**
Directly Under Transmission Line	29.7	57.5	86.7
50 feet (15 meters)	6.5	19.5	Not reported
65 feet (20 meters)	Not reported	Not reported	29.4
100 feet (30 meters)	1.7	7.1	12.6
200 feet (61 meters)	0.4	1.8	3.2
300 feet (91 meters)	0.2	0.8	1.4

[1] kV = kilovolt

Source: NIEHS 2002. Data reported are from Bonneville Power Administration for transmission lines in the Northwest and are average levels at a height of 3.3 feet (1 m) based on the 1990 annual mean loads.

EMF in the Vicinity of the Alternative Corridors

The alternative corridors traverse undeveloped areas where measurable EMF is not present except in the vicinity of existing power line corridors. The nearest power line that would emit EMF is the 500-kV SWPL, which is perpendicular to and just north of the corridors. EMF emitted from this power line would be as described in Table 3.8-1.

Regulations

There are no federal standards in the United States that limit occupational or residential exposure to EMF. Only two states, Florida and New York, have set standards for magnetic fields, and those are the maximum fields that existing lines produce at maximum load-carrying conditions (NIEHS 2002). Those standards range from 150 milligauss (for 69- to 230-kV systems) at the edge of the right-of-way to 250 milligauss (for “certain existing” 500-kV systems). Both states set a standard of 200 milligauss at the edge of the right-of-way for typical 500-kV transmission lines.

Although the existing data do not provide sufficient evidence to conclude that EMF causes cancer, both the International Agency for Research on Cancer and the California Department of Health Services list EMF as a potential carcinogen. In 2006, the CPUC updated its EMF Policy in Decision 06-01-042, reaffirming that health hazards from exposures to EMF have not been established and that state and federal public health regulatory agencies have determined that setting numeric exposure limits is not appropriate (CPUC 2006).

3.8.2 Environmental Impacts

3.8.2.1 Methodology

The County of San Diego Guidelines for Determining Significance – Hazardous Materials and Existing Contamination (2007g) were reviewed; however, these guidelines relate to either sites with existing known contamination; sites that would handle hazardous materials in excess of the

California Health and Safety Code; or sites that would involve handling of hazardous materials within one-quarter mile of a school or daycare facility. The proposed project sites does not meet any of these criteria, therefore, impacts associated with the transport, use, and disposal of hazardous materials and the potential for accidents or upsets involving hazardous materials were analyzed qualitatively. The potential for construction to encounter contaminated soils also was assessed in consideration of current land use and the lack of known contaminated sites in the area (see Section 3.8.1). The groundwater table is substantially below ground level in the vicinity of the alternative corridors, and excavation and drilling conducted during construction would not encounter groundwater (see Section 3.11 [Water Resources]). Therefore, there would not be an impact to public health due to exposure to contaminated groundwater or an impact to public health due to contamination of groundwater from accidental release of hazardous substances during construction.

Impacts from EMF associated with operation of the alternative transmission lines were evaluated based on reported information on the health effects of EMF, described above, and the distances to potentially sensitive receptors. The potential for public exposure to induced currents and the potential for electrical field interference were evaluated based on the project's compliance with regulatory safety criteria; impacts would be similar for both lattice towers and monopoles.

3.8.2.2 Alternative 1 – No Action

Under the No Action alternative, the transmission line would not be installed and the conditions related to public health and safety would remain unchanged. Without construction of the project, the impacts described below would not occur.

3.8.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Public Exposure to Contaminated Soils and Hazardous Materials[35]

There are no identified contaminated sites within the proposed construction corridor, and because of the remoteness of the corridor, there is little potential for unknown contaminated soils to be present. As a result, there is little potential for construction personnel or the public to be exposed to contamination during construction. A potential mitigation measure not identified by the applicant (Mitigation Measure Public Health-1; evaluate contaminated sites) would further minimize potential impacts to worker and public health and safety from releases of previously unidentified contaminated areas within the corridor by requiring that construction workers be trained to identify contaminated soil and that ESJ follow specific procedures in the event that contaminated soils are encountered.

Minimal amounts of hazardous materials, such as vehicle fuels, oils, cleaners, and paints, would be used and stored during construction. Although there would be a potential for accidental releases of these hazardous materials, ESJ would implement its SWMP to minimize and contain releases. The SWMP lists the procedures that ESJ would follow when handling hazardous materials during construction of the project. The SWMP includes a Spill Prevention and Control

[35] Hazardous materials would consist primarily of construction-related vehicular fuels, lubricants, as well as paints and solvents.

Plan that also includes procedures that ESJ would incorporate into project construction to minimize the release of hazardous materials. This plan identifies the potentially hazardous materials to be used during the project; describes the transport, storage, and disposal procedures for these substances; and describes the procedures to be followed in the event of a spill of a contaminating or toxic substance. Key procedures in the SWMP, including measures included in the Spill Prevention and Control Plan, are summarized below:

- ESJ would store the minimum amount of hazardous materials necessary at the construction site;
- Products would be kept in original containers with the original manufacturer's label;
- Hazardous waste material would be disposed of in the manner specified by the manufacturer and by local, state, and federal regulations;
- Hazardous materials would be stored aboveground, and bulk storage tanks having a capacity of greater than 55 gallons (212 liters) would be provided with secondary containment;
- Storage or hazardous materials, chemicals, fuels, oils, and fueling of construction equipment would not occur within 100 feet (30 m) of desert washes;
- Care would be taken to follow directions and warnings for products used onsite. The Material Safety Data Sheets, which provide pertinent information for each product, would be kept onsite;
- Vehicles at the construction sites would be monitored for leaks and receive regular maintenance to reduce the chance of leakage. Petroleum products would be stored in tightly sealed containers that are clearly labeled;
- Waste oil and other petroleum-based products would be disposed of at an existing disposal site in accordance with applicable regulations;
- Materials and equipment needed for cleanup procedures would be kept readily available on the site, either at an equipment storage area or on the contractors trucks;
- Personnel onsite would be made aware of cleanup procedures and the location of spill cleanup equipment;
- Spills would be contained and cleaned up immediately after discovery;
- Manufacturer methods for spill cleanup of a material would be followed as described on the material's Material Safety Data Sheets;
- Toxic, hazardous, or petroleum product spills required to be reported by regulation would be documented to the appropriate federal, state, and local agencies; and
- Spills would be documented and a record of the spills would be kept with the SWMP.

Given the implementation of the SWMP, including the measures in the Spill Prevention and Control Plan, the potential for a release of hazardous substances during construction is low. If an accidental release were to occur, implementation of the procedures would result in a rapid cleanup of the released material. In addition, the alternative corridor area is remote and rural and few individuals would be near the right-of-way during construction. Therefore, the use of hazardous substances used during construction is not expected to affect public health and safety.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 would not impact public health and safety. JCSD's Well #6 is an existing non-potable water well and its use would not affect public water supply. A short segment of new access road would be required to transport the water from the well to Old Highway 80. Similar to the alternative corridors, no known sites of contamination are located within the proposed access road site and all construction activities would comply with measures outlined in the SWMP and Spill Prevention and Control Plan. Therefore, no impacts to public health and safety are anticipated.

Operation Impacts

During operation of the ESJ U.S. Transmission Line project, most potential impacts would be associated with the transmission of electricity. The following sections address the potential for impacts due to operation of the proposed project:

- Public Exposure to Contaminated Soils and Hazardous Materials;
- EMFs;
- Induced Currents;
- Electrical Field Interference;
- Structural Failures; and
- Terrorism.

Public Exposure to Contaminated Soils and Hazardous Materials

No substantial ground disturbance would occur during operations, and therefore, there would not be an impact on public health and safety due to exposure to contaminated soils. The procedures described above for the initial construction phase would also be implemented during routine maintenance and repair procedures. Such activities are not expected to generate substantial quantities of hazardous wastes, and would not require onsite storage or treatment of hazardous materials or hazardous wastes. Any hazardous materials used for maintenance and wastes generated during maintenance would be handled in accordance with applicable laws and regulations, including California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). Soil contamination could result from accidental release of hazardous materials (e.g., vehicular fuels and lubricants) during maintenance of the proposed transmission line. If such releases occurred, they would likely be small and localized and would be cleaned up in accordance with regulatory requirements and the Spill Prevention and Control Plan. In addition, the project would be in a remote and rural area, and few, if any, individuals not associated with ESJ would be in the vicinity of any such release prior to cleanup. As a result, the potential for impacts to public health and safety would be minor but would exist over the life of the project.

Electric and Magnetic Fields

Once energized, the transmission line would generate EMF, as do all alternating current circuits. As noted in Table 3.8-1, the typical magnetic field strength for a 230-kV transmission line at a distance of 65 feet (20 m) from the line is about 29.6 milligauss. The right-of-way for the 230-kV Route would be a total of about 130 feet (39.6 m) centered on the transmission line, and therefore, 29.6 milligauss is the approximate strength expected at the edge of the right-of-way. Beyond that distance, the strength of the field would decrease rapidly and would be at about the same level of household magnetic fields between about 200 and 300 feet (61 and 91 m) from the transmission line. Maintenance personnel and members of the public who are present in the immediate vicinity of the transmission line would be temporarily exposed to EMF from the project. However, there are no public trails, recreational areas, or other developments to cause visitors to linger in the vicinity of the transmission lines; thus, little public exposure is expected, and what exposure does occur would be brief.

The project would be located in an undeveloped area, which would minimize the potential for public exposure. The nearest potential residence is an unoccupied mobile home approximately 1,600 feet (490 m) to the west. EMF levels at this distance would be below typical household levels.

As reported by DOE (2005), for the past several decades, many studies of the potential adverse health effects caused by long-term exposure to magnetic fields have been conducted, particularly with regard to cancer and reproductive effects. As stated by DOE:

> *The consensus of scientific panels reviewing this research is that the evidence does not support a cause-and-effect relationship between magnetic fields and any adverse health outcomes.*

In addition, NIEHS (2002) stated the following:

> *In 1999, at the conclusion of the EMF RAPID Program, the NIEHS reported to the U.S. Congress that the overall scientific evidence for human health risk from EMF exposure is weak. No consistent pattern of biological effects from exposure to EMF had emerged from laboratory studies with animals or with cells. However, epidemiological studies (studies of disease incidence in human populations) had shown a fairly consistent pattern that associated potential EMF exposure with a small increased risk for leukemia in children and chronic lymphocytic leukemia in adults. Since 1999, several other assessments have been completed that support an association between childhood leukemia and exposure to power-frequency EMF. These more recent reviews, however, do not support a link between EMF exposures and adult leukemias. For both childhood and adult leukemias, interpretation of the epidemiological findings has been difficult due to the absence of supporting laboratory evidence or a scientific explanation linking EMF exposures with leukemia.*

> *In its 2002 report on the possible risks of EMF, the California EMF project concluded that EMF at elevated exposure levels could increase disease risk to some degree with regard to childhood leukemia, but otherwise agreed with the findings of the NIEHS (California EMF Program 2002). In its 2007 report on the health effects of EMF, WHO*

> *again concluded that the evidence for EMF causing childhood leukemia is weak, and further stated that the evidence is much weaker for other childhood cancers, cancers in adults, depression, suicide, cardiovascular disorders, reproductive dysfunction, developmental disorders, immunological modifications, neurobehavioural effects, and neurodegenerative disease* (WHO 2007).

As a result, no impact to public health and safety is expected due to magnetic fields generated during operation of the project.

Induced Currents

EMF generated by the proposed transmission line could induce currents and voltages in nearby conductive objects such as automobiles, and metal roofs, or buildings. The induced currents in these objects could result in a small electrical shock or a perceptible current if contacted by humans or animals. These small shocks are a nuisance, but do not cause physiological harm. These possible effects would only be experienced by people in vehicles using the access road along the transmission line right-of-way or by people touching fences that are in close proximity to the transmission line (e.g., the fencing proposed as part of the ECO Substation, see Section 2.6). As a result, the potential for such impacts would be limited to maintenance personnel and occasional users of the access road. The small induced current would not be a danger but would be an annoyance to some who experience the small electrical shock; this does not represent an impact to public health and safety. This potential impact can be reduced with the use of electrical grounding of metallic objects (such as fences) within and near the right-of-way that have the potential for induced voltages. ESJ would incorporate grounding features into the project design in accordance with industry design standards for electrical transmission structures. These grounding measures would effectively minimize and potentially eliminate the impacts from induced currents.

Vandalism and theft attempts may result in significant electrical shocks due to induced currents. Nationwide, many would-be thieves have been electrocuted while attempting to steal equipment from energized facilities. Federal and other utilities use physical deterrents such as fencing, cameras, warning signs, and rewards to help prevent theft, vandalism, and unauthorized access to facilities. As discussed in Section 2, ESJ would post warning signs in both English and Spanish on the transmission line structures to deter unauthorized access to facilities. Further, with the incorporation of grounding features into the project design, impacts from induced currents would be minimized.

Electrical Field Interference

The electrical fields associated with transmission lines have the potential to interfere with cardiac pacemakers, which could result in impacts to public health. There are two general types of pacemakers: asynchronous pacemakers that pulse at a predetermined rate; and synchronous pacemakers, that pulse only when the sensing circuitry of the device determines that pacing is necessary. Asynchronous pacemakers are generally immune to interference because they do not have sensing circuitry and are relatively uncomplicated. Synchronous pacemakers can be affected by electrical fields between 2- and 9-kV per meter that may cause an erroneous signal in the pacemaker's sensing circuitry (EPRI 1985 and 2004). However, prolonged asynchronous pacing is not considered a significant concern by cardiovascular specialists, who commonly vuce this mode to evaluate pacemaker performance. In addition, the proposed route traverses an undeveloped area approximately 1,600 feet (490 m) from the nearest (unoccupied) residence; therefore, no impact to public health and safety is expected due to with interference to cardiac pacemakers due to operation of the project.

The occupational exposure guidelines developed by American Conference of Governmental Industrial Hygienists state that workers with cardiac pacemakers should not be exposed to a 60-Hz magnetic field greater than 1 gauss (1,000 milligauss) or a 60-Hz electric field greater than 1 kV per meter (1,000 V/m) (NIEHS 2002). That magnetic field strength is substantially greater than the magnetic field strength of transmission lines, and there would be no effect on maintenance workers with cardiac pacemakers due to the magnetic field from the transmission lines.

During the public scoping meeting held for the project, a concern was raised regarding the potential for the proposed transmission line to interfere with radio frequency and signals at Jacumba Airport. Consultation with the County of San Diego Department of Public Works Airport Engineer confirmed that, based on the distance of the proposed project from the airport, no interference with airport radio signals would occur (Nelson 2009).

Intentionally Destructive Acts and Other Causes of Structural Failure

DOE considered the potential for impacts from intentionally destructive acts and other potential causes of transmission line structural failure. Transmission line structures used to support overhead transmission lines in California must meet the requirements of the CPUC's General Order No. 95, Rules for Overhead Electric Line Construction (CPUC 2009). In addition, transmission lines must meet both the requirements of the CPUC General Order and the National Electrical Safety Code for loading requirements related to wind conditions (IEEE 2006). Transmission support structures are designed to withstand different combinations of loading conditions, including extreme winds. These design requirements include use of safety factors that consider the type of loading as well as the type of material used (e.g., steel, wood, or concrete). The proposed transmission towers would be designed to withstand wind loading of up to 125 miles (200 km) per hour.

Failures of transmission line support structures are rare; however, they may occur as a result of extremely high loading conditions such as tornadoes, ice storms, or Santa Ana winds. The 230-kV Route would be constructed on steel lattice towers or tubular steel monopoles, and failure would be extremely unlikely. In addition, the transmission line would extend through a rural area where the closest residence (an unoccupied mobile home) is about 1,600 feet (490 m) from the right-of-way and few if any people would be in the vicinity of the towers during periods of high loading conditions. Therefore, the potential for a tower failure to affect public safety would be minor, but would exist over the life of the project.

Failures may also occur as a result of intentional destructive acts. In the aftermath of the terrorist attacks that occurred on September 11, 2001, terrorism has become a very real issue for the facilities under DOE's jurisdiction. Increased security awareness has occurred throughout the electrical transmission industry and the nation. Due to the various motivations and abilities of terrorist organizations in conjunction with the extensive electrical transmission infrastructure within the U.S., the likelihood of future acts of terrorism occurring along the project corridor is unpredictable. The project would include aboveground electrical transmission lines and supporting towers or tubular steel monopoles within an unfenced utility right-of-way and would, therefore, be accessible to those desiring to damage the system. The transmission line support structures would be constructed on footings in the ground and would be difficult to dislodge. In general, the proposed transmission line presents no greater target for intentional destructive acts than any other high-voltage transmission lines or power plants in the U.S. While the likelihood for intentional destructive acts on the proposed structures is difficult to predict given the characteristics of the project, it is unlikely that such acts would occur based on past experience along the thousands of miles of electrical transmission lines in the country. If such an act were to occur and succeed in destroying towers or other project-related equipment, the main consequence for the public would be disruption of electrical service.

Impacts in the U.S. due to Related Activities in Mexico

No impacts to U.S. public health and safety are anticipated from construction and operation of the ESJ Wind project in Mexico due to the distance of the wind turbines and the associated transmission line from any populated areas in the U.S. (a minimum of 4 miles [6.4 km] from the transmission line corridor at the U.S.-Mexico border to the nearest community in the U.S.). Impacts in the U.S. related specifically to fire are addressed in Section 3.9 (Fire and Fuels Management).

3.8.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

The existing conditions related to public health and safety along the 500-kV Route are essentially the same as those described above for the 230-kV Route because the routes are adjacent to each other. The unoccupied mobile home is slightly farther from the 500-kV Route: the mobile home is about 2,000 feet (610 m) west of right-of-way of the 500-kV Route, as compared to about 1,600 feet (490 m) west the right-of-way of the 230-kV Route.

Construction, operation, and maintenance of the 500-kV Route system would be substantially the same as for the 230-kV Route, and therefore, the impacts to public health and safety would also be essentially the same, and the same potential mitigation measure would apply. The primary differences would be that 500-kV transmission lines generate higher levels of EMF than 230-kV lines, and the 500-kV Route would be constructed slightly farther from the unoccupied mobile home. The magnetic field strength at about 100 feet (31 m) from the transmission line (the approximate edge of the right-of-way), would be 12.6 milligauss; however, at 300 feet (91 m) from the transmission line, the magnetic field strength would be at or near the typical household level. At the mobile home, the magnetic field strength from the transmission line would be substantially lower.

3.8.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The existing conditions related to public health and safety along the revised 230-kV and 500-kV Routes are essentially the same as those described above for the original routes because the routes are adjacent to each other. The unoccupied mobile home is slightly farther from the revised routes: the mobile home is about 2,550 feet (777 m) farther west of right-of-way of the revised 500-kV Route, as compared to 2,000 feet (610 m) from the original 500-kV route, and the mobile home is about 2,300 feet (701 m) west of the right-of-way of the revised 230-kV route, as compared to about 1,600 feet (490 m) west of the right-of-way of the original 230-kV Route.

Construction, operation, and maintenance of the revised 230-kV and 500-kV Routes would be substantially the same as for Alternatives 2 and 3 and therefore, the impacts to public health and safety would also be essentially the same, and the same potential mitigation measure would apply.

3.8.3 Mitigation Measures

The following potential mitigation measure would further reduce potential impacts to public health and safety.

Public Health-1: Evaluate Contaminated Sites

Construction personnel installing the proposed transmission lines should be trained in identifying potential contamination prior to beginning work (e.g., through odor detection and visual observation of discolored soils or oil sheens). In the event that unknown contamination is discovered during excavation or backfilling with imported soils (e.g., discolored soils, oil sheens, etc.) the following steps would be implemented to prevent mobilization of contaminants and exposure of workers and the public:

- **Step 1.** A qualified environmental scientist should perform a characterization study of the site to determine the nature and extent of the contamination present at the location before construction activities proceed within the project right-of-way near the suspect site. The characterization should determine the need for further investigation and/or remediation of the soil conditions at or near the contaminated site and within areas of ground disturbance for the project (e.g., if there would be little or no contact with contaminated materials, industrial cleanup levels would likely be applicable).
- **Step 2.** If no human contact with potentially contaminated materials is anticipated, then no further mitigation would be required for the location. If it is determined that further excavation would disturb the suspect site or potentially result in mobilization of the potential contamination into groundwater, undertake a Phase II Environmental Site Investigation involving sampling and analytical characterization of potentially contaminated areas with the project right-of-way or reroute the line away from the contamination area.
- **Step 3.** Should further investigation reveal high levels of hazardous materials, mitigate health and safety risk according to County of San Diego Certified Unified Program Agency or Regional Water Quality Control Board regulations or requirements. This would include site-specific Health and Safety Plans, Work Plans, and/or Remediation Plans.

In addition to the steps above, if imported soil is required to backfill excavated areas, ESJ should sample the soil prior to backfilling to ensure that it is free of contamination.

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3.9 FIRE AND FUELS MANAGEMENT

This section analyzes the potential impacts of the proposed project with regard to fire risk and fuels management, including potential impacts on fire protection services.

3.9.1 Affected Environment

3.9.1.1 Fire Conditions

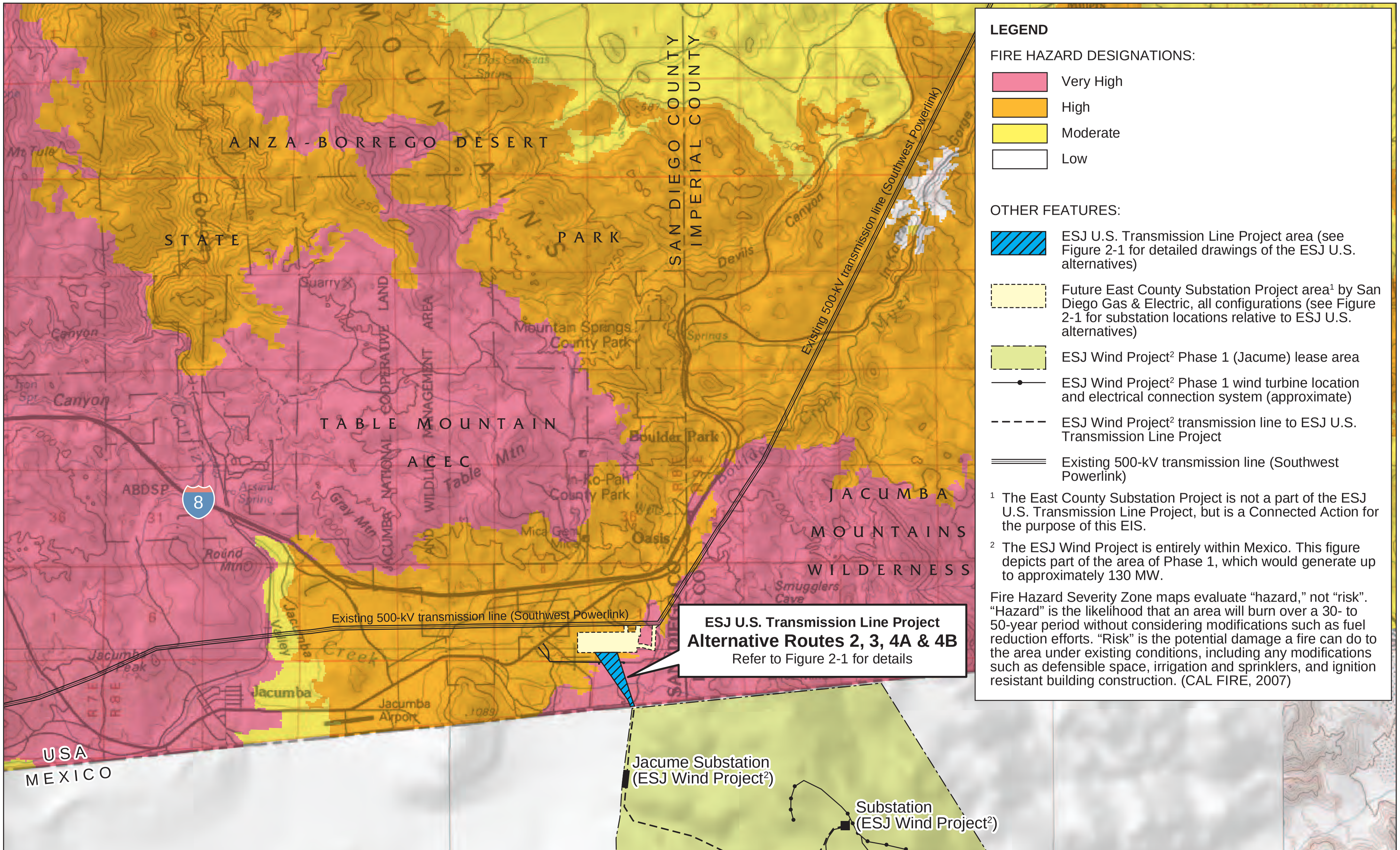
The climate in central San Diego County (mild, wet winters and hot, dry summers) supports dense, drought-adapted shrublands that are highly flammable, especially in the fall as fuel moistures reach very low levels. Most critically, winds originating from the Great Basin, locally known as the Santa Ana winds, create extreme fire weather conditions that are characterized by low humidity, sustained high-speed winds, and extremely strong gusts. Santa Ana winds create extremely dangerous fire conditions and have been the primary driver of most of California's catastrophic wildfires. Santa Ana winds are at their peak during fall and early winter months, which mark the height of fire season. Because of the presence of dense, dry fuels and periodic Santa Ana winds, southern California has been characterized as having one of the most fire-prone landscapes in the world.

Fire hazard is defined as a measure of the likelihood of an area burning and how it burns (e.g., intensity, speed, and embers produced). The CAL FIRE Fire Resource and Assessment Program establishes fire hazard classification maps. Figure 3.9-1 depicts the CAL FIRE classifications of the alternative corridors and the surrounding area in eastern San Diego County and southwestern Imperial County. Most of that area is classified as either "very high" or "high" fire hazard area; in contrast, the fire hazard rating in central and eastern Imperial County is low due to the area's desert climate and low concentration of vegetation and other fuel materials (CPUC/BLM 2008b). As depicted on Figure 3.9-1, the alternative corridors extend primarily through the very high hazard zone; a small portion of the northern ends of the corridors is in the high hazard zone.

3.9.1.2 Firesheds

A fireshed is a regional landscape that is delineated using an array of fire behavior models and Geographic Information System (GIS) data; the delineation is based on fire history, fire regime, vegetation, topography, and potential wildfire behavior. The fireshed development process is used as an assessment tool to identify high fire risk areas[36] and predict future fires to better reduce fire risk and to protect communities. A summary of fireshed boundaries near the alternative corridors is provided below based on recent fireshed delineations prepared for the Sunrise Powerlink RDEIR/SDEIS project (CPUC/BLM 2008b).

[36] Fire risk is a measure of the potential for damage and includes consideration of the susceptibility of what is being protected from fire. Factors such as defensible space, non-flammable roofs, and ignition-resistant construction reduce fire risk.



0 1 2 3 Miles
0 1 2 3 4 Kilometers

Source(s):
Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CAL FIRE 2007; CPUC/BLM 2011a; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1979, 2006.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.9-1

FIRE HAZARD SEVERITY ZONES IN THE PROJECT VICINITY

May 2012

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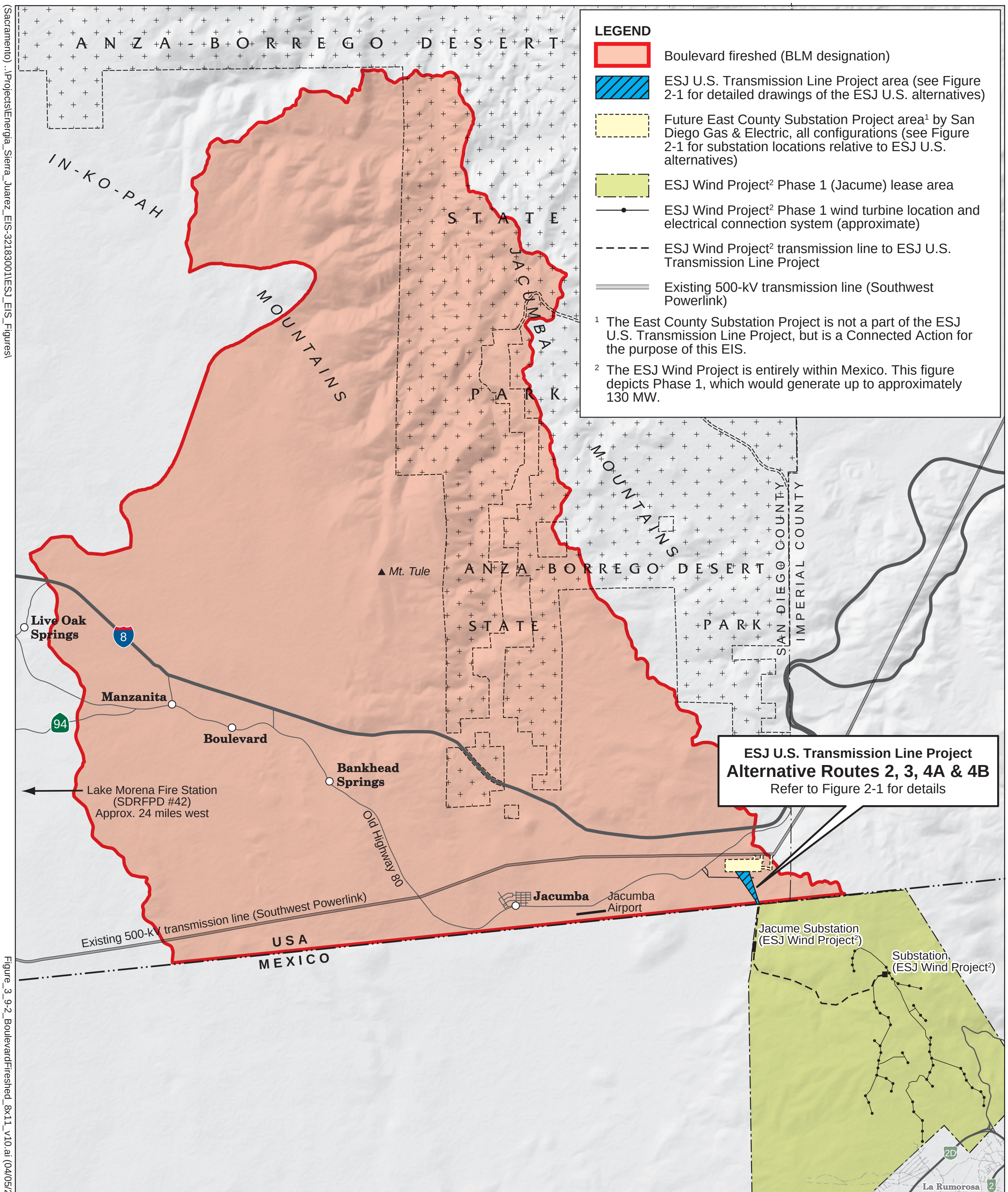
Figure_3_9-1_FireHazard_11x8_v8.ai (04/05/2012, 04:17 pm) R. Wurgler/T. Murphy

As depicted on Figure 3.9-2, the alternative corridors are located on the eastern border of the Boulevard Fireshed, which is the most southeastern fireshed of those delineated for the Sunrise Powerlink RDEIR/SDEIS project. The Boulevard Fireshed consists of approximately 73,000 acres (29,540 ha) and encompasses the southeastern corner of San Diego County, including the towns of Jacumba, Manzanita, and Boulevard, which are all federally-designated communities at risk of wildfire. In addition, the In-Ko-Pah Mountains and the wilderness areas in the southern portion of Anza-Borrega Desert State Park, both of which are north of the corridors, are in the fireshed.

Elevations in the Boulevard Fireshed range from 1,640 feet (500 m) above mean sea level (msl) on the desert floor (approximately 7 miles [11 km] to the west of the alternative corridors) to 4,647 feet (1,416 m) on Mt. Tule in the In-Ko-Pah Mountains (approximately 8 miles [12.8 km] northwest of the alternative corridors). Average annual rainfall is between 8 and 14 inches (20 to 36 cm) per year. As a result, much of the area (including the alternative corridors) is bare, with sparse desert chaparral vegetation and granitic boulders. The sparse vegetation limits the spread of wildfires; however, in recent years, non-native invasive weeds, including cheatgrass (*Bromus tectorum*), medusa head (*Taenintherum caput-medusae*), and Sahara mustard (*Brassica tournefortii*), have started to invade the area. These weeds are fire-adapted and are able to spread quickly, which has resulted in alterations to the dominant plant community of the fireshed. Exotic, grass-dominated landscapes ignite more easily and tend to spread fires more rapidly than native desert vegetation.

The southeastern boundary of the Boulevard Fireshed is located at the U.S.-Mexico border. The presence of undocumented aliens crossing into the U.S. creates an additional human influence on the wildland areas in the vicinity of the alternative corridors; campfires and other activities of undocumented aliens caused about 10 percent of all reported ignitions[37] over a 13-year period (CPUC/BLM 2008b). Two fires that were ignited by undocumented aliens near the border in 2004 burned a combined 110 acres (45 ha) within the fireshed. However, while there have been a total of 225 recorded ignitions in the fireshed in the past 13 years, only 29 fires have been recorded in the Boulevard Fireshed since 1959. Of these 29 fires, three have burned over 1,000 acres (405 ha) and have been classified as major events. The largest fire in the Boulevard Fireshed in the last 50 years was the 1982 Tule Fire, which burned 4,645 acres (1,880 ha) within the fireshed. All other fires were relatively small, and much of the fireshed shows no recorded fire history (CPUC/BLM 2008b). In San Diego County as a whole, there have been several major wildfires resulting in structural damage in the past 10 years (County of San Diego 2010c).

[37] An ignition is the initiation of combustion as evidenced by glow, flame, or explosion, whereas a fire is the rapid oxidation of a fuel following ignition and resulting in heat, light, and other byproducts. An ignition does not always result in a fire (CAL FIRE 2009).



Source(s):
Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2008b, 2011a; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1979, 2006.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.9-2

BOULEVARD FIRESHED

May 2012

3.9.1.3 Firefighting Services

Fire protection along the alternative corridors is under the jurisdiction of the San Diego Rural Fire Protection District. Initial response to fires in the vicinity of the corridors is provided by the Boulevard Fire and Rescue, located 10 miles (16 km) west, which is staffed 24 hours per day, 7 days a week. Fire Station 48 in Jacumba, approximately 4 miles (6.4 km) west, is not currently staffed, but resources at the station include a 1,000 gallon-per-minute (3,850 liters-per-minute) fire engine and a 1,800-gallon (6,920-liter) water tender. The next closest Rural Fire Protection District fire engine is located in Lake Morena, approximately 24 miles (39 km) to the west (Eldred 2010; see also EIS Volume 3 Comments and Responses Document, comment letter 306). The CAL FIRE San Diego Unit also provides firefighting services in the area. In addition, the CAL FIRE San Diego Unit is responsible for protecting unincorporated portions of the county, including portions of the county that are protected by fire protection districts. The CAL FIRE station nearest to the corridors is the White Star station in Campo, approximately 10 miles (16 km) to the west (CAL FIRE 2009). This station maintains four full-time personnel during peak fire season (May through November) and two to three personnel the remainder of the year. Resources at the White Star station include one fire engine as well as a reserve engine that is shared among multiple stations (Custeau 2009).

3.9.2 Environmental Impacts

3.9.2.1 Methodology

Potential impacts with regard to fire and fuels management were evaluated by assessing the site burn probability and the potential for ignition to result in a fire with implementation of the alternatives. In addition, potential impacts to firefighting services were evaluated through coordination with the San Diego Rural Fire Protection District and review of the County of San Diego Guidelines for Determining Significance – Emergency Response Plans (2007d), which addresses interference with emergency air support.

3.9.2.2 Alternative 1 – No Action

The proposed transmission line would not be constructed under this alternative; therefore, no impacts related to fire and fuels management would occur.

3.9.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Construction activities would occur in an area on the eastern border of the Boulevard Fireshed, and would include use of equipment such as earth movers, generators, vehicles, and chainsaws. That equipment along with the construction personnel would introduce a variety of potential wildfire ignition sources to surrounding vegetation fuels and combustible construction materials. Construction-related ignitions have the potential to escape containment and become fires. Because the right-of-way has moderate to low fuel loads, extends through generally level terrain, and is exposed to high winds, it has a moderate burn probability and a moderate potential for an ignition to escape containment and result in a fire. Due to the proximity of the community of Jacumba (approximately 4 miles [6.4 km] to the west), the potential for a wildfire caused during construction is considered temporary, but the impact of a fire could be potentially major. Implementation of the following potential additional mitigation measures (not identified by the applicant), described more fully in Section 3.9.3, would reduce the probability of a wildfire during construction:

- Fire-1 (Develop and Implement Construction Fire Prevention Plan);
- Fire-2 (Coordinate with Emergency Fire Suppression Activities); and
- Fire-3 (Remove Hazards from Work Areas).

Construction of the proposed transmission line would also create the potential for the introduction and spread of non-native, invasive plants through movements of vehicles into and out of the construction area. As discussed in the environmental setting, certain invasive plants, such as cheatgrass, medusa head, and Saharan mustard, can contribute to changes in wildfire frequency, timing, and spread. Although these species have already been introduced into the Boulevard Fireshed, additional inadvertent introduction of such plants during construction of the proposed project would increase wildfire risks near the construction area; the increase in risk resulting from the introduction of weedy species would be permanent and represents a moderate impact. However, this impact could be reduced to minor through implementation of a potential additional mitigation measure (Mitigation Measure Biology-3 Weed Control Plan), as described in Section 3.1 (Biological Resources).

The construction impacts described above would be the same for lattice towers and monopoles.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 would not result in short-term and minor impacts with regard to fire and fuels management. Construction of a new access road would be required to facilitate access from Old Highway 80 to the well. Construction activities could create the potential for ignitions and the spread of non-native invasive plants, as described above for the alternative corridors. However, implementation of Mitigation Measures Fire-1, Fire-2, and Fire-3, as well as Biology-3 would ensure impacts are minor. Following completion of the access road, no impacts are anticipated associated with the use of the well.

Operations Impacts

The transmission line would be a potential source of wildfire ignitions for the life of the project and would increase the risk of a wildfire. Fires can be started by electrical transmission lines in the following ways:

- Introduction of non-native, invasive plants;
- Vegetation contact with conductors;
- Exploding hardware, such as transformers and capacitors;
- Floating or wind-blown debris contact with conductors or insulators;
- Conductor-to-conductor contact;
- Dust or dirt on insulators causing flashover;
- Bullet, airplane, or helicopter contact with conductors or support structures; and

- Other third-party contact, such as Mylar balloons, kites, and wildlife.

Line faults caused by any of the events listed above are unpredictable, although rare. A fire that starts in the transmission corridor could burn into the town of Jacumba or across the U.S.-Mexico border to the town of La Rumorosa (located approximately 2.4 miles [3.9 km] southeast of the southernmost point of the 230-kV line at the U.S.-Mexico border) during extreme weather conditions (e.g., Santa Ana winds), potentially placing many structures at risk. This impact would be reduced to some extent by implementation of the Fire Protection Plan developed for the project (Hunt Research Corporation 2009), which includes the following measures:

- Provide 30 feet (9 m) of fuel clearance on all sides of the towers;
- Maintain 10 feet (3 m) of vertical clearance between vegetation and transmission wires;
- Mark towers with tags to indicate they are "high voltage" (i.e., that they carry greater than 750 volts);
- Place no new plants, shrubs, trees, or other vegetation in the right-of-way or in the area within 30 feet (9 m) beyond the outer edges of the right-of-way; and
- Maintain the prescribed defensible space (e.g., clear all vegetation or cut all vegetation to no more than 6 inches [15 cm] in height) on at least an annual basis prior to May 1, or more often as necessary (i.e., as warranted by certain conditions, such as higher than normal rainfall). In addition, the applicant would comply with California Public Resources Code 4292, which governs power line fuel modification.

The San Diego Rural Fire Protection District's November 2, 2010 letter to ESJ indicates acceptance of this plan. In addition, as required, the applicant has obtained an executed Development Agreement with the Rural Fire Protection District, which was approved by the District Board in April 2011. The Development Agreement includes a requirement for ESJ to provide its pro-rata share of funding for four part-time firefighting positions that would be deployed up to 90 days per year. Rural Fire Protection District information regarding the Fire Protection Plan and associated Development Agreement is provided in Appendix B[38]. However, not all potential ignition sources can be eliminated by implementation of measures such as those included in the Fire Protection Plan. For example, ignition could occur due to line faults caused by unpredictable events such as conductor contact by floating debris, gun shots, and helicopter collisions. The right-of-way extends along a relatively flat, defensible landscape with sparse desert chaparral fuels, and access to the right-of-way would be modified to meet County of San Diego Public Safety and Fire Code Standards[39]; however, during a wildfire, the overhead

[38] Appendix B includes correspondence related to fire protection matters. This includes: July 2009 letter from the Rural Fire Protection District indicating that the plan meets the objectives of the California Fire Code (2007 edition) and District Requirements for a discretionary project; the District's June 2011 letter; County of San Diego DPLU Form 399 F, Fire Service Availability Form, signed by the District and dated May 2011; ESJ's March 2011 comment letter to the CPUC and BLM's ECO Substation/Tule Wind/ESJ Project Draft EIR/EIS; and November 2009 letter from the San Diego County Fire Agency.

[39] As described in Section 2, the permanent access road to the project right-of-way from Old Highway 80 (either Option A or B) would be widened to 28 feet (8.5 m) to accommodate firefighting apparatus in accordance with the Public/Private Road Standards and the County Fire Code, Section 96.1.503.

transmission lines would reduce the effectiveness of ground firefighting efforts. General firefighting guidelines recommend that ground attacks be avoided within at least 500 feet (152 m) of a power line conductor. Those guidelines also recommend that when encountering a downed, energized power line, ground-based firefighters should remain at a distance equal to the distance between two towers in order to ensure firefighter safety (NIOSH 2002; CPUC/BLM 2008b).[40] Maintaining a minimum 500-foot (152-m) safety buffer between firefighters and downed power lines and structures greatly reduces the risk of electrical structure contact; however, it also reduces the effectiveness of ground-based frontal attacks. Therefore, in the event of a proximate fire, the proposed transmission line would create an obstacle to firefighting and wildfire containment and would reduce the effectiveness of firefighting efforts. If a fire were to occur during extreme weather conditions and could not be initially contained, it could grow to be a major fire. This represents a potential major impact to firefighting efforts that would last for the life of the project.

Aerial firefighting efforts could also be compromised by the presence of the transmission lines. Transmission lines create a hazard for low-flying spotter aircraft and aircraft that apply aerial retardant. Visibility of the transmission lines could be obstructed due to smoke, thus limiting the ability of pilots to work safely in the project area. Implementation of potential Mitigation Measure Transportation-1 (coordination with U.S. Border Patrol and CAL FIRE) would reduce the potential for conflicts with firefighting aerial operations. As described in Section 3.7.3, under potential Mitigation Measure Transportation-1, ESJ would provide written notification to all CAL FIRE aircraft working in the county stating when and where the new transmission lines and towers are to be erected; provide design details; and resolve any potential issues related to agency ground and aerial operations. However, even with the implementation of this mitigation measure, if a fire were to occur in the area, the presence of the transmission line is considered a potential major impact to aerial firefighting efforts that would last for the life of the project.

Implementation of a potential additional mitigation measure (Mitigation Measure Biology-3 Weed Control Plan), as described in Section 3.1 (Biological Resources) would reduce long-term impacts from the introduction of non-native, invasive plants that could be introduced during the life of the project.

ESJ would implement routine maintenance and inspections of the towers and conductors, including inspection of potential fire hazards. These procedures would reduce the risk from wildfires; however, even with routine maintenance and inspection, the project would increase the potential for fires for the life of the project.

Impacts in the U.S. due to Related Activities in Mexico

Impacts could occur in the U.S. due to activities associated with the ESJ Wind project if a wildfire were to originate in Mexico and travel north across the U.S.-Mexico border. This situation could result from an incident associated with the ESJ Wind project transmission lines in

[40] Wildland firefighters working around energized power lines are exposed to electrical shock hazards, including direct contact with downed power lines, contact with electrically charged materials and equipment due to broken lines, contact with smoke that can conduct electricity between lines, and the use of solid-stream water applications around energized lines. Between 1980 and 1999 in the U.S., there were 10 firefighter fatalities due to electrical structure contact during wildfire suppression (NFPA 2001, as cited in CPUC/BLM 2008a).

the vicinity of the border (similar to the operational risks scenario described above), or as a result of a fire that originates in the wind turbine development area. Wind turbines can be the source of wildfire ignitions due to wind turbine collapse, power collection line failure, turbine malfunction or mechanical failure, and lightning- and bird-related incidents. When mechanical or electrical failures cause turbines to catch fire, they may burn for many hours due to the limited ability of fire suppression crews to effectively fight fires that are hundreds of feet above the ground. Wind-blown flaming debris from a turbine fire could ignite vegetation in the surrounding area (CPUC/BLM 2008b), and smoke from a fire would be visible in the U.S. However, based on wind pattern data, the prevailing wind direction tends to be from northwest to the southeast, rather than from south to north (see Section 3.10 [Air Quality and Greenhouse Gases]).

Phase 1 of the ESJ Wind project would occupy an area of approximately 4.6 square miles (11.8 square km) in the La Rumorosa area of northern Baja, Mexico. The distance between the U.S. border and the nearest turbine would be about 0.7 mile (1.1 km) (Figure 1-2). The distance between the community of Jacumba (the nearest community in the U.S.) and the nearest turbine would be about 6 miles (9.7 km). The total height of the combined tower structure and rotor blades would likely be up to 431 feet (130.5 m) depending on the tower height and the turbine rotor blade diameters. In addition, the turbines would be sited in steep terrain with chaparral fuels. The introduction of this equipment and associated operation and maintenance activity could thus increase the potential for fires. Furthermore, the height of the turbines, difficult terrain, the extensive overhead electrical connector system, and large geographic extent of the wind project could present challenges to firefighters in the event of a large wildfire.

DOE reviewed a partial translation of the Mexican MIA permit. The permit requires a Fire Protection Plan to be prepared prior to construction in coordination with relevant agencies. The purpose of the plan would be to evaluate the likelihood of fire sources, identify preventive measures, and develop site-specific action plans in the event of a fire in the ESJ Wind project area. Burning is not permitted for land clearing.

Certain specific design, operations, and maintenance features could be implemented for individual turbines to reduce the probability of a fire. These features include lightning protection systems and thermal monitoring systems that detect temperature increases and automatically shut off the generating system above a critical thermal threshold. Wind turbine fire protection systems including low-flammability materials, maintenance, training, and automatic detection, as well as nacelle suppression and warning systems are currently available and widely used in wind turbines. For example, potential fire-related impacts associated with the proposed Tule Wind project in southern San Diego County were identified, and several applicant-proposed measures and CPUC/BLM identified mitigation measures have been proposed to minimize the potential for an ignition. These measures include automatic fire suppression systems in the wind turbine nacelles; various design features such as arc flash relays; fuel management around project features (i.e., 100-foot clearance around turbines with fire-safe vegetation and annual fuel management); placement of several 10,000-gallon water storage tanks throughout the project area for regional fire suppression support; training of both construction and operational personnel by qualified fire protection specialists on the proper use of Type VI firefighting equipment to fight incipient fires; and funding for firefighting organizations. The following specific fire detection, warning, and suppression systems would be implemented for each wind turbine generator at the Tule Wind project (CPUC/BLM 2011a):

- Use of non-combustible or difficult to ignite materials.
- Early fire detection and warning systems.
- Maintenance according to manufacturer specifications.
- Frequent maintenance.
- Auto switch-off and complete disconnection from the power supply system.
- Ongoing hazard/fire safety training for staff.
- Automatic fire extinguishing systems in the nacelle of each wind turbine (stationary, inert gas, or similar).
- Non-combustible or high flash point lubricant oils.

It is not known whether the ESJ Wind project plans to incorporate these or other specific fire prevention and control measures. Operation of the ESJ Wind project could thus increase the potential for fires that originate in Mexico, and these fires could spread into the U.S. under certain weather conditions. Given the distance between the wind farm and the U.S., the more likely scenario for a cross-border fire would originate from the transmission line near the U.S.-Mexico border. This impact is considered moderate, and it would last for the life of the ESJ Wind project.

3.9.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

The 500-kV Route would be in the same general area as the 230-kV Route, and construction, operation, and maintenance activities would be essentially the same for both alternatives. Therefore, the same impacts would occur, and the same potential mitigation measures would apply.

3.9.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The revised 230-kV and 500-kV Routes would be in the same general area as the original Routes, and construction, operation, and maintenance activities would be essentially the same for all alternatives. Therefore, the same impacts would occur, and the same potential mitigation measures would apply.

3.9.3 Mitigation Measures

The following potential mitigation measure in addition to the APMs contained in the Fire Protection Plan for the project's operational period (described above) would further reduce potential impacts of the project with regard to fire risk and fuels management.

Fire-1: Develop and Implement a Construction Fire Prevention Plan

ESJ should develop a Construction Fire Prevention Plan for the project and monitor construction activities to ensure implementation and effectiveness of the Plan.[41] Plan reviewers should include the San Diego Rural Fire Protection District and CAL FIRE. The Rural Fire Protection District has issued revised recommended fire protection mitigation measures specific to construction of the ESJ U.S. Transmission Line project. These mitigation measures provide detailed criteria for matters to be addressed in the plan, which must be approved by the Fire District prior to start of construction. The agreed-upon mitigation requires that the applicant provide a draft plan for the District's review and approval at least 90 days prior to start of construction. ESJ should implement the Fire Prevention Plan during all construction and maintenance activities. All construction work should follow the Fire Prevention Plan guidelines and commitments, and Fire Prevention Plan contents should be incorporated into the construction contracting agreements. Primary Fire Prevention Plan enforcement implementation responsibility should remain with ESJ.

Fire-2: Coordinate with Emergency Fire Suppression Activities

ESJ should ensure that personnel and construction equipment do not create obstructions to firefighting equipment or crews, and that personnel comply with the following in consultation with fire agencies:

- Onsite ESJ and contractor personnel should coordinate fire suppression activities through the active Fire Incident Commander.
- To the extent practicable, ingress and egress to construction-related access roads should remain unobstructed at all times.
- Construction in the work area should cease in the event of a fire within 1,000 feet (305 m) of the work area. The work area includes the transmission line right-of-way, construction laydown areas, pull sites, access roads, and any other sites adjacent to the right-of-way where personnel are active or where equipment is in use or stored.

Fire-3: Remove Hazards from Work Areas

ESJ should clear brush and dead and decaying vegetation from work areas prior to starting construction and/or maintenance work. Work areas include only those areas where personnel are active or where equipment is in use or stored, and may include portions of the transmission line right-of-way, construction laydown areas, pull sites, access roads, parking pads, and other sites adjacent to the right-of-way where personnel are active or where equipment is in use or stored. Cleared dead and decaying vegetation should either be removed or chipped and spread on the right-of-way in piles no higher than 6 inches (15 cm).

[41] ESJ has indicated to DOE that it intends to develop the Construction Fire Prevention Plan prior to the start of construction. Refer to:

http://www.esjprojecteis.org/docs/Sempra_Response_to_DOE_Questions_2011-07-01.pdf

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3.10 AIR QUALITY AND CLIMATE CHANGE

This section addresses the potential impacts of the proposed project alternatives on local and regional air quality in the U.S. and on global climate change.

3.10.1 Affected Environment

The alternative corridors would be entirely in the San Diego Air Basin, which comprises all of San Diego County. Information regarding the affected environment was obtained from the County of San Diego Air Pollution Control District (SDAPCD) and the County of San Diego DPLU. The locations of the alternative corridors are depicted on Figures 1-1 and 1-2.

3.10.1.1 Climate

The climate of southern California is classified as semiarid, although it contains three distinct zones of rainfall with corresponding vegetation characteristics. The three climatic zones are broadly defined as coastal, mountain, and desert; the alternative corridors are in the Jacumba Valley, which is a desert valley.

Jacumba, the nearest community to the alternative corridors, has an average low temperature of 34 degrees Fahrenheit (°F; 1 degree Celsius [°C]) in January and an average high temperature of 93°F (34°C) in July. This region is considered the driest climate in California. Annual average precipitation for the Jacumba Valley ranges between 14 and 16 inches (36 cm to 41 cm). Precipitation mostly occurs from November through May and from August through September. Distribution and intensity of rainfall events are sporadic (USEPA 1994).

Throughout much of the year, prevailing daytime winds typically come from offshore and push air south and east, which prevents air from Mexico being blown in the direction of the alternative corridors. Occasional weak outflows from land transport some air from Tijuana into the parts of San Diego that are adjacent to the U.S.-Mexico border. These outflows are weak, and the morning sea breeze usually carries this transported air inland from the populated coastal area before contaminants in the air are photochemically changed into smog by the sun. The SDAPCD has been working with government agencies to identify ways to reduce emissions from vehicles licensed in Mexico traveling to the U.S. (SDAPCD 2009).

3.10.1.2 Air Quality Standards

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) have been established by the U.S. Environmental Protection Agency (USEPA).[42] The NAAQS represent maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health (primary standards) and welfare (secondary standards). The USEPA has defined six criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$, respectively),[43] and airborne lead (Pb). The Clean Air Act allows states to adopt ambient air quality standards and other

[42] http://www.epa.gov/air/criteria.html

[43] PM_{10} refers to particulate matter 10 microns or smaller in diameter, and similarly for $PM_{2.5}$.

regulations as long as they are at least as stringent as federal standards. The California Air Resources Board (CARB) has established the State Implementation Plan (SIP), which describes how the state will comply with the Clean Air Act; it consists of narrative, rules, technical documentation, and agreements that the state uses to maintain acceptable air quality and to improve air quality in areas with unacceptable levels of atmospheric contaminants. CARB also established the California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. Federal and California ambient air quality standards are presented in Table 3.10-1.

3.10.1.3 Attainment Status

Areas that violate federal and/or state air quality standards are designated as nonattainment areas for the relevant pollutants, as opposed to areas that comply with federal and/or state air quality standards, and hence are designated as attainment areas (i.e., areas that have attained compliance for the relevant pollutants). Areas where insufficient data are available are designated as unclassified areas.

A formal conformity determination is required for federally sponsored or funded actions in nonattainment areas or in certain maintenance areas when the total direct and indirect net emissions of nonattainment pollutants (or their precursors) exceed specified thresholds (Section 176(c) of the Clean Air Act Amendments of 1990). This regulation ensures that federal actions conform to the SIP and local agency (e.g., SDAPCD) NAAQS attainment plans. All local attainment plans must be approved by the state and incorporated into the SIP.

Most of San Diego County is currently designated a federal attainment or unclassifiable area for all criteria pollutants except O_3 (8-hour), for which the basin is classified as nonattainment. However, small portions of eastern San Diego County associated with the Campo, Cuyapaipe, La Posta, and the Manzanita Indian reservations are designated as being in full attainment. With regard to state criteria, the San Diego Air Basin is currently classified as a “serious” O_3 nonattainment area and a nonattainment area for PM_{10} and $PM_{2.5}$ (SDAPCD 2008). Table 3.10-2 lists the attainment status in San Diego County for each of the criteria pollutants.

3.10.1.4 Local Sources of Pollutants

The most significant regional sources of O_3, NO_2, and CO in ambient air are automobiles and other onroad vehicles. Ozone is not directly emitted; rather, photochemical O_3 is formed by the atmospheric reaction of volatile organic compounds (VOC)[44] and nitrogen oxide (NO_X as NO_2) in sunlight. VOC and NO_X are combustion products from gas and diesel engines, along with CO, SO_2, PM_{10}, and $PM_{2.5}$. Due to the alternative corridors’ proximity to I-8 and Old Highway 80, vehicle emissions are the greatest contributors to local pollutants.

[44] Also referred to as reactive organic compounds (ROC) or reactive organic gases (ROG).

Table 3.10-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		Federal Standards[1]	
		ppmv	μg/m^3	ppmv	μg/m^3
Ozone (O_3)	1-hour	0.09	177	–	–
	8-hour	0.07	137	0.075	147
Nitrogen Dioxide (NO_2)	1-hour	0.18	338	–	–
	Annual	0.03	56	0.053	100
Sulfur Dioxide (SO_2)	1-hour	0.25	655	0.075	–
	3-hour (secondary)	–	–	0.50	1,309
	24-hour	0.04	105	0.14	367
	Annual	–	–	0.03	79
Carbon Monoxide (CO)	1-hour	20	22,898	35	40,071
	8-hour	9	10,304	9	10,304
Respirable Particulate Matter (PM_{10})	24-hour	–	50	–	150
	Annual	–	20	–	–
Fine Particulate Matter ($PM_{2.5}$)	24-hour	–	–	–	35
	Annual	–	12	–	15
Lead (Pb)	30-day	–	1.5	–	–
	Rolling 90-day	–	–	–	0.15
	Quarterly	–	–	–	1.5
Sulfates (as SO_4)	24-hour	–	25	–	–
Hydrogen Sulfide (H_2S)	1-hour	0.03	42	–	–
Vinyl Chloride (C_2H_3Cl)	24-hour	0.01	26	–	–
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per km; visibility of 10 miles or more due to particles when relative humidity is less than 70%.		–	–

[1] Commonly known as the National Ambient Air Quality Standards (NAAQS)

ppmv = parts per million by volume;μg/m^3 = micrograms per cubic meter
For gases, μg/m^3 is calculated from ppmv based on pollutant molecular weight and standard conditions
(Standard Temperature = 25 °C [77 °F]; Standard Molar Volume = 24.465 liter/g-mole)

Sources: CARB 2010, USEPA 2010

Table 3.10-2
Attainment Status Summary – San Diego County

Criteria Pollutant	Federal Designation	State Designation
Ozone (O_3) (1-hour)	Attainment[1]	Nonattainment
Ozone (O_3) (8-hour)	Nonattainment[2]	Nonattainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Carbon Monoxide (CO)	Attainment	Attainment
Particulates (as PM_{10})	Unclassified[3]	Nonattainment
Particulates (as $PM_{2.5}$)	Attainment	Nonattainment
Lead (Pb)	Attainment	Attainment
Sulfates (as SO_4)	(no federal standard)	Attainment
Hydrogen Sulfide (H_2S)	(no federal standard)	Unclassified
Vinyl Chloride (C_2H_3Cl)	(no federal standard)	Unclassified
Visibility	(no federal standard)	Unclassified

1 The federal 1-hour standard of 0.12 parts per million by volume (ppmv) was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for a long period and because this benchmark is addressed in the SIP (per SDAPCD).

2 The 0.08 ppmv federal 8-hour ozone standard applied until May 27, 2008; after that, the standard was changed to 0.075 ppmv.

3 At the time of designation, if the available data do not support a designation of attainment or nonattainment, the area is designated as unclassified.

Source: SDAPCD 2010

Local emissions of PM_{10} are primarily the result of fugitive dust from travel on unpaved roads, as well as construction and agricultural activities. Coarser particles also may be emitted from activities that disturb the topsoil. Other sources include wind-blown dust, pollen, salts, brake dust, and tire-wear. Although $PM_{2.5}$ is a subset of PM_{10}, it differs from the rest of PM_{10}. While the majority of ambient PM_{10} results from direct emissions of the pollutant, a significant amount of the ambient $PM_{2.5}$ results from chemical transformation (i.e., chemical reaction) of precursors and condensing of gaseous pollutants in the atmosphere. Other than direct $PM_{2.5}$ emissions, the key pollutants contributing to $PM_{2.5}$ concentrations in the atmosphere are SO_2, NO_X, VOCs, and ammonia (CARB 2005).

The SDAPCD ambient air monitoring station closest to the alternative corridors is the Alpine monitoring station, located at 2300 West Victoria Drive, Alpine, California, approximately 40 miles (64 km) northwest of the corridors. The Alpine monitoring station measures only O_3 and NO_2. Table 3.10-3 summarizes validated annual air quality data collected at Alpine and other air monitoring stations in the region during the most recent five-year period for which validated data are available, i.e., from 2004 through 2008. Table 3.10-4 compares these data against state and federal standards as applicable and indicates whether or not the pollutants meet or exceed the status. For O_3, the number of days exceeding the standards in any given year is also listed.

3.10.1.5 Odors

The alternative corridors are in a relatively remote and fairly pristine desert area with a small population and no typical sources of odors. There is no record of offensive (nuisance) odors reported in the vicinity of the corridors.

Table 3.10-3
Ambient Air Quality in Project Vicinity – Regional Maxima and Averages

Pollutant[1]	Period	Units	2008	2007	2006	2005	2004
Ozone (O_3)	1-hour max	ppmv	0.140	0.130	0.120	0.110	0.110
	8-hour max[2]	ppmv	0.110	0.090	0.100	0.090	0.090
Nitrogen Dioxide (NO_2)	1-hour max	ppmv	0.047	0.057	0.057	0.061	0.063
	Annual avg	ppmv	0.008	0.010	0.010	0.011	0.011
Sulfur Dioxide (SO_2)	24-hour max	ppmv	0.004	0.004	0.006	0.005	0.015
	Annual avg	ppmv	0.002	0.003	0.003	0.003	0.003
Carbon Monoxide (CO)	1-hour max	ppmv	5.6	5.2	5.7	5.9	5.3
	8-hour max	ppmv	2.8	3.2	3.6	3.1	3.6
Particulates (as PM_{10})	24-hour max	$\mu g/m^3$	40	48	47	48	55
	Annual avg	$\mu g/m^3$	27	26	27	28	30
Particulates (as $PM_{2.5}$)	24-hour max	$\mu g/m^3$	31	43	38	41	44
	Annual avg	$\mu g/m^3$	13	12	11	11	13

[1] Data are reported for the nearest air quality monitoring station that measures each pollutant, as follows:
O_3 and NO_2 – Alpine Monitoring Station (40 miles (64 km) northwest of the corridors)
SO_2 – Chula Vista Monitoring Station (55 miles (88 km) west-northwest of the corridors)
CO – Escondido Monitoring Station (65 miles (105 km) northwest of the corridors)
PM_{10} and $PM_{2.5}$ – El Cajon Monitoring Station (49 miles (79 km) west-northwest of the corridors)

[2] The 0.08 ppmv federal 8-hour ozone standard applied until May 27, 2008; 0.075 ppmv thereafter.

Source: SDAPCD 2010

Table 3.10-4
Ambient Air Quality in Project Vicinity – Compliance History

Pollutant[1]	Period	Criteria	2008	2007	2006	2005	2004
Ozone (O_3)[2]	1-hour	State	Exceed	Exceed	Exceed	Exceed	Exceed
		days[3]	13	17	21	13	5
	8-hour	Federal	Exceed	Exceed	Exceed	Exceed	Exceed
		days[3]	10	6	14	5	2
Nitrogen Dioxide (NO_2)	1-hour	State	Meet	Meet	Meet	Meet	Meet
	Annual	State	Meet	Meet	Meet	Meet	Meet
Sulfur Dioxide (SO_2)	24-hour	State	Meet	Meet	Meet	Meet	Meet
	Annual	Federal	Meet	Meet	Meet	Meet	Meet
Carbon Monoxide (CO)	1-hour	State	Meet	Meet	Meet	Meet	Meet
	8-hour	State	Meet	Meet	Meet	Meet	Meet
Particulates (as PM_{10})	24-hour	State	Meet	Meet	Meet	Meet	Exceed
	Annual	State	Exceed	Exceed	Exceed	Exceed	Exceed
Particulates (as $PM_{2.5}$)	24-hour	Federal	Meet	Exceed	Exceed	Exceed	Exceed
	Annual	State	Exceed	Meet	Meet	Meet	Exceed

[1] Data are reported for the nearest air quality monitoring station that measures each pollutant, as follows:
O_3 and NO_2 – Alpine Monitoring Station (40 miles (64 km) northwest of the corridors)
SO_2 – Chula Vista Monitoring Station (55 miles (88 km) west-northwest of the corridors)
CO – Escondido Monitoring Station (65 miles (105 km) northwest of the corridors)
PM_{10} and $PM_{2.5}$ – El Cajon Monitoring Station (49 miles (79 km) west-northwest of the corridors)
[2] The 0.08 ppmv federal 8-hour ozone standard applied until May 27, 2008; 0.075 ppmv thereafter.
[3] Days = number of days standards were exceeded in the year
Source: SDAPCD 2010

3.10.1.6 Sensitive Receptors

Sensitive receptors are those populations that are more susceptible to the effects of air pollution than the population at large and those located in close proximity to localized sources of hazardous air pollutants (also referred to as air toxics) and CO, which are of particular concern. Sensitive receptors can include long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, parks and recreations centers, and athletic facilities. For air quality analyses, sensitive receptors within 0.25 mile (0.4 km) of a site are typically identified; no sensitive receptors are located within this distance from either of the alternative corridors. The nearest potential sensitive receptor is a mobile home located approximately 0.5 mile (0.8 km) west of the proposed transmission line route. Based on field observations this residence appears to be unoccupied.

3.10.1.7 Greenhouse Gases and Climate Change

The American Meteorological Society refers to climate change as any systematic change in the long-term statistics of climate elements (such as temperature, pressure, or winds) sustained over several decades or longer (American Meteorological Society 2009). The American Meteorological Society (2009) also indicated that climate change may be due to natural external forcings, such as changes in solar emission or slow changes in the Earth's orbital elements; natural internal processes of the climate system; or anthropogenic forcing. The climate system can be influenced by changes in the concentration of various gases in the atmosphere (greenhouse gases [GHG]) that affect the Earth's absorption of radiation.

In its Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2007, USEPA (2009) provided summary information on the work of the United Nations Framework Convention on Climate Change and the Intergovernmental Panel on Climate Change (IPCC); key information from that report is summarized below.

The United Nations Framework Convention on Climate Change defined climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods." In its Second Assessment Report of the science of climate change, the IPCC (1996, as cited in USEPA 2009) concluded that "human activities are changing the atmospheric concentrations and distributions of greenhouse gases and aerosols. These changes can produce a radiative forcing by changing either the reflection or absorption of solar radiation, or the emission and absorption of terrestrial radiation." Building on this conclusion, the IPCC Third Assessment Report (IPCC 2001, as cited in USEPA 2009) asserted that "concentrations of atmospheric greenhouse gases and their radiative forcing have continued to increase as a result of human activities."

The IPCC reports that the global average surface temperature of the Earth has increased by between 1.1 ± 0.4°F (0.6 ± 0.2°C) over the twentieth century. This value is about 0.27°F (0.15°C) larger than that estimated by the Second Assessment Report, which reported for the period up to 1994, "owing to the relatively high temperatures of the additional years (1995 to 2000) and improved methods of processing the data."

While the Second Assessment Report concluded, "the balance of evidence suggests that there is a discernible human influence on global climate," the Third Assessment Report more directly connects the influence of human activities on climate. IPCC concluded that, "In light of new evidence and taking into account the remaining uncertainties, most of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations."

In its most recent report (Fourth Assessment Report), IPCC (2007, as cited in USEPA 2009) stated that warming of Earth's climate is unequivocal, and that warming is very likely attributable to increases in atmospheric greenhouse gases caused by human activities. IPCC further stated that changes in many physical and biological systems, such as increases in global temperatures, more frequent heat waves, rising sea levels, coastal flooding, loss of wildlife habitat, spread of infectious disease, and other potential environmental impacts are linked to changes in the climate system, and that some changes might be irreversible.

There currently are no federal standards relating to GHG emissions, although the USEPA and other federal agencies have established voluntary programs with state and local agencies and businesses intended to increase energy and reduce GHG emissions from the electricity generation and transmission sector. The State of California has adopted the Global Warming Solutions Act of 2006 (Assembly Bill 32), which codifies California's goal of reducing statewide emissions of greenhouse gases to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on global warming emissions that will be phased in starting in 2012 to achieve maximum technologically feasible and cost-effective greenhouse gas emission reductions. California state law (California Health and Safety Code, Section 38505(g)) defines GHGs to include the following: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The most common GHG that results from human activity is CO_2, followed by CH_4 and N_2O (Office of Planning and Research 2008).

Global warming potential is defined by the United Nations Framework Convention on Climate Change (2009) as "an index representing the combined effect of the differing times greenhouse gases remain in the atmosphere and their relative effectiveness in absorbing outgoing infrared radiation" and is intended to serve as an estimate of how much a given mass of a particular GHG contributes to global warming. It is a relative scale that compares the mass of each GHG to the mass of a reference gas, namely CO_2 (USEPA 2009). The global warming potential of emissions is measured in metric tons of CO_2 equivalents. CO_2 equivalents are calculated by multiplying the mass of each emitted gas by the coefficient of its global warming potential and summing the results for all the different gases. Based on the most recently published inventory of California's estimated GHG emissions, statewide emissions of CO_2 equivalents equaled 480 million metric tons in 2006 (CARB 2009). San Diego County's estimated 2004 GHG emissions totaled 34 million metric tons of CO_2 equivalents, and more recent data indicate emission levels remained at this level through 2006 (University of San Diego 2008).

Neither the federal government nor California has established thresholds for determining the significance of GHG emissions and their contribution to climate change. In California, however, CARB has proposed an operational significance threshold of 7,000 metric tons of CO_2 equivalents per year for non-exempt industrial projects (CARB 2008). In this impact assessment, the proposed CARB threshold is shown in Tables 3.10-5 and 3.10-8 to provide a relative (i.e., non-binding) characterization of the potential impacts on climate change that would result due to implementation of the alternatives. No enforceable rules or regulations have been promulgated by CARB or any other state agency that define a significant source of GHG emissions. In addition, there are no applicable facility-specific emission limitations or caps for GHG emissions, either statewide or at the local Air Pollution Control District or Air Quality Management District level. Thus, there is no present state or local regulatory or guidance mechanism for determining whether a project advances or hinders California's GHG reduction goals (California Air Pollution Control Officers Association 2008).

Table 3.10-5
Emissions Significance Thresholds

Type of Emissions	Construction		Operation	
	lb/day	tons/yr	lb/day	tons/yr
Reactive Organic Gases (ROG as CH_4)	75	14	55	n/a
Carbon Monoxide (CO)	550	100	550	n/a
Nitrogen Oxide (NO_X as NO_2)	250	40	55	n/a
Sulfur Dioxide (SO_X as SO_2)	250	40	150	n/a
Particulates (PM_{10})	100	15	150	n/a
Particulates ($PM_{2.5}$)	55	10	55	n/a
Carbon Dioxide Equivalents (CO_2 eqv)	n/a	7,716	n/a	7,716

lb/day = pounds per day; tons/yr = tons per year
Sources: SDAPCD 1998; ICAPCD 2007; County of San Diego 2007a; CARB 2008

The Council on Environmental Quality (CEQ) on February 18, 2010, issued Draft Guidance on Considering Climate Change under NEPA for public comment. In the draft guidance, CEQ states that a "reference point of 25,000 metric tons of direct CO_2-equivalent GHG emissions may provide agencies with a useful indicator – rather than an absolute standard of significant effects – for agencies' action-specific evaluation of GHG emissions and disclosure in their NEPA documents. CEQ does not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment."

3.10.2 Environmental Impacts

3.10.2.1 Methodology

Impacts to air quality would result from gaseous and particulate emissions caused by construction equipment and vehicles. Detailed lists of construction equipment, the anticipated construction schedule, and emission calculations are provided in Appendix F. The analysis of air quality impacts of the alternatives was based on equipment specifications and planning estimates for the various construction activities as detailed in Appendix F.

Emission calculations were performed using the most recent (2008) emission factors published by the South Coast Air Quality Management District (SCAQMD 1993, with updates in 2008)[45] and the USEPA (2006, 2009). Although actual construction is expected to require approximately two months of planned work activities, construction could be distributed over a 6-month period if work stoppages are required as a result of inclement weather or other factors. Extending the schedule to 6 months would not affect the air quality analysis because it is based on maximum daily emissions (pounds per day) and total emissions (tons per year), which would remain

[45] SDAPCD does not publish its own set of emission factors. The SCAQMD factors are conservative pre-processed output from CARB's onroad vehicle and offroad equipment emission factor programs EMFAC and OFFROAD, respectively, which are based on federal emissions standards contained in 40 CFR 86 et seq. and 40 CFR 89.112.

unchanged. Air quality impacts were assessed using significance thresholds established by the SDAPCD for air quality impact analyses, as outlined in the County of San Diego Guidelines for Determining Significance – Air Quality (2007a), which are listed in Table 3.10-5. The greatest potential for impacts would occur during the construction activities that result in ground disturbances. As discussed below, impacts from inspection and maintenance activities during operations were assessed qualitatively, through comparison to emissions from construction.

Emissions from construction and operation emissions were also compared to applicable general conformity thresholds to determine if implementation of either alternative would require a formal federal conformity determination. An alternative would be exempt from a conformity determination if the total direct and indirect emissions from construction and operation activities would be less than the applicable thresholds. In San Diego County, general conformity thresholds have been established for ozone precursors and PM_{10}.[46] The applicable threshold levels are 50 tons per year for NO_X and VOCs, 70 tons per year for PM_{10}, and 100 tons per year for CO (40 CFR 93.153).

3.10.2.2 Alternative 1 – No Action

Under the No Action alternative, the proposed transmission line would not be installed; therefore, there would be no change from current levels of impact on air quality in the U.S. or on global climate change.

3.10.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Air Quality. Project construction would generate fugitive dust and exhaust emissions from the use of construction equipment and vehicles. Access road construction, marshalling of materials, structural foundation excavation and concrete placement, tower structure delivery and setup, conductor installation, and fugitive dust from travel along the right-of-way could each occur simultaneously in different places on any given day of the estimated 54-working-day construction period; however, construction emissions would vary substantially from day to day, depending on the level of activity, the specific type of activity, and, for dust, the prevailing weather conditions. Table 3.10-6 lists estimated equipment and vehicle requirements and maximum use during the various activity phases. Table 3.10-7 presents a summary of the estimated maximum construction emissions (conservative case; i.e., the estimates are higher than would likely occur on a daily basis) with implementation of the fugitive dust reduction measures that would be required by the SDAPCD.

[46] General conformity thresholds are only established for those pollutants for which area emissions exceed designated NAAQS. As shown in Table 3.10-2, San Diego County is a designated attainment area for all pollutants except ozone and PM_{10}.

Table 3.10-6
Estimated Equipment and Vehicle Use During Construction

Activity	Equipment and Vehicles				Working Days[1]	Daily		
	Type	Category	BHP	qty		hours	VMT	VKT
Survey Sites	pickup truck	onroad LD		1	6		50	80
Worker Commuting	pickup truck	onroad LD		20	54		1,000	1,609
Hauling, fill dirt	dump truck, 18 cubic yards	onroad HHD		12	48		1,080	1,738
Aerial Support	helicopter	aircraft	420	1	3	8		
Marshalling Yards (Staging Areas)	pickup truck	onroad LD		3	54		150	241
	water truck	onroad HHD		1	54		50	80
	tractor truck w/trailer	onroad HHD		1	48		50	80
	hydraulic crane, 25 ton	offroad	300	1	36	3.33		
	loader, model 980	offroad	300	1	48	3.75		
	forklift, 5 ton	offroad	155	1	48	3.75		
	portable generator	offroad	5	1	48	3.75		
Grading & Road Work	pickup truck	onroad LD		2	12		100	161
	water truck	onroad HHD		1	12		50	80
	bulldozer	offroad	285	1	12	8		
	steamroller	offroad	80	1	12	8		
Foundations	pickup truck	onroad LD		2	12		100	161
	water truck	onroad HHD		1	12		50	80
	concrete truck	onroad HHD		2	12		200	322
	drill rig	offroad	600	1	12	10		
Steel Assembly & Erection	pickup truck	onroad LD		3	12		150	241
	water truck	onroad HHD		1	12		50	80
	tractor truck w/trailer	onroad HHD		1	12		50	80
	crane, 40 ton	offroad	350	1	12	10		

Table 3.10-6
Estimated Equipment and Vehicle Use During Construction

Activity	Equipment and Vehicles				Working Days[1]	Daily		
	Type	Category	BHP	qty		hours	VMT	VKT
	air compressor	offroad	75	1	12	10		
	portable generator	offroad	5	1	12	10		
Conductor Installation	pickup truck	onroad LD		2	12		100	161
	water truck	onroad HHD		1	12		50	80
	flatbed truck w/reels	onroad MD		1	12		50	80
	rigging truck	onroad MD		5	12		250	402
	dump truck	onroad HHD		1	6		50	80
	puller tensioner	offroad	165	1	12	10		
	splice rig	offroad	300	1	6	10		
	portable generator	offroad	5	1	12	10		
Cleanup	pickup truck	onroad LD		2	12		100	161

[1] Section 2 (Proposed Action and Alternatives) indicates that work would be completed over a six-month period; however, the work is expected to occur over a number of sporadic intervals. In no case would a continuous period of work exceed 54 days.

HHD = heavy duty
LD = light duty
MD = medium duty
qty = quantity
VMT = vehicle miles traveled
VKT = vehicle kilometers traveled

For onroad vehicles, weight class applies in lieu of BHP rating

BHP = brake horsepower (measure of an engine's output without the loss in power caused by the gearbox, generator, differential, water pump, and other auxiliary components such as alternator, power steering pump, exhaust system, etc.)

Construction activities occur six days per week maximum; Daily operating hours, VMT and VKT are maximum estimates

Model 980 Loader used for loading haul trucks with fill dirt

Source: Sempra 2009, as cited in EDAW, Inc. 2009b

Table 3.10-7
Estimated Maximum Construction Emissions[1]

Criteria Emissions	Peak lb/day	Threshold lb/day	Significant Yes/No	Total tons[2]	Threshold tons[2]	Significant Yes/No
Reactive Organic Gases (ROG as CH_4)	8	75	No	0.21	14	No
Carbon Monoxide (CO)	37	550	No	0.95	100	No
Nitrogen Oxide (NO_X as NO_2)	74	250	No	1.92	40	No
Sulfur Dioxide (SO_X as SO_2)	0	250	No	0.00	40	No
Combustion Particulates (C-PM_{10})	4	100	No	0.09	15	No
Combustion Particulates (C-$PM_{2.5}$)	3	55	No	0.08	10	No
Fugitive Dust (F-PM_{10})	85	100	No	1.94	15	No
Fugitive Dust (F-$PM_{2.5}$)	16	55	No	0.34	10	No

[1] Includes dust suppression measures required by the SDAPCD
[2] Entire project
Fugitive dust and combustion particulates are determined exclusively; C = combustion particle, F = fugitive dust
Sources: SCAQMD 1993, with updates in 2008; USEPA 2010; SDAPCD 1998; ICAPCD 2007; County of San Diego 2007a

Consistent with SDAPCD Rule 55 – Fugitive Dust Control (adopted June 24, 2009; effective December 24, 2009), the following measures would be implemented where and as applicable:

- Water or non-toxic soil stabilizers would be applied to all unpaved access roads, parking areas, and staging areas with sufficient frequency to maintain an effective level of soil moisture or cohesion while avoiding excessive water application.
- Sites would be pre-watered 48 hours in advance of clearing and the amount of disturbed area would be reduced where possible in order to conserve water.
- Construction grading would be prohibited on days when the wind gusts exceed 25 mph (40 kilometers per hour [kph]) to the extent feasible to control fugitive dust and reduce water consumption.
- All trucks hauling soil and other loose material would be pre-moistened and covered or maintain at least 2 feet (0.6 m) of freeboard.
- Vehicle speeds would be limited to 15 mph (24 kph) on unpaved roads.
- Paved access roads would be machine-swept daily if visible soil material is carried onto adjacent public roads or streets. If necessary, trucks and equipment would be washed upon exiting the job site and before entering public roads or streets.
- Soil stabilizers would be applied to inactive construction areas on an as-needed basis.
- Exposed stockpiles of soil and other excavated materials would be contained within perimeter silt fencing, watered, treated with soil binders, or covered as necessary.

- Vegetative ground cover would be planted in disturbed areas as soon as possible following construction.
- A Dust Control Plan would be prepared and filed in advance of construction in accordance with SDAPCD guidelines pursuant to Rule 55. The plan would describe how these measures would be implemented and monitored at all locations of the Project. The Dust Control Plan would identify nearby sensitive receptors, such as residences (if any); and, specify the means of minimizing impacts on these receptors (for example, by locating equipment and staging areas away from sensitive receptors). The Dust Control Plan would emphasize water conservation by limiting water application strictly to necessary quantities.

Additionally, where applicable, water would be applied in sufficient amounts and frequency to maintain a stabilized surface starting from the point of intersection of a dirt or gravel road with the public road paved surface, or else rattle plates (grizzlies) would be used to minimize mud and dust from being transported onto paved roadway surfaces from dirt or gravel roads. Measures involving water use may need to be modified as appropriate depending on water supply conditions during construction.

As shown in Table 3.10-7, maximum emissions of criteria pollutants are estimated to be well below applicable thresholds, including general conformity thresholds. Construction impacts would be temporary, localized, and minor, and a formal Conformity Determination is not required. Since estimated emissions are based on conservative assumptions (i.e., the maximum potential impact is estimated), actual emissions are expected to be lower. Fugitive dust emissions would be minimized through compliance with SDAPCD Rule 55 – Fugitive Dust Control, as previously discussed. Fugitive dust emissions would be largely associated with earthmoving and fill dirt hauling during roadwork and laying of foundations. Therefore, truck trips are assumed to occur for a brief period of 48 working days after which the bulk of fugitive dust emissions from project construction would permanently cease. Potential mitigation measures in addition to the APMs described above that could further reduce emissions from combustion and dust in the project area during construction are Mitigation Measures Air Quality-1 (use low-emission construction equipment), Air Quality-2 (minimize vehicle idling), and Air Quality-3 (encourage carpooling).

Climate Change. Construction would result in a minor amount of GHG emissions because of the short duration and relatively small number of emission sources (essentially vehicles). Table 3.10-8 lists the estimated maximum GHG emissions that would be emitted during construction activities.

As shown in Table 3.10-8, maximum GHG emissions (CO_2 equivalents) are estimated to be well below the threshold proposed by CARB. The construction emissions from the 230-kV transmission line would be equivalent to an estimated 0.00003 percent of California's estimated 2006 emissions (480 million metric tons of CO_2 equivalents [CARB 2009]), and 0.00045 percent of San Diego County's estimated 2006 emissions (34 million metric tons of CO_2 equivalents [University of San Diego 2008]).

Table 3.10-8
Estimated Maximum Construction GHG Emissions

Greenhouse Gas Emissions	Peak	Total	Threshold	Significant
	lb/day	tons[1]	tons[1]	Yes/No
Carbon Dioxide (GHG - CO_2)	11,173	263	n/a	n/a
Methane (GHG – CH_4)	0.5	0.01	n/a	n/a
Nitrous Oxide (GHG - N_2O)	0.4	0.01	n/a	n/a
Carbon Dioxide Equivalents (CO_2 eqv)[2]	11,269	266	7,716	No

1 Entire project

2 Carbon dioxide equivalents (CO_2 eqv) are calculated by summing the products of mass GHG emissions by species times their respective global warming potential (GWP) coefficients.

Sources: SCAQMD 1993, with updates in 2008; USEPA 2009; CARB 2008

As a result, the contribution to climate change from GHG emissions during construction of the 230-kV Route would be extremely small when compared with local and state inventories and the impacts on climate change are expected to be minor. However, the estimated emissions are conservative-case and actual emissions would likely be lower. Although the release of GHG during construction would be temporary, the GHG emissions would likely remain in the atmosphere long-term. Implementation of potential Mitigation Measures AQ-1 (use low-emission construction equipment), AQ-2 (minimize vehicle idling), and AQ-3 (encourage carpooling) would further reduce GHG emissions during construction.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 would not result in air quality or climate change impacts. The main purpose of the water use is to control dust and particulates at the construction site. JCSD's Well #6 is an existing well and no new land disturbance or construction will be required to facilitate trucking of water from the well site to the project construction site. The air quality analysis performed for the ESJ U.S. Transmission Line project (Section 3.10) accounts for construction associated with the proposed access road, as well as various offsite trucking activities, including water delivery.

Operations Impacts

Air Quality. Once constructed, there would not be any direct emission of air pollutants from the proposed transmission line. Its only function would be to transmit electricity generated by the ESJ Wind project in Mexico. Because this electricity would be produced without burning carbon-based fuel, essentially no air pollutants would be generated per megawatt-hour of output dispatched (except for de minimis emissions related to inspections and maintenance [vehicle access], discussed below). Additionally, by transmitting electricity from the wind turbines, the 230-kV transmission line would aid in reducing the need to generate electricity within the U.S. using fossil-fuel generating resources, which could indirectly lead to reduced emissions from fossil fuel-fired power plants.

Inspection and maintenance activities would require occasional vehicle trips to patrol the right-of-way and conduct any necessary repairs. Equipment and vehicle usage would be considerably less than required during construction, and the incremental increase in emissions caused by such usage would of a de minimis nature and considerably below the applicable threshold shown in Table 3.10-5. Impacts to air quality due to inspection and maintenance activities would be minor, periodic, and of short duration on each occasion, but would occur for the life of the ESJ U.S. Transmission Line project.

Climate Change. Sulfur hexafluoride (SF_6) is a highly potent GHG (GWP 22,800) that is used as a dielectric medium (gaseous insulator) in high-voltage switchgear and circuit breakers at electric substations to prevent arcing (IPCC 2007). It is not associated with transmission lines per se; rather, it is associated only with facilities that are connected to transmission lines (i.e., the ECO Substation switchyard). Operation of the 230-kV Route would not directly result in emissions of SF_6, however, since the ECO Substation switchyard is a connected action under CEQ's NEPA regulations, some of its fugitive SF_6 emissions are considered associated with the transmission line operation as proposed. According to SDG&E, the ECO Substation switchyard would lose about 0.03 metric tons (30 kilograms) per year of SF_6 or 684 metric tons per year CO_2 equivalents (SDG&E 2009b; IPCC 2007). To minimize fugitive SF_6 losses, SDG&E would implement a monitoring plan which would include inventorying SF_6 in its equipment, accounting for make-up quantities, identifying and repairing or replacing leaky equipment in a timely fashion, training employees on the climate change effects of SF_6, and including design elements to reduce energy consumption and thermal cycling of switchgear which helps reduce leakage (SDG&E 2009b).

Alkaline soils, such as soils found in desert environments in the project area, have been studied for their ability to sequester CO_2. A 2008 news report published in Science[47] indicates that there may be a link between alkaline sinks and CO_2 sequestration. A research team measured CO_2 flux above Mojave desert vegetation in an area of loamy sand soil at the Nevada Test Site from March 2005 to February 2007. The team reported that the desert biome absorbed roughly 100 grams of carbon per square meter, a value as large as is reported for temperate forests and grassland ecosystems. Other researchers have expressed surprise at these results. The mechanisms of the uptake process are not well understood, and the rate and duration of carbon uptake is highly variable.

Nevertheless, applying this metric of 100 grams of carbon per square meter per year, and assuming that the soil disturbance from the associated with transmission line and access road improvements (up to 10.8 acres [4.4 ha] of permanent land disturbance) results in a total loss of sequestration properties, then an estimated 4.4 metric tons CO_2 per year would not be captured in the onsite soils. This potential loss of CO_2 sequestration capacity is notable, but is considered a de minimis emissions impact. As a point of reference, CARB has proposed an operational significance threshold of 7,000 metric tons of CO_2 equivalents per year for non-exempt industrial projects (CARB 2008).

As discussed above, the transmission line would transmit electricity generated by the ESJ Wind project without burning carbon-based (or any other) fuel; therefore, essentially no GHG would be generated per megawatt-hour of output dispatched (except for related to inspections and

[47] Stone 2008. Available online at: http://www.ecostudies.org/press/Schlesinger_Science_13_June_2008.pdf.

maintenance). Additionally, by transmitting electricity from the wind turbines, the transmission line would aid in reducing the need to generate electricity using fossil-fuel generating resources, which could indirectly lead to reduced GHG emissions from fossil fuel-fired power plants, as estimated below.

The ESJ Wind project would potentially have an average annual generating capacity of approximately 5,475,000 megawatt-hours[48] which would otherwise cause to be emitted about 2,190,000 metric tons of CO_2 equivalents annually from mixed generating resources serving the California region[49] (TCR 2008). In addition to GHG, criteria pollutants (VOC, CO, NO_X, SO_X, PM_{10}, $PM_{2.5}$) from natural gas, coal, and biomass generating resources would otherwise be emitted elsewhere. Thus, the ESJ U.S. Transmission Line project would have a quantifiable positive effect on the environment over the long-term since GHG and criteria emissions from fuel combustion would be avoided.

Because wind energy is intermittent, it is possible that back-up fossil-fueled generation could be necessary. However, it is also possible that renewable sources of generation could be used (e.g., solar). The potential need for and source of back-up generation, and thus the potential emissions from such a source, is speculative. Therefore, there is no basis upon which to make conclusions regarding back-up generation or associated potential emissions.[50]

Impacts in the U.S. due to Related Activities in Mexico

Air quality impacts in the U.S. due to related activities in Mexico would occur if criteria pollutant emissions resulting from construction or operation of the ESJ Wind project affected air quality in the U.S. Construction activities south of the border would result in fugitive dust and exhaust emissions from vehicles and other activities. Prevailing wind in the vicinity of the ESJ Wind project is from the northwest, thus most construction emissions would be transported farther south, away from the U.S., in the direction of the prevailing winds. However, air quality impacts affect a basin and it is possible that the wind will be blowing in a direction where construction emissions and PM_{10} in particular, would reach the US. Therefore, temporary air quality impacts could occur in the U.S. from construction activity in Mexico. No air emissions in the U.S. are anticipated during operation of the ESJ Wind project because the de minimis emissions from inspection and maintenance activities in Mexico would be typically directed southward.

With regard to climate change, impacts could occur in the U.S. as a result of GHG emissions during the transport of wind turbine components on U.S. Highways.[51] As discussed in

[48] Assumes 1,250 MW total installed capacity operating at 50 percent average annual capacity factor.

[49] GHG emissions are 882 lb/MW-hr or 0.40 metric tons/MW-hr as CO_2 equivalents for the California region (TCR 2008).

[50] This is an electrical grid management issue that is addressed by California Independent System Operator (ISO). The issue of grid reliability will be considered by DOE external to the NEPA process. Additional discussion on this issue was provided by Sempra in their July 1, 2011 letter to DOE. This letter is available on the project website: http://www.esjprojecteis.org/docs/Sempra_Response_to_DOE_Questions_2011-07-01.pdf.

[51] Emissions of criteria pollutants during transport of turbine components are regulated as mobile source emissions and would not involve the creation of a new stationary source; therefore, criteria pollutants have not been estimated.

Section 3.7 (Transportation and Traffic), it is assumed that construction of the ESJ Wind project in Mexico may require the transport of wind turbines and associated equipment from the U.S. into Mexico and transportation of each turbine may require up to 15 truckloads. The potential transport scenarios identified would involve transport of turbine components from either the Port of Houston, the Port of San Diego, or from the Midwest along major U.S. highways to the Otay Mesa border crossing, which is approximately 5.4 miles (8.7 km) east of the San Ysidro (Tijuana) border crossing in San Diego County.

To estimate the potential GHG emissions of turbine transport scenarios, round trip distances were used to account for multiple trips needed to transport the wind turbine components proposed for Phase 1 of the ESJ Wind project. Vehicle requirements and utilization for turbine transport and estimated GHG emissions are listed in Tables 3.10-9 and 3.10-10, respectively. As shown in the tables, due to the much greater distance involved, GHG emissions associated with trucking turbine components from the Port of Houston or the Midwest would be considerably higher than from the Port of San Diego, although all would still comprise a temporary and incremental increase in total GHGs emitted (worst-case, Houston, would be less than 0.02 percent of San Diego's total emissions in 2006). Development of future phases of wind development would result in additional incremental emissions.

3.10.2.4 Alternative 3 – Single Circuit 500-kV Transmission Line

The site terrain, topographic features, and air quality along the 500-kV Route are substantially similar to the 230-kV Route described above because the routes are adjacent to each other; and construction, operations, and maintenance activities for the 500-kV Route would be substantially the same as for the 230-kV Route. Consequently, the impacts that would occur under the 500-kV Alternative would be substantially similar to those described for 230-kV Alternative. Impacts would be temporary and minor during construction, and long-term but minor during operations. The same potential mitigation measures would apply, as described below.

3.10.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The site terrain, topographic features, and air quality along the revised 230-kV and 500-kV Routes are substantially similar to the Alternative 2 and 3 routes described above because all proposed routes are adjacent to each other. Construction, operations, and maintenance activities for the revised routes would also be substantially the same as for Alternatives 2 and 3. Consequently, the impacts that would occur under Alternative 4 would be substantially similar to those described for Alternatives 2 and 3. Impacts would be temporary and minor during construction, and long-term but minor during operations. The same potential mitigation measures would apply, as described below.

Table 3.10-9
Estimated Vehicle Use for Transport of Wind Turbines

Point of Origin	Vehicle Type	Category	Truckloads per Turbine	Travel Days per Truckload	Total Number of Turbines	VMT per Load	VKT per Load	Total VMT	Total VKT
Port of San Diego	Tractor truck w/ trailer	Onroad HHD	15	1	52	600	966	31,200	50,212
Port of Houston	Tractor truck w/ trailer	Onroad HHD	15	6	52	7,500	12,070	2,340,000	3,765,865
Midwest[1]	Tractor truck w/ trailer	Onroad HHD	15	8	52	7,500	12,070	3,120,000	5,021,153

HHD = heavy duty
VMT = vehicle miles traveled
VKT = vehicle kilometers traveled
Daily VMT and VKT are maximum estimates

[1] Midwest origin estimated to require approximately 3,000 travel miles one-way as measured from major cities (e.g. Chicago, Minneapolis)

Source: Sempra 2009, as cited in EDAW, Inc. 2009b

Table 3.10-10
Estimated Wind Turbine Trucking GHG Emissions

Greenhouse Gas Emissions	via San Diego		via Houston		via Midwest	
	Peak lb/day	**Total tons[1]**	**Peak lb/day**	**Total tons[1]**	**Peak lb/day**	**Total tons[1]**
Carbon Dioxide (CO_2)	2,532	66	31,653	4,938	31,653	6,584
Methane (CH_4)	0.1	0.00	1.0	0.15	1.0	0.20
Nitrous Oxide (N_2O)	0.1	0.00	0.9	0.14	0.9	0.19
Total Carbon Dioxide Equivalents (CO_2 eqv)[2]	**2,557**	**66**	**31,956**	**4,985**	**31,956**	**6,647**

[1] Total emissions for transport of all turbines in Phase 1.

[2] Carbon dioxide equivalents (CO_2 eqv) are calculated by summing the products of mass GHG emissions by species times their respective GWP coefficients.

Sources: SCAQMD 1993, with updates in 2008; USEPA 2009

3.10.3 Mitigation Measures

Implementation of the following potential air quality mitigation measures would reduce the already temporary and minor air quality impacts from construction.

Air Quality-1: Use Low-Emission Construction Equipment

Construction equipment should be maintained in accordance with the manufacturer specifications and ESJ should use low-emission equipment (described below). All offroad construction equipment and portable equipment diesel engines not registered under the CARB Statewide Portable Equipment Registration Program, that have a rating of 50 horsepower (hp) or more, would meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, Sec. 2423(b)(1) unless that engine is not available for a particular item of equipment. In the event a Tier 2 engine is not available for any offroad engine larger than 100 hp, that engine would be equipped with a Tier 1 engine. If any engine larger than 100 hp does not meet Tier 1 standards, that engine should be equipped with a catalyzed diesel particulate filter (soot filter), unless the engine manufacturer indicates that the use of such devices is not practical for that particular engine type. ESJ should substitute small electric-powered equipment for diesel- and gasoline-powered construction equipment, where feasible.

Air Quality-2: Minimize Vehicle Idling

To the extent feasible and when safe to do so, unnecessary construction vehicle idling time should be minimized. The ability to limit construction vehicle idling time is dependent upon the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following start-up that limit their availability for use following start-up. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. ESJ should apply a “common sense” approach to vehicle use; if a vehicle is not required for use immediately or continuously for construction activities, its engine would be shut off. Construction foremen should include briefings to crews on vehicle use as a part of pre-construction conferences including a discussion of “common sense” regarding vehicle use. Nothing in this mitigation measure should be construed to create or contribute to a traffic hazard or obstruction on public roadways caused by stopped vehicles.

Air Quality-3: Encourage Carpooling

If suitable park-and-ride facilities are available in the vicinity of the alternative corridors, construction workers should be encouraged to carpool to the job site to the extent feasible. The ability to develop an effective carpool program for the project would depend upon the proximity of carpool facilities to the job site, the geographical commute departure points of construction workers, and the extent to which carpooling would not adversely affect worker arrival time and the project’s construction schedule.

3.11 WATER RESOURCES

This section analyzes the potential impacts of the project on surface water and groundwater resources, including wetlands and floodplains.

3.11.1 Affected Environment

3.11.1.1 Surface Water Resources

The alternative corridors are located in the Anza-Borrego hydrologic unit within the Colorado River Hydrologic Basin as defined by the Colorado River Regional Water Quality Control Board. The basin encompasses approximately 20,000 square miles (51,200 square km) in the southeastern portion of California, including parts of San Bernardino, Riverside, and San Diego counties, and all of Imperial County. Drainage within the Anza-Borrego hydrologic unit flows to the Salton Sea, with the exception of two areas in the northwest corner of the unit that drain internally to the Clark and Borrego valleys. The alternative corridors are within a semi-arid, desert region that is dominated by dry washes and intermittent drainages. The average annual rainfall in the area, as measured in Boulevard, California (approximately 10 miles [16.1 km] west of the corridors) is 12.7 inches (32.2 cm), with the majority of precipitation occurring between November and May (Western Region Climate Center 2003). Surface water runoff primarily occurs during the winter in response to seasonal rainfall, with occasional runoff in the summer in association with local thunderstorms.

Surface water resources in the vicinity of the corridors consist of ephemeral creeks and washes that flow only in response to rainfall events. The USGS In-Ko-Pah Gorge quadrangle map (USGS 1975) depicts an intermittent stream flowing from east to west near the corridors as depicted in Figure 3.11-1. This drainage is located approximately 1,200 feet (370 m) south of the main access road into the area and approximately 1,700 feet (523 m) north of the U.S.-Mexico border. The results of a survey conducted by EDAW, Inc. in April 2009 indicate that the identified "intermittent stream" is actually an erosive drainage feature (Erosion Feature 1) associated with water runoff from the adjacent roadway used by the U.S. Border Patrol (EDAW, Inc. 2009a). It is described as a series of rill (narrow) erosive features that are generally 3 to 6 inches (8 to 15 cm) deep and 2 to 3 feet (0.6 to 0.9 m) wide. These erosion features converge to create a wider erosion feature that becomes indiscernible as the flow appears to transition to sheet flow (EDAW, Inc. 2009b) east of the alternative corridors. The EDAW, Inc. survey was conducted to determine whether or not there are jurisdictional waters of the U.S. (under Section 404 of the Clean Water Act) or waters of the State of California (under Section 1600 et seq. of the California Fish and Game Code) within or near the alternative corridors. The results of the survey concluded that this drainage feature did not meet the criteria for jurisdictional waters of the U.S. since it appears to convey runoff for only a short distance over a short duration and it lacks evidence of a definable bed, bank, or ordinary high water mark (EDAW, Inc. 2009b). Accordingly, it is not considered waters of the U.S. under Section 404 of the Clean Water Act or waters of the State of California under Section 1600 et seq. of the California Fish and Game Code. The location of Erosion Feature 1, as mapped by EDAW, Inc. (2009a), is shown in Figure 3.11-2a (Alternatives 2 and 3) and Figure 3.11-2b (Alternatives 4A and 4B). Site photographs from the EDAW, Inc. (2009a) survey are presented in Figure 3.11-3 and this drainage feature is shown in Photograph 3. The map key for the site photographs is provided on Figure 3.11-2a.

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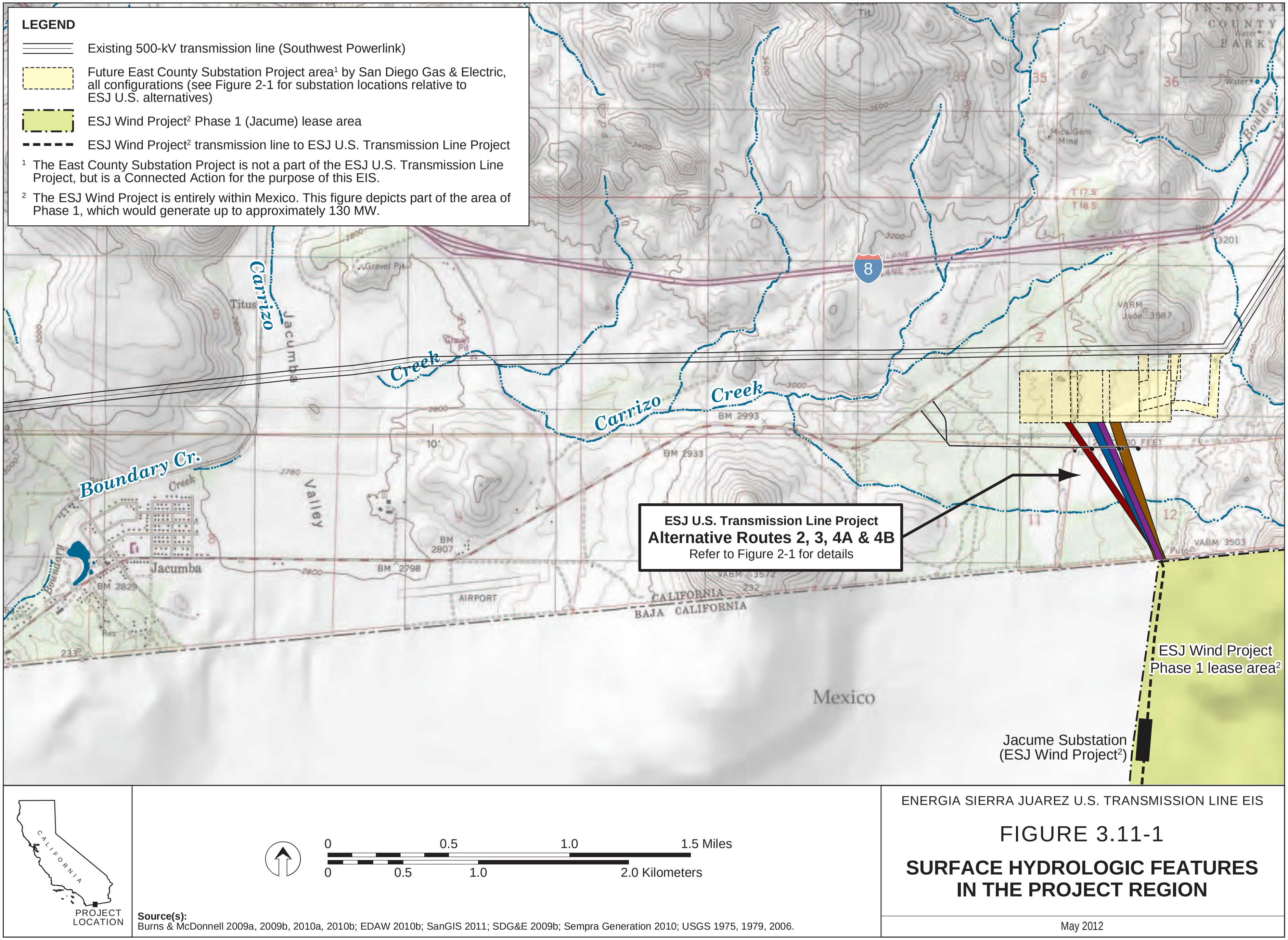

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.11-1

SURFACE HYDROLOGIC FEATURES IN THE PROJECT REGION

May 2012

Source(s):
Burns & McDonnell 2009a, 2009b, 2010a, 2010b; EDAW 2010b; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1975, 1979, 2006.

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_11-1_SurfaceHydrologicFeatures-Regional_11x8_v7.ai (04/05/2012, 04:19 pm) R. Wurgler/C. Blankenhorn/T. Murphy

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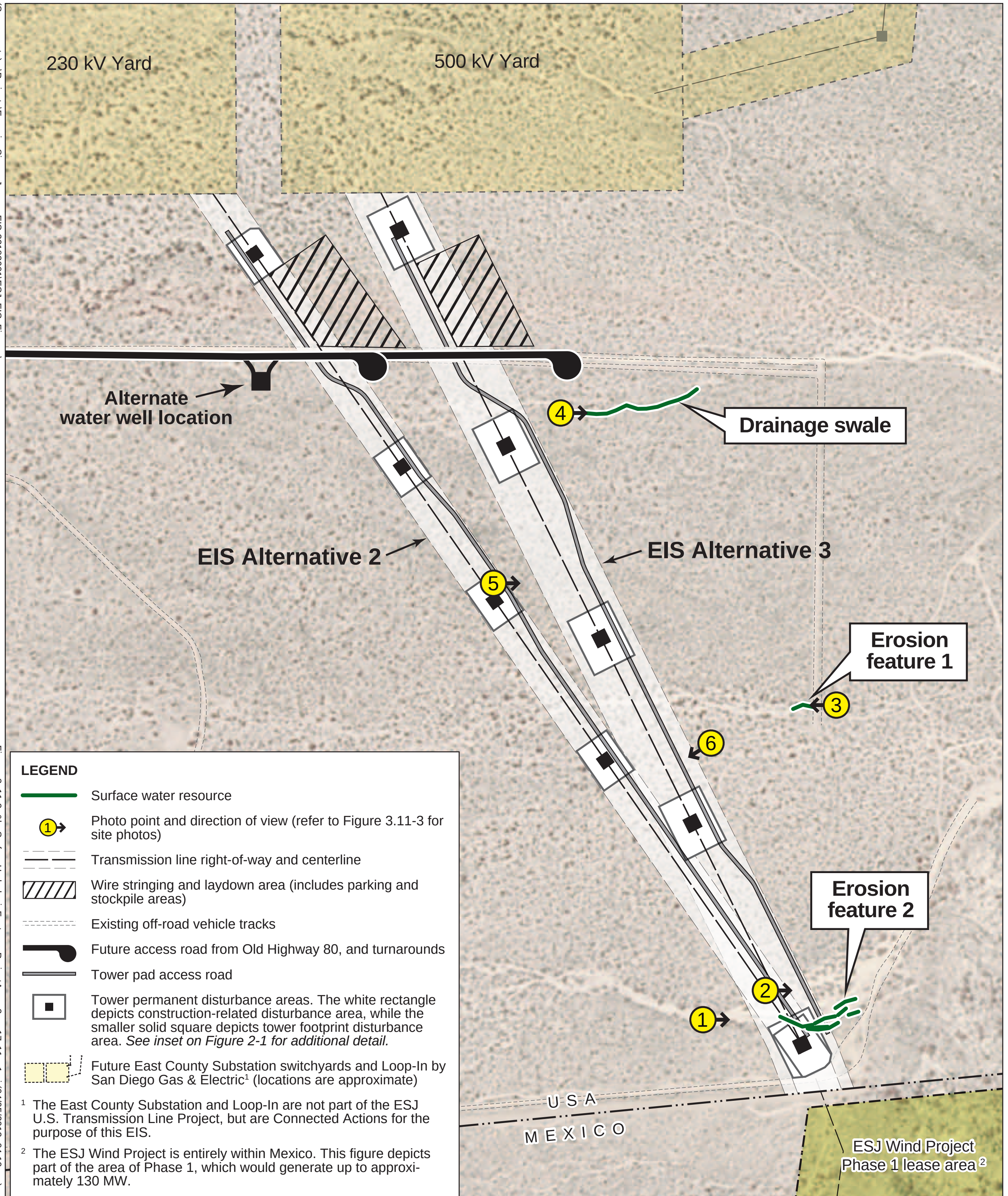

PROJECT LOCATION

0 200 400 600 800 Feet
0 40 80 120 160 200 Meters

Source(s): Burns & McDonnell 2009a, 2009b, 2010a, 2010b; EDAW 2010b; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1979, 1998, 2006.

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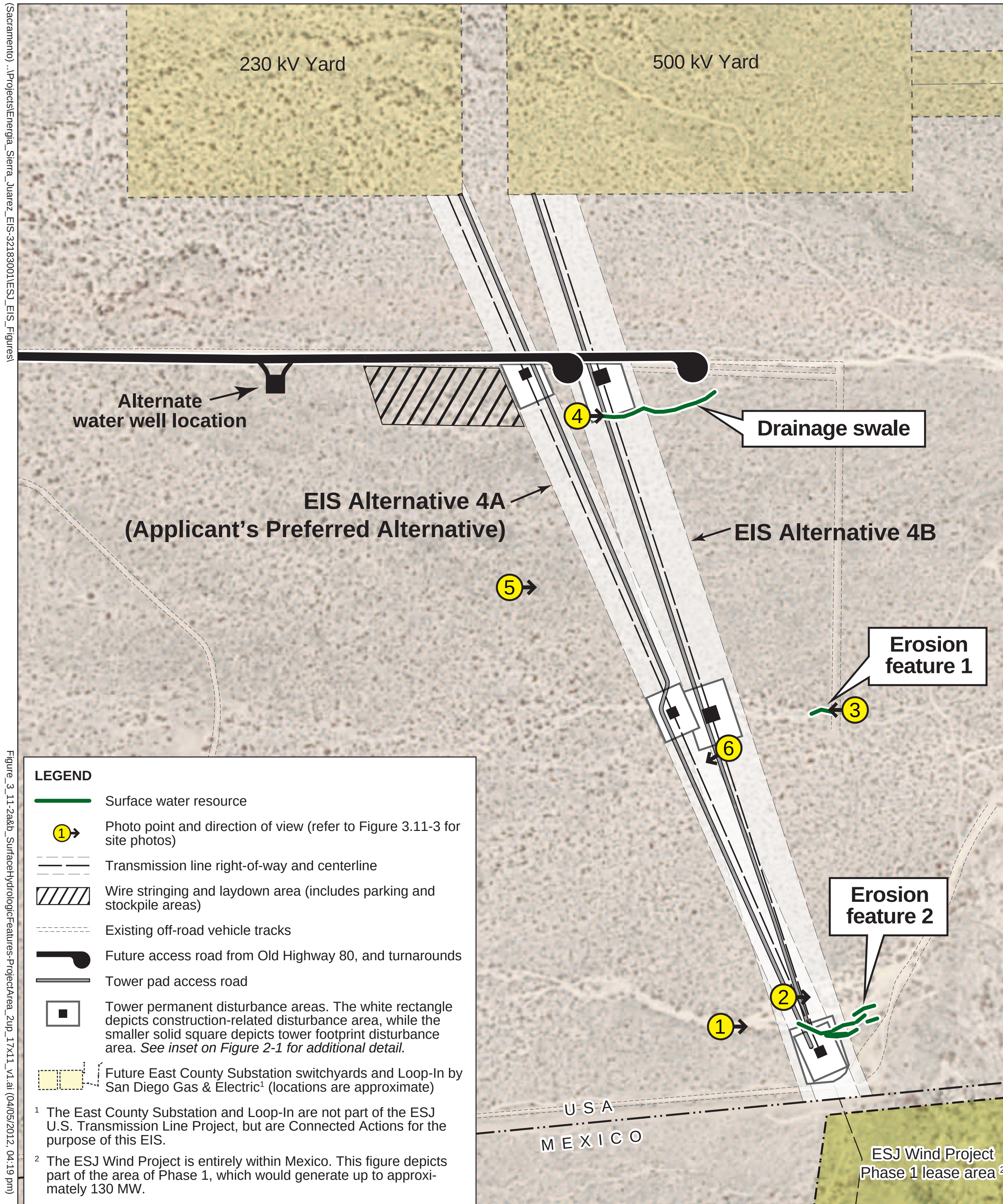
FIGURE 3.11-2a

SURFACE HYDROLOGIC FEATURES IN THE PROJECT AREA ALTERNATIVES 2 AND 3

April 2012



PROJECT LOCATION

0 200 400 600 800 Feet
0 40 80 120 160 200 Meters

Source(s): Burns & McDonnell 2009a, 2009b, 2010a, 2010b; EDAW 2010b; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1979, 1998, 2006.

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FIGURE 3.11-2b

SURFACE HYDROLOGIC FEATURES IN THE PROJECT AREA ALTERNATIVES 4A AND 4B

April 2012

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View of southern erosive feature looking east, with roadway in top background.

View of southern erosive feature looking east, with roadway in top background.

View of middle erosive feature looking west.

View of northern swale, looking east.

Representative upland view, looking east.

Representative upland view, looking southwest.

Source:
EDAW 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.11-3

SITE PHOTOGRAPHS

May 2012

Figure_3_11-3_SitePhotos-SurfaceHydrologicFeatures_8x11_v5.ai (04/05/2012, 04:19 pm) R. Wurgler/T. Murphy

In addition to the drainage described above, two other drainage features were identified during the jurisdictional waters survey conducted by EDAW, Inc. These drainages are a swale that is located approximately 150 feet (46 m) south of the main access road into the project area (Figure 3.11-3, Photograph 4) and an erosive drainage feature (Erosion Feature 2; Figure 3.11-3, Photographs 1 and 2) that is located approximately 225 feet (78 m) north of the U.S.-Mexico border fence. The northerly drainage swale flows from east to west and is approximately 3 feet (0.9 m) wide. No evidence of an ordinary high water mark is present in the swale, and it becomes indiscernible as the flow appears to transition to sheet flow approximately 100 feet (30 m) into the survey area (EDAW, Inc. 2009a). Like Erosion Feature 1, Erosion Feature 2 flows from east to west and appears to be associated with water runoff from the roadway used by the U.S. Border Patrol. This drainage consists of rill (narrow) erosive features that are generally 3 to 6 inches (8 to 15 cm) deep and 2 to 3 feet (0.6 to 0.9 m) wide. These erosion features converge to create a wider erosion feature that becomes indiscernible as the flow appears to transition to sheet flow (EDAW, Inc. 2009a). As with Erosion Feature 1, the drainage swale and Erosion Feature 2 do not meet the criteria for jurisdictional waters of the U.S. because these features appear to convey runoff for only a short distance over a short duration and lack evidence of a definable bed, bank, or ordinary high water mark (EDAW, Inc. 2009a). Accordingly, the channels are not considered waters of the U.S. under Section 404 of the Clean Water Act or waters of the State of California under Section 1600 et seq. of the California Fish and Game Code.

3.11.1.2 Groundwater Resources

The alternative corridors are not within the boundaries of a designated groundwater basin as defined by the California Department of Water Resources (CDWR). The nearest CDWR designated basin is the Jacumba Valley Groundwater Basin which is located approximately 3 miles (4.8 km) west of the alternative corridors (CDWR 2004).

As defined by CDWR, the Jacumba Valley Groundwater Basin encompasses approximately 6,400 acres (2,590 ha) and is bounded by faults on the east and west, the U.S.-Mexico border to the south, and the crystalline rocks of the Peninsular Ranges to the north (CDWR 2004). Groundwater levels within the basin are relatively stable with some seasonal fluctuations (Roff and Franzone 1994, as cited in CDWR 2004). Groundwater recharge primarily occurs through infiltration of precipitation and surface water runoff from the Boundary Creek and Flat Creek drainages (CDWR 2004) (Figure 3.11-1). Recharge from runoff in Boundary Creek was calculated as approximately 980 acre-feet/year (1.2-million cubic meters per year) (Roff and Franzone 1994, as cited in CDWR 2004) and recharge from runoff in both Boundary Creek and Flat Creek was calculated as approximately 2,700 acre-feet/year (3.3-million cubic meters per year) (Swenson 1980, as cited in CDWR 2004). Groundwater usage within the Jacumba Valley Groundwater Basin is estimated at approximately 810 acre-feet/year (1 million cubic meters per year) (Roff and Franzone 1994, as cited in CDWR 2004).

The primary water bearing units within the basin consist of the Holocene age alluvium and the Table Mountain Formation. The alluvial aquifer is unconfined and is estimated to be approximately 100 to 150 feet (30 to 46 m) thick primarily consisting of gravel, sand, and clay (Roff and Franzone 1994 and Swenson 1980, as cited in CDWR 2004). Groundwater in storage within the alluvial aquifer is estimated to range from 3,200 to 16,000 acre-feet (4 million to 20 million cubic meters per year) (Roff and Franzone 1994 and Swenson 1980, as cited in

CDWR 2004). Wells within the alluvial aquifer can yield more than 1,000 gallons/minute (3,800 liters/minute) (Roff and Franzone 1994, as cited in CDWR 2004).

The Table Mountain Formation is a semi-confined to confined aquifer that is up to 600 feet (183 m) thick (Swenson 1980, as cited in CDWR 2004). The formation is situated below the alluvial aquifer and is separated from the Holocene alluvial aquifer by the Jacumba volcanics (Swenson 1980, as cited in CDWR 2004). It consists of Tertiary age, medium- to coarse-grained sandstone and conglomerate that rest unconformably on crystalline basement rock (CDWR 2004). Groundwater in storage within the Table Mountain Formation is estimated to range from 84,000 to 169,000 acre-feet (104 million to 209 million cubic m) (Swenson 1980, as cited in CDWR 2004).

The nearest known well to the alternative corridors is a private water supply well located approximately 2 miles (3.2 km) to the north, immediately west of the intersection of Old Highway 80 and Carrizo Gorge Road. This well was drilled to a depth of approximately 213 feet (65 m) below ground surface (bgs) and depth-to-groundwater was recorded at approximately 90 feet (27 m) bgs (Bennett 2009). As described in Section 2, and depicted in Figure 1-2, the Jacumba Community Services District (JCSD) Well #6, which is proposed for use for construction water, is located approximately 4.2 miles (6.8 km) to the west, adjacent to Old Highway 80.

3.11.1.3 Water Supply

The alternative corridors are in the service area of the San Diego County Water Authority (SDCWA), which has total water supplies of 709,940 acre-feet (876 million cubic m) (SDCWA 2008). Water supplies in the vicinity of the corridors are obtained from groundwater.

3.11.1.4 Water Quality

As required by Section 303 of the Clean Water Act, the Colorado River Regional Water Quality Control Board has identified beneficial uses of waters within the Colorado River Hydrologic Basin and developed water quality criteria to protect these designated uses. Water bodies that do not meet the specified criteria are included on the 303(d) list of impaired water bodies. The surface water resources in the vicinity of the alternative corridors are not identified in the Colorado River Regional Water Quality Control Board 303(d) list and have no identified beneficial uses (Colorado River Regional Water Quality Control Board 2006).

The dominant groundwater types within the Jacumba Valley Groundwater Basin range from sodium chloride to sodium sulfate and calcium chloride to calcium sulfate (CDWR 2004). Total dissolved solids (TDS) concentrations range from 296 to 6,100 milligrams per liter (mg/L) and conductivity ranges from 499 to 8,030 µmhos (Roff and Franzone 1994, as cited in CDWR 2004). Groundwater quality degrades in the northern portion of the basin in the vicinity of the Carrizo Gorge where spring water has TDS concentrations ranging from 2,000 to 6,000 mg/L (CDWR 2004). Groundwater delivered by the public well in the community of Jacumba (located approximately 3.75 miles (6.04 km) west of the alternative corridors) meets all primary and secondary maximum contaminant level standards for inorganic constituents and nitrates (CDWR 2004).

3.11.1.5 Floodplains

Floodplains and flood control in San Diego County are managed by the County of San Diego Flood Control District. Floodplains in the eastern portion of the county, which includes the alternative corridors, are associated with ephemeral creeks such as Potrero Creek and Carrizo Creek. The project area is designated as Zone D (FEMA 1997) in the Flood Insurance Rate Map (FIRM) for eastern San Diego County, indicating that the area has possible but undetermined flood risks. Since no significant watercourses are situated within or in the near vicinity of the corridors, the potential for flooding is expected to be low.

3.11.1.6 Wetlands

Wetlands are defined by the U.S. Army Corps of Engineers (USACE) and USEPA as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3 [b]; 1984). Three criteria are necessary to define wetlands: hydrophytic vegetation, hydric soils, and wetland hydrology. Non-wetland water features that are considered jurisdictional under Section 404 of the Clean Water Act are considered waters of the U.S. and include all interstate waters and those features with defined bed, bank, and channel that have a clear link (nexus) to interstate waters.

National Wetland Inventory maps prepared by USFWS do not depict any wetlands within or near the alternative corridors (USFWS 2009b). In accordance with the County of San Diego (2009a) Guidelines, a site-specific wetland survey was conducted within an approximately 65-acre (26.3 ha) corridor, which included both the 230-kV and the 500-kV transmission line Route alternatives and associated access roads. In addition, the survey was conducted within a 100-foot-wide (30-m-wide) area around the primary survey corridor (EDAW, Inc. 2009a; see Figure 3.11-2a). The results of the survey indicated that no wetlands are present within either alternative corridor or in the vicinity of those corridors since neither hydrophytic vegetation nor field indicators of wetland hydrology were present (EDAW, Inc. 2009a).

3.11.2 Environmental Impacts

3.11.2.1 Methodology

As previously discussed, no jurisdictional waters of the U.S. are present within or near the alternative corridors. The three drainage features that were identified during the jurisdictional waters survey conducted in April 2009 (EDAW, Inc. 2009a) appear to convey runoff for only a short distance over a short duration and lack evidence of a definable bed, bank, or ordinary high water mark (EDAW, Inc. 2009a). Accordingly, the impact analysis did not address potential impacts to jurisdictional waters. In addition, impacts to wetland resources were not addressed since no wetlands are present in the vicinity of either alternative route. DOE reviewed the County of San Diego Guidelines for Determining Significance – Hydrology (2007h) during its evaluation of potential impacts to surface water which deals primarily with flood risk. However, although the FEMA floodplain designation indicates that the area has “possible but undetermined flood risks,” the impact evaluation does not address flooding since the potential for flooding is expected to be low due to the absence of significant watercourses within or in the near vicinity of the alternative corridors. This evaluation addresses the potential to alter existing drainage patterns of the site. With regard to potential impacts to groundwater, DOE reviewed the County of San Diego Guidelines for Determining Significance – Groundwater Resources (2007f) and consulted with County personnel in assessing potential impacts to groundwater quality and supply.

3.11.2.2 Alternative 1 – No Action

Under the No Action alternative, the proposed transmission line would not be constructed and the existing water resources would remain as described above. No impacts on local or regional hydrology, water quality, or water supply would occur.

3.11.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line (Applicant's Preferred Alternative)

Construction Impacts

ESJ estimates that 780,000 gallons (2.4 acre-feet or 2,950 cubic m) of water would be required during construction of the 230-kV Route for dust abatement, cleaning construction equipment, and concrete production for tower foundations. Dust suppression would occur on each day that grading takes place and on unpaved access roads. Dust suppression and other air quality protection measures are described in Section 3.10 (Air Quality and Climate Change). Comparatively small amounts of potable water would be needed for sanitary and drinking purposes. As described in Section 2.0 (Proposed Action and Alternatives), except for drinking water, the water used for construction would most likely be obtained from an existing non-potable (brackish) water well about 4.5 miles [7.2 km] west of the site owned by the JCSD. The water would be trucked to the construction area using tank trucks and stored on the right-of-way. In the event that an existing supply is not available, ESJ would construct a new temporary water well within the right-of-way (indicated as "Alternate water well location" in Figure 2-1). If a new well is constructed, ESJ would report such drilling and logging to CDWR.

Recharge of the Jacumba Valley Groundwater Basin is estimated at 2,700 acre-feet/year (3.3 million cubic m/year) and groundwater usage in the basin is estimated at approximately 810 acre-feet/year (1 million cubic m/year) (Roff and Franzone 1994 and Swenson 1980, as cited in CDWR 2004). The estimated volume of water (2.4 acre-feet or 2,950 cubic m) that would be required during short-term construction of the transmission line is relatively small (less than 0.1 percent) in comparison to the annual recharge and, therefore, would not impact the locally available water supply. Accordingly, impacts related to groundwater resources, the primary water supply in the area, during construction are considered temporary and minor. Nevertheless, water resources are generally scarce in the project area, and this short-term impact could be further reduced by the potential mitigation measure (not identified by the applicant) of preferentially selecting non-potable water sources to the extent practical for project-related uses (Mitigation Measure Water-1).

The alternative route is not within a designated groundwater basin as defined by CDWR. Groundwater quality impacts are not anticipated during construction because the depth to groundwater is estimated at approximately 90 feet (27 m) bgs at the nearest well, and this depth is well below the maximum depth of tower construction, which is approximately 20 feet (6 m) bgs.

Groundwater Extraction

As described in Section 2, ESJ proposes to purchase groundwater from an offsite well known as JCSD Well #6. JCSD Well #6 is a non-potable well due to elevated sulfide and fluoride concentrations in the water. Approximately 2,500 gallons of water a day would be supplied, 6 days a week, for approximately 6 months. This would amount to approximately 780,000 gallons of water (2.4 acre-feet), which is a very small fraction of the annual recharge of 2,700 acre-feet/year in the Jacumba Valley Groundwater Basin.

The County of San Diego analyzed the potential use of groundwater on the project area and regional groundwater resources in accordance with the County's guidelines. The results of that analysis are provided in a March 4, 2010 memorandum from the County Groundwater Geologist to the County Project Planner (Bennett 2010). According to the County's analysis, if groundwater is proposed from an onsite well rather than obtaining groundwater from the JCSD, there would be no groundwater investigation requirements. The basin is located in an undeveloped region of the County. Therefore, the pumping of approximately 2.4 acre-feet of water needed for the project in a basin with no other known groundwater users would have a less than significant impact on groundwater resources.

The County of San Diego's Guidelines for Determining Significance – Groundwater Resources (2009f) contain a series of thresholds for determining significance for both water quantity and water quality. Since the water proposed for this project is not for potable use, the water quality threshold is not applicable. To evaluate cumulative impacts to groundwater resources, a water balance analysis is typically required. However, due to the limited amount of groundwater proposed and the temporary use, a water balance analysis is not required. To evaluate offsite well interference as a result of this project, the following guideline for determining significance was used:

> *As an initial screening tool, offsite well interference will be considered a significant impact if after a five year projection of drawdown, the results indicate a decrease in water level of 20 feet or more in the offsite wells. If site-specific data indicates water bearing fractures exist which substantiate an interval of more than 400 feet between the static water level in each offsite well and the deepest major water bearing fractured in the well(s), a decrease in saturated thickness of 5% or more in the offsite well would be considered a significant impact.*

Summary of Aquifer Test from JCSD #6. JCSD Well #6 is located on the western edge of the town of Jacumba. The well was drilled in April 2003 to a depth of 465 feet below ground surface (bgs). The well was cased to a depth of 113 feet and screened from the bottom of the casing down to a depth of 465 feet, entirely within fractured bedrock. A 24-hour step-drawdown test was conducted in April 2003 to obtain an approximate production rate for the well, and drawdown and recovery plots were developed (Figures 1 and 2 of the County's memorandum). The well was pumped at 200 gallons per minute, and stepped up to 300, 400, and then 600 gallons per minute after six hours of pumping. At 12 hours, the water level had declined by 89 feet and remained at that level until the end of the 24 hour well test. Just 5.6 hours after pumping stopped the water level had fully recovered to its level before pumping started. A total of approximately 759,000 gallons (2.3 acre-feet) of water was pumped from the well in 24 hours.

These results indicate that the well could easily supply the water needed for the project. (Bennett 2010).

Calculation of Offsite Drawdown. The nearest offsite well is JCSD Well #4, located 60 feet (18 m) southeast of JCSD Well #6 and completed in the shallow alluvial aquifer. According to the County's guidelines, impacts would be considered significant if drawdown in this well was 20 feet after 5 years of pumping. Calculations conducted by the County of San Diego, based on the aquifer transmissivity (745 feet^2/day) and expected pumping rate of 2,500 gallons per day for six months, predict drawdown of 0.3 foot in JCSD Well #4. Based on the County's guidelines, this would be considered to be a minor impact based on the well interference threshold.

In summary, the County of San Diego's groundwater analysis confirms DOE's assessment that groundwater impacts from JCSD's Well #6 would be temporary and minor.

Surface Water. The proposed transmission line would require the installation of up to five lattice towers or steel monopoles within California. Road improvements would include the realignment and widening of an existing east-west access road between Old Highway 80 and the northern portion of the transmission line corridor, and construction of a new north-south maintenance access road parallel to the transmission towers. Grading would be required at each tower or pole location, and along the access roadway and maintenance road. Due to the area's topography, which ranges from level to gently rolling, grading would not be extensive. Installation of the towers or monopoles is expected to result in the permanent disturbance of approximately 19,200 square feet (approximately 0.44 acre, or 0.2 ha) at the base of each tower separated by a distance of approximately 1,500 feet (457 m) (monopoles would result in a slightly smaller area of disturbance). Total permanent land disturbance would be approximately 9.7 acres (3.9 ha) and would have a minimal impact on the overall surface water flows of the right-of-way.

Operation Impacts

No impacts to surface water quality or groundwater are anticipated during the operational life of the project. No new plants, shrubs, or trees would be planted in the right-of-way or in the 30-foot (9.1-m) area on each side of the right-of-way; therefore, no water will be required for site revegetation and restoration during the project operations.

Impacts in the U.S. due to Related Activities in Mexico

Based on a review of publicly available aerial photography and topographic mapping for the project region both north and south of the border, no surface water features traverse the U.S.-Mexico border in the project area, and there is no apparent evidence of historical flash flooding or significant surface flows such that transmission facilities on either side of the border would be exposed to flood damage risks. Therefore, construction and operation activities in Mexico would not result in effects in the U.S. related to surface water hydrology and water quality. Groundwater basins south of the project area in Mexico are not well-understood. However, any potential impacts on groundwater supply and/or quality associated with construction of the ESJ Wind project would be localized due to the distance between the wind turbine work areas and the U.S. border.

3.11.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

As shown on Figure 3.11-2, the 500-kV Route is essentially the same as the 230-kV Route and the existing conditions along this alternative route are also essentially the same as those of the 230-kV Route alternative. In addition, ESJ would use the same construction and operational practices for the 500-kV Route as described for the 230-kV Route. Therefore, water resources impacts for the 500-kV Route would be the same as those described above for 230-kV Route.

3.11.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The existing conditions along the revised 230-kV and 500-kV routes are also essentially the same as those of the original Route alternatives because the routes are adjacent (Figure 3.11-2b). In addition, ESJ would use the same construction and operational practices for the Alternative 4 Routes as described for Alternatives 2 and 3. Therefore, water resources impacts for the Alternative 4 Routes would be the same as those described above for Alternatives 2 and 3.

3.11.3 Mitigation Measures

ESJ would incorporate plans and procedures into the project to minimize the potential for adverse effects to water resources. The following potential additional mitigation measure (not identified by the applicant) would further reduce the potential short-term impact on local water resources.

Water-1: Use Non-Potable Water

To the extent that ESJ has optional sources of water, preference should be given to the use of non-potable water for all project-related uses during construction.

3.12 GEOLOGY AND SOILS

This section presents an assessment of the potential impacts of the project to geologic, soil, mineral, and paleontological resources, and the potential effect of soils and geologic hazards on the project.

3.12.1 Affected Environment

3.12.1.1 Topography

Topography in the vicinity of the alternative corridors primarily consists of gently sloping hills and low-lying desert. Elevations range from 3,323 feet (1,013 m) above mean sea level (amsl) in the southeastern portion of the alternative corridors, near the U.S.-Mexico border, to 3,231 feet (985 m) amsl in the northwest portion of the site. A steep slope is located to the east of the corridors and rises to an elevation of 3,500 feet (1,067 m) amsl within about 0.5 mile (0.8 km) of the nearest corridor.

3.12.1.2 Geology

The alternative corridors are within the eastern escarpment of the Peninsular Range batholith, which was formed by the La Posta pluton, a large intrusive body of igneous rock (Walawender and Hanan 1991). The Peninsular Ranges include a series of north-northwest-trending mountains. The range is divided on the basis of age into the older western zone (greater than 100 million years old) and the younger eastern zone (less than 100 million years old). The alternative corridors are in the eastern zone of the Peninsular Ranges in the Jacumba Mountain area. The geology of this area primarily consists of Holocene age alluvium that is composed of unconsolidated stream, river, and alluvial fan deposits of gravel, sand, silt, and clay.

3.12.1.3 Soils

The soils underlying the corridors primarily are composed of Rositas soils with lesser areas of Rough Broken Land, Mecca soils, and Acid Igneous Rock Land as shown on Figure 3.12-1a (Alternatives 2 and 3) and Figure 3.12b (Alternatives 4A and 4B). These soils types are described below and in Table 3.12-1. No desert pavement is present in the vicinity of the alternative corridors.

Rositas soils are very deep, loamy coarse sands that are derived from eroding granite ridges. These somewhat excessively drained soils are variable in depth (0 to 60 inches [0 to 152 cm]) and are characterized by rapid permeability, a low shrink-swell potential, negligible to low runoff, slight erodibility for water, and severe wind erodibility (BLM 2008a; NRCS 2007; CPUC/BLM 2008b). Rositas soils have a high corrosion potential for steel, but low corrosion potential for concrete (BLM 2008a; NRCS 2007).

Rough Broken Land is present along the western portion of the access road and north of the alternative line routes. This land-type consists of steep and very steep land dissected by many narrow V-shaped valleys and sharp tortuous divides. These areas are well to excessively drained with variable shrink-swell potential and rapid to very rapid runoff (BLM 2008a; NRCS 2007). The erosion hazard in these areas is high (BLM 2008a; NRCS 2007).

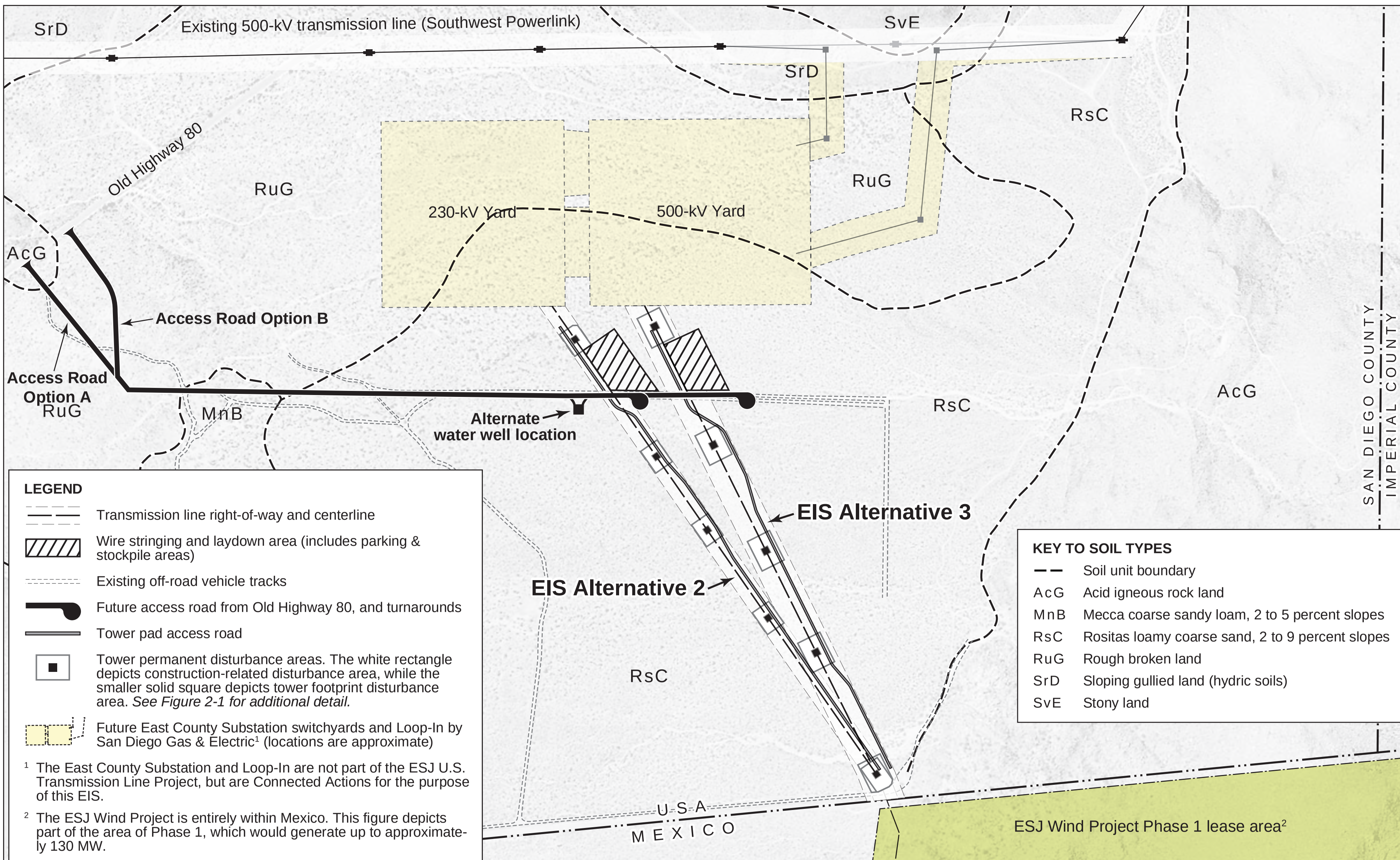
Table 3.12-1
Characteristics of Project Area Soils

	Erosion Hazard	Shrink/Swell Potential	Corrosion Potential	Runoff	Drainage
Rositas Coarse Loamy Sand	Slight for water; Severe for wind	Low	High (steel) Low (concrete)	Negligible to low runoff	Somewhat excessively drained
Acid Igneous Rock	Severe	Low	N/A	Rapid	N/A
Mecca Sandy Loam	Slight to moderate	Low	High (steel) Low (concrete)	Slow	Well Drained
Rough Broken Land	High	Variable	N/A	Rapid to very rapid	Well drained to excessively drained

N/A = not available
Source: NRCS 2007

Mecca soils are present along the central portion of the existing and future access roads and consist of very deep, well-drained coarse sandy loam that is derived from granite alluvium. These soils are characterized by a low shrink-swell potential, slow runoff, and a slight to moderate erosion hazard (BLM 2008a; NRCS 2007). Mecca soils have a high corrosion potential for steel, but low corrosion potential for concrete (BLM 2008a; NRCS 2007).

Acid Igneous Rock Land is present along the western edge of the access road and immediately southeast of the alternative corridors. This land-type consists of rough, broken terrain that is primarily composed of large boulders and rock outcrops of granite, granodiorite, tonalite, quartz diorite, gabbro, basalt, or gabbro diorite. The soil material in these areas primarily consists of very shallow (0 to 4 inches [0 to 10.2 cm]) loamy to coarse sand that overlies decomposed granite or basic igneous bedrock (BLM 2008a; NRCS 2007). These areas have a low shrink-swell potential, rapid runoff, and a severe erosion hazard (BLM 2008a; NRCS 2007).



Source(s):
Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2011a; NRCS 2007; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1998.

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FIGURE 3.12-1a

SOIL TYPES IN THE PROJECT VICINITY ALTERNATIVES 2 AND 3

April 2012

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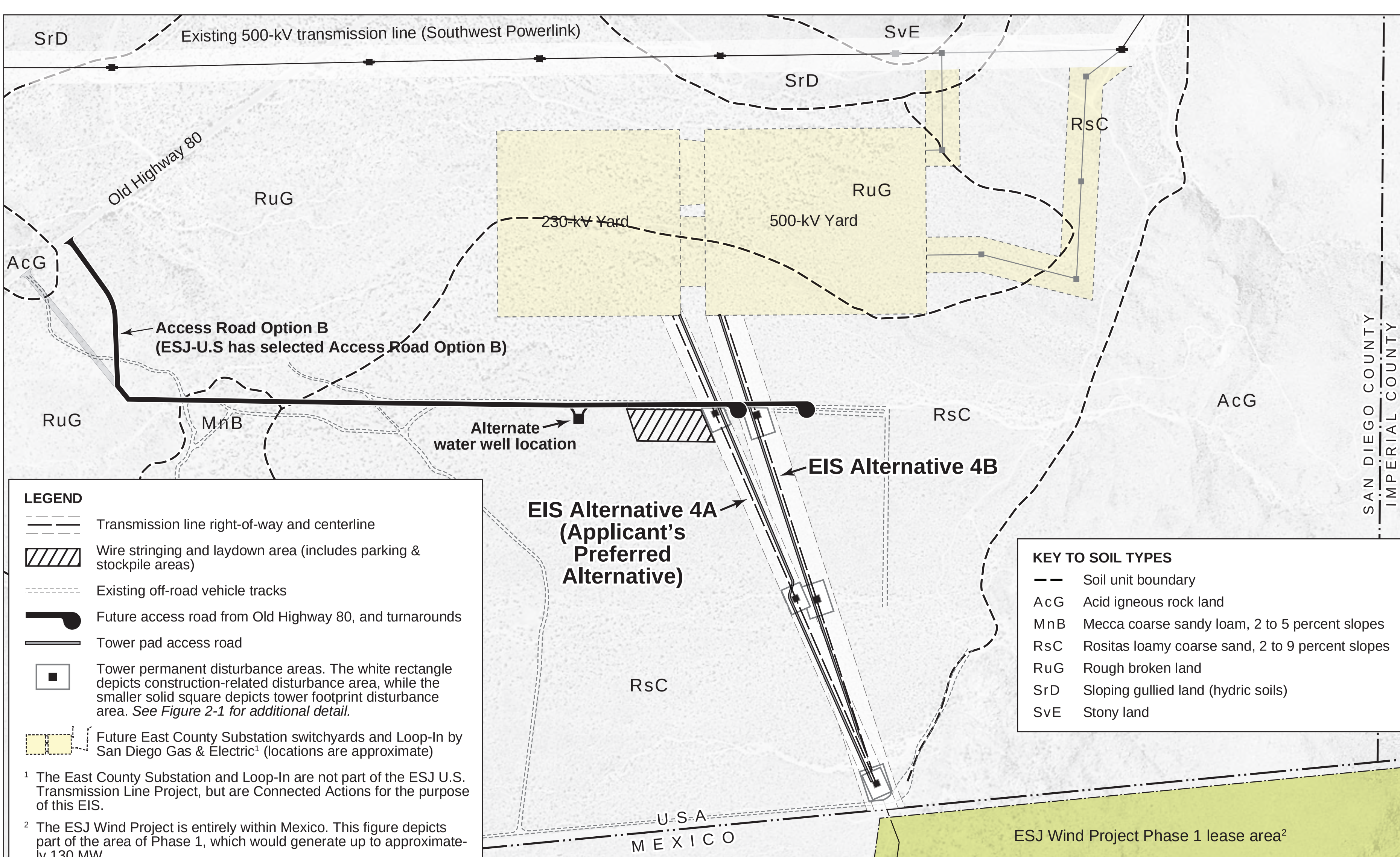


Source(s):
Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2011a; NRCS 2007; SanGIS 2011; SDG&E 2009b; Sempra Generation 2010; USGS 1998.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.12-1b

SOIL TYPES IN THE PROJECT VICINITY ALTERNATIVES 4A AND 4B

April 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS_32183001\ESJ_EIS_Figures\ Figure_3_12-1a&b_SoilTypes_2up_11x17_v1.ai (04/05/2012, 04:19 pm) R. Wurgler/M. Schwartz/T. Murphy

3.12.1.4 Seismicity

Major fault lines in the general vicinity of the alternative corridors primarily trend northwest-southeast. No active faults are present nearby; the nearest active faults are located near Julian and Elsinore, California, approximately 15 miles (24 km) north and 10 miles (16 km) north-northeast, respectively. However, geological maps indicate the presence of two inactive buried faults located adjacent to the corridors beneath the central portion of the proposed ECO Substation switchyard (see Section 4.0 [Connected Action]). Although both faults are relatively short, fault rupture could occur as a result of stress or movement related to large earthquakes on large faults in the region (SDG&E 2009b). The California Geological Survey is tasked with zoning areas according to seismic hazard by the Alquist-Priolo Special Studies Zone Act of 1972. The seismic zone rating system establishes building requirements for an area based on the probability of a high seismic event occurring in that region. The alternative corridors are not located in a fault rupture hazard zone identified by the Alquist-Priolo Special Studies Zone Act; however, faults in San Diego County have historically been active and, according to the California Geological Survey, a major seismic event (magnitude 6.2 or greater) can reasonably be expected to occur in San Diego County every 100 years (California Geological Survey 2007). Therefore, the California Geological Survey has placed San Diego County within Seismic Risk Zone 4, which is the highest rating and requires compliance with the strictest building standards. The seismic shaking hazard evaluation for the area traversed by the proposed corridors indicates that a peak ground acceleration of 20 to 30 percent of the acceleration of gravity (or higher) has a 10 percent chance of occurring during a 50-year period (California Geological Survey 2007).

In the past year, two seismic events (one major and one non-major) were felt in the alternative corridors area. On April 4, 2010, a magnitude 7.2 earthquake was centered approximately 54 miles (87 km) southeast of the alternative corridors. This event, named the Sierra El Mayor earthquake, occurred along the main plate boundary between the Pacific and North American plates; more specifically, along a strike-slip segment coinciding with the southeastern part of the Laguna Salada fault system (USGS 2010a). Although this earthquake was categorized as a major seismic event by the California Geological Survey, a USGS Instrumental Intensity Shakemap for this seismic event indicated that the peak ground acceleration in the area of the project corridors was between 3.9 and 18 percent of the acceleration of gravity, and potential damage to the area was classified as “light” to “very light” (USGS 2010b).

The second seismic event occurred on June 14, 2010. This magnitude 5.7 earthquake was centered approximately 12 miles (19.3 km) east-northeast of the alternative corridors. A USGS Instrumental Intensity Shakemap for this seismic event indicated that the peak ground acceleration in the area of the alternative corridors was between 3.9 and 9.2 percent of the acceleration of gravity, and potential damage to this area would be classified as “very light” (USGS 2010c).

3.12.1.5 Slope Stability

Areas that are susceptible to slope instability include moderate to steep slopes, slopes underlain by highly weathered and unconsolidated sediments, and areas of previous landslide activity. Slope instability issues can include landslides, rockfalls, and debris flows. The alternate line routes consist of gently sloping topography, and, therefore, the potential for slope instability is low. The southern portion of the corridors near the U.S.-Mexico border is situated near a relatively steep slope, but no evidence of slope instability such as landslides or rockfalls is present in this area.

3.12.1.6 Liquefaction

Liquefaction is a condition that occurs when loose, cohesionless, saturated soil is subjected to vibration or shock waves. Soil liquefaction can lead to landslides and earthflows, movement or failure of foundations and footings, and mobility of buried objects. Potential for liquefaction is primarily restricted to areas of shallow groundwater that are underlain by young alluvial and lacustrine deposits. Although the alternative corridors are located within a “Potential Liquefaction Area” as identified by the County of San Diego, as discussed in Section 3.11 (Water Resources), the depth to groundwater in the vicinity of the alternative routes is approximately 90 feet (27 m) bgs. Accordingly, the potential for liquefaction in the area is generally low.

3.12.1.7 Mineral Resources

No known active mineral resource sites, sand or gravel pits, or BLM mining claims are present in the vicinity of the alternative corridors. The nearest BLM mining claim is a “placer” claim that is located approximately 1 mile (1.6 km) northwest of the route (BLM 2009c).

3.12.1.8 Paleontological Resources

The County of San Diego prepared a draft map that identifies areas with high, moderate, low, and no potential for paleontological resources. Based on the County’s map, the geologic material in the area of the alternative corridors is Holocene age alluvium (less than 10,000 years in age). Typically formations of that age are not considered a paleontological resource. Therefore, the area traversed by the alternative corridors has a low potential for containing paleontological resources (County of San Diego 2009c, 2010c).

3.12.2 Environmental Impacts

3.12.2.1 Methodology

The analysis considered the potential for alternatives to affect geologic resources and soil erosion, and how the alternatives could be affected by geologic processes and soil properties. The analysis addresses each of the issue areas identified in the County of San Diego Guidelines for Determining Significance – Geologic Hazards (2007e), including liquefaction, seismicity, landslides, and expansive soils. None of the alternatives would affect mineral resources since no claims are located within or near the right-of-way of either alternative corridor. Similarly, the alternatives would not affect paleontological resources since the area is composed of Holocene age alluvium that has a low potential for containing paleontological resources.

3.12.2.2 Alternative 1 – No Action

Under the No Action alternative, the proposed project would not be constructed and no impacts to geology or soils would occur.

3.12.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Soil disturbance associated with construction vehicle use and excavation and grading required for placement of towers could result in increased erosion during construction. As described in Section 2.0 (Proposed Action and Alternatives), ESJ has restricted the area of construction vehicle and equipment use to the extent practical by limiting the width of the construction right-of-way and consolidating the construction staging areas, which would reduce the potential for erosion. As discussed in Section 3.8 (Public Health and Safety), ESJ has prepared an SWMP; this plan includes measures that would minimize soil erosion. These measures are listed below and are depicted on the Preliminary Grading and Erosion Control Plan drawings for the ESJ U.S. project (Appendix B):

- Silt fences would be installed on the boundary of the construction area where there is a possibility that silt may migrate from the disturbed area. All silt barriers would be put in place during clearing and would be placed perpendicular to the direction of water flow and as close to the site contours as possible. No grading would be performed until silt barrier installation is complete;
- Sandbags would be placed perpendicular to the silt fence to form cross barriers every 492 feet (150 m) along each reach of the silt fence;
- The silt fence would be left in place until final stabilization has occurred;
- Any disturbed area left exposed for 14 days would be stabilized with mulch or temporary seeding;
- Erosion control measures would be regularly inspected and maintained at all times;
- Slope protection (the use of erosion control measures) would occur following the clearing or grading of slopes or for those slopes that are more than three feet (0.9 m) in height. Currently it is not anticipated that the design would include any slopes that are more than three feet (0.9 m) in height;
- To reduce wind erosion, temporary disturbed areas would be wetted as necessary;
- Temporarily disturbed areas would be revegetated after construction;
- Erosion control measures would be installed and maintained as specified by the California Department of Transportation Construction Site BMP Manual; and
- Erosion control measures would be inspected at least once per week and both prior to and after predicted rain events.

Given the implementation of these measures, construction impacts would be minor and temporary, generally lasting for only the six-month construction period. There is a potential for erosion impacts after completion of construction due to improperly controlled site runoff; these impacts would be minor provided that the control measures are left in place, inspected, and maintained until final stabilization has occurred. The potential for soil erosion during and after construction could be further reduced by limiting modifications to the access road to the extent practical in areas of Acid Igneous Rock or Rough Broken Land, which are very sensitive to disturbance and have a high erosion potential. Mitigation Measure Geology-1 (limit modification to access road) is an additional potential mitigation measure (not identified by the applicant) that would reduce potential erosion both during and after construction. This potential mitigation measure is detailed in Section 3.12.3.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 would not result in impacts related to geology and soils. The main purpose of the water use is to control dust and particulates at the construction site; this will also serve to protect onsite soils. However, construction of the new access road from the well site to Old Highway 80 would result in a temporary disturbance of soils. As discussed above in reference to the alternative corridors, construction activities would comply with all measures described in the SWMP. Therefore, any impacts are considered short-term.

Operations Impacts

Long-term erosion could occur as a result of maintenance activities and vehicle use on the project access roads (e.g., if the road is frequently used by U.S. Border Patrol vehicles). This impact is expected to be long-term but minor because the roads would be designed for heavy vehicle use, and the site topography (gently rolling slopes) is not conducive to rapid soil loss. Implementation of potential Mitigation Measure Geology-1 (limit modification to access road) would further reduce the potential for long-term soil erosion.

Onsite soils have a high potential for corrosion of structural components such as uncoated steel. However, ESJ would not have uncoated steel in contact with onsite soils; and ESJ's proposed inspection, maintenance, and repair program would likely identify and remedy corrosion problems before they result in a structural failure. As a standard industry practice, geotechnical review of onsite soils would be conducted during the detailed design phase of the project to assess soil characteristics at the structure locations, and the recommendations of the geotechnical review would be incorporated into the final design. This would reduce the potential for support structure damage caused by problematic soils. Impacts of corrosive soils on project structures would be minor but would occur over the life of the project.

As noted above, no active faults are present nearby; the nearest active faults are located near Julian and Elsinore, California, approximately 15 miles (24 km) north and 10 miles (16 km) north-northeast, respectively, and geological maps indicate the presence of two inactive buried faults located adjacent to the corridors. Although both of the inactive faults are relatively short, the proposed transmission line could experience moderate to high groundshaking during a large earthquake associated with one of the major faults in the region (such as the magnitude 7.2 earthquake which occurred southeast of the corridor on April 4, 2010). Although such seismically-induced groundshaking could damage project facilities, overhead transmission lines and their support structures are designed for dynamic loading under variable wind conditions that generally exceed earthquake loads. This inherent design feature tends to minimize the potential for damage to structures from groundshaking related to earthquakes. Further, overhead transmission lines consist of a system of support structures and interconnecting wire that is inherently flexible, and industry experience has demonstrated that these facilities generally do not experience significant damage due to earthquakes (CPUC/BLM 2008a). The potential for an earthquake to cause significant damage to project facilities is considered a minor impact based on these design features and due to the distance to active faults, but the potential for impact would occur over the life of the project.

The potential for liquefaction along the proposed route is low because the depth to groundwater in the area is approximately 90 feet (27 m) bgs, which is well below the maximum depth of tower or monopole foundations. No impacts related to liquefaction are anticipated.

Slope instability, seismically induced or otherwise caused, can include landslides, rockfalls, and debris flows. The 230-kV Route consists of gently sloping topography, and, therefore, the potential for slope instability is low. The southern portion of the corridor near the U.S.-Mexico border is situated near a relatively steep slope; however, no evidence of slope instability such as landslides or rockfalls is present in this area. Accordingly, no impacts related to slope instability are anticipated.

Impacts in the U.S. due to Related Activities in Mexico

Based on field observations and a review of aerial photography, the topography, soils, and geologic conditions along the U.S. portion of the proposed route are generally consistent with those on the portion of the route in Mexico. As in the U.S., impacts resulting from transmission line construction in Mexico would be localized and therefore would not affect geology and soils in the U.S. In addition, potential impacts to geology and soils in the U.S. due to sediment and pollutants, transported by Flat Creek (an east-to-west drainage feature located approximately 0.5 mile [0.8 km] south of the U.S.-Mexico border) and other drainages from construction of the ESJ Wind project and the associated transmission line in Mexico are not likely due to the relatively low gradients, ephemeral nature, and relatively high infiltration rates along these drainages. As a result, no impacts in the U.S. due to the ESJ Wind project would occur.

3.12.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

The geologic characteristics and soils along the 500-kV Route are substantially the same as those along the 230-kV Route, and construction, operation, and maintenance procedures for the 500-kV Route would be essentially the same as those for the 230-kV Route. Consequently, the impacts that would occur due to implementation of the 500-kV Route would be essentially the same as those described above for the 230-kV Route.

3.12.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant’s Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The geologic characteristics and soils along the revised 230-kV and 500-kV Routes are substantially the same as those along the original 230-kV and 500-kV Routes, and construction, operation, and maintenance procedures for the revised Routes would also be essentially the same as those for the original Routes. Consequently, the impacts that would occur due to implementation of the Alternative 4 Routes would be essentially the same as those described above for Alternatives 2 and 3.

3.12.3 Mitigation Measures

ESJ has proposed to incorporate standardized engineering design measures, plans and procedures into the project to minimize adverse effects related to soil erosion during construction and operations. The following potential mitigation measure not proposed by the applicant would further reduce the potential for the project to affect soils resources and for geologic and soils resources to affect project structures.

Geology-1: Limit Modification of Access Roads

Widening or upgrading of existing access roads should be minimized to the extent practical in areas of Acid Igneous Rock or Rough Broken Land, which are very sensitive to disturbance and have a high erosion potential.

3.13 SOCIOECONOMICS

This section analyzes potential impacts on socioeconomic resources, including population growth, housing, and employment. The discussion of the socioeconomic setting and potential impacts are focused on conditions in San Diego County because that is where the ESJ U.S. Transmission Line project would be located. The ESJ U.S. Transmission Line project also could draw on resources in nearby Imperial County and provide economic benefits to that county, as well.

3.13.1 Affected Environment

3.13.1.1 Population

The SANDAG is the County of San Diego's Regional Planning Agency and maintains demographic information for all jurisdictions within San Diego County. In order to provide statistical information for smaller geographic areas, SANDAG has divided the county into Major Statistical Areas (MSA) and Subregional Areas (SRA). The alternative corridors are located within the SANDAG East County MSA 6 and Mountain Empire SRA 62 (Figure 3.13-1). Table 3.13-1 presents SANDAG's most recent population statistics for these areas in comparison to San Diego County as a whole, as well as projected populations for 2020, and 2030 and the anticipated percent change for these statistical areas. As shown in the table, while the total population of San Diego County is projected to increase by 27 percent from 2008 to 2030, both MSA 6 and SRA 62 are expected to experience much greater increases in population (174 percent and 151 percent, respectively).

3.13.1.2 Housing

The housing stock in San Diego County consisted of approximately 1,140,350 units in 2008 (SANDAG 2009). Approximately half of this stock was composed of single-family units, and 37 percent of the remaining stock was composed of multi-family units. As shown in Table 3.13-2, the number of housing units for the county is expected to increase 21 percent from 2008 to 2030. Similar to the population projections, much greater increases are projected for MSA 6 and SRA 62 over the same period.

Temporary Housing

Three hotels with a total of approximately 40 rooms are located in the vicinity of the alternative corridors (in the town of Boulevard). However, although temporary housing is limited in the local area, more than 54,000 temporary housing units (including hotels, casinos, bed and breakfasts, country inns, and health spas) are located in San Diego County. The combined average annual occupancy rate of all of available units is 72.9 percent (SDG&E 2009b).

3.13.1.3 Employment

The San Diego region economy is based primarily on the service, retail trade, government, and manufacturing sectors. As of January 2009, the county average unemployment rate was 9.3 percent, just slightly below the state unemployment rate of 11.3 (California Employment Development Department 2009).

Table 3.13-1
Population and Estimated Growth for San Diego County and Affected Subareas

	2008	2010	2020	2030	Percent Change
San Diego County	3,146,274	3,245,279	3,635,855	3,984,753	27%
MSA 6	21,082	25,008	37,331	57,838	174%
SRA 62	6,657	7,612	9,564	16,725	151%

Source: SANDAG 2009

Table 3.13-2
Total Housing Units and Estimated Growth for San Diego County and Affected Subareas

	2008	2010	2020	2030	Percent Change
San Diego County	1,140,349	1,174,180	1,309,340	1,383,803	21%
MSA 6	11,444	12,836	16,215	23,685	107%
SRA 62	2,775	3,129	3,650	6,104	120%

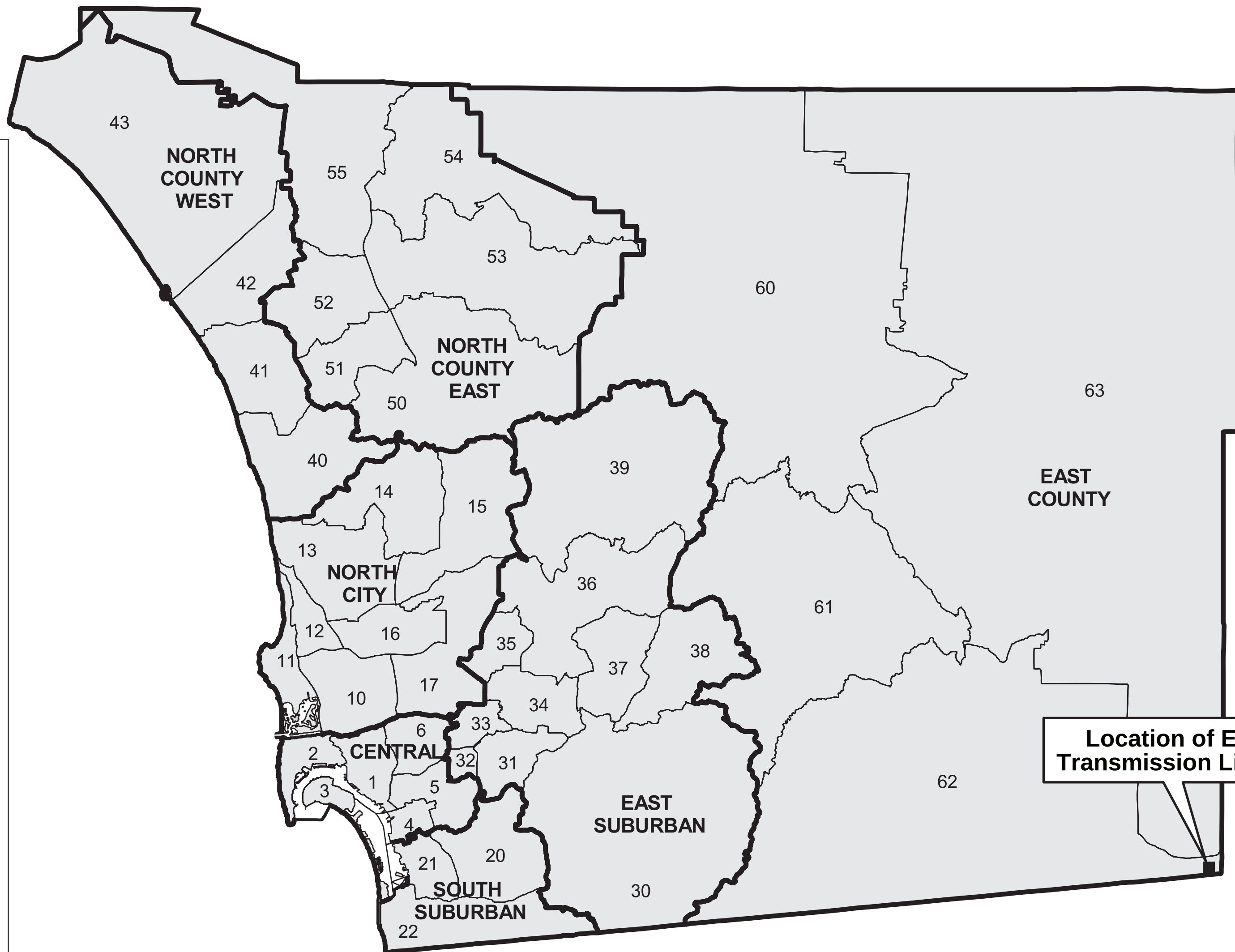
Source: SANDAG 2009

The estimated total employment for San Diego County, MSA 6, and SRA 62 is shown in Table 3.13-3. Overall, county employment is expected to increase 38 percent by 2030. Much greater increases are projected for MSA 6 (140 percent) and SRA 62 (162 percent) in the same time period.

Table 3.13-3
Total Employment and Estimated Growth for San Diego County and Affected Subareas

	2000[1]	2010	2020	2030	Percent Change
San Diego County	1,384,676	1,573,742	1,741,033	1,913,682	38%
MSA 6	6,837	6,201	10,652	16,443	140%
SRA 62	2,030	2,123	3,635	5,323	162%

[1] From 2000 Census
Source: SANDAG 2009



LEGEND

Major Statistical Areas

Subregional Areas

CENTRAL
1 CENTRAL SAN DIEGO
2 PENINSULA
3 CORONADO
4 NATIONAL CITY
5 SOUTHEASTERN SAN DIEGO
6 MID-CITY

NORTH CITY
10 KEARNY MESA
11 COASTAL
12 UNIVERSITY
13 DEL MAR-MIRA MESA
14 NORTH SAN DIEGO
15 POWAY
16 MIRAMAR
17 ELLIOTT-NAVAJO

SOUTH SUBURBAN
20 SWEETWATER
21 CHULA VISTA
22 SOUTH BAY

EAST SUBURBAN
30 JAMUL
31 SPRING VALLEY
32 LEMON GROVE
33 LA MESA
34 EL CAJON
35 SANTEE
36 LAKESIDE
37 HARBISON CREST
38 ALPINE
39 RAMONA

NORTH COUNTY WEST
40 SAN DIEGUITO
41 CARLSBAD
42 OCEANSIDE
43 PENDLETON

NORTH COUNTY EAST
50 ESCONDIDO
51 SAN MARCOS
52 VISTA
53 VALLEY CENTER
54 PAUMA
55 FALLBROOK

EAST COUNTY
60 PALOMAR-JULIAN
61 LAGUNA-PINE VALLEY
62 MOUNTAIN EMPIRE
63 ANZA-BORREGO SPRINGS

AREA SHOWN IN THIS FIGURE

Source(s):
SANDAG/SourcePoint 2002.

0 10 20 30 Miles

0 10 20 30 40 Kilometers

*San Diego Association of Governments

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 3.13-1

SANDAG*-DEFINED MAJOR STATISTICAL AREAS AND SUBREGIONAL AREAS

May 2012

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_3_13-1_SANDAG-DefinedStatisticalAreas_11x8_v5.ai (04/05/2012, 04:19 pm) R. Wurgler/T. Murphy

3.13.2 Environmental Impacts

3.13.2.1 Methodology

Impacts related to socioeconomics would occur if the proposed project resulted in short-term or long-term population growth that exceeded the available housing supply or reduced the availability of employment opportunities for existing residents. Socioeconomic impacts would also result if the proposed project resulted in changes to revenue of local businesses or affected the property value of nearby residents. Available statistics were reviewed and compared to the level of employment and duration of construction and operations associated with the 230-kV and 500-kV Route alternatives.

3.13.2.2 Alternative 1 – No Action

Under the No Action Alternative, the Presidential permit would not be issued and the proposed transmission line would not be constructed. Local housing and economic activity would continue at the levels described in Section 3.13.1.

3.13.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Construction of the 230-kV Route would involve a very small work force (20 to 25 workers) for a very short period of time (maximum 6 months). Given such a small and temporary labor requirement, and the availability of a large construction labor force in San Diego and Imperial counties, it is highly unlikely that project construction would result in the in-migration of any workers to the area. Therefore, any adverse impacts of project-related population growth on housing or public services are likely to be negligible. If construction workers need temporary housing while working on the project, there are three hotels with a total of approximately 40 rooms in the nearby town of Boulevard, and over 54,000 temporary housing units in all of San Diego County (SDG&E 2009b). In terms of beneficial impacts, the project would provide some short-term jobs and income for residents of San Diego and Imperial counties.

Local businesses are present approximately 2.75 miles (4.4 km) northwest of the 230-kV Route at the I-8 – Carrizo Gorge Road interchange, and in the community of Jacumba, approximately 4 miles (6.4 km) west of the project site. The 230-kV Route would not require the removal or relocation of any business uses; and given the distance to the proposed transmission line and the limited number of truck trips required, no nuisance effects related to noise or air emissions would occur.

Employment of construction personnel would provide a temporary beneficial impact on local businesses and the regional economy through increased expenditure of wages for goods and services. Personnel for construction would be drawn from local populations. A limited number of construction personnel may require temporary housing, likely in local hotels, and would purchase food, beverages, and other commodities, which would provide temporary benefits to the local economy.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 would not result in socioeconomic impacts. As discussed above, the existing well provides non-potable water, and extraction of this water at the proposed rate and volume for use during construction activities would not affect other nearby potable water wells.

Operations Impacts

Operation and maintenance of the proposed project would provide additional work for two existing workers. These two workers would perform needed services at the proposed transmission line in addition to their duties at other locations, so no new jobs would be created. Therefore, project operations and maintenance would not result in the in-migration of any workers to the area, and there would be no adverse impacts on housing or public services. In terms of beneficial impacts, the project would provide additional work for two workers who likely reside in San Diego County or Imperial County.

The presence of the 230-kV Route could potentially indirectly reduce the value of nearby properties. Claims of diminished property value for similar projects has been based on concerns about hazards to human health and safety; increased noise and traffic; and impacts to visual resources associated with living in close proximity to the transmission lines. As discussed in Sections 3.6 (Noise); 3.7 (Transportation and Traffic); and 3.8 (Public Health and Safety), no impacts with regard to increased noise and traffic or EMF concerns in relation to nearby sensitive receptors are anticipated; potential impacts to property values are related to impacts to visual resources.

Several studies related to property value effects from transmission lines and wind turbines were reviewed, and research indicates that there is no significant effect of transmission lines on property values. Several of the studies reviewed are included below:

High-Voltage Transmission Lines: Proximity, Visibility, and Encumbrance Effects, prepared by James A. Chalmers, PhD, and Frank A. Voorvaart, PhD is a study published in the Appraisal Journal, Summer 2009, and conclude:

> *"There is no evidence of systematic effects of either proximity or visibility of 345-kV transmission lines on residential real estate values….The professional literature cited, combined with the results reported here, support the position that a presumption of material negative effects of HVTLs on property values is not warranted." [page 239]*

The full text of this study is available online at:
http://www.msti500kv.com/uploads/docs/High%20Voltage.pdf.

The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis by Ben Hoen, Ryan Wiser, Peter Cappers, Mark Thayer, and Gautam Sethi was prepared by the Ernest Orlando Lawrence Berkeley National Laboratory in December 2009 and concludes:

> *"The various analyses are strongly consistent in that none of the models uncovers conclusive evidence of the existence of any widespread property value impacts that might*

be present in communities surrounding wind energy facilities. Specifically, neither the view of the wind facilities nor the distance of the home to those facilities is found to have any consistent, measurable, and statistically significant effect on home sales prices. Although the analysis cannot dismiss the possibility that individual homes or small numbers of homes have been or could be negatively impacted, it finds that if these impacts do exist, they are either too small and/or too infrequent to result in any widespread, statistically observable impact."[page iii]

The full text of this study is available online at: http://eetd.lbl.gov/EA/EMP/reports/lbnl-2829e.pdf. A summary presentation of the study is available online at: http://eetd.lbl.gov/EA/EMP/reports/lbnl-2829e-ppt.pdf.

Also see Field Guide to Wind Farms and their Effect on Property Values, published by the National Association of Realtors and available online at: http://www.realtor.org/library/library/fg509#topicb, which reaches similar conclusions.

Substantial research regarding this issue was also presented in the Sunrise Powerlink RDEIR/SDEIS, Section D.14.5.1 (CPUC/BLM 2008b). This research indicates that while there is some evidence that overhead transmission lines have the potential to reduce the value of nearby property, any effects are usually smaller than anticipated and difficult to quantify due to the individuality of properties/neighborhoods, differences in personal preferences of individual buyers/sellers, and the weight of other factors that contribute to a person's decision to purchase a property. Other factors (e.g., neighborhood factors, square footage, size of lot, irrigation potential) are more likely than overhead transmission lines to be major determinants of the sales price of property (Knoll and Priestly 1992; CPUC/BLM 2008b). Further, incremental effects on property values that may result from overhead transmission lines would diminish over time, and most likely disappear in 5 years (CPUC/BLM 2008b).

Based on the studies provided above, as well as those discussed in the Sunrise Powerlink RDEIR/SDEIS, it is unlikely that the proposed transmission line would result in a permanent adverse impact on property values.

Similarly, it is unlikely that transmission lines would have a significant impact on rural tourism. An Environmental Impact Study conducted by the Energy Ministry of Scotland regarding a proposed transmission line found that there are a variety of factors that influence tourism, and studies have been unable to isolate the impact of transmission lines on tourism. In general, evidence on the likely impact of transmission lines on tourism has been deemed unsatisfactory to draw any conclusions, but it is likely that any impact from the proposed transmission lines would be short-term (Scottish Energy Market 2010).

Impacts in the U.S. due to Related Activities in Mexico

The construction of wind turbines in Mexico could affect property values in the U.S. if property buyers and sellers reassessed property values downward as a result of perceived negative changes in the viewshed from U.S. properties. As discussed in Section 3.2 (Visual Resources), the wind turbines would be visible from private land in and around the community of Jacumba (see Figure 3.2-9 which provides a simulation of views of the wind turbines from Jacumba). To the extent that the wind turbines would substantially change the visual setting in a portion of the community's viewshed, the wind development could indirectly result in impacts on property values. The nature and severity of potential visual impacts are addressed in Section 3.2 (Visual Resources). The effect of views of wind turbines on property value is highly subjective and case-specific, depending on a number of factors including the distance of wind turbines to affected properties, existing conditions prior to development of the wind turbines, and the general economic climate. Few complete studies have been conducted relating property values to the presence of wind farms, and two of the most widely cited studies in the U.S. (Sterzinger et al. 2003; Haughton et al. 2004) reach contradictory conclusions on the subject. The Renewable Energy Policy Project recently performed a statistical analysis that compared changes in property values over time among homes with wind farms in the viewshed and other comparable homes in the community. The study found that there was no statistical difference in property values among the datasets for all communities analyzed (Sterzinger et al. 2003). In contrast, as part of an economic analysis of a proposed wind farm off the coast of Nantucket, Haughton et al. (2004) conducted a survey of the affected homeowners that concluded property values could decrease by as much at 4 percent. As noted in the Sunrise Powerlink RDEIR/SDEIS (CPUC/BLM 2008b), various other studies have concluded that any adverse property value impacts tend to diminish over time, and within five years the change is negligible. This is most likely due to increased screening as trees and shrubbery grow and/or diminished sensitivity to the project proximity in the absence of adverse publicity. Based on these studies, the potential for adverse property value impacts exists, but any decrease in property values is likely to be minor and short-term.

The construction of wind turbines in Mexico could also reduce recreational visitation to the public lands within the project area in the U.S., if visitors perceive the area's recreational resources as less desirable due to changes in the viewshed from vantage pints within U.S. In turn, this decrease in visitation could result in reduced visitor-serving commercial revenues within local communities. The nature and severity of potential visual impacts on recreational uses are addressed in Section 3.2 (Visual Resources), and recreational resources are described in Section 3.4 (Recreation). As with private property values, the effect of distant views of wind turbines on recreational use in the U.S. is highly subjective and case-specific, depending on the distance of wind turbines to the affected recreational lands; the existing recreational conditions prior to development of the wind turbines; the general values attributed to the recreational resource; and the relative proportion of local incomes that are attributable to recreational visitation. No studies have been found in literature that describe the indirect effect of recreational visitation after construction of wind turbines that alter distant views from recreational areas. Based on the Visual Resources analysis presented in Section 3.2, it is likely that any decrease in recreation visitation and associated visitor-serving income would be minor and short-term.

3.13.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

Socioeconomic impacts for this alternative would be substantially the same as for 230-kV Route because the routes are adjacent to each other; construction, operations, and maintenance activities for the 500-kV Route would be substantially the same as for the 230-kV Route.

3.13.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

Socioeconomic impacts for the revised 230-kV and 500-kV routes would be substantially the same as for the original Routes because the routes are adjacent to each other; construction, operations, and maintenance activities would also be substantially the same as described for Alternatives 2 and 3.

3.13.3 Mitigation Measures

No mitigation measures are indicated because any impacts related to socioeconomics would be either minor or beneficial. Socioeconomic impacts related to potential mitigation measures that are indicated for other issues would depend on the nature of the mitigation measures. In general, measures are likely to create local employment as a result of hiring and material procurement. Mitigation-related wage and salary spending and material expenditures would have a beneficial effect on the overall level of economic activity in the county.

3.14 ENVIRONMENTAL JUSTICE

This section describes the minority and low-income populations in the vicinity of the proposed transmission line and addresses the potential for disproportionately high or adverse impacts to these segments of the population. Assessment of environmental justice is required by E.O. 12898, Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations (59 FR 7629), signed in February 1994. E.O. 12898 directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

3.14.1 Affected Environment

3.14.1.1 Minority Populations

Per CEQ guidance, "minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population of other appropriate unit of geographic analysis" (CEQ 1997b). Table 3.14-1 presents the most recent statistics (2008) on minority populations for census tracts in San Diego County located near the alternative corridors (Census Tracts 210 and 211) and for the nearest census tract east of the alternative corridors in Imperial County (Census Tract 123.01). The most recent statistics (2010) on minority population in all of San Diego and Imperial counties are also provided in Table 3.14-1 (note that following the publication of the Draft EIS, the U.S. Census Bureau released results of the 2010 survey; the tables below have been updated accordingly). As shown in the table, minorities comprise 50 percent or more of the population in both counties, thus indicating the presence of a minority population. Minorities comprise a greater percentage of the population east of the alternative corridors in Census Tract 123.01 and Imperial County than they do in Census Tracts 210 and 211 and San Diego County.

3.14.1.2 Low-Income Populations

Per CEQ Guidance, "low-income populations in the affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty" (CEQ 1997b, Environmental Justice: Guidance Under the National Environmental Policy Act). Table 3.14-2 presents the percent of population living below the poverty level in the areas nearest the alternative corridors. According to the 2005-2009 American Community Survey (the most current data that are available), 12 percent of all households in San Diego County and 21 percent of all households in Imperial County were below poverty level compared to 12 percent and 27 percent for Census Tract 210 and Census Tract 211, respectively (U.S. Census Bureau 2011). The percent of population below the poverty level in Census Tract 211, in which the alternative corridors are located, is more than double that of San Diego County as a whole and is also greater than in Imperial County as a whole. Therefore, this tract is considered to contain a low-income population. The percent of population below the poverty line in Census Tract 210 is equivalent to the value for San Diego County and less than Imperial County and is not considered to contain a low-income population.

Table 3.14-1
Population and Ethnicity for Areas Near the Alternative Corridors

Race/Ethnicity	Census Tract 210 (San Diego)	Census Tract 211 (San Diego)	Census Tract 123.01 (Imperial)	Jacumba CDP	Imperial County	San Diego County	State of California
White (non-Hispanic)	2,803	4,139	1,085	322	23,927	1,500,047	14,956,253
Black (non-Hispanic)	16	172	1,550	4	5,114	146,600	2,163,804
Other (non-Hispanic)	93	600	119	28	5,216	457,318	6,120,180
Hispanic[1]	1,528	2,678	2,879	207	140,271	991,348	14,013,719
Total	4,440	7,586	5,633	561	174,528	3,095,313	37,253,956
Total Minority	1,637	3,447	4,548	239	150,601	1,595,266	22,297,703
Percent Minority	37%	45%	81%	43%	86%	52%	60%

[1] The Hispanic category is an ethnic, rather than racial distinction. These tables include only non-Hispanic individuals in the black, white, and other categories to avoid double-counting.

Source: U.S. Census Bureau 2011 (http://factfinder2.census.gov/)

Table 3.14-2
Population below the Poverty Threshold for Areas near the Alternative Corridors

	Census Tract 210 (San Diego)	Census Tract 211 (San Diego)[1]	Census Tract 123.01 (Imperial)	Imperial County	San Diego County	State of California
Population below the Poverty Threshold	320	1,867	178	31,850	334,712	4,694,423
Total Population	2,753	6,856	870	150,020	2,900,201	35,543,481
Percent Population below the Poverty Threshold	11.6	27.2	20.5	21.2	11.5	13.2

[1] The alternative corridors are located in Census Tract 211.

Source: U.S. Census Bureau 2010 (http://factfinder2.census.gov/)

3.14.2 Environmental Impacts

3.14.2.1 Methodology

Potential impacts were assessed in the context of area demographics, including the proximity of populated areas, to determine whether they would disproportionately affect minority or low-income population groups.

3.14.2.2 Alternative 1 – No Action

Under the No Action alternative, the Presidential permit would not be issued, and the proposed transmission line would not be constructed. No adverse impacts to minority and low-income populations in the vicinity of the ESJ U.S. Transmission Line project would occur.

3.14.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line Construction Impacts

As discussed above, both minority and low-income populations are considered to be present in the project area. However, there is no potential for construction of the 230-kV Route to cause disproportionately high and adverse effects to the minority or low-income populations because of the distance between the right-of-way and the nearest populations. The nearest presently occupied residences are approximately 2 miles (3.2 km) west of the right-of-way, and the nearest residential community, Jacumba, is located approximately 4 miles (6.4 km) west. As discussed elsewhere in Section 3, construction of the 230-kV Route would not result in major adverse health and safety, air quality, noise, socioeconomic, or other impacts and identified minor impacts would not disproportionately affect minority populations in comparison to the general population. Additionally, no information suggests that there are differential patterns of consumption of natural resources that would cause minority or low-income populations to experience impacts that are substantially different from impacts on the general population.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 would not result in adverse impacts. As discussed above, the existing well provides non-potable water, and extraction of this water at the proposed rate and volume for construction-related activities would not affect other nearby potable water wells. Therefore, no minority or low-income populations would be disproportionately impacted by the extraction of groundwater from Well #6 or from construction of the new access road proposed from the well to Old Highway 80.

Operations Impacts

As discussed above, both minority and low-income populations are considered to be present in the project area. However, the nearest presently occupied residences are approximately 2 miles (3.2 km) west of the right-of-way and the nearest residential community is 4 miles (6.4 km) west. Further, as discussed elsewhere in Section 3, operation of the 230-kV Route would not result in major adverse health and safety, air quality, noise, socioeconomic, or other impacts on local communities. The identified minor impacts would not disproportionately affect minority or low-income populations in comparison to the general public. Additionally, no information suggests that there are differential patterns of consumptions of natural resources that would cause minority or low-income populations to experience substantially different impacts than the general population. Therefore, there is no potential for operation of the 230-kV Route to cause disproportionately high or adverse impacts to minority or low-income populations in comparison to the general population.

Impacts in the U.S. due to Related Activities in Mexico

As discussed elsewhere in Section 3, construction and operation of the ESJ Wind project in Mexico is not expected to adversely affect the communities in the vicinity of the ESJ U.S. Transmission Line project; therefore, there is no potential for the ESJ Wind project to disproportionately affect minority or low-income populations in the U.S.

3.14.2.4 Alternative 3 – Single-Circuit 500 kV Transmission Line

The existing conditions described for the 500-kV Route are the same as for the 230-kV Route because the routes are adjacent to each other. Construction, operations, and maintenance activities for Alternative 3 would be substantially the same as for Alternative 2. Consequently, the impacts that would occur under the 500-kV Route would be as described for the 230-kV Route. No disproportionately high or adverse impacts to minority or low-income populations would occur.

3.14.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The existing conditions described for Alternative 2 and 3 Routes are the same as for the revised 230-kV and 500-kV Routes because they are all adjacent to one another. Construction, operations, and maintenance activities for Alternative 4 would also be substantially the same as for Alternatives 2 and 3. Consequently, the impacts that would occur under the revised 230-kV and 500-kV Routes would be as described for the original Routes. No disproportionately high or adverse impacts to minority or low-income populations would occur.

3.14.3 Mitigation Measures

No mitigation measures are indicated.

3.15 SERVICES AND UTILITIES

This section addresses potential impacts of project implementation on public services (schools, hospitals, and law enforcement) and utilities (electrical power, sanitary waste, telecommunications, and solid waste). Requirements of the U.S. International Boundary and Water Commission related to international border monuments are also addressed in this section. Fire protection, wildfire risk, and management of onsite fuels are addressed in Section 3.9 (Fire and Fuels Management). Water supplies are addressed in Section 3.11 (Water Resources).

3.15.1 Affected Environment

3.15.1.1 Services

Both of the alternative corridors are in the Mountain Empire Unified School District. The nearest school is approximately 4 miles (6.4 km) away in the community of Jacumba. The nearest hospital is located in El Centro, approximately 35 miles (56 km) east of the alternative corridors.

Local law enforcement services for the area that includes the alternative corridors are provided by the County of San Diego Sheriff's Department office in the community of Boulevard. The U.S. Border Patrol, San Diego Sector, Campo Station is responsible for the border area extending from approximately 4 miles (6.4 km) west of Tecate to the San Diego/Imperial County line and maintains a regular presence in the vicinity of the corridors. Since this area is largely undeveloped high desert land with minimally maintained roads, agents patrol the border on foot, horseback, mountain bikes, all-terrain vehicles (ATVs) and 4-wheel-drive vehicles (U.S. Department of Homeland Security 2007).

3.15.1.2 Utilities

SDG&E provides electrical service in the vicinity of the corridors. SDG&E maintains the existing SWPL transmission line that extends west and east through the Mountain Empire subregion of the county, which includes the alternative corridors. SDG&E has substation facilities located in Boulevard and Cameron Corners, which are west and northwest of the corridors site, respectively.

Sanitary waste in nearby communities is handled via private septic systems. SBC and Cox Communications provide telecommunications services in the vicinity of the alternative corridors.

There are many landfills in San Diego and Imperial counties. The two landfills closest to the corridors are:

- Allied Imperial Landfill (104 East Robinson Road, Imperial). This facility has a maximum permitted throughput of 1,135 tons/day, and a remaining capacity of approximately 1.9 million cubic yards (44 percent of its overall capacity) (California Department of Resources Recycling and Recovery 2009a); and
- Imperial Solid Waste Site (1705 West Worthington Road, Imperial). This facility has a maximum permitted throughput of 207 tons/day and a remaining capacity of approximately 184,000 cubic yards (9.5 percent of its overall capacity) (California Department of Resources Recycling and Recovery 2009b).

A permit is required from the International Boundary and Water Commission (IBWC) before construction commences. The applicant must submit engineering drawings for review and approval by IBWC. Drawings need to show the location of each component in relation to the international boundary and the cadastral survey markers, and all structures must be offset from the international boundary by a minimum of 3 feet and allow a clear line-of-sight between any affected monuments. This permit requirement is listed in Section 8 (Applicable Laws, Regulations, Permits, and Executive Orders).

3.15.2 Environmental Impacts

3.15.2.1 Methodology

Project activities were examined qualitatively for their potential to disrupt or increase the demand for services and utilities. There are no applicable County guidelines for determining significance of impacts to services and utilities.

3.15.2.2 Alternative 1 – No Action

Under the No Action Alternative, the proposed transmission line would not be installed; therefore, no impacts related to existing services or utilities would occur.

3.15.2.3 Alternative 2 – Double-Circuit 230-kV Transmission Line

Construction Impacts

Public Services

Construction would require between 20 and 25 construction workers during the 2- to 6-month construction period. Construction is expected to require approximately 2 months, although it could be distributed over 6 months if periodic work stoppages are required as a result of inclement weather or other factors. The majority of the construction workers would likely be from the relatively large labor pool within commuting distance of the 230-kV Route; therefore, construction would not result in an increase in the local population (see Section 3.13, Socioeconomics, for additional information). As a result, schools would not be affected, and any increased demand on hospitals would be temporary and minor.

In general, construction sites are targets for theft and vandalism. This issue has been prevalent at construction sites located near the U.S.-Mexico border (e.g., look-alike vehicles have been used by unauthorized individuals to gain access to construction sites and theft of construction equipment has occurred). Theft and vandalism from construction sites could increase impacts to public services by creating an increase in stolen goods trafficking and an increase in movement across the U.S.-Mexico border for illicit purposes. The U.S. Border Patrol, which is the main agency engaged in law enforcement activity in the vicinity of the project, has indicated that it would not alter its border protection mission by providing security at a commercial construction site (Soule 2009; included in Appendix G [Agency Consultations]). U.S. Border Patrol has suggested that certain measures can be taken to prevent unauthorized use of the improved access road and ensure the security of the construction areas. These actions may include contracting with a private security agency to assist in protecting the construction area; securing unused construction equipment; and establishing a means to positively identify all vehicles and personnel involved in the construction activities. Mitigation Measure Services-1 (Coordinate with U.S. Border Patrol and Local Law Enforcement and Secure Construction Site) is an additional mitigation (not identified by the applicant) that would address the effect of increased demand for border law enforcement by coordinating with the U.S. Border Patrol and local law enforcement, and identifying and implementing site-specific security measures. With implementation of this mitigation measure, any increased demand on law enforcement - in particular the U.S. Border Patrol and the County of San Diego Sheriff's Department - would be temporary. No other law enforcement impacts are identified.

Utilities

The proposed project would not be co-located with existing utility systems and, therefore, would not affect these systems. The SWPL transmission line, which is owned and operated by SDG&E, would not be affected by project construction or operation.

Portable toilets would be provided for use by the construction workers. These facilities would be delivered to and removed from the construction right-of-way by a licensed portable sanitation company, and the waste material would be disposed of at an approved facility. As a result, there would be no installation of new septic systems and no impacts to existing local septic systems. As discussed in Section 2.4.3, project construction would require 20 to 25 workers. Although it is anticipated that some use of wireless communications would be required during construction activity, it is assumed that the workers already own or use devices with wireless technology and therefore, the project would not result in any increased demand in wireless communications or impact service to other customers.

Waste generation during construction would include packaging, excess building materials that would be returned to vendors or recycled, excess soil that would be used in grading other parts of the site, and small amounts of incidental waste that cannot be recycled. All waste material generated during project construction would be deposited in dumpsters or covered bins that would be removed from the construction right-of-way by a licensed waste hauler for proper disposal. The waste exported offsite would be a small percentage of the permitted throughput for the closest landfills, both of which have sufficient capacity to accommodate the solid waste generated by the project, and which together represent only a small fraction of the region's total landfill capacity. To minimize the volume of solid waste, ESJ would segregate recyclable wastes in compliance with the County of San Diego construction and demolition debris ordinance. This ordinance requires that a minimum of 90 percent of inert material and 70 percent of other materials be recycled. Compliance with the ordinance would also require that ESJ submit quarterly Debris Management Reports to the County of San Diego Department of Public Works Solid Waste Planning and Recycling Section during construction, including receipts for landfill disposal and recycling. As a result, impacts associated with solid waste disposal would be small and of short duration.

Groundwater Extraction

The proposed use of groundwater from JCSD's Well #6 would not result in services or utilities impacts. JCSD's Well #6 is an existing well, and the construction of a new access road to facilitate trucking of water from the well site to the project construction site is a minor construction activity that would not impact utility services. Refer to Section 3.11 (Water Resources) for information on water supply and demand for project construction.

Operations Impacts

Project operations would not result in added population (refer to Section 3.13 [Socioeconomics]), and therefore, would not result in increased demand for public services or utilities. As there would be no permanent structures except the proposed towers or monopoles associated with the project, project operations would not result in increased demand for waste management services or utility connections. In addition, although project operations would not require increased patrols of the area by the U.S. Border Patrol or local law enforcement, the U.S. Border Patrol has indicated that their agents may use the project access road during patrols as necessary (Good and Soule 2009; Good 2010).

Impacts in the U.S. due to Related Activities in Mexico

There would not be impacts on U.S. utilities that result from related activities in Mexico. The only potential for an impact on public services would be associated with an increase need for law enforcement. That could result if the increased presence of personnel in the border area during construction of the transmission line in Mexico increased the demand for County of San Diego law enforcement and U.S. Border Patrol services. However, because construction of the transmission line in Mexico would be separate from construction of the ESJ U.S. Transmission Line project, there would be minimal cross-border activity. At most, this would result in a minor and temporary impact on those agencies.

3.15.2.4 Alternative 3 – Single-Circuit 500-kV Transmission Line

Because of the proximity of the two alternative routes, the services, and utilities setting for the 500-kV Route is the same as for the 230-kV Route. Construction, operations, and maintenance activities for the 500-kV Route would be substantially the same as for the 230-kV Route. Consequently, the services and utilities impacts that would occur under Alternative 3 would be essentially the same as those described for Alternative 2.

3.15.2.5 Alternative 4 – Revised Double-Circuit 230-kV Transmission Line Route (Applicant's Preferred Alternative) or Single Circuit 500-kV Transmission Line Route

The services and utilities setting for the revised 230-kV and 500-kV Routes are the same as for the original Routes because they are adjacent and in close proximity to one another. Construction, operations, and maintenance activities for the relocated routes would also be substantially the same as for the original Routes described in Alternatives 2 and 3. Consequently, the services and utilities impacts that would occur under Alternative 4 would be essentially the same as those described for Alternatives 2 and 3.

3.15.3 Mitigation Measures

The following potential mitigation measure not proposed by the applicant would reduce potential impacts on law enforcement services.

Services-1: Coordinate with U.S. Border Patrol and Local Law Enforcement and Secure Construction Site

ESJ should coordinate with the U.S. Border Patrol and local law enforcement and implement appropriate actions to prevent unauthorized use of the improved access road and ensure the security of the construction right-of-way. These actions may include contracting with a private security agency to assist in protecting the construction area; securing unused construction equipment; and establishing a means to positively identify all vehicles and personnel involved in the construction activities.

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3.16 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Implementation of the ESJ U.S. Transmission Line project along any of the alternative routes, or along the revised alternative routes, would result in some unavoidable adverse environmental impacts in the U.S. These impacts are identified below by resource area.

3.16.1 Biological Resources

Due to fire safety conditions at the site, the ESJ Fire Protection Plan requires a cleared space of 30 feet (9.1 m) on all sides of the proposed towers (or 10 feet [3 m] around monopoles). This would result in the permanent removal of vegetation with Sonoran Mixed Woody Scrub and Peninsular Juniper Woodland and Scrub habitat. ESJ is working with the County of San Diego to provide a conservation easement to offset the impacts (as required by the County) and preserve habitat that is functionally similar to that impacted by project construction. Unavoidable impacts to wildlife include temporary increases in noise, dust, and the presence of humans during construction activity which could alter the behavior and success of nesting birds and foraging wildlife. ESJ has incorporated a number of measures into project design to reduce such impacts to minimal levels.

3.16.2 Visual Resources

Construction of the access roads and transmission line towers or monopoles would introduce unnatural vegetation lines and soil color contrast (e.g., land scarring). Potential mitigation measures would reduce impacts to moderate levels but impacts would be permanent and unavoidable. The presence of the transmission line once constructed would add industrial structures to a primarily rural, open space area and result in minor to moderate long-term adverse impacts to visual resources. The ESJ Wind project would also introduce tall, highly visible vertical elements into the U.S. viewshed that would change the existing visual character. The hillside and ridgeline presence of the wind turbines would result in a substantial increase in industrial character, diminution of visual quality and increase in visual contrast, particularly as viewed from the community of Jacumba. In the context of the existing landscape's visual sensitivity, the resulting visual impact of these related activities in Mexico is considered unavoidable, major, and permanent. There is no mitigation available to reduce visual impact of the ESJ Wind project to a level that would be minor.

3.16.3 Noise

During construction, daytime noise would increase in areas located near the right-of-way. There are no residences in these areas, and the nearest recreational area is about 0.5 mile (0.8 km) east. Since this impact is associated with the construction phase only, it would be temporary and short-term. During dry weather conditions (which is almost always the case in the study area), noise associated with corona effects would not be audible beyond the right-of-way. During very infrequent rainfall events, the noise level at the edge of the right-of-way would be less than 24 dBA. This is a low level (typical of the noise level in a library), which would not be expected to create a disturbance.

3.16.4 Traffic and Transportation

During construction, there would be a temporary increase in traffic to and from the project site. Typical daily construction-related traffic would be about to about 7 to 12 heavy vehicles and 20 to 25 construction worker vehicles. Additional heavy truck trips would be generated due to the one-time delivery of tower parts, and the import and export of earthwork materials. The transportation route roads have ample capacity to accommodate the additional vehicle trips associated with construction personnel and delivery of equipment and materials without reducing the existing LOS, and no temporary road or lane closures would be required. Vehicle use for the ESJ Wind Project would be localized within the wind turbine development area in Mexico. ESJ has indicated that the wind turbines and associated equipment would originate in the U.S. and be transported to the ESJ Wind project sites within Mexico via the Otay Mesa border crossing in San Diego County. However, as of this writing, the transportation route for the wind turbine components in the U.S. has not yet been determined.

3.16.5 Fire and Fuels Management

Construction activities associated with the proposed project could increase wildfire risks in and near the construction area as a result of inadvertent introduction of non-native invasive plant species and ignition sources in a fire-prone area. Potential mitigation measures would minimize the potential for a wildfire caused during construction, but the impact of a fire could be potentially major. Following completion of construction activity, the long-term presence of the transmission line would be a potential source of wildfire ignitions for the life of the project and would increase the risk of a wildfire. This impact would be reduced to some extent by implementation of the Fire Protection Plan developed for the project. However, not all potential ignition sources can be eliminated by implementation of measures such as those included in the Fire Protection Plan and impacts are considered potentially major and unavoidable. Similarly, operation of the ESJ Wind project could increase the potential for fires that originate in Mexico, and these fires could spread into the U.S. under certain weather conditions. Given the distance between the wind farm and the U.S., the more likely scenario for a cross-border fire would originate from the transmission line near the U.S.-Mexico border. This impact is considered moderate and unavoidable, and it would last for the life of the ESJ Wind project.

3.16.6 Air Quality and Climate Change

Construction and maintenance of the transmission line would result in unavoidable emission of criteria pollutants in the San Diego Air Basin. Impacts from construction would include fugitive dust emissions generated by the operation of construction vehicles. Fugitive dust would be concentrated in the immediate vicinity of the transmission lines and would be of short duration. There would also be exhaust emissions from construction vehicles. Given the small number of vehicles involved, the short duration of construction, and the distance of the construction sites from populated areas, no substantial effect on air quality would occur.

The maintenance of the transmission line would likewise result in the emission of small quantities of dust and exhaust emissions. The emissions resulting from the relatively few trips required for line maintenance would be of a de minimis nature and would occur infrequently, but last for the life of the project.

3.16.7 Water Resources

Construction of the transmission line would unavoidably consume water resources for dust abatement, cleaning construction equipment, and concrete production for tower foundations. The estimated volume of water (2.4 acre-feet or 2,950 cubic m) that would be required during short-term construction of the transmission line is relatively small in comparison to the annual recharge and, therefore, would not impact the locally available water supply. Accordingly, impacts related to groundwater resources, the primary water supply in the area, during construction are considered temporary and minor.

3.16.8 Geological Resources

The transmission line construction process would unavoidably have some effects on geological resources. Soils would be disturbed during the construction of towers or monopoles, and access roads. The construction of footings for towers or monopoles would result in the permanent displacement of soils. Removal of vegetation and compaction would occur in the work areas, with potential impacts on erosion. Soil displacement and compaction would also occur during the grading and use of access roads.

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SECTION 4

CONNECTED ACTIONS (ECO SUBSTATION AND SWPL LOOP-IN)

4.1 ENVIRONMENTAL ANALYSIS OF CONNECTED ACTIONS

On August 11, 2009, SDG&E filed an application with the CPUC for a Permit to Construct the ECO Substation Project (CPUC Application A.09-08-003). The CPUC has evaluated the SDG&E ECO Substation Project under CEQA. EPA published a Notice of Availability of the Final EIR/EIS for the SDG&E ECO Substation Project on October 14, 2011 (76 FR 63922). The EIR/EIS provides a comprehensive analysis of potential impacts of the ECO Substation switchyards and the SWPL loop-in. According to SDG&E, the purpose of the ECO Substation Project is to "provide an economical interconnection platform for renewable energy projects and to improve reliability to electric customers in southeastern San Diego County." As discussed in Section 1.1.2, the ECO Substation switchyards and SWPL loop-in (two components of the SDG&E ECO Substation project) are considered connected actions to the proposed ESJ U.S. Transmission Line project. Detailed descriptions of the ECO Substation switchyards and SWPL loop-in are provided in Section 2.9.

This section provides a discussion of the potential impacts of construction and operation of the ECO Substation switchyards and SWPL loop-in based on an independent evaluation of the following analyses:

- October 2011, Final Environmental Impact Report/Environmental Impact Statement (ECO Substation Project EIR/EIS) prepared for CPUC and BLM for the combined ECO Substation project, Tule Wind project, and ESJ U.S. Transmission Line project.[1] The ECO Substation Project EIR/EIS was released after the publication of the Draft ESJ U.S. Transmission Line project EIS; therefore the evaluation of the ECO Substation presented in this section has been updated to incorporate this new information. The ECO Substation Project EIR/EIS was prepared based on the most accurate information regarding project design provided by SDG&E and is the most comprehensive evaluation of potential impacts of the ECO Substation and SWPL loop-in (CPUC/BLM 2011a).
- August 2009, Proponent's Environmental Assessment (PEA) for San Diego Gas & Electric East County Substation Project, prepared by SDG&E for the ECO Substation Project. In this document, SDG&E conducted an evaluation of the potential impacts

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[1] The ECO Substation Project Final EIR/EIS is available online at: http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/ECOSUB.htm#Final%20EIR/EIS

The EPA's Federal Register Notice of Availability of the Final EIR/EIS is available online at:

http://www.gpo.gov/fdsys/pkg/FR-2011-10-14/pdf/2011-26610.pdf. The BLM and CPUC Notice of Availability is available online at; http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/1-NOA_ECO.FEIR-EIS.pdf associated with construction and operation of the ECO Substation and SWPL loop-in[2] as part of its permit application package submitted to the CPUC (SDG&E 2009b).

- October 2008, Sunrise Powerlink Final EIR/EIS, which included an assessment of potential impacts of the proposed ECO Substation and SWPL loop-in as connected actions to the Sunrise Powerlink project based on conceptual plans for the two actions. (This document was prepared prior to the development of a complete project description for the ECO Substation project.) (CPUC/BLM 2008a and 2008b)[3].

The relevant analyses from these documents are incorporated into this EIS by reference and summarized below by issue area, consistent with the organization of Section 3 (Affected Environment, Impacts, and Mitigation Measures).

As discussed in Section 2, subsequent to the publication of DOE's Draft EIS, SDG&E proposed an "ECO Substation Alternative" that shifted the location about 700 feet (213 m) east of the originally proposed ECO Substation location (Figure 2-1b). The ECO Substation Alternative Site was initially described in the Draft ECO Substation EIR/EIS (CPUC/BLM 2010), and SDG&E subsequently indicated that the new alternative location is its preferred alternative.[4] The purpose of the revised location was primarily to avoid potential impacts to cultural resources that were identified in the initially proposed location. This alternative would also change the configuration of the SWPL loop-in (two additional structures required), which would result in an increased area of temporary and permanent disturbance. In addition, the northwest corner of the western ECO Substation switchyard pad would be removed to reduce permanent impacts to surface waters (SDG&E 2011). DOE's analysis of potential impacts presented below considers the impacts of the ECO Substation Alternative based on an independent review of SDG&E's application materials and the ECO Substation EIR/EIS alternatives analysis. As can be seen in Figure 2-1b, there is considerable physical overlap between the original and revised locations, and the remainder of the alternative site and the surrounding undeveloped open space are very similar to the initially proposed site in topography, vegetation, soils, geology, and associated

[2] The ECO Substation application documents, including the PEA, are available online at: http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/ECOSUB.htm.

[3] The Final EIR/EIS for the Sunrise Powerlink Project refers to the ECO Substation as the "Jacumba Substation" and the ESJ Wind Project as the "La Rumorosa Wind Project." The Sunrise Powerlink Final EIR/EIS (CPUC/BLM 2008a) is available online at: http://www.cpuc.ca.gov/environment/info/aspen/sunrise/toc-feir.htm#p4. The primary documents within the Sunrise Final EIR/EIS that were reviewed for this EIS connected action analysis are the July 2008 Recirculated Draft EIR/Supplemental Draft EIS (CPUC/BLM 2008b), available at http://www.cpuc.ca.gov/Environment/info/aspen/sunrise/toc-rdeir.htm; and Appendix 12 of the October 28, 2008 Final EIR/EIS, which provides the full text of all mitigation measures, and is available online at: http://www.cpuc.ca.gov/environment/info/aspen/sunrise/feir/apps/App%2012.pdf.

[4] The ECO Substation Alternative is described in Attachment A of SDG&E's 4 March 2011 letter to the CPUC and BLM, which is available online at:

http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/E/05APP_03.04.11_SDGE%20(Wrazen).pdf

The ECO Substation EIR/EIS presents a comparison of the originally proposed substation location and the alternative site in Section E, which is available online at:

http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/Final_EIR/E%20_Comparison_of_Alternatives.pdf. Slight modifications to the ECO Substation design were made in February 2011 for the ECO Substation Alternative Site. These modifications include the addition of a staging yard north of the ECO Substation, as well as minor changes to the construction buffer and retention basin.

visual resources. Consequently, nearly all of the impacts and recommended mitigation measures identified for the original proposed location are unchanged for the alternative location. The alternative site presents slightly different impacts on vegetation (including less impact to peninsular woodland and more impact to woody scrub) and overall fewer impacts in the areas of cultural resources and water resources.

4.1.1 Biological Resources

Potential impacts to biological resources associated with the construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.2.3 of the ECO Substation Project EIR/EIS; Section 4.4 of the SDG&E PEA; and Section 2.2.2, starting at page 2-18, of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink EIR/EIS. Associated mitigation measures are listed in the ECO Substation Project EIR/EIS at Section D.2.3, and in the Sunrise Powerlink Final EIR/EIS, in Appendix 12, beginning at page Ap.12-2. Potential impacts addressed in these analyses include:

- Temporary and permanent losses of native vegetation.
- Introduction of invasive, nonnative, or noxious plant species during construction activity.
- Creation of dust during construction activity that may result in degradation of plant species.
- Direct or indirect loss of listed or sensitive plants or a direct loss of habitat for listed or sensitive plants.
- Disturbance to wildlife and potential wildlife mortality during construction and maintenance activities (including use of access roads).
- Direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife.
- Loss of nesting birds and violation of Migratory Bird Treaty Act during construction activity.
- Adverse impacts to linkages or wildlife movement corridors, the movement of fish, and/or native wildlife nursery sites during construction and operation activity.

According to the ECO Substation Project EIR/EIS, construction of the ECO Substation and SWPL loop-in would result in the temporary removal of 26.94 acres (10.90 ha) and permanent removal of 89.84 acres (36.36 ha) characterized by Sonoran mixed woody succulent scrub and Peninsular juniper woodland and scrub (ECO Substation EIR/EIS Table B-1, page B-1 and Section B.3, and Section D.2.1.2). Tables D.2-3 and D.2-7 of the ECO Substation EIR/EIS provide temporary and permanent acreages for the entire ECO Substation project as originally proposed, and under the revised ECO Substation location alternative, respectively. These tables do not provide a breakdown of acreages for these vegetation communities within the ECO Substation switchyards and SWPL loop-in project components. A May 2010 survey report prepared for SDG&E (Insignia Environmental 2010b) indicates that the original proposed ECO Substation would result in temporary impacts of 8.3 acres (3.4 ha) of mixed desert scrub and 16.6 acres (6.7 ha) of Peninsular juniper woodland habitat as well as the permanent removal of 14.5 acres (9.3 ha) of mixed desert scrub and 74.3 acres (30.1 ha) of juniper woodland.

Temporary impacts would be mitigated in accordance with a Habitat Restoration Plan developed for the project.[5] Permanent impacts would be mitigated with a combination of habitat restoration and habitat compensation at a 1:1 ratio.

With regard to sensitive plant species, rare plant surveys conducted in 2008 (Sunrise Powerlink EIR/EIS and PEA), 2009 (PEA only), and 2010 (ECO Substation Project EIR/EIS only) concluded that no special status plants occur at the proposed ECO Substation switchyard site. Based on DOE's independent analysis of these documents, no impacts to rare or sensitive plant species are anticipated to result from construction or operation of the ECO Substation switchyards and SWPL loop-in.

With regard to sensitive wildlife species, based on the current distribution of the federally-endangered Peninsular bighorn sheep and their potential habitat, the Sunrise Powerlink EIR/EIS states that the species has a high potential to occur along the SWPL loop-in and at the ECO Substation switchyard site. The Sunrise Powerlink EIR/EIS states that the impact to vegetation communities that are part of peninsular bighorn sheep habitat is considered a significant and unavoidable impact, although mitigation measures are recommended to partially provide compensatory mitigation.[6] Surveys for Peninsular bighorn sheep were not recommended by the USFWS for the proposed sites. Based on DOE's independent analysis of the documents and the location of the ECO Substation switchyards and SWPL loop-in south of an existing major wildlife movement barrier (I-8) and outside of designated critical habitat, no impacts to Peninsular bighorn sheep are expected. Furthermore, as stated in Section 3.1 (Biological Resources), as of May 14, 2009, the critical habitat area for Peninsular bighorn sheep is approximately 3 miles (4.8 km) east of the ECO Substation switchyards and SWPL loop-in.

With regard to the Quino checkerspot butterfly, both the Sunrise Powerlink EIR/EIS and PEA conclude that no impacts are anticipated to occur as a result of the connected actions (the ECO Substation Project EIR/EIS references the studies in these documents in making the same conclusion). Protocol level surveys conducted for the Sunrise Powerlink EIR/EIS and PEA did not observe Quino checkerspot butterfly, host plants or nectar plants for the species at the ECO Substation switchyards and SWPL loop-in sites. According to the Sunrise Powerlink EIR/EIS, "because 2008 was a good year for the Quino checkerspot butterfly, the survey would have found Quino checkerspot butterfly or their host plants had they been present at the [ECO] Substation site." Further, following completion of construction activities, the PEA states that SDG&E would utilize the existing Habitat Conservation Plan for Quino checkerspot butterfly

[5] In contrast to the ESJ U.S. Transmission Line project which does not include restoration of disturbed areas because of fire safety restrictions at the site, the project description for the SDG&E ECO Substation Project provided in the ECO Substation Project EIR/EIS states that all temporary disturbance areas would be revegetated. The impact acreages include vegetation clearance requirements, similar to those required for the ESJ U.S. Transmission Line project.

[6] The Sunrise Powerlink EIR/EIS does not consider regulatory compliance measures or standard best management practices as part of the proposed Project and recommends such compliance measures as mitigation for identified significant impacts. In contrast, the PEA includes standard BMPs and APMs as part of the project description for the connected actions, and also considers compliance with federal, state, and local regulations as part of the project description. Therefore, many of the significant impacts identified in the Sunrise Powerlink EIR/EIS are considered less than significant in the PEA because recommended mitigation measures in the Sunrise Powerlink EIR/EIS are considered APMs or regulatory compliance in the PEA.

during all maintenance activities. Additional surveys were conducted in 2009 and 2010 for the ECO Substation Project EIR/EIS. Although Quino checkerspot butterflies were observed during these surveys, the individuals were not observed at the ECO Substation switchyard or SWPL loop-in sites. Therefore, no impacts to this species are anticipated as a result of the connected actions.

With regard to potential impacts to other sensitive species, a CNDDB search conducted for the PEA indicated 8 special status wildlife species with the potential to occur at the ECO Substation switchyard or SWPL loop-in site, including one reptile, three avian species, and four mammals. The PEA notes that temporary and permanent vegetation removal would result in the loss of suitable foraging and denning habitat, which could impact other sensitive species if present on the project site (e.g., northern red-diamond rattlesnake, pallid bat, San Diego desert woodrat). In addition, construction activity would result in indirect and direct impacts to these species due to disturbance caused by an increase in vehicle activity, direct mortality by vehicles, disruption of hibernating, feeding and breeding as a result of increased human activity, and direct removal of active burrows. The PEA states that permanent construction impacts to habitat for sensitive and common species would be limited because the percentage of suitable habitat that would be removed during construction of the ECO Substation switchyard and structures for the SWPL loop-in would be small in comparison to the total amount of available habitat in the area. Further, impacts to sensitive mammal species would be minor with the implementation of APMs[7], such as construction personnel training, pre-construction surveys, and construction monitoring. The PEA also notes that sensitive and common species of reptiles and mammals could potentially fall into and become trapped within ECO Substation switchyards retention basins; however, implementation of APMs that require escape ramps in the design and construction of the ponds would ensure that impacts to such species would be minor. Based on DOE's independent evaluation of the two analyses, the potential for impacts to other sensitive wildlife species during construction and operation of the connected actions is considered minor.

With regard to sensitive bird species, large stick nests were observed on several transmission towers in the vicinity of the proposed ECO Substation switchyard site during reconnaissance surveys conducted for the PEA, indicating the potential for nesting raptors in the area. The PEA states that construction activities could result in disturbance of nesting raptors; however, with implementation of APMs such as pre-construction surveys and avoidance (e.g., maintaining a certain distance from identified nests and/or avoiding construction activities during nesting season), impacts would be reduced to minor levels. Similarly, the Sunrise Powerlink EIR/EIS concludes that potential impacts to nesting birds would be less than significant with the implementation of mitigation measures. Based on DOE's independent review of both documents, as well as the conclusions of biological surveys conducted for the ESJ U.S. Transmission Line project, impacts to nesting bird species during construction of the connected actions are considered minor.

According to the PEA, operation of the ECO Substation switchyards would not require any new activities because SDG&E already operates other facilities in the area; therefore, operation of the ECO Substation switchyards would not impact any sensitive natural communities and would

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[7] A complete list of all APMs included in the PEA can be found starting at page 3-71 of the PEA: http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/3%20Project%20Description.pdf

result in minor impacts to plant and animal species. Further, the PEA states that operation of the ECO Substation switchyards would not conflict with local policies or conservation plans. Based on an independent review of this analysis, it is anticipated that operation of the ECO Substation switchyards would result in minor impacts, if any, to biological resources and would not conflict with local policies or conservation plans.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised locations, and the remainder of the alternative site and the surrounding undeveloped open space are very similar to the initially proposed site in topography and vegetation type. A site survey report indicates that the alternative footprint would temporarily impact approximately 3.3 additional acres (1.3 ha) of mixed desert scrub (11.6 acres [4.7 ha] total) and 2.2 fewer acres (0.9 ha) of juniper woodland habitat (14.6 acres [5.9 ha] total) and would permanently impact approximately 20.9 additional acres (8.5 ha) of mixed desert scrub and approximately 11.9 fewer acres (4.8 ha) of juniper woodland habitat (35.4 and 62.4 total acres [14.3 and 25.3 ha], respectively). Thus, the alternative footprint would result in a slightly larger overall impact to vegetation, but less loss of woodland vegetation, which is considered by the County of San Diego to have greater value (Insignia Environmental 2010b). Based on an independent review of the biological resources at the alternative site, and comparison to the original site resources, it is anticipated that construction and operation of the ECO Substation Alternative site would result in the same impacts as for the original location. No new impacts or mitigation measures are identified.

4.1.2 Visual Resources

Potential impacts to aesthetics and visual resources associated with the construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.3.3 of the ECO Substation Project EIR/EIS; Section 4.1 of the PEA; and Section 2.3.2 of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS, starting at page 2-44. Associated mitigation measures are listed in the ECO Substation Project EIR/EIS at Section D.3.3 and in the Sunrise Powerlink Final EIR/EIS in Appendix 12, beginning at page Ap.12-57. Potential impacts addressed in those analyses include:

- Short-term visibility of construction activities, equipment, and night lighting.
- Degradation of existing visual character and quality[8] due to long-term landscape alteration and visibility of land scars and vegetation clearance in arid and semi-arid landscapes.
- Increased long-term visual contrasts in desert landscape, including structure contrast, industrial character, view blockage, skylining, and glare when viewing the ECO Substation switchyards (e.g., from Old Highway 80).

[8] The visual analysis of the ESJ U.S. Transmission Line project presented in Section 3.2 describes visual character based on vividness, intactness, and unity as defined in the FHWA visual resources manual. The ECO Substation Project EIR/EIS similarly analyzes potential impacts to visual character and quality but has used the methodology and terminology adopted by the BLM in their Visual Resources Manual. Both methodologies are widely used to assess impacts to visual resources and meet the San Diego County Guidelines for Determining Significance to Visual Resources (2007i).

- Adverse effects on a scenic vista from Table Mountain ACEC (located north of KOP 6 discussed in Section 3.2).
- New light sources (e.g., lamps near electrical equipment and floodlights near substation gates) that would adversely affect day or nighttime views in the area throughout life of project.
- Inconsistency with federal, state, or local regulations, plans, and standards applicable to the protection of visual resources.

The ECO Substation Project EIR/EIS states that substation and SWPL loop-in construction activities would be visible to motorists traveling on Old Highway 80 and I-8; however, the views would be brief. Construction activities would also be visible to recreationists at nearby recreation areas, including Anza Borrego Desert State Park, Table Mountain ACEC, and the Jacumba Mountains Wilderness Area. Additional visual simulations conducted for the PEA determined that the ECO Substation switchyard would be visible from the Jacumba Mountains Wilderness Area to the east, particularly Nopal Peak which provides limited access to hikers and off-road vehicles. The PEA analysis concludes that given the viewing distances (approximately 0.75 mile [1.2 km]) and perspective from Nopal Peak, visible sections of the substation would include the substation pad and graded slopes but that the transmission poles would be nearly imperceptible. Implementation of APMs is expected to minimize the potential visual contrast and reduce impacts to minor levels. Construction equipment and activity would not be visible from residential areas. While night lighting may be required, lighting would not be visible from occupied residences.

The ECO Substation Project EIR/EIS states that the presence of the ECO Substation switchyard and SWPL loop-in would have an adverse impact on hiking trails and scenic viewpoints in the Table Mountain ACEC, the Airport Mesa and the Jacumba Mountains Wilderness public lands. However, due to the distance and the natural back-screening provided by the desert the ECO Substation Project EIR/EIS concludes that the impacts would be less than significant and no mitigation measures are recommended.

The ECO Substation Project EIR/EIS states that the ECO Substation would be openly visible from I-8 and that its presence would create a significant visual impact for motorists. Although Old Highway 80 and I-8 are both classified as eligible state scenic highways and are county-designated scenic highways, neither has been officially designated as a state scenic highway in the vicinity of the ECO Substation project, so the EIR/EIS found that there would be no identifiable state scenic highway visual impacts. Figure 4-1 provides a simulated view of the completed ECO Substation switchyards and SWPL loop-in, as viewed from Old Highway 80. In addition, a number of visual simulations of the ECO Substation are available in the ECO Substation Project EIR/EIS (Figures D.3-6B and 6C, D.3 7B-7E). According to the ECO Substation Project EIR/EIS, the historic designation of Old Highway 80 does not influence the future planning or development of adjacent public and private properties. By comparison, the Sunrise Powerlink EIR/EIS concludes that, even with the implementation of recommended mitigation measures, the ECO Substation switchyards as viewed from an identified Key Viewing Point located on Old Highway 80 (approximately the same location as the simulated view shown in Figure 3.2-2), would result in significant and unavoidable impacts to visual resources.

The East County Substation is not a part of the ESJ U.S. Transmission Project, but it is a Connected Action for the purpose of this EIS.

The viewpoint in this simulation is on Interstate 8, northwest of the project site. Landscaping is depicted at 8 years maturity.

PROJECT LOCATION

Source:
SDG&E 2009b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 4-1

EAST COUNTY (ECO) SUBSTATION VISUAL SIMULATION

May 2012

The ECO Substation Project EIR/EIS finds that the ECO Substation facilities would introduce strong and long-term visual contrasts due to the size and character of the project against the desert landscape. It recommends surface treatment to reduce visual contrast and screening to hide the structures as much as possible, but concludes that mitigation would not eliminate significant visual impacts. Night-time lighting would include 14 100-watt floodlamps installed near the substation gates and building entrances that would be illuminated permanently. Although the lights would be directed downward and would be non-glare fixtures, the ECO Substation Project EIR/EIS concludes that this nighttime lighting would "be a constant source of annoyance" for motorists in the area.

The ECO Substation Project EIR/EIS also evaluates the visual impacts of the proposed ECO Substation Project for consistency with local visual resource plans, policies, and regulations relevant to the project area. The ECO Substation Project EIR/EIS determines that the ECO Substation and SWPL loop-in are consistent with visual resource policies identified in the BLM Eastern San Diego County Resource Management Plan, County of San Diego Zoning Ordinance (Sections 6320, 6322, and 6324), and County of San Diego Light Pollution Code (Dark Skies Ordinance). The same EIR/EIS finds that the project would not be consistent with the newly adopted updates to the County of San Diego General Plan, Conservation and Open Space Element because the project would impact views from scenic highways (the updated General Plan designates I-8 and Old Highway 80 as County-designated scenic highways). However, because the County does not have land use jurisdiction over the ECO Substation project area (per California Constitution Article 12, Section 8), inconsistency with this policy is not considered an impact for purposes of the ECO Substation EIR/EIS; therefore, the document determined that impacts with regard to consistency with local visual resource policies, plans, and regulations would be less than significant and no mitigation would be required.

Based on DOE's independent evaluation of these documents, impacts to visual resources as a result of construction and operation of the ECO Substation switchyards and SWPL loop-in would include a reduction in quality of scenic vistas from I-8 and Old Highway 80. In addition, new light sources from the ECO Substation would adversely affect nighttime views from nearby highways and Table Mountain ACEC.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised locations, and the remainder of the alternative site and the surrounding undeveloped open space are very similar to the initially proposed site in topography, vegetation type, and associated visual resources. Accordingly, it is anticipated that construction and operation of the ECO Substation Alternative site would result in the same visual resources impacts as for the original location. No new impacts or mitigations are identified.

4.1.3 Land Use

Potential impacts to land use associated with the construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.4.3 of the ECO Substation Project EIR/EIS; Section 4.9 of the PEA; and Section 2.4.2 of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS, starting at page 2-63. Associated mitigation measures are listed in the ECO Substation Project EIR/EIS at Section D.4.3 and in the Sunrise Powerlink Final EIR/EIS at Appendix 12. Potential impacts addressed in these analyses include:

- Temporary disturbance of existing land uses during construction.
- Division of an established community.
- Conflicts with applicable land use plans, policies, and regulations.
- Conflicts with applicable habitat conservation plan.

Similar to the ESJ U.S. Transmission Line project, the ECO Substation switchyards and structures associated with the SWPL loop-in would be located on undeveloped, private land designated for Rural Lands (RL-80) in the updated County of San Diego General Plan (refer to Figure 3.5-1) and zoned General Rural by the County of San Diego Zoning Ordinance. The nearest residence to the ECO Substation switchyards and SWPL loop-in would be a mobile home located approximately 0.5 mile (0.8 km), west of the site. Because the site proposed for the ECO Substation switchyard and structures for the SWPL loop-in is undeveloped and not located in close proximity to any established communities (e.g., Jacumba or Boulevard), the ECO Substation Project EIR/EIS, Sunrise Powerlink EIR/EIS and PEA all conclude that construction and operation of the connected actions would not result in the division of an established community or disturb existing land uses.

The ECO Substation Project EIR/EIS states that construction and operation of the ECO Substation switchyards and SWPL loop-in would not conflict with applicable land use or habitat conservation plans, including the County of San Diego General Plan in effect at the time of the analysis (County of San Diego 2003), the Eastern San Diego County Management Framework Plan (BLM 1981), the Eastern San Diego County RMP (BLM 2008a), the Mountain Empire Subregional Plan in effect at the time of the analysis (County of San Diego 1995; 2010), SDG&E Subregional Natural Community Conversion Plan (CDFG 1995), SDG&E - Quino Checkerspot Butterfly Low-Effect Habitat Conservation Plan (USFWS 2008) and the San Diego County Multiple Species Conservation Program (County of San Diego 1998). In addition, the ECO Substation Project EIR/EIS finds that the construction and operation of the ECO Substation switchyards and SWPL loop-in would also not conflict with the County of San Diego Zoning Ordinance, the Jacumba Airport Land Use Compatibility Plan, and the County of San Diego General Plan Update; Conservation and Open Space, and Mobility Elements (County of San Diego 2011d).

However, the ECO Substation Project EIR/EIS indicates that the project would not be consistent with all land use policies of the County of San Diego General Plan Update Land Use, Safety, and Noise elements and the County of San Diego General Plan Update, Boulevard Subregional Planning Area Community Plan. The ECO Substation Project EIR/EIS concludes that although the project is not consistent with all land use policies, the County of San Diego has no land use jurisdiction over the ECO Substation project (per California Constitution Article 12, Section 8), and thus the project is not required to be consistent with all planning documents. Therefore, the document concluded that the impacts would be less than significant. Based on an independent review of these analyses, and a review of the approved County General Plan Update, construction and operation of the ECO Substation switchyards and SWPL loop-in are not anticipated to cause adverse impacts to existing land uses, but would conflict with applicable land use policies within the General Plan Update. No additional potential impacts related to land use have been identified and no mitigation measures are indicated.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised substation and SWPL loop-in locations, and site conditions at the remainder of the alternative site and in the surrounding undeveloped open space are very similar to those of the initially proposed site. Accordingly, it is anticipated that construction and operation of the ECO Substation Alternative site would result in the same land use impacts as for the original location. No new impacts or mitigations are identified.

4.1.4 Recreation

Potential impacts to recreation associated with the construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Sections D.5.3 and D.3.3.3 of the ECO Substation Project EIR/EIS; Section 4.13 of the PEA and Section 2.5.2, starting at page 2-69, in the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS. Associated mitigation measures are provided in the ECO Substation Project EIR/EIS at Section D.5.3 and in the Sunrise Powerlink Final EIR/EIS at Appendix 12, beginning at page Ap.12-57. Potential impacts addressed in these analyses include:

- Temporary reduction in access and visitation to recreation and wilderness areas during construction.
- Change in the character of a recreation area and diminishment of its recreational value.
- Permanent prevention of recreational activities.
- Increased unauthorized access to specially designated or restricted areas. Adverse effect on existing scenic vistas.

The ECO Substation switchyards and structures associated with the SWPL loop-in would be located on undeveloped, private land approximately 0.5 mile (0.8 km) from the nearest recreational area (BLM-managed open space to the east, described in Section 3.4 [Recreation]). The ECO Substation Project EIR/EIS concludes that no major direct impacts to recreation areas would result from construction, operation, or maintenance of the ECO Substation switchyards and SWPL loop-in structures, nor would new access roads result in increased unauthorized access to specially designated areas or restricted areas. Based on review of these analyses, the projects would cause minimal direct adverse impacts on the nearby recreation areas.

As discussed in Section 4.1.2, the ECO Substation Project EIR/EIS found that the facilities would have an adverse impact on the scenic vistas for recreation users in Table Mountain ACEC and Jacumba Mountain Wilderness. The Sunrise Powerlink EIR/EIS suggests that the mitigation measures identified for visual resources would reduce impacts to the character of nearby recreation areas. Based on independent review of these analyses, users of nearby recreation areas could experience adverse impacts from damage to scenic vistas.

No additional potential impacts related to recreation have been identified and no mitigation measures are indicated.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised substation and SWPL loop-in locations, and the remainder of the alternative site and the surrounding undeveloped open space are very similar to the initially proposed site in topography, vegetation type, and associated visual resources. Accordingly, it is anticipated that impacts to recreation from construction and operation of the ECO Substation Alternative site would be the same as for the original location. No new impacts or mitigation measures are identified.

4.1.5 Cultural Resources

Potential impacts to cultural resources associated with the construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section 7.3.3 of the ECO Substation Project EIR/EIS; Section 4.5 of the PEA; and Section 2.7.2, starting at page 2-80, of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS. Associated mitigation measures are provided in the ECO Substation Project EIR/EIS at Section 7.3.3; and the Sunrise Powerlink Final EIR/EIS at Appendix 12, beginning at page Ap.12-78. Potential impacts addressed in these analyses include:

- Adverse changes to known historic properties, unknown significant buried prehistoric and historic archaeological sites, buried Native American remains, or Traditional Cultural Properties during construction activity.
- Adverse changes to known historic properties, unknown significant buried prehistoric and historic archaeological sites, buried Native American remains, or Traditional Cultural Properties during operation.

The ECO Substation Project EIR/EIS states that there are eight prehistoric archaeological sites (CA-SDI-7074, -7079, -7082, -19618, -19619, -9621, -19622, and -19627) located within the ECO Substation APE. The ECO Substation Project EIR/EIS notes that the sites have not been formally evaluated for eligibility for listing on the NRHP, but two are characterized as having sufficient surface artifact distributions such that they will potentially be considered for listing. Further, the ECO Substation Project EIR/EIS states that all other previously recorded archaeological sites within the ECO Substation and SWPL loop-in APEs have been determined to not exist and therefore are not NRHP-eligible historic properties or California Register of Historic Resources-eligible historic resources.

The ECO Substation Project EIR/EIS notes that ground-disturbing construction activities have the potential to impact significant buried prehistoric or historic archaeological resources (CA-SDI-7074 and CA-SDI-19627); if they cannot be avoided during construction activities the ECO Substation EIR/EIS indicates that the sites must be evaluated for NRHP or California Register of Historic Resources eligibility to determine their significance and, if necessary, impacts must be mitigated. Mitigation measures include developing and implementing a Historic Properties–Cultural Resources Treatment Program, training contractors, avoiding significant resources, performing construction monitoring and temporarily halting construction if unknown resources are encountered until said resources are evaluated by an archaeologist. Similarly, the PEA and Sunrise Powerlink EIR/EIS recommend mitigating impacts to buried prehistoric or historic archaeological resources through demarcation of known resources, training construction personnel, and compensatory mitigation. With the implementation of these mitigation measures, the ECO Substation Project EIR/EIS finds that impacts would be less than significant.

According to the ECO Substation Project EIR/EIS, a review of archival information and survey results indicates that no known historic architectural resources are located at the site proposed for the ECO Substation switchyards and structures associated with the SWPL loop-in[9]. However, based on the density of prehistoric and historic resources in the vicinity, the ECO Substation Project EIR/EIS states that there is a high potential for cultural resources to be encountered during construction of the ECO Substation switchyards and SWPL loop-in, and ground-disturbing construction activities could impact such resources. Impacts to historic architectural resources from ground-disturbing construction activities would be reduced to minor levels with implementation of mitigation measures, previously discussed.

With regard to potential impacts to Native American cultural resources and human remains, the ECO Substation Project EIR/EIS states that, based on consultation with the NAHC[10], no known cemeteries or Native American remains are located on the site proposed for the ECO Substation switchyards and structures associated with the SWPL loop-in; therefore, the potential for encountering human remains during construction and operation is low. The ECO Substation Project EIR/EIS concludes that, if any human remains are discovered during operation and maintenance activities, direct impacts would be significant, and the mitigation measures discussed above would reduce impacts to minor levels. In addition, in the event that human remains are discovered during construction, SDG&E would be required by the Native Graves Protection and Repatriation Act to halt all work and implement appropriate notification procedures; therefore, direct impacts are not anticipated.

The ECO Substation Project EIR/EIS states that the proposed substation and SWPL loop-in could potentially adversely affect Traditional Cultural Properties. The scope, nature, and extent of any Traditional Cultural Properties associated with the APE are currently unknown, so potential NRHP eligibility must be assumed. Impacts to Traditional Cultural Properties could be significant but mitigated to a less than significant level with the aforementioned mitigation measures, and by conducting Native American consultation. Based on an independent analysis of the ECO Substation Project EIR/EIS, as well as the Sunrise Powerlink EIR/EIS and PEA, and the Native American tribal consultative process for the ESJ U.S. Transmission Line project (Appendix D.1), as well as applicable laws and regulations, potential impacts to known and unknown cultural resources, including Native American resources, during construction of the ECO Substation switchyards and SWPL loop-in are considered minor with the implementation of the mitigation measures proposed in the ECO Substation Project EIR/EIS, as discussed above.

ECO Substation Alternative Location. As noted above, the ECO Substation Alternative location would reduce cultural resources impacts associated with the original switchyard and SWPL loop-in location. Potential impacts would be avoided or reduced at several prehistoric archaeological sites (CA-SDI-7074, -7079, -7082, -19618, -19619, -9621, -19622, and -19627)

[9] The proposed location of the ECO Substation switchyard was shifted to the east after the publication of the Sunrise Powerlink EIR/EIS accounting for the difference in records search results.

[10] The PEA states that letters to initiate consultation were sent to representatives of the Campo Kumeyaay Nation, Manzanita Band of Kumeyaay Nation, Ewiiaaapaayp Tribal Office, and Kumeyaay Cultural Heritage Preservation Committee. At the time of writing the PEA, only one response had been received (from Campo Kumeyaay Nation requesting to be informed of progress). The ECO Substation EIR/EIS includes a mitigation measure requiring the applicant to assist the lead agency in completing the Native American Consultation Process.

located within the ECO Substation APE. The relocation would also avoid or reduce impacts at several prehistoric sites identified in the Sunrise Powerlink EIR/EIS (Sites CA-SDI-2720, CA-SDI-6115, CA-SDI-7083, and CA-SDI-8307). No new impacts or mitigation measures are identified.

4.1.6 Noise

Potential noise impacts associated with construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.8.3.3 of the ECO Substation Project EIR/EIS; Section 4.10 of the PEA; and Section 2.8.2, starting at page 2-94, of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS. Associated mitigation measures are listed in the ECO Substation Project EIR/EIS at Section D.8.3; and in the Sunrise Powerlink Final EIR/EIS in Appendix 12, beginning at page Ap.12-89. Potential impacts addressed in these analyses include:

- Effects of construction noise on sensitive receptors.
- Potential for construction noise to violate local rules, standards, and/or ordinances.
- Corona effects from ECO Substation switchyard equipment.
- Groundborne vibration during construction activity.
- Substantial temporary and permanent increase in ambient noise levels in the project vicinity from inspection and maintenance activities.

Similar to the ESJ U.S. Transmission Line project, the nearest sensitive receptor to the ECO Substation switchyards would be a single mobile home located approximately 0.5 mile (0.8 km) west of the site. The next closest receptor would be located north of I-8, approximately 1.4 miles (2.25 km) northeast of the ECO Substation switchyards. According to the ECO Substation Project EIR/EIS, which relies on the noise study conducted for the PEA, existing average daytime and nighttime noise levels at the ECO Substation switchyard site are 46 and 37 dBA, respectively. Noise contours prepared for construction of the ECO Substation switchyard and structures associated with the SWPL loop-in indicate that noise levels at the property line would remain below the County of San Diego noise ordinance threshold (75 dBA). Similarly, noise contours depicting noise levels during operation of the ECO Substation switchyards and SWPL loop-in show that noise levels would remain below the County of San Diego Noise Ordinance threshold for lands zoned Rural Use (45 dBA).

According to the ECO Substation Project EIR/EIS, the 8-hour construction noise level is anticipated to reach up to 60 dBA during construction of the ECO Substation and the SWPL loop-in, which is below the County threshold for noise. Construction activities may be required at night to allow for evening material delivery and to comply with the Caltrans weight limits on state highways. This impact would be partially controlled by implementing an APM to ensure that nighttime construction activities would not create noise in excess of an hourly average of 45 dBA when measured at the border of the nearest residence. However, if the nighttime construction impacts cannot be fully mitigated, impacts would remain adverse and significant.

In addition, relying on models from the PEA, the ECO Substation Project EIR/EIS studied anticipated groundborne vibration during construction activity and determined that because no residents or other receptors are within 100 feet (30 m) of the proposed site, no impacts would occur. Therefore, the ECO Substation Project EIR/EIS concludes that construction and operation of the ECO Substation switchyards and SWPL loop-in would not result in substantial temporary or permanent increases in ambient noise levels in the project vicinity. Based on an independent review of this analysis, impacts with regard to noise during construction and operation of the connected actions are expected to be minor.

With regard to corona noise, the ECO Substation Project EIR/EIS modeled future noise level associated with the ECO Substation switchyard and determined that the primary source of operating noise would be the on-site transformers. The ECO Substation Project EIR/EIS indicates that no noise-sensitive areas would be exposed to noise levels above the 45 dBA threshold as a result of corona noise from the switchyard, so there would not be an adverse impact and no mitigation is required. The ECO Substation Project EIR/EIS also concludes that the corona noise associated with the SWPL loop-in would not exceed 34 dBA, and that because noise levels generally decrease in intensity by 6 dBA for each doubling of distance from the source, corona noise during poor weather conditions is expected to be less than 34 dBA at the nearest sensitive receptor and the associated increase in ambient noise would be less than 5 dBA. However, the ECO Substation Project EIR/EIS states that the noise level at the right-of-way may exceed the County’s noise ordinance criteria, resulting in an adverse impact that would be mitigated to less than significant by configuring conductors to minimize noise impact. The Sunrise Powerlink EIR/EIS and PEA both conclude that corona noise would be minor and do not propose any mitigation measures (Sunrise Powerlink EIR/EIS) or APMs (PEA). Finally, the Draft ECO Substation Project EIR/EIS also indicates that there could be temporary increases in noise due to routine maintenance and vegetation clearance of the substation switchyard and the SWPL loop-in, but concludes that these activities would not generate substantial noise and impacts would be less than significant. Based on an independent review of these analyses, noise impacts from facility operations, including impacts of corona noise, are considered minor. No additional potential impacts related to noise have been identified and no additional mitigation measures are indicated.

ECO Substation Alternative Location. Due to the considerable similarity of and physical overlap between the original and revised substation and SWPL loop-in locations, it is anticipated that construction and operation of the ECO Substation Alternative site would result in the same noise impacts as for the original location. No new impacts or mitigations are identified.

4.1.7 Transportation and Traffic

Potential impacts to transportation and traffic associated with the construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.9.3 of the ECO Substation Project EIR/EIS; Section 4.14 of the PEA and Section 2.9.2, starting at page 2-101, of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS. Associated mitigation measures are provided in the ECO Substation Project EIR/EIS at Section D.9.3 and Appendix 12, beginning at page Ap.12-91 of the Sunrise Powerlink Final EIR/EIS. Potential impacts addressed in these analyses include:

- Generation of additional traffic on vicinity roadways during construction.

- Disrupted flow of traffic from temporary lane and/or road closures during construction activity.
- Temporary disruptions to the operations of emergency service providers or result in inadequate emergency access.
- Increases in hazards due to design features and/or incompatible uses.
- Physical damage to roadways from construction vehicles.
- Conflicts with planned transportation projects.

Since the project sites are located in the same area in the southeastern corner of San Diego County, existing roadway conditions in the vicinity of the ECO Substation switchyards and SWPL loop-in would be identical to those described for the ESJ U.S. Transmission Line project. As described in the ECO Substation Project EIR/EIS, construction of the ECO Substation switchyards and structures associated with the SWPL loop-in would result in the daily addition of approximately 50 to 60 personal vehicle trips and 60 to 70 construction vehicle trips (including haul truck trips and water truck trips) on I-8 and the local roadway network for the duration of construction activity (approximately 5 months). In comparison to existing conditions (described in Section 3.7, Transportation and Traffic), the additional vehicles would result in estimated increase of average daily traffic by 0.5 and 0.2 percent in San Diego and Imperial Counties, respectively. Therefore, based on the expected scale of the ECO Substation switchyards (including the SWPL loop-in) and the short duration of construction activity, the ECO Substation Project EIR/EIS concludes that impacts with regard to the generation of additional traffic on vicinity roadways would be minor. The PEA and Sunrise Powerlink EIR/EIS reach the same conclusions. Based on an independent review of all three analyses, no major impacts to transportation or traffic are expected during construction of the connected actions.

The ECO Substation Project EIR/EIS further states that construction of the ECO Substation switchyards and structures associated with the SWPL loop-in would not require the closure of any vicinity roads, and any temporary lane closures would be brief (e.g., 10-15 minutes while pulling a conductor across a roadway). No road and lane closures would occur during operation or maintenance of the ECO Substation switchyards or SWPL loop-in. Therefore, the ECO Substation Project EIR/EIS concludes that construction of the ECO Substation switchyards and structures associated with the SWPL loop-in would not result in disruptions to the operations of emergency service providers or result in inadequate emergency access. In the event that lane or road closures are required, the ECO Substation Project EIR/EIS recommends a Traffic Control Plan, which includes a provision to ensure advance coordination with emergency service providers in order to prevent emergency service disruptions. Based on an independent review of this analysis, with implementation of the recommended mitigation measures, impacts with regard to emergency access are considered minor. In addition to the impacts discussed above, the ECO Substation Project EIR/EIS, as well as the Sunrise Powerlink EIR/EIS, states that construction activity associated with the ECO Substation switchyards and structures associated with the SWPL loop-in could potentially result in significant physical damage to vicinity roadways, including increased wear or deterioration; however, with the implementation of a recommended mitigation measure to repair damaged roads, the ECO Substation Project EIR/EIS concludes that impacts would be reduced to minor levels. Based on an independent review of this analysis, impacts with regard to roadway damage are considered minor.

The ECO Substation Project EIR/EIS notes that the project activities associated with the switchyards and SWPL loop-in could increase hazards due to heavy truckloads traveling on new project roads. New roads would be constructed to allow access to the project switchyard and SWPL loop-in; therefore, the applicant would be required to obtain transportation permits and encroachment permits from Caltrans and construction and traffic control permits from the County of San Diego. With the procurement of the appropriate permits, the ECO Substation Project EIR/EIS finds that impacts would not be considered significant and no mitigation is required. Based on an independent review of proposed roads associated with the ECO Substation Project, no impacts associated with traffic hazards are anticipated.

With regard to planned transportation projects, as stated in Section 3.7 (Transportation and Traffic), no major transportation projects are planned in the vicinity of the ECO Substation switchyards or SWPL loop-in during the proposed schedule for construction. Prior to construction, SDG&E would obtain an encroachment permit to conduct work in the public right-of-way; this permit process would ensure that no impacts or conflicts would occur. Based on an independent review of these analyses, no impacts with regard to planned transportation projects are anticipated. No additional potential impacts related to transportation and traffic have been identified, and no additional mitigation measures are indicated.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised substation and SWPL loop-in locations, and the remainder of the alternative site and the surrounding undeveloped open space are very similar in topography to the initially proposed site. The access road location and design for the alternative site would be very similar to the original switchyard site design. Based on an independent review of the traffic and transportation impacts associated with the alternative site and design, and comparison to the original site and design, it is anticipated that construction and operation of the ECO Substation Alternative site would result in the same impacts as for the original location. No new impacts or mitigation measures are identified.

4.1.8 Public Health and Safety

Potential impacts to public health and safety associated with the construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.10.3 of the ECO Substation Project EIR/EIS; Section 4.7 of the PEA and Section 2.10.2 of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS, beginning on page 2-112. Associated mitigation measures are identified in the ECO Substation Project EIR/EIS at Section D.10.3 and in the Sunrise Powerlink Final EIR/EIS in Appendix 12, page Ap.12-94. Potential impacts addressed include:

- Accidental spill or release of hazardous materials during construction and/or operation which could contaminate soil and groundwater.
- Safety hazards for anyone accessing the project site during construction, operation, or decommissioning.
- Induced currents and shock hazards in joint use corridors.

- Effects on cardiac pacemakers.

Hazards associated with wind and earthquake impacts to proposed structures. SDG&E conducted a Phase I Environmental Site Assessment for the proposed ECO Substation Project site and included the results in the ECO Substation Project EIR/EIS and PEA. The assessment found no hazardous material sites within 2 miles (3.2 km) of the ECO Substation Project; however, three informal shooting ranges were identified on the ECO Substation switchyard parcel that may present concerns to environmental health and human safety and were identified as recognized environmental conditions. Based on the ECO Substation switchyard site's remote location away from any sensitive receptors (see Section 4.1.6), and with the implementation of recommended mitigation measures presented in the ECO Substation Project EIR/EIS regarding proper handling and disposal of hazardous materials, as well as the Hazardous Materials Mitigation Plan, Health and Safety Program and a Waste Management Plan, the ECO Substation Project EIR/EIS concludes that any impacts associated with potential releases of hazardous materials during construction and operation would be minor and would not pose a major threat to public health or safety. The Sunrise Powerlink EIR/EIS and PEA reach the same conclusion, with implementation of comparable mitigation measures (Sunrise Powerlink EIR/EIS) and APMs (PEA). Based on an independent review of these analyses and the results of the database search, impacts with regard to hazardous materials, if any, are considered minor.

The ECO Substation Project EIR/EIS states that impacts to soil or groundwater would be less than significant during routine maintenance and operation of the switchyards and SWPL loop-in but that there could be a significant impact during emergency situations or emergency maintenance. However, with the implementation of a site-specific Spill Prevention Control and Countermeasure Plan to address spill response, and a Hazardous Materials Business Plan that contains basic information about the hazardous materials on-site, this impact would be mitigated to less than significant. The ECO Substation Project EIR/EIS also notes that unintentional safety hazards could adversely affect construction workers or the general public accessing the project site during construction, operation, or decommissioning, especially due to unauthorized entrances. To prevent unauthorized access, perimeter fencing should be used around the site, a safety assessment should be performed, all entrances should be locked and monitored, warning signs should be posted, and a Health and Safety plan should be followed. If these mitigation measures are implemented then safety concerns due to unauthorized access would be reduced to less than significant.

The ECO Substation Project EIR/EIS does not identify structure failure during winds or earthquakes; the effect of electrical fields on pacemakers; or induced current or shock hazards as potential safety concerns. However, the PEA and Sunrise Powerlink EIR/EIS both identify these issues as potential impacts. With regard to potential safety issues associated with the potential for structure failure during high winds or earthquakes, the PEA states that the ECO Substation switchyards would be configured according to the Institute of Electrical and Electronics Engineers' "Recommended Practices for Seismic Design of Substations" (Standard 693-2005; IEEE 2005) in order to withstand anticipated ground motion. In addition, the Sunrise Powerlink EIR/EIS states that such structures must meet the requirements of CPUC General Order 95, "Rules for Overhead Electric Line Construction." Therefore, both documents conclude that any potential hazards to human health and safety resulting from wind or earthquake impacts to the proposed structures would be minor. In addition, the Sunrise Powerlink EIR/EIS addresses potential safety impacts of the electrical field at the ECO Substation switchyards to cardiac pacemakers and increased hazards of induced currents and shocks. The Sunrise Powerlink EIR/EIS concludes that while exposure to the electric fields may result in asynchronous pacing in older model pacemakers, such effects are not a problem to modern pacemakers and no impacts to human health are anticipated. Similarly, the potential for induced currents and shocks would be minimal if all electrical structures are properly grounded; therefore, with the implementation of the recommended mitigation measure to implement grounding measures, the Sunrise Powerlink EIR/EIS concludes that no impacts to public health or safety would result from operation of the ECO Substation switchyards. Based on an independent review of these analyses, with the implementation of recommended mitigation measures, no impacts to public safety are anticipated. No additional impacts related to public health and safety have been identified and no additional mitigation measures are indicated.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised substation and SWPL loop-in locations, and site conditions at the remainder of the alternative site and in the surrounding undeveloped open space are very similar to those of the initially proposed site. Public health and safety issues and impacts for the alternative site would be the same as for the original switchyard location. No new impacts or mitigation measures are identified.

4.1.9 Fire and Fuels Management

Potential impacts related to fire and fuels management associated with the construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.15.3 of the ECO Substation Project EIR/EIS; Section 4.7 and 4.12 of the PEA; and Section 2.15.2 of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS, beginning on page 2-158. Associated mitigation measures are identified in the ECO Substation Project EIR/EIS in Section D.15.3 and Appendix 12 of the Sunrise Powerlink Final EIR/EIS, starting at page Ap.12-118. Potential impacts addressed in these analyses include:

- Increased probability of a wildfire due to equipment used during construction and maintenance activities.
- Introduction of non-native plants that would contribute to an increased ignition potential and rate of fire spread.
- Increased probability of wildfire and reduction in the effectiveness of firefighting efforts.
- Exposure of people or structures to a risk of loss, injury, or death related to wildland fires.

Similar to the ESJ U.S. Transmission Line project, the ECO Substation switchyard would be located in an area classified as a very high fire threat by the California Fire and Resource Assessment Program. Available fire fighting services in the vicinity would be the same as those described for the proposed project in Section 3.9 (Fire and Fuels Management). The ECO Substation Project EIR/EIS indicates that construction of the ECO Substation switchyards, as well as the operation and maintenance of the facilities, could result in potentially major fire hazards and increased wildfire probability as a result of increased vehicle and human presence and heat or sparks from construction equipment. However, the document concludes that impacts would be reduced to minor levels with implementation of mitigation measures, including development and implementation of a Construction Fire Prevention Plan and implementation of Sempra Utilities' Wildfire Prevention and Fire Safety Guide. In addition, SDG&E is required to enter into a development agreement with the Rural Fire Protection District and San Diego County Fire Authority, and prepare a customized Fire protection plan for the Project. Based on an independent analysis of these documents, with implementation of the recommended measures, impacts are considered minor. The PEA and Sunrise Powerlink EIR/EIS also conclude that construction of the ECO substation and SWPL loop-in could result in potentially major fire hazards that could be reduced to minor levels with implementation of mitigation measures (Sunrise Powerlink EIR/EIS) and APMs (PEA) that are comparable to those proposed in the ECO Substation Project EIR/EIS.

In addition to potential ignitions from construction vehicles, the ECO Substation Project EIR/EIS addresses the potential for activities associated with the construction and operation of the ECO Substation switchyards to result in the spread of non-native invasive weeds. In particular, the ECO Substation Project EIR/EIS notes that certain invasive plants that are common in the region (e.g., cheatgrass, medusa head, and Saharan mustard) are highly flammable and contribute to changes in wildfire frequency, timing and spread. The introduction of such plants as a result of construction and operation activities could exacerbate wildfire risks in the vicinity of the ECO Substation switchyards. However, the ECO Substation Project EIR/EIS concludes that the potential for wildfire risks associated with invasive plants would be reduced to minor levels with the implementation of the recommended mitigation measure to develop and implement a Disturbed Area Revegetation Plan. The Sunrise Powerlink EIR/EIS presents similar conclusions, but presents a Weed Control Plan rather than a Disturbed Area Revegetation Plan. Based on an independent review of the ECO Substation Project EIR/EIS and Sunrise Powerlink EIR/EIS analyses, with implementation of the recommended measure, impacts are considered minor.

With regard to the present and ongoing source of potential wildfire ignitions due to operation and maintenance of the substation switchyards and SWPL loop-in, the ECO Substation Project EIR/EIS concludes that the project presents an ongoing risk. The substation includes various ignition sources that could occasionally fail and result in open flame, sparks, or burning liquids. These events are rare but beyond the control of the project applicant. Thus, the ECO Substation Project EIR/EIS concludes that this risk is significant and cannot be mitigated to a level that is less than significant. Nonetheless, the aforementioned mitigation measures would reduce the likelihood of ignition. Similarly, the Sunrise Powerlink EIR/EIS states that the presence of the ECO Substation switchyards would create an ongoing source of potential ignitions due to line faults caused by unpredictable events such as conductor contact by floating debris; therefore, even following implementation of a recommended mitigation measure to maintain adequate vegetation clearance, the Sunrise Powerlink EIR/EIS concludes that operational impacts associated with fire and fuels management would be significant and unavoidable.

The ECO Substation Project EIR/EIS indicates that the ECO Substation would be constructed to current building codes and regulatory requirements, would receive ongoing maintenance to minimize the possibility of fire escaping into wildland fuels, and would have access roadways sufficient to ensure adequate access during fires or medical emergencies. Therefore, the document finds that the facility would not reduce the effectiveness of firefighting.

Based on an independent review of both analyses and the existing fire hazards in the area, even with implementation of recommended mitigation measures (ECO Substation Project EIR/EIS and Sunrise Powerlink EIR/EIS) and APMs (PEA), impacts with regard to potential ignitions and hazards to firefighting are considered major and unavoidable. No additional impacts related to fire and fuels management have been identified and no additional mitigation measures are indicated.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised substation and SWPL loop-in locations, and the remainder of the alternative site and the surrounding undeveloped open space are very similar in topography and vegetation type to the initially proposed site. Accordingly, fuel management and fire response issues for the alternative site would be very similar to those for the original switchyard location and it is anticipated that construction and operation of the ECO Substation Alternative site would result in the same impacts as for the original location. No new impacts or mitigation measures are identified.

4.1.10 Air Quality and Climate Change

Potential impacts to air quality and climate associated with construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Sections D.11.3 (Air Quality) and D.18.3 (Climate Change) of the ECO Substation Project EIR/EIS, Section 4.3 of the ECO Substation PEA and Section 2.12.2, starting at page 2-122, of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS. The full text of the mitigation measures related to air quality impacts at the ECO Substation switchyards as proposed by the ECO Substation Project EIR/EIS are located at Sections D.11.3 and D.18.3 and are included in the Sunrise Powerlink Final EIR/EIS in Appendix 12, at page Ap.12-101. Topics addressed in these analyses include:

- Construction-phase and operations-phase fugitive dust and other pollutant emissions from on-road vehicles, off-road vehicles, and off-road equipment use.
- Exhaust emissions of VOC and NO_X exceeding the general conformity *de minimis* thresholds from construction.

Greenhouse gas emissions from ECO Substation switchyard operations, including the GHG SF_6, which is used as a dielectric medium in high-voltage switchgear and circuit breakers at substations. Similar to the ESJ U.S. Transmission Line project, construction emissions would vary substantially from day to day, depending on the level of activity, the specific type of operation, and the prevailing weather conditions; however, air emissions are anticipated to be greater than described for the ESJ U.S. Transmission Line project due to the larger area of land disturbance associated with the ECO Substation switchyards. The ECO Substation Project EIR/EIS concludes that air emissions during construction of the ECO Substation switchyards would be minor for all criteria pollutants with the exception of NO_x and PM_{10}. The ECO Substation EIR/EIS analysis calculated the predicted emissions of pollutants using the URBEMIS model, based on estimated construction days, equipment required, and area disturbed. The model results indicate that the pounds per day emission rate during construction activity would exceed SDAPCD thresholds for NO_x and PM_{10} (Table 4-1).

Table 4-1
ECO Substation Project EIR/EIS Estimated Construction Emissions for ECO Substation Switchyards and SWPL Loop-In

Project Component	Criteria Pollutant	SDAPCD Significance threshold (lbs per day)	Emissions (lbs per day)
ECO Substation Switchyards	$PM_{2.5}$	55	33.34
	PM_{10}	100	106.89
	NO_X	250	383.91
	SO_X	250	0.25
	CO	550	247.95
	VOC	75	50.10
SWPL Loop-In	$PM_{2.5}$	55	2.51
	PM_{10}	100	4.50
	NO_X	250	76.55
	SO_X	250	0.01
	CO	550	33.49
	VOC	75	8.35

According to the ECO Substation Project EIR/EIS, construction of the ECO Substation would result in dust and exhaust emissions of criteria pollutants and toxic air contaminants, primarily NO_X, CO, and PM_{10} produced from heavy equipment use. The project emissions are expected to be well below the daily significance thresholds for VOCs, CO, SO_X, and $PM_{2.5}$; but, would exceed the daily significance threshold for NO_X and PM_{10} during construction activities, and would contribute to existing air quality violations of O_3 standards since NO_X is an O_3 precursor. According to the ECO Substation Project EIR/EIS, results from the URBEMIS 2007 land use and air emissions model found that implementation of appropriate dust control and emission-reduction mitigation measures could not reduce construction impacts on air quality to less than significant levels. Mitigation measures include minimizing dust on roads, using dust suppression techniques and technology on vehicles, limiting idling, and encouraging carpools. With regard to operational emissions, the ECO Substation Project EIR/EIS concludes that there would be no major impacts to air quality. Sources of operational air emissions at the substation would be periodic vehicle trips for maintenance and inspection and periodic operation of two diesel-fired emergency generators. The ECO Substation Project EIR/EIS found that daily operational emissions would be well below significance thresholds. Additionally, the ECO Substation Project EIR/EIS states that two diesel-fired emergency generators at the ECO substation would emit diesel exhaust particulate matter, which the state of California identifies as a toxic pollutant, but these emissions would not cause unacceptable health impacts due to the limited operation of the generators. Therefore, the ECO Substation Project EIR/EIS found that operational impacts to air quality would be less than significant. The Sunrise Powerlink EIR/EIS and PEA also conclude that operation impacts to air quality would be less than significant. The ECO Substation Project EIR/EIS estimates the potential CO emissions during operation and maintenance of the ECO Substation switchyards to be 110.65 lb/day. DOE's preliminary independent analysis of potential CO emissions based on the information provided in the Project Description and using current emission factors (using the EMFAC program which is based on federal emission factors described in 40 CFR 86 and 40 CFR 89.112 [see Section 3.10 for further explanation]) confirms the ECO Substation Project EIR/EIS calculations; therefore, the anticipated emissions would be well below the SDAPCD threshold, and therefore a minor impact.

The ECO Substation Project EIR/EIS estimated that construction for the entire SDG&E ECO Substation Project, including the 138-kV transmission line and Boulevard substation rebuild in addition to the ECO Substation switchyards and loop-in, would emit a total of 13,934 metric tons of CO_2eqv over three years of construction. During ECO Substation operations, GHG emissions would result from burning of fuel for vehicle and equipment operation. An additional potentially significant potential source of GHGs would be fugitive emissions of sulfur hexafluoride (SF6), an extremely potent GHG. SF6 is used as a dielectric medium in high-voltage switchgear and circuit breakers at substations and is typically associated only with facilities which are connected to transmissions lines, such as the ECO Substation switchyards. The PEA states that the ECO Substation switchyards would emit 0.03 metric tons per year of SF6 (approximately 684 metric tons CO_2eqv per year). To minimize impacts from fugitive SF6 losses, the PEA states that SDG&E would implement a monitoring plan which would include measuring SF6 in its equipment, identifying and repairing or replacing leaky equipment in a timely fashion, training employees on the effects of SF6, and including design elements to reduce energy consumption. The ECO Substation Project EIR/EIS reports an estimate of 3,668 metric tons CO_2eqv for total ECO Substation Project emissions (including operation of components that are not connected actions for the ESJ U.S. Transmission Line project). The ECO Substation Project EIR/EIS noted that annual GHG emissions would be below the threshold of 7,716 metric tons CO_2eqv per year that has been proposed as an indicator in CARB draft guidance on analyzing impacts of GHG emissions (CARB 2008). In addition, construction emissions were amortized over the operating life of the ECO Substation Project to determine annualized emissions of 4,132 metric tons CO_2eqv per year, which is below the South Coast Air Quality Management District interim significance threshold of 10,000 metric tons CO_2eqv per year. The ECO Substation Project EIR/EIS determined that GHG impacts would be less than significant.

With regard to climate change, the ECO Substation Project EIR/EIS concludes that project construction, operation and maintenance would not cause a significant net increase in greenhouse gas emissions, nor would it conflict with any plans or regulations adopted for the purpose of reducing GHG emissions. Thus, impacts on greenhouse gases and climate change are not significant. Based on an independent review of these analyses and the existing air quality conditions in the area, no additional potential air quality and climate change impacts have been identified and no additional mitigation measures are indicated.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised substation and SWPL loop-in locations, and the remainder of the alternative site and the surrounding undeveloped open space are very similar to the initially proposed site in topography, vegetation, and soils. The amount of site grading and general construction methods for the alternative site would be very similar to the original switchyard location, and thus the short-term construction emissions would be very similar to the emissions estimated for the original location. Accordingly, it is anticipated that construction and operation of the ECO Substation Alternative site would result in the same impacts as for the original location. No new impacts or mitigation measures are identified.

4.1.11 Water Resources

Potential impacts to water resources associated with construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.12.3 of the ECO Substation Project EIR/EIS; Section 4.8 of the ECO Substation PEA; and in Section 2.12.2, beginning on page 2-128, of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS. Associated mitigation measures are identified in the ECO Substation Project EIR/EIS at Section D.12.3 and in Appendix 12, page Ap.12-104 of the Sunrise Powerlink Final EIR/EIS. Potential impacts addressed in these analyses include:

- Depletion of local water supplies due to water required for dust suppression.
- Degradation of water quality due to erosion and sedimentation during construction activity or substantial changes to the existing drainage of the site.
- Degradation of water quality due to accidental spills or releases of potentially hazardous materials.
- Releases of contaminants during construction or during operation of the substation.
- Creation of new impervious surface areas.
- Alteration of existing drainage patterns.

The ECO Substation switchyards would permanently fill three, small desert swales (total of approximately 0.5 acre [0.2 ha]) that could potentially fall under the jurisdiction of the USACE, the RWQCB, and/or the CDFG. As described in the ECO Substation Project EIR/EIS, potential impacts to these drainages would be reduced to minor levels by obtaining permits from the appropriate regulatory agency and complying with applicable compensation requirements specified by the agency. Similar to the ESJ U.S. Transmission Line project, the ECO Substation switchyards and SWPL loop-in would not be located within the boundaries of a designated groundwater basin as defined by DWR. Further, the ECO Substation switchyards and SWPL loop-in would not be located within any FEMA-designated 100-year or 500-year floodplains.

The ECO Substation Project EIR/EIS notes that excavation activities are unlikely to contaminate groundwater through accidental material spills because groundwater in the area is typically not present within the maximum 25-foot depth of project excavation. However, to ensure avoidance of impacts, the ECO Substation Project EIR/EIS recommends implementing a mitigation measure to avoid and protect groundwater during excavation.

The ECO Substation Project EIR/EIS states that construction of the ECO Substation would require the use of approximately 30 million gallons (94 acre-feet, 114,000 cubic meters) of water during construction, purchased from local water purveyors. According to the PEA, water would be provided by either a well installed at the ECO Substation switchyard site or purchased from the City of El Centro or the Imperial Irrigation District. The PEA concludes that water use during construction would result in minor impacts to local water supply. DOE's comparison of the anticipated water use with the recharge rate of the Jacumba Valley Groundwater Basin (approximately 2,700 acre-feet per year [3.3 million cubic meters per year], as discussed in Section 3.11 [Water Resources]) demonstrates that if this volume of water is obtained from local groundwater sources, this use would result in only minor and short-term impacts to the area's groundwater resources. The ECO Substation Project EIR/EIS concludes that construction activity could degrade water quality as a result of erosion and sedimentation. However, by implementing a Stormwater Pollution Prevention Plan and an Erosion Control and Sediment Transport Control Plan, the project would comply with federal, state, and County of San Diego water pollution control laws and impacts would be reduced to less than significant. In addition, the ECO Substation Project EIR/EIS notes that construction activities could cause the accidental release of hazardous materials used during construction, such as diesel fuel, hydraulic fluid, oils and grease, and concrete. However, these impacts could be mitigated to a less than significant level with the implementation of mitigation measures described above, as well as the hazardous waste mitigation measures discussed in Section 4.1.10. The ECO Substation Project EIR/EIS addresses the creation of new impervious surfaces which could reduce groundwater recharge rates and affect stormwater drainage onsite. According to the ECO Substation Project EIR/EIS, construction of the ECO Substation switchyards would require substantial grading and the installation of a concrete building pad which would alter the natural drainage pattern of the proposed site and potentially reduce groundwater recharge; however, a Stormwater Management plan would be developed as part of the project, as recommended by the ECO Substation Project EIR/EIS. With implementation of mitigation measures, the ECO Substation Project EIR/EIS concludes that impacts to stormwater drainage and associated erosion would be minimal. The PEA and Sunrise Powerlink EIR/EIS reach the same conclusions but also suggest installation of swales to control stormwater.

The ECO Substation Project EIR/EIS, as well as the PEA and Sunrise Powerlink EIR/EIS, all state that the implementation of APMs (PEA) and recommended mitigation measures (ECO Substation Project EIR/EIS and Sunrise Powerlink EIR/EIS), including compliance with NPDES regulations, and proper disposal and cleanup of hazardous materials would ensure that any potential water quality impacts resulting from construction and operation activities would be minimal. Based on an independent review of these analyses, impacts to surface water resources are considered minor. No additional potential impacts to water resources have been identified and no additional mitigation measures are indicated.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised substation and SWPL loop-in locations, and the remainder of the alternative site and the surrounding undeveloped open space are very similar to the initially proposed site. The ECO Substation EIR/EIS indicates that the alternative location would reduce the area of desert swales (considered waters of the United States) that would be potentially impacted by the original switchyard location. In other respects, the amount of site grading and general construction methods for the alternative site would be very similar to the original switchyard location, and thus the potential short-term construction impacts to water quality, and the short-term impact from use of groundwater for construction would be very similar to the impacts identified for the original location. Accordingly, it is anticipated that construction and operation of the ECO Substation Alternative site would result in the slightly fewer impacts than the original location. No new impacts or mitigation measures are identified.

4.1.12 Geology and Soils

Potential impacts to geology and soils associated with construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.13.3 of the ECO Substation Project EIR/EIS, Section 4.6 of the ECO Substation PEA; and in Section 2.13.2, beginning on page 2-142, of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS. Associated mitigation measures are identified in the ECO Substation Project EIR/EIS at Section D.13.3 and in the Sunrise Powerlink Final EIR/EIS in Appendix 12, at page Ap.12-112. Potential impacts addressed in these analyses include:

- Triggering or accelerating erosion due to construction activity.
- Exposure of people and/or structures to adverse effects as a result of problematic soils, slope instability, or significant groundshaking.
- Destruction or disturbance of significant paleontological resources during construction.

Similar to the ESJ U.S. Transmission Line project, the ECO Substation switchyards and SWPL loop-in would be located on flat to gently sloping terrain. Geological mapping of the area indicates that the central portion of the ECO Substation switchyard site is crossed by two buried inactive faults (Brooks and Roberts 2003). Although these faults are relatively short and are not expected to generate large, significantly damaging earthquakes, fault rupture can occur along their traces as a result of stress or from sympathetic movement related to large earthquakes on the distant Elsinore Fault.

Soil types and soil hazards would be as described in Section 3.12 (Geology and Soils). The ECO Substation Project EIR/EIS also discusses the potential for soil erosion resulting from construction activities associated with the substation switchyards and SWPL loop-in and recommends implementing an Erosion Control and Sedimentation Plan, Stormwater Pollution Prevention Plan, and associated best management practices to ensure that impacts are less than significant. The PEA and Sunrise Powerlink EIR/EIS also conclude that impacts can be mitigated to a less than significant level. In addition, the ECO Substation Project EIR/EIS, PEA and Sunrise Powerlink EIR/EIS conclude that with the implementation of recommended mitigation measures, and APMs (PEA) including implementation of recommendations from a project-specific geotechnical report, impacts associated with exposing people and/or structures to adverse effects as a result of problematic soils or slope instability would be minor.

The ECO Substation Project EIR/EIS notes that two inactive faults cross the proposed ECO Substation switchyard site, as discussed in Section 4.8 (Public Health and Safety), but also states that transmission lines and substations are designed to withstand strong ground shaking, as well as moderate ground-deformation impacts associated with strong seismic shaking. To mitigate potential impacts from more severe seismicity, the ECO Substation Project EIS/EIR includes mitigation measures requiring that geotechnical investigations should be conducted before development and that the facilities should be inspected following major seismic events. With the incorporation of these standard engineering practices, the EIR/EIS concludes that impacts would be minor. The PEA reaches the same conclusions in regard to the effects of groundshaking on public safety.

The ECO Substation Project EIR/EIS also finds that construction of the ECO Substation switchyards could potentially destroy or disturb significant paleontological resources. The Table Mountain Formation, a Miocene-age sandstone, which underlies part of the site, may contain fossil remains of land mammals. Significant excavation required for construction of the substation could disturb paleontological resources if any are present on the site. The Table Mountain Formation is classified as “High Sensitivity – Class 4” in the BLM’s Potential Fossil Yield Classification system. Accordingly, the ECO Substation Project EIR/EIS identified the impact as potentially significant, but determined that it could be mitigated to a less than significant level by inventorying paleontological resources in the project area prior to construction, developing a resource monitoring and treatment plan, performing construction monitoring, and training construction personnel.

Based on an independent review of these analyses, with the implementation of the recommended measures, potential impacts with regard to geology and soils are considered minor. No additional potential impacts have been identified and no additional mitigation measures are indicated.

ECO Substation Alternative Location. There is considerable physical overlap between the original and revised substation and SWPL loop-in locations, and the remainder of the alternative site and the surrounding undeveloped open space are very similar to the initially proposed site in topography, vegetation, soil types, and geology. The amount of site grading and general construction methods for the alternative site would be very similar to the original switchyard location, and thus the potential impacts related to soils and geology would be very similar to the impacts identified for the original location. No new impacts or mitigation measures are identified.

4.1.13 Socioeconomics

Potential impacts to socioeconomics associated with construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.16.3 of the ECO Substation Project EIR/EIS, in Section 4.11 of the ECO Substation PEA; and in Section 2.14.2, beginning on page 2-150, of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS. Associated mitigation measures are identified in the ECO Substation Project Final EIR/EIS at Section D.16.3. Potential impacts explored in these analyses include:

- Displacement of people or housing
- Changes in revenue for businesses, tribes, or governments due to the presence of the transmission line
- Property tax revenues and/or fees
- Property values

Displacement of people or housing was found not be a potential impact. There are no existing occupied residences on or near the proposed ECO Substation and SWPL loop-in location, so there is no potential for displacement.

Similar to the ESJ U.S. Transmission Line project, the ECO Substation Project EIR/EIS states that construction personnel associated with the ECO Substation switchyards and SWPL loop-in would be drawn from the local region. About 54 workers (36 workers estimated for the ECO Substation and 18 workers for the SWPL loop-in) would be required during peak construction with no additional employees required for operation of the Substation. Therefore, the ECO Substation Project EIR/EIS concludes that the temporary increase in employment would benefit the region. The PEA adds that the majority of construction workers associated with the ECO Substation switchyards would be expected to commute to the site and no temporary increases in local population or demand for local housing are expected. Once operational, the PEA notes that the majority of operational activities would be unmanned and no permanent jobs would be created; therefore, the PEA concludes that operation of the ECO Substation switchyards would not result in permanent impacts to population or housing supply. Based on an independent review of these analyses, no impacts with regard to population and housing would result from construction or operation of the ECO Substation switchyards or SWPL loop-in.

The ECO Substation Project EIR/EIS addresses the potential economic impacts of the ECO Substation switchyards, including employment, county revenue and property value. The analysis provided indicates that property taxes at the ECO Substation switchyard site would increase as a result of the construction and operation of the ECO Substation switchyards, which would generate additional county revenue. In addition, employment of construction personnel would be beneficial to local businesses through increased expenditure of wages for goods and services, including local hotel rooms, food, and beverages. Therefore, the ECO Substation Project EIR/EIS concludes that similar to the ESJ U.S. Transmission Line project, construction of the ECO Substation switchyards would result in minor beneficial impacts with regard to increased government revenue and spending at local businesses.

With regard to property value, the ECO Substation Project EIR/EIS indicates that, similar to the ESJ U.S. Transmission Line project, the presence of the ECO Substation switchyards and SWPL loop-in may incrementally reduce property values; however, such effects would be very small and diminish over time. Therefore, the ECO Substation Project EIR/EIS concludes that any potential impacts would be less than significant. The Sunrise Powerlink EIR/EIS reaches the same conclusion with regard to county revenue and property value.

Based on an independent review of this analysis, potential economic impacts of the connected actions are considered minor. No additional potential impacts related to socioeconomics have been identified and no additional mitigation measures are indicated.

ECO Substation Alternative Location. The original and revised substation and SWPL loop-in locations are very similar and the overall scale and design of the alternative location is unchanged. Therefore, construction and operation of the ECO Substation Alternative site would result in the same impacts as for the original location. No new impacts or mitigation measures are identified.

4.1.14 Environmental Justice

Potential impacts associated with construction and operation of the ECO Substation switchyards and SWPL loop-in, and related to environmental justice, are addressed in Section D.17.3 of the ECO Substation Project EIR/EIS, and in Section F.1.2.4 of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS, starting at page F-17. The ECO Substation PEA does not address potential impacts related to environmental justice. Environmental justice is the consideration of any identified impacts that would result in disproportionately high or adverse impacts to minority or low-income populations.

The ECO Substation switchyards and SWPL loop-in would be located on undeveloped, private land, within the same census tract as the ESJ U.S. Transmission Line project (Census Tract 211). The nearest occupied residence is located approximately 0.5 mile (0.8 km) northwest of the site. As indicated in Section 3.14, this census tract contains both minority and low-income populations. However, construction of the ECO Substation and SWPL loop-in would not result in major adverse health and safety, noise, socioeconomic, or other impacts and identified minor impacts would not disproportionately affect minority or low-income populations in comparison to the general population. Additionally, no information suggests that there are differential patterns of consumption of natural resources that would cause minority or low-income populations to experience impacts that are substantially different from impacts on the general population. The ECO Substation EIR/EIS concludes that no environmental justice impacts would result from construction or operation of the proposed project (Section D.17.3 and F.3.16). The Sunrise Powerlink Final EIR/EIS concludes that no environmental justice impacts would result from the ECO substation construction (Section F.1.2.4, pages F-17 & 18).

ECO Substation Alternative Location. The original and revised substation and SWPL loop-in locations are very similar and the overall scale and design of the alternative location is unchanged. Therefore, construction and operation of the ECO Substation Alternative site would result in the same impacts as for the original location. No new impacts or mitigation measures are identified.

4.1.15 Services and Utilities

Potential services and utilities impacts associated with construction and operation of the ECO Substation switchyards and SWPL loop-in are addressed in Section D.14.3 of the ECO Substation Project EIR/EIS; in Section 4.12 and 4.15 of the ECO Substation PEA and in Section 2.14.2, beginning on page 2-148, of the Recirculated Draft EIR/Supplemental Draft EIS section of the Sunrise Powerlink Final EIR/EIS. Topics addressed in these analyses include:

- Impact on need for public services and utilities in the project area.
- Potential for disruption of existing utility systems due to collocation accidents.
- Adequacy of water supply.
- Adequacy of wastewater treatment capacity.
- Adequacy of permitted landfill capacity.

Since the ECO Substation switchyards and SWPL loop-in would be located in the same general area as the ESJ U.S. Transmission Line project, the existing setting for public services and utilities is the same as described in Section 3.15 (Services and Utilities). The ECO Substation Project EIR/EIS indicates that construction and operation of the ECO Substation switchyards and SWPL loop-in would not generate wastewater and would generate minimal amounts of solid waste. Furthermore, the ECO Substation Project EIR/EIS indicates that there is sufficient water supply to fulfill construction, operation and maintenance requirements for the substation switchyards and SWPL loop-in, and that any impacts to water resources would be mitigated, as described in Section 4.1.13. In addition, construction and operation of the ECO Substation switchyards or SWPL loop-in would not result in any temporary or permanent increases in local populations. Therefore, the ECO Substation Project EIR/EIS concludes that construction and operation of the ECO Substation switchyards or SWPL loop-in would not result in an increased demand on public services (e.g., law enforcement, schools, or hospitals) and utilities. The PEA and Sunrise Powerlink EIR/EIS also conclude that there would not be increased demand on public utilities resulting from construction and operation of the ECO substation. In addition, given the remote location of the ECO Substation switchyards and SWPL loop-in, the ECO Substation Project EIR/EIS, as well as the PEA and Sunrise Powerlink Final EIR/EIS, concludes that disruptions to existing utility systems are unlikely. The ECO Substation Project EIR/EIS does not recommend any mitigation measures (or APMs) for the switchyards and loop-in. However, the Sunrise Powerlink EIR/EIS recommends a mitigation measure to ensure maximum recycling activities would occur.

Based on an independent review, impacts to utilities and services during construction and operation of the ECO Substation switchyards and SWPL loop-in are found to be minor. However, similar to the ESJ U.S. Transmission Line project, security of the ECO Substation switchyards and SWPL loop-in construction sites may require additional security measures (see Section 3.15 for more information on these measures). No additional potential impacts have been identified and no additional mitigation measures are indicated.

ECO Substation Alternative Location. The original and revised substation and SWPL loop-in locations are very similar and the overall scale and design of the alternative location is unchanged. Therefore, construction and operation of the ECO Substation Alternative site would result in the same impacts as for the original location. No new impacts or mitigation measures are identified.

SECTION 5

CUMULATIVE IMPACTS

Even if an individual project has a minor effect, significant environmental effects may result from the combination of the minor effects of multiple individual actions over time (CEQ 1997a). The CEQ regulations implementing the procedural provisions of NEPA define cumulative impacts as those impacts "on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). The regulations further explain that "cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." This section addresses potential cumulative impacts of the ESJ U.S. Transmission Line project, when added to impacts from other past, present, and reasonably foreseeable future actions in the region.

5.1 METHODOLOGY

The cumulative impacts analysis presented in this document is based on the potential effects of the ESJ U.S. Transmission Line project when added to impacts from other past, present, and reasonably foreseeable future actions in the region. The potential effects are evaluated both for the period of project construction (anticipated to be up to 6 months), and for the post-construction (operation) period of the project.

The region of influence (ROI) varies for each resource area, depending on the distance a potential effect can travel or be experienced. For example, cumulative effects to visual resources are typically limited to other projects that occupy the same field of view as the alternative corridors. However, comments received during the public scoping process for the ESJ U.S. Transmission Line project indicate that members of the public and community groups are concerned with changes in the general visual quality of the region that may be diminished by the proliferation of visible structures, even if the changes are not within the same field of view as the alternative corridors. Therefore, for visual resources, the ROI is relatively large and includes southeastern San Diego County and southwestern Imperial County. In comparison, since impacts to geology and soils are limited to the existing resources onsite, the ROI for cumulative effects is the alternative corridors' rights-of-way. Cumulative issues relating to environmental justice could result from potential effects identified under all other resource areas; therefore, the ROI for environmental justice includes southeastern San Diego County and southwestern Imperial County. The ROI for the remaining resource areas is as follows: for biological resources, land use, recreation, and cultural resources, the ROI is southeastern San Diego County and southwestern Imperial County; for water resources, the ROI is the alternative corridors' rights-of-way and Jacumba groundwater basin; for socioeconomics, the ROI is the census tract that includes the alternative corridors and the towns of Jacumba and Boulevard; for transportation and traffic the ROI is the segment of I-8 between eastern San Diego County and western Imperial County; and for air quality, the ROI is the San Diego Air Basin, including the potential for wind transport of air pollutants generated by reasonably foreseeable actions from Mexico into the air resources ROI (in the U.S.). The analysis includes actions that could be reasonably anticipated to occur and have cumulative effects within the ROI of each resource area.

5.2 REASONABLY FORESEEABLE ACTION IDENTIFICATION

The cumulative impact analysis incorporates the sum of the effects of the ESJ U.S. Transmission Line project in combination with past, present, and future actions, since impacts may accumulate or develop over time. The actions described in this analysis are those that have already occurred, are ongoing, or are "reasonably foreseeable"; that is, they are funded for future implementation, or are included in firm near-term plans. In addition, DOE has limited its identification of reasonably foreseeable projects to those proposals with the potential to be executed within the next 10 years. Projects predicted to occur beyond 10 years are generally presumed to be speculative and thus not reasonably foreseeable. Types of actions with firm near-term plans include:

- Actions for which NEPA and/or CEQA documents are in preparation or finalized;
- Actions in a detailed design phase;
- Actions listed in formal NOI published in the *Federal Register* or State publications;
- Actions for which enabling legislation has been passed or a Memorandum of Understanding has been signed; and
- Actions that have been submitted to federal and state regulators to begin the permitting process.

Table 5-1 summarizes actions that have been identified as recently completed, ongoing, or reasonably foreseeable and are thus included in the analysis of cumulative impacts. These actions were identified through the scoping process for the ESJ U.S. Transmission Line project, discussions with regional resource agencies (e.g., Caltrans, BLM, County of San Diego, U.S. Border Patrol), review of the Cal-ISO Interconnection Queue[1], review of regional planning documents (e.g., County of San Diego General Plan), and NEPA and CEQA documents for other known actions in the area (e.g., Sunrise Powerlink and SDG&E ECO Substation Project). Each action is described in greater detail in the sections below and displayed in Figure 5-1.

[1] The Cal-ISO Interconnection Queue is periodically updated and lists energy-related facilities that have submitted requests to interconnect to the existing electric transmission system. The list as of February 2012 is available online at: http://www.caiso.com/Documents/ISOGeneratorInterconnectionQueue.pdf. Refer to the California ISO for the most recent report, at: http://www.caiso.com/. For the current report, enter the phrase "Cal-ISO Interconnection Queue" in the search function.

Table 5-1
Past, Present, and Reasonably Foreseeable Future Actions That May Cumulatively Affect Resources of Concern

Section Number	Project Name	Status	Primary Impact Location
Energy Projects			
5.2.1	Sunrise Powerlink Transmission Line Project	Approved by the CPUC in December 2008, BLM in January 2009, and U.S. Forest Service in July 2010. Construction began on the project in September 2010	Imperial County/San Diego County
5.2.2	SDG&E ECO Substation Project (138-kv Transmission Line, Boulevard Substation Expansion, White Star Communication Facility)[1]	The CPUC and BLM released a Draft EIR/EIS for public review December 24, 2010. Public comment period ended February 16, 2011. The EPA Notice of Availability for the Final EIR/EIS was published October 14, 2011	Southeastern San Diego County
5.2.3	Tule Wind Energy Project	The CPUC and BLM released the Draft EIR/EIS for public review December 24, 2010. Public review period ended February 16, 2011. The EPA Notice of Availability for the Final EIR/EIS was published October 14, 2011	Boulevard
5.2.4	Campo Shu'luuk Wind Energy Project	The Bureau of Indian Affairs (BIA) and Campo Band of Mission Indians issued a NOI to construct the Campo Shu'luuk Wind Project in May 2011.	Campo
5.2.5	SDG&E Manzanita Wind Project	A feasibility study was conducted in 2004, and BIA is currently in possession of the tribal resolution to proceed with the NOI. No actions have been taken on this project since the 2004 feasibility study.	Boulevard
5.2.5	Jewel Valley Wind Project	A preliminary wind energy assessment has been completed and an Administrative Permit application has been approved by the County of San Diego for development of meteorological towers.	Boulevard
5.2.5	Ocotillo Wind Projects (Palm Canyon Wash	BLM and Imperial County issued a NOA for a Draft EIS/EIR in July 2011. The public	southwestern Imperial County

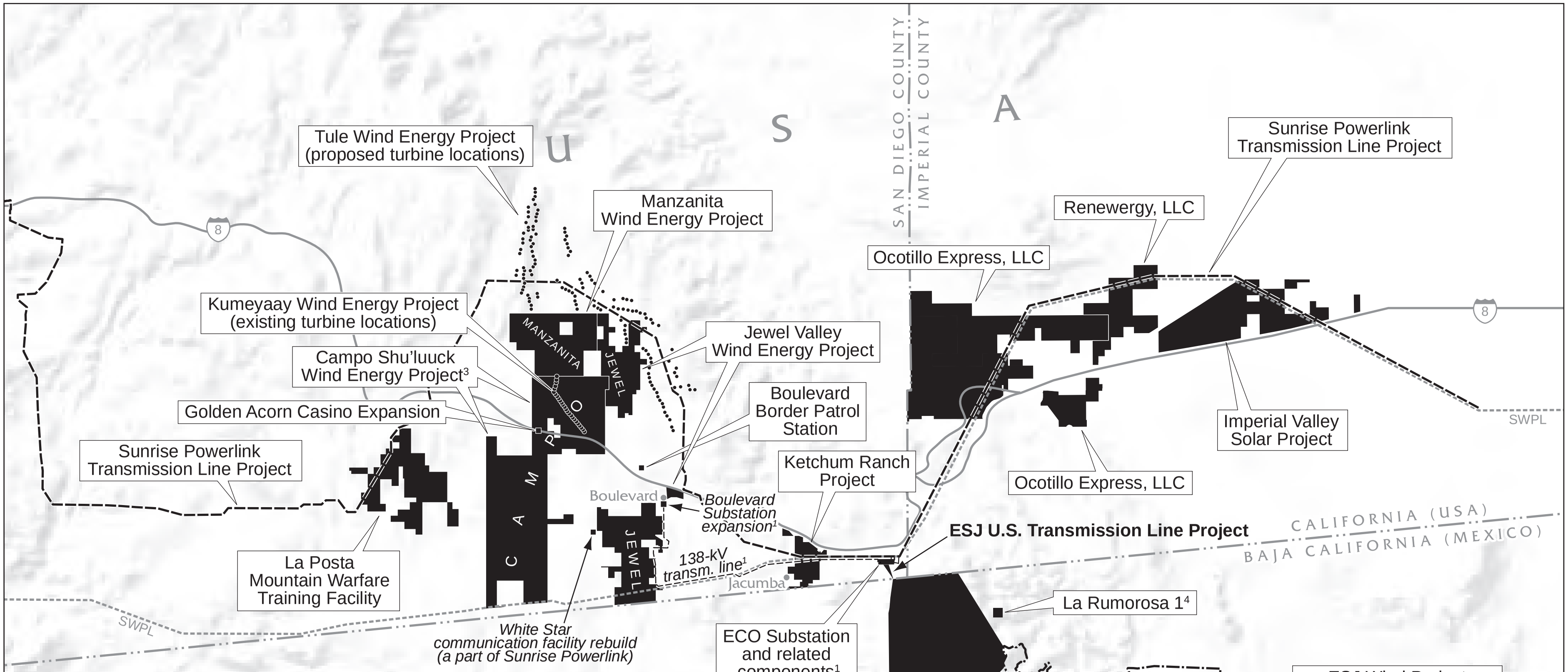
Table 5-1
Past, Present, and Reasonably Foreseeable Future Actions That May Cumulatively Affect Resources of Concern

Section Number	Project Name	Status	Primary Impact Location
	and Sugarloaf Mountain)	comment period closed on October 5, 2011. The Notice of Availability of the Final EIR/EIS was issued March 9, 2012. BLM's Record of Decision was published in the Federal Register on May 11, 2012.	
5.2.5	Renewergy Wind Project	BLM has granted a right-of-way BLM has granted a right-of-way	southwestern Imperial County
5.2.5	Kumeyaay Wind Project	Wind turbines have been installed and in operation since 2006	Boulevard
5.2.5	Imperial Valley Solar Project	BLM published a Final EIS and ROD on October 5, 2010. Construction is anticipated to begin first quarter 2013	Southwestern Imperial County
5.2.6	La Rumorosa I Project	Constructed in September 2009	Baja California and southeastern San Diego County
Development Projects			
5.2.7	U.S. Border Patrol Boulevard Station	A Final Environmental Assessment and Finding of No Significant Impact were published by the U.S. Army Corps of Engineers in February 2010. Construction is currently underway and expected to be completed by September 2012.	Boulevard
5.2.7	Campo Casino Expansion	A Tribal Compact Environmental Analysis was issued in 2007. Public review ended in August, 2008. No further advancements have been made since that time.	Campo/Boulevard
5.2.7	Ketchum Ranch	Application for development filed with County of San Diego	Jacumba

Table 5-1
Past, Present, and Reasonably Foreseeable Future Actions That May Cumulatively Affect Resources of Concern

Section Number	Project Name	Status	Primary Impact Location
Regional Planning Projects			
5.2.8	County of San Diego General Plan Update	The Final EIR was published August, 2011. The General Plan Update was approved August 3, 2011.	San Diego County/ Mountain Empire Sub-Region
5.2.9	BLM South Coast Resource Management Plan Revision	BLM published a NOI for development of the Resource Management Plan in August, 2007. The Draft Resource Management Plan has not yet been released.	Portions of San Diego, Riverside, Los Angeles, Orange, and San Bernardino Counties
5.2.10	BLM Eastern San Diego County Resource Management Plan Revision	Adopted October 2008	Portions of San Diego County
5.2.11	East County Multiple Species Conservation Plan	On hold. No progress since 2009.	Portions of San Diego County
5.2.12	Solar Energy Development	Under environmental review by the DOE and BLM. The DOE and BLM published a joint NOA for a Programmatic EIS in December 2010 (75 FR 78980). In October 2011, the DOE and BLM published a NOA for a Supplement to the draft Programmatic EIS.	Jacumba Mountain Wilderness Area, Imperial County

[1]This cumulative assessment addresses all of the SDG&E ECO Substation Project components. Section 4 (Connected Actions) provides additional analysis of the ECO Substation switchyard and the SWPL loop-in as stand-alone projects because they are connected actions to the ESJ U.S. Transmission Line project.

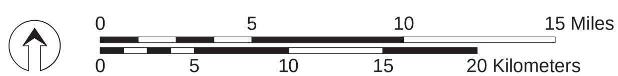


[1] The ECO Substation (switchyards and Loop-In) are Connected Actions for the purpose of this EIS. The Boulevard Substation expansion and 138-kV transmission line to Boulevard Substation are components of the ECO Substation Project.

[2] The ESJ Wind Project is entirely within Mexico. Phase 1 would generate up to approximately 130 MW. Future phases would result in up to approximately 1,250 MW (inclusive of Phase 1).

[3] This figure depicts the Campo Indian Reservation; the precise location of the proposed wind energy project on the reservation has not yet been determined.

[4] In late 2009, five 2-MW wind turbines were installed near the border in Mexico as part of the La Rumorosa 1 project. The exact location of these turbines is unknown to DOE; therefore the position of the project on this figure is approximate.



Source(s):
AECOM 2010b; Burns & McDonnell 2009a, 2009b, 2010a, 2010b; CPUC/BLM 2011a, 2011b; SDG&E 2009b; Sempra Generation 2010; USGS 2006.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 5-1

PROJECTS CONSIDERED IN CUMULATIVE IMPACTS ANALYSIS

May 2012

(Sacramento) ..\PROJECTS\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_5-1_ProjectsConsideredInCumulative_plus_ESJ_11x8_v13.ai (04/05/2012, 04:17 pm) R. Wurgler/T. Murphy

5.2.1 Sunrise Powerlink Transmission Line

SDG&E is constructing a new 150-mile (241.4 km) transmission line between Imperial and San Diego Counties that will consist of a new 91-mile (146.4 km) single-circuit 500-kV overhead electric transmission line connecting the existing Imperial Valley Substation to a proposed new Central East Substation (in San Diego County, near the community of San Felipe). Between the Central East Substation and the existing Pensaquitos Substation in the City of San Diego, SDG&E will construct a new 59-mile (94.9 km) 230-kV double-circuit and single-circuit transmission line, portions of which are to be underground. The CPUC voted in December 2008 to approve the Final Environmentally Superior Southern Route; this route traverses the ESJ U.S. Transmission Line project area near Old Highway 80, parallel to the existing SWPL, and immediately north of the proposed ECO Substation Project. The BLM issued a ROD[2] for the project in January 2009 approving the same route. The U.S. Forest Service issued a ROD[3] for the project in July 2010 to allow construction through 19 miles (30.6 km) of the Cleveland National Forest. Various appeals were filed against these agency actions, and those appeals were not sustained. Opponents of the project have initiated litigation against these agencies' decisions, asserting that agencies had failed to fully assess the project's environmental impacts. Construction of the line began in the second half of 2010 and is expected to be completed over a period of 2 years (BLM 2009f). On June 30, 2011, a U.S. District court rejected a lawsuit intended to halt project construction (San Diego Union Tribune 2011).

White Star Communication Facility

SDG&E owns and operates a communications facility at White Star in an easement that is adjacent to an existing communication facility owned by the County of San Diego. As a part of the Sunrise Project, SDG&E would replace 2 wooden poles with one 75-foot (22.8-m) tall steel tubular pole at this site. The new equipment to be installed would include a 6-foot (1.8-m) diameter microwave antenna, waveguide, and grounding attached to the steel pole. The microwave dish would be attached to the tower approximately 50 feet (15.2 m) from the ground.

In addition, voice radio antennas may be attached to the tower to support electrical crews' fieldwork and operation safety. SDG&E would remove an existing equipment control shelter and install a small, pre-fabricated control building, 12 feet (3.7 m) by 16 feet (4.9 m) in size, adjacent to the new steel pole, which would house the microwave radio system and other telecommunication equipment. SDG&E would also be required to install a 48-VDC direct current battery, including a rectifier, and 1 backup generator. The new facility would be approximately 30 feet wide by 30 feet long (9.1 m by 9.1 m) and enclosed within a 6-foot (1.8-meter) high chain-link fence (SDG&E 2009b).

5.2.2 SDG&E East County Substation Project

As described in Section 2.9 and discussed in Section 4, SDG&E has filed an application with the CPUC for a Permit to construct a new substation in eastern San Diego County (ECO Substation)

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2 The BLM ROD for the Sunrise Powerlink Project can be found at the following website: http://www.cpuc.ca.gov/environment/info/aspen/sunrise/rod.pdf

3 The USFS ROD for the Sunrise Powerlink Project can be found at the following website: http://www.fs.fed.us/r5/cleveland/projects/sunrise-powerlink/fs-rod-july-09-2010.pdf

which would loop into the existing SWPL transmission line.[4] BLM and the CPUC published a joint NOI/Notice of Preparation for an EIS/EIR for the project in December 2009 (BLM 2009e) and a joint Notice of Availability for a Draft EIS/EIR in January 2011 (CPUC/BLM 2011a). The CPUC and BLM released a Draft EIR/EIS for public review December 24, 2010. Public comment period ended February 16, 2011. The Environmental Protection Agency published a notice regarding the Final EIR/EIS for the project in the Federal Register on October 14, 2011 (76 FR 63922, available online: http://www.gpo.gov/fdsys/pkg/FR-2011-10-14/pdf/2011-26610.pdf). The proposed ECO Substation switchyards and SWPL loop-in would be located on the south side of I-8 and Old Highway 80, east of Jacumba, on the west side of the Jacumba Mountain range and north of the U.S.-Mexico border. The ECO Substation switchyards would be located entirely on privately-owned, undeveloped land. SDG&E would acquire up to 6 parcels to construct the ECO Substation switchyards, totaling approximately 498 acres (202 ha) of land, of which the ECO Substation switchyards would occupy approximately 58 acres (23.5 ha). The following subsections describe the additional components of the SDG&E ECO Substation Project.

138-kV Transmission Line

SDG&E is planning to construct a 13.3 mile (21.4-km) 138-kV transmission line to connect the ECO Substation switchyard facility with the existing SDG&E Boulevard Substation. The transmission line would include approximately 98 steel transmission poles. In addition, nine wooden distribution poles would be installed to replace the existing distribution Circuit 445 poles; this distribution line would be collocated on the new 138-kV transmission line structures near the intersection of Jewel Valley Road and Tule Jim Lane in Boulevard. Some service lines may need to be extended to the relocated distribution line. The final approximately 440 feet (134 m) of the 138-kV transmission line would be installed underground in a concrete duct bank, terminating at the rebuilt Boulevard Substation. One steel cable riser pole would be installed at the end of the overhead segment to connect the overhead conductors to the underground substation getaways.

This transmission line would exit the west side of the ECO Substation switchyard facility and then parallel the existing SWPL transmission line for approximately 5.7 miles (9.2 km) to the west. At this point, the line would cross under the SWPL and continue parallel for approximately 3.2 miles (5.1 km) along its north side until it intersects with an existing dirt access road. At this point, the line would turn and continue generally north for approximately 1.5 miles (2.4 km). The line would cross over Tule Jim Lane and run north along the west side of Tule Jim Lane for approximately 1.3 miles (2.1 km) until it crosses Eady Lane. At this point, the line would change from an aboveground line to an underground line and turn northeast for approximately 0.1 mile (0.2 km) until it enters the rebuilt Boulevard Substation (SDG&E 2009b).

Boulevard Substation

The interconnection of a 138-kV transmission line with the Boulevard Substation would require rebuilding and expansion of the Boulevard Substation. SDG&E acquired one 8.5-acre (3.4-ha) parcel attached to the eastern property line of the existing substation, in which the Boulevard

[4] Additional information regarding the ECO Substation Project is available online at: http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/ECOSUB.htm

Substation would be rebuilt to operate at 138/69/12-kV. One residential home and eight associated structures located on this parcel would be demolished prior to expanding the substation. A new 25-foot (7.6 m) wide, asphalt-paved access road, approximately 190 feet (58 m) in length, would be constructed off of Old Highway 80 to the rebuilt substation site. A paved spur road off the main access road, approximately 210 feet (64 m) in length, would provide secondary access into the substation. The fenced area of the new substation would be approximately 2 acres (0.8 ha) (277 feet by 319 feet [84.4 m by 97.2 m]), allowing for the installation of new 138-kV, 69-kV, and 12-kV facilities to accommodate connection of the new 138-kV transmission line, as well as the potential for up to 4 generation tie-lines. In order to connect the existing 69-kV transmission line to the rebuilt Boulevard Substation, 2 new direct embedded steel poles, approximately 85 feet (26 m) tall, would be installed southwest of the rebuilt Boulevard Substation. The electrical facilities would include 138-kV, 69-kV and 12-kV air-insulated buses, transformers, circuit breakers, disconnect switches, communication equipment and protective relays (SDG&E 2009b).

5.2.3 Tule Wind Energy Project

Iberdrola Renewables has submitted an application for a right-of-way to construction a wind energy project on BLM-managed land; and state, private, and tribal lands in the McCain Valley, which are north of I-8, the alternative corridors, and the existing Kumeyaay Wind Farm. The wind turbines (approximately 125) would be constructed on approximately 15,500 acres (6,272.7 ha) and would provide up to 200 MW of power. Current plans for the Tule Wind Energy project would tie this project into the proposed Boulevard Substation rebuild component of the SDG&E ECO Substation Project (described above). BLM and the CPUC published a joint NOI/Notice of Preparation for an EIS/EIR for the project in December 2009[5] (BLM 2009e) and issued a joint Notice of Availability for a Draft EIS/EIR in January 2011. The CPUC and BLM released a Draft EIR/EIS for public review December 24, 2010. The public comment period ended February 16, 2011. The Environmental Protection Agency published a notice regarding the Final EIR/EIS for the project in the Federal Register on October 14, 2011 (76 FR 63922, available online: http://www.gpo.gov/fdsys/pkg/FR-2011-10-14/pdf/2011-26610.pdf). Figure 5-2, developed by the BLM and CPUC to provide additional information during the NEPA and CEQA scoping processes is included here to illustrate project details (including potential wind turbine locations, the electrical connections system, and generation tie lines to the Boulevard substation).

5.2.4 Campo Shu'luuk Wind Energy Project

On May 20, 2011, the BIA, acting as lead agency, and the Campo Band of Mission Indians (Tribe), acting as a cooperating agency, issued a NOI to prepare an EIS for the proposed Campo Shu'luuk Wind Project[6]. The project is located on the Campo Indian Reservation in southeastern San Diego County. The project study area, for all phases, covers approximately 4,660 acres

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5 Additional information regarding the Tule Wind Energy Project is available online at http://www.blm.gov/ca/st/en/info/fed_reg_archives/2009/december/tule_wind_noi.html and http://www.iberdrolarenewables.us/tulewind/news/index.html

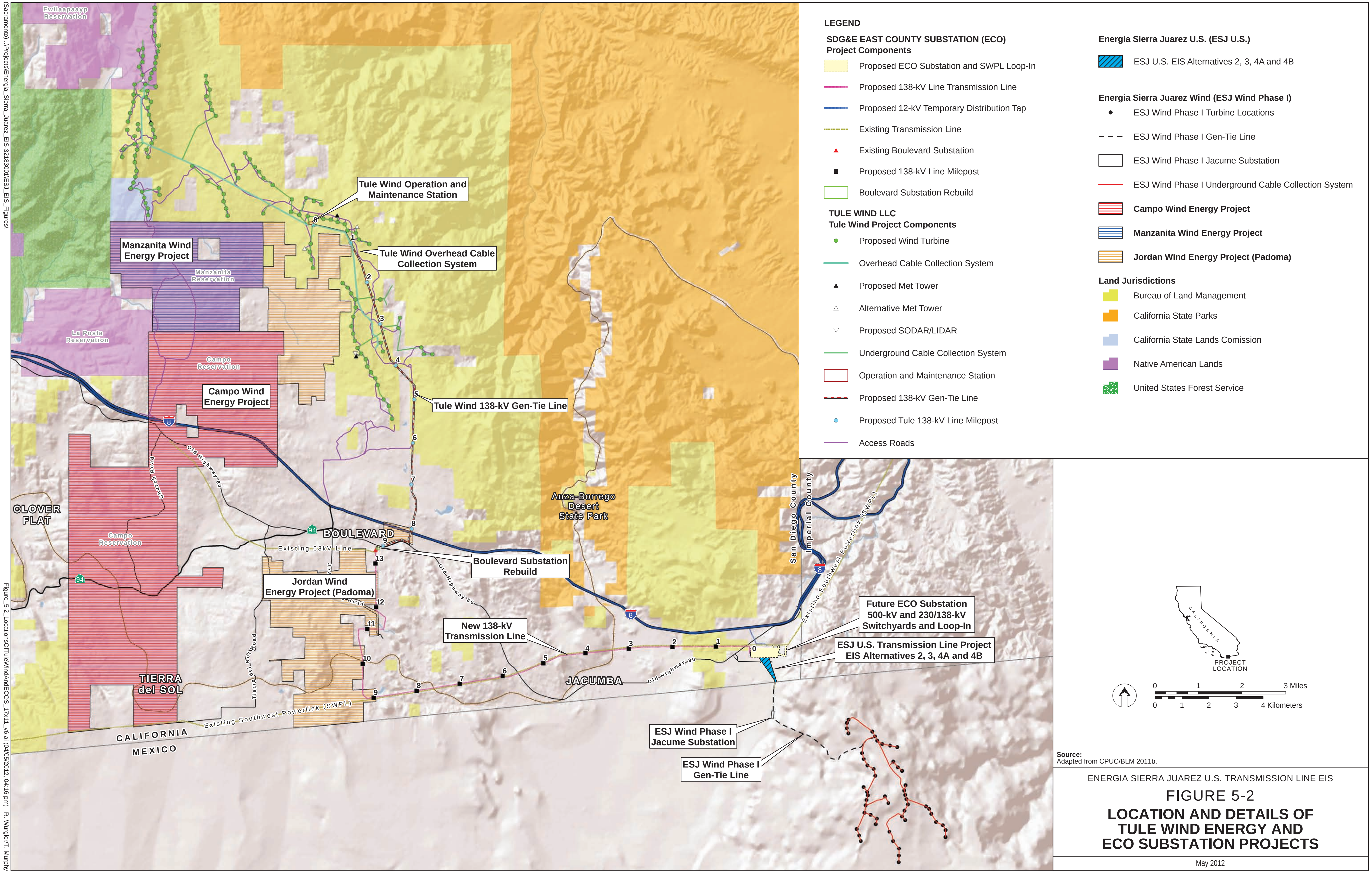
6 Additional information regarding the Campo Shu'luuk Wind Energy Project is available online at: http://www.gpo.gov/fdsys/pkg/FR-2011-05-20/html/2011-12416.htm

(1,886 ha) on the Campo Indian Reservation, but total disturbed area would be substantially less. The facility, intended for commercial wind generation, would generate 250 MW of electricity, enough to power approximately 40,000 homes. The initial phase would generate up to 160 MW with up to 80 turbines. The substation would be sited on a 2-acre (0.8-ha) area and would consist of a graveled, fenced area with a transformer and switching equipment. Up to 5 miles of new 3-phase 138-kV overhead interconnection transmission circuit would be constructed within the Campo Indian Reservation from the project collector substation to a SDG&E switchyard. The SDG&E switchyard and related transmission line upgrades would be subject to approval by the CPUC and the BIA. Other project facilities, all located within the Campo Indian Reservation, would include up to three permanent meteorological towers, temporary material laydown areas during construction, temporary office areas, an operation and maintenance building, approximately 25 miles of new access roads, and a temporary concrete batch plant. The wind power generation facility would operate year-round for a minimum of 25 years (USEPA 2011).

5.2.5 SDG&E Manzanita Wind Project

The Manzanita Tribe proposes a project capable of generating up to 57.5 MW, which could include up to 25 wind turbines depending on the turbine size selected. The proposed wind turbines are proposed to be located on the same ridgeline as the existing Kumeyaay Wind facility. Turbines are proposed to be approximately 414 feet (126 m) tall from ground to tip of the turbine blade fully extended. The Manzanita Wind Project would connect with the Boulevard Substation Rebuild component of the ECO Substation Project.

A feasibility study for the project was conducted in 2004, and the BIA is currently in possession of the tribal resolution to proceed with the Department of the Interior NOI. No actions have been taken on this project since the 2004 Feasibility study. It is expected that the Campo and Manzanita wind energy projects would develop a switchyard for both facilities on non-tribal lands and a new 138-kV transmission line would be constructed along the existing right-of-way of the 69-kV transmission corridor that currently connects to the existing Boulevard Substation. The new 138-kV transmission line would interconnect with the proposed Boulevard Substation Rebuild component of the ECO Substation Project.



ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 5-2

LOCATION AND DETAILS OF TULE WIND ENERGY AND ECO SUBSTATION PROJECTS

May 2012

5.2.6 Jewel Valley Project

ENEL, the developer of the Jewel Valley Project, has completed a preliminary wind energy assessment to construct and operate up to 158 MW of wind energy generation and up to 10 MW of solar power generation on private land north and south of I-8 near Boulevard. Proposed plans for the northern property include up to 66 MW of wind energy generation and may utilize up to 28 wind turbines of 2.3 MW to 3.0 MW each. The northern portion of the project may also include up to 10 MW of solar power generation. The southern portion of the project may include up to 92 MW of wind energy generation and may utilize up to 40 wind turbines of 2.3 MW to 3.0 MW each. The towers of the proposed wind turbines would be approximately 260 feet (79 m) tall (height from ground to tip of fully extended blade would be approximately 450 feet [137 m]). As proposed, construction of the project would begin in January 2014. The proposed point of interconnection is the Boulevard Substation Rebuild component of the ECO Substation Project (ENEL 2011)[7]. ENEL submitted an Administrative Permit application to the County of San Diego for development of the meteorological towers for the project and recently received approval from the County of San Diego's Zoning Administrator.

5.2.7 Express Wind Projects (Palm Canyon Wash and Sugarloaf Mountain)

Ocotillo Express, LLC submitted an application to BLM for a right-of-way authorization to construct, operate, maintain and decommission a 15,000-acre (6,070 ha) and 550 MW wind energy project. The project would include a substation, as well as administration, operation and maintenance facilities, transmission and temporary construction areas. The project would be located on BLM lands and a small area of Imperial County lands approximately five miles west of Ocotillo, between the Tule Wind project to the west and the Imperial Valley Solar project to the east, and just northeast of the ESJ Wind project. The Ocotillo Express would rely on the Sunrise Powerlink to connect the proposed project to Southern California. A NOI to Prepare a Land Use Plan Amendment and an EIS for the Ocotillo Express Wind Project was issued by BLM on December 13, 2010. The public comment period closed on January 21, 2011. A draft EIR/EIS for the project was issued by Imperial County and BLM in June 2011, and the Notice of Availability of the Final EIR/EIS was issued March 9. 2012. BLM’s Record of Decision was published in the Federal Register on May 11, 2012.[8] (BLM 2011b; Imperial County 2011).

The project would be constructed in two phases. Phase I would create 299 MW of energy, and Phase II would provide an addition 251 MW. The project would consist of at least 193 turbines and a maximum of 244 turbines (Basin and Range Watch). The turbines would be 2.3 MW Siemens turbines or 1.8 MW Vesta turbines. Assuming that government approvals are granted, the project is expected to be completed by the end of 2012. SDG&E announced a 20-year contract to purchase 315 MW of energy (Varin 2011).

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7 Additional information regarding the Jewel Valley Project is available online: http://jewelvalleyproject.com/overview.asp

8 The Ocotillo Express Wind project EIR/EIS and other project documents are available online at: http://www.icpds.com/?pid=2843 and http://www.blm.gov/ca/st/en/fo/elcentro/nepa/ocotillo_express_wind.html

5.2.8 Renewergy Wind Project

The BLM authorized a right-of-way for the Renewergy wind energy project in January 2007. The right-of-way expires in 2013. The project site consists of 11,227 acres (4,543 ha) near El Centro in Imperial County. No additional information is known about the project.

5.2.9 Existing Kumeyaay Wind Turbines

The Kumeyaay Wind Project began operations in 2006 as the result of a partnership between Babcock & Brown and GE Energy Financial Services. The wind project is located atop the Tecate Divide, 70 miles (112.7 km) east of San Diego and 18 miles (30.0 km) north of the Mexican border. The wind farm consists of twenty-five 2 MW wind turbines, which combined generate 50 MW of wind energy. The turbines feed power into the SDG&E grid (Northrup 2007).

5.2.10 Imperial Valley Solar Project

Stirling Energy System submitted an Application for Certification to the California Energy Commission in June 2008 to construct a 750 MW solar energy facility on a 6,500-acre (2,630-ha) project site in Imperial County 14 miles (22.5 km) west of El Centro and 4 miles (6.4 km) east of Ocotillo Wells. The primary equipment for the generating facility would include approximately 30,000 25-kilowatt solar dish Stirling systems and associated infrastructure. The project would also include the construction of a new 230-kV substation located in the approximate center of the site and would be connected to the SDG&E Imperial Valley Substation via a 10.3-mile (16.6 km), double-circuit, 230-kV transmission line.

The double-circuit 230-kV transmission line would parallel the SWPL transmission line within the designated right-of-way (BLM 2008b). BLM published a NOI for the project on October 17, 2008, the California Energy Commission found the Application for Certification data adequate on October 8, 2009, and BLM published a Notice of Availability of the Draft EIS on February 12, 2010 (BLM 2010).[9] BLM published the Record of Decision granting the right-of-way on October 5, 2010. Construction is expected to begin in first quarter 2013 (BLM 2011a). However, as of December 2010, a federal injunction has been placed on the project as a result of lack of appropriate consultation with Native Americans (Sign on San Diego 2010).

5.2.11 La Rumorosa I Project and other Potential Wind Projects in Northern Baja

Turbo Power Services installed five 2-MW wind turbines on the road between Mexicali and Tijuana, Baja California, Mexico in September 2009. The project was implemented as a local-consumption project for the municipalities of Mexicali and Tijuana and is expected to generate the equivalent to half the electricity demand in the region, which includes about 35,000 families

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[9] Additional information regarding the Imperial Valley Solar project is available online at: http://www.energy.ca.gov/sitingcases/solartwo/index.html

(Latin American Wind Energy Association 2009)[10]. The approximate location of this project is shown on Figure 5-1.

Other potential wind projects have been announced in the Sierra Juarez mountains of northern Baja, Mexico, such as Cannon Power Group and Gamesa's Aubanel wind project, which is planned for construction 15 miles (24 km) south of the U.S. Mexico border (see: http://www.cannonpowergroup.com/media/baja-news/baja-to-harness-wind-power/; also see Footnote 16 in Section 3.2). The Aubanel wind development project and other wind developments in the border region have the potential to further diminish the intactness of the viewshed along the Sierra Juarez Mountains, as viewed from the U.S.

5.2.12 Ketchum Ranch Project

The Ketchum Ranch Specific Plan proposes a residential community with recreational and visitor-oriented commercial uses on approximately 1,300 acres (526 ha) on the east side of Carrizo Gorge Road, on the east side of the community of Jacumba. The proposed Specific Plan would be developed in two phases.

Phase 1 would develop the southern 653 acres (264 ha) of the Ranch with 1,110 residential units and various support and neighborhood commercial and recreational uses such as a golf course, equestrian trails, clubhouse, tennis courts, swimming pools and other residential-orientated recreational uses. Phase 1 would also include a sewage treatment facility, and may include a hotel and visitor-serving recreational uses in the northern portion of the Specific Plan Area.

The proposed sewage treatment facility and trunk lines would be sized to serve future phases of development. Phase 2 would develop the northern 694 acres (281 ha) of the Specific Plan area with residential, light industrial, and commercial uses. Phase 2 would be deferred for a minimum of 3 years or until Phase 1 is expanded to include the northern portion of the Ranch (CPUC/BLM 2010).

5.2.13 U.S. Border Patrol Boulevard Station

A new border patrol facility is proposed on the east side of Ribbonwood Road, just north of I-8. The project proposes construction, operation and maintenance of an administration building, detention center, maintenance garage, dog kennels, equine facilities, emergency helipad, a 160-foot communications tower, an indoor shooting range, and security fencing and lighting on a 32-acre (13-ha) site. The facility would be operated 24 hours a day, 7 days per week. At least 250 personnel, over three shifts, would occupy the site throughout the week. The U.S. Army Corps of Engineers issued a Final EA and Finding of No Significant Impact for this project in February 2010. Construction is proposed to be completed by September 2012, depending on available funding (CPUC/BLM 2010).

[10] Additional information regarding the La Rumorosa I project is available online at: http://www.windfair.net/press/6094.html; http://www.rechargenews.com/energy/wind/article172862.ece

5.2.14 Campo Casino Expansion

The Golden Acorn Casino, located off Old Highway 80 on the south side of the I-8 Crestwood Road exit, was constructed and began operations in 2001. Expansion plans for the casino include 17,800 square feet (5,435 m^2) of additional gaming and non-gaming casino area; construction of a 3-story, 150-room hotel; 900-space parking structure; RV Park; up to two wind turbines; and improvements to the water and wastewater systems. Non-gaming areas are to include a trading post, arcade, coffee bar, administrative offices, bowling center, snack bar, entertainment hall, and retail/restaurant uses. In addition, a new hotel and other facilities are planned just southwest of the Kumeyaay Wind facility. The project is to be constructed in three phases over a period of approximately 7 years (CPUC/BLM 2010).

5.2.15 County of San Diego General Plan Update

The County of San Diego DPLU developed a Draft General Plan Update for the county. The Notice of Publication of the Draft EIR for the General Plan Update was published June 2009 and the General Plan Update was adopted by the County of San Diego Board of Supervisors on August 3, 2011[11].

According to the Updated General Plan zoning of the parcels proposed for the ESJ U.S. Transmission Line project will be changed from Multiple Rural Use to Rural Lands (RL-80), which allows one dwelling unit per every 80 acres (32 ha). The Rural Lands category will be applied to large open space and very low density private and publicly owned lands that provide for agriculture, managed resource production, conservation, and recreation and thereby retain the rural character for which much of unincorporated San Diego County is known. According to the Updated General Plan, rural areas are not appropriate for intensive residential or commercial uses due to significant topographical or environmental constraints, limited access, and the lack of public services or facilities. Also, according to the updated Mobility Element developed as part of the Updated General Plan, Old Highway 80 and Carrizo Gorge Road will be downgraded from their current classification as Major Collector (4 lanes) to Light Collector with Improvement Options (2+ lanes) (County of San Diego 2011).

5.2.16 South Coast Resource Management Plan Revision

The BLM is currently developing a revision to the South Coast Resource Management Plan (RMP). The revised South Coast RMP would provide guidance for the management of approximately 300,000 acres (121,400 ha) of BLM-administered public lands in portions of San Diego, Riverside, San Bernardino, Orange, and Los Angeles Counties. A NOI for the development of the RMP was published in the Federal Register in August 2007 (72 FR 44173).[12] Included in the Planning Area for this RMP is the BLM land north of the alternative corridors in San Diego County. As of September 2011, the Draft RMP has not yet been released (BLM 2008c). According to BLM staff, the Draft RMP planning area does not extend to BLM lands in vicinity of the ESJ U.S. Transmission Line project (Hill 2010).

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[11] Additional information regarding the County of San Diego General Plan Update is available online at: http://www.sdcounty.ca.gov/dplu/gpupdate/index.html

[12] Additional information regarding the South Coast Resource Management Plan is available online at: http://www.blm.gov/ca/st/en/fo/palmsprings/SCRMP_Revision.html

5.2.17 Eastern San Diego County Resource Management Plan Revision

In October 2008, the BLM signed the ROD implementing the revised Eastern San Diego County RMP. The Planning Area for the revised RMP includes the area proposed for the alternative corridors, although the corridors are not located on BLM-administered land. Within the revised RMP, the alternative corridors rights-of-way are located in the Jacumba/Boulevard Destination Special Recreation Management Area (SRMA). The Jacumba/Boulevard Destination SRMA includes the most extensively used areas in the Planning Area. Land uses include the established campgrounds, horse corrals, and designated off-highway vehicle use area and route network. The SRMA also includes lands that are designated as wilderness areas, wilderness study areas, and ACECs. The primary activities in these areas are camping, off-highway vehicle use, equestrian use, target shooting, hunting, mountain biking, hiking and backpacking, wildflower and wildlife viewing, rock hounding, and pleasure touring. The SRMA boundaries are not intended to confer BLM authority, responsibility, or jurisdiction over lands and waters that are not administered by the BLM. Instead, planning boundaries reflect the fact that these adjacent lands are vital in the appropriate management of the entire area. Under the revised RMP, this SRMA would be managed as a regional or national destination through collaborative partnerships in order to promote the continued use of the lands for these activities (BLM 2008a).[13]

5.2.18 East County Multiple Species Conservation Plan

The County of San Diego Multiple Species Conservation Program is a division of the County of San Diego DPLU that is tasked with preserving and protecting San Diego's native habitats and watersheds as well as ensuring compliance of projects with CEQA, NEPA, and the ESA. The Program is in the process of preparing a Multiple Species Conservation Plan for the County and has developed a draft Map for the East County Study Area which covers the area east of Alpine to the Imperial County line and north to Riverside County. The draft map was released for public review in December 2008. Although the alternative corridors are included in the Study Area as depicted on the draft map, it is not part of the Program area and has not been designated a Conservation Strategy Area (County of San Diego 2008). As of January 2012, no further progress has been made on the Multiple Species Conservation Plan.

5.2.19 Solar Energy Development

The DOE and BLM published a NOA in December 2010 (75 FR 78980) for a draft Programmatic EIS (DOE/BLM 2010) to evaluate utility-scale solar energy development, to develop and implement agency-specific programs or guidance that would establish environmental policies and mitigation strategies for solar energy projects, and to amend relevant BLM land use plans with the consideration of establishing a new BLM Solar Energy Program. The BLM is considering taking further actions to facilitate solar energy development in compliance with various orders, mandates, and agency policies. For the BLM, these actions include the evaluation of a new Solar Energy Program applicable to utility-scale solar energy development on BLM-administered lands in 6 southwestern states (Arizona, California, Colorado, Nevada, New Mexico, and Utah). The DOE is considering taking actions to facilitate solar energy development in compliance with various orders, mandates, and agency policies. For

[13] Additional information regarding the Eastern San Diego County Resource Management Plan is available online at: http://www.blm.gov/ca/st/en/fo/elcentro/esdrmp.html

the DOE, these actions include the evaluation of developing new programmatic guidance relevant to DOE-supported solar energy projects. The BLM and the DOE are working jointly as lead Agencies to prepare the Programmatic EIS to evaluate the proposed BLM program and whether to develop the DOE guidance. In October 2011, the DOE and BLM revised the Solar PEIS to better meet their solar energy objectives and published a NOA for a Supplement to the draft Programmatic EIS (Supplement). The DOE and BLM prepared a targeted Supplement that includes modified and new components of the proposed BLM Solar Energy Program, DOE's proposed programmatic environmental guidance, and references to relevant portions of the Solar draft Programmatic EIS. Maps in the October 2011 Solar Supplement indicate the location of two BLM tracts of land (proposed solar energy zones) that have been identified for in-depth study of solar development in California. The nearest proposed BLM solar energy zone to the ESJ U.S. Transmission Line project (the Imperial East SEZ) includes 5,717 acres (23.1 km^2) located in southeastern Imperial County, approximately 20 miles (32 km) east of El Centro along the U.S.-Mexico border (DOE/BLM 2011).[14]

5.3 CUMULATIVE IMPACTS ANALYSIS

The cumulative impacts analyses presented in the following sections encompass the direct and indirect impacts associated with both the ESJ U.S. Transmission Line project, and the potential impacting factors for each of the currently ongoing or reasonably foreseeable future actions described in Section 5.2. Cumulative impacts on environmental resources from other past actions on environmental resources are reflected in the discussions of the affected environment in Section 3. The cumulative impact analysis considers the period of construction for the ESJ U.S. Transmission Line project and the post-construction period of operation.

5.3.1 Biological Resources

Cumulative impacts to biological resources would result if the ESJ U.S. Transmission Line project, in combination with other projects considered in this analysis, resulted in impacts to special status plant or wildlife species, nesting birds, or loss of habitat. Existing linear development features including I-8 and Old Highway 80 to the north, and the U.S.-Mexico border fence to the south, have the potential to inhibit the north-south movement of large terrestrial wildlife species through the area. The ESJ U.S. Transmission Line project design incorporates widely spaced transmission towers (or monopoles), which would not substantially interfere with connectivity between blocks of habitat or potentially block or substantially interfere with the movement of terrestrial wildlife.

Biological surveys conducted in the area for the SDG&E ECO Substation Project found small mammal burrows in high densities throughout the site, as well as three inactive bird nests. In addition, four special status plant and wildlife species were found to occur or have a high potential to occur in the area. Construction activities associated with the ESJ U.S. Transmission Line project in combination with the ECO Substation switchyard could result in cumulative disturbance of wildlife due to temporary cumulative increases in ambient noise levels. However,

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14 Additional information regarding the Programmatic EIS for solar energy development is available online at: http://solareis.anl.gov/. The October 2011 Supplement to the Programmatic EIS is available at: http://solareis.anl.gov/news/index.cfm#supptodraft. The Imperial East SEZ is shown on Figure C.2.1-2, page C-41 of the Supplement.

environmental protection measures incorporated into the ESJ U.S. Transmission Line project design would ensure the ESJ U.S. Transmission Line project contributions to such noise increases would be minor. In addition, protocol-level surveys for the Quino checkerspot butterfly conducted for the ECO Substation Project in 2009 located individuals of the species and larval host plants at Jacumba Peak (within the designated critical habitat area), along the 138-kV transmission line route and over 5 miles (8 km) west of the ESJ U.S. Transmission Line project. As discussed in Section 4.0 (Connected Action), the surveys did not identify any individual or larval host plants at the ECO Substation switchyard facility. Therefore, the ESJ U.S. Transmission Line project would not contribute to any potential cumulative impacts to the Quino checkerspot butterfly.

Implementation of the projects considered in this analysis would result in the permanent loss of habitat and permanent protection of other habitat areas as an offset for the losses (see Table 5-2 below). The five projects listed in the table would cumulatively affect 7,459 acres (3,019 ha) of habitat in the region, while securing the protection of an additional 8,189 acres (3,314 ha). The ESJ U.S. Transmission Line project contribution to these cumulative impact would be a very minor (approximately 9 acres [3.6 ha] of permanent habitat loss and 12.5 acres [5 ha] of offset) component of the total.

Table 5-2
Cumulative Impacts to Habitat

Project	Permanent Impacts to Habitat	Offset
ESJ U.S. Transmission Line Project	9 acres (3.6 ha)	12.48 acres (5.1 ha)
ECO Substation Project	94.5 acres (38.2 ha)	94.5 acres (38.2 ha)
Tule Wind Project	513.3 acres (207.7)	513.3 acres (207.7 ha)
Sunrise Powerlink Project	657 acres (266 ha)	950 acres (384 ha)
Imperial Valley Solar Project	6,185 acres (2,503 ha)	6,619 acres (2,679)
Cumulative Total	7,459 acres (3,016 ha)	8,189 acres (3,134 ha)

Note: Impacts to habitat included only for those projects considered in this analysis for which information is available.
Source: CPUC/BLM 2008b; 2011

The County's guidelines allow for mitigation of habitat through either the purchase mitigation within an established mitigation bank, onsite preservation, and/or offsite preservation with financial and legal agreements for long term management of the resource in perpetuity. The ESJ U.S. Transmission Line project would contribute to cumulative impacts to two vegetation communities (habitat types): Sonoran mixed woody scrub and peninsular juniper woodland and scrub (Section 3.1.2). Table 5-3 reports the total impacts to those vegetation communities due to the three ongoing and reasonably foreseeable projects in the vicinity of the ESJ U.S. Transmission Line project that report impacts to these communities. About 102 acres (41 ha) of each vegetation community would be lost or damaged due to the three projects. The significance of these impacts is indicated by the County of San Diego specifications for mitigation ratios for these vegetation communities: 1:1 for Sonoran mixed woody scrub and 3:1 for peninsular juniper woodland and scrub.

The presence of the proposed transmission line, the ESJ Wind project, and other electrical transmission and wind projects in the region could result in impacts to migratory birds due to collisions with transmission lines, towers, or turbines. As described in Section 3.1 (Biological Resources), the alternative corridors would not be located in a known major flyway or migratory corridor. Similarly, the other wind projects considered in this cumulative analysis (Campo, Tule, Ocotillo, Jewel Valley, Manzanita, and Kumeyaay Wind Energy projects) would also be located outside of known major flyways or migratory corridors. Impacts to avian species would most likely consist of impacts to raptors, which are known to forage along ridgelines and could collide with the turbines. Migratory birds, including raptors, are protected by international treaties of which both the U.S. and Mexico are signatories. The USFWS is the regionally responsible agency designated to ensure compliance with the Migratory Bird Treaty Act in the U.S. In consultation with the USFWS or its Mexican counterpart, all of the projects would be required to implement measures to avoid and/or minimize impacts to migratory birds. However, specific mitigation measures and their effectiveness have not been determined, and some loss of migratory raptors is a likely cumulative impact.

Table 5-3
Total Impacts to Specific Vegetation Communities Affected by the ESJ U.S. Transmission Line Project Due to Present and Reasonably Foreseeable Projects in the Vicinity

Project	Sonoran Mixed Woody Scrub [a]	Peninsular Juniper Woodland and Scrub
ESJ U.S. Transmission Line [b]	7.2 (2.9 ha)	2.6 (1.1 ha)
ECO Substation [c]	39.6 (16 ha)	94.5 (38.2 ha)
Sunrise Powerlink [d]	55 (22 ha)	5.8 (2.4 ha)
Total	101.8 (41 ha)	102.9 (41.9 ha)

Notes
[a] Includes both Sonoran mixed woody scrub and Sonoran mixed woody and succulent scrub.
[b] Table 3.1-2 and 3.1-3, using the highest impact of the access road options.
[c] Initial project design, described in ECO Substation EIR/EIS October 2011, Table D.2-3.
[d] Sunrise Powerlink Final EIR/EIS October 2008, Table D.2-7.

The presence of the proposed transmission lines associated with multiple wind development projects in the region could result in cumulative project impacts due to bird collisions and electrocution from transmission lines. These impacts generally occur when: 1) birds cross power lines in daily use areas (e.g., when moving between foraging and roosting habitat); and 2) migrants encounter lines while traveling at reduced altitudes (most species fly well above transmission lines and, except for landing and takeoff, few migrants are below 500-600 feet above ground level). Therefore, collision risk is higher for bird species whose foraging, nesting, and/or roosting areas are geographically separated on opposite sides of a transmission line and for migrants that fly at low altitudes (CPUC/USFS 2009). Collisions are more probable near wetlands that attract large flocks of waterfowl and shorebirds, valleys that are bisected by transmission lines, and within narrow passes where power lines run perpendicular to flight paths (CPUC/USFS 2009). The projects considered in this cumulative analysis would not be within any known major bird migration corridors or major daily use areas. Further, high-voltage transmission lines with large conductors and transmission support structures are relatively visible to birds, which minimizes the potential for collisions.

Larger avian species, such as raptors are susceptible to electrocution from transmission lines. The Avian Power Line Interaction Committee (APLIC) is a consortium of utility industry, wildlife resource agencies, conservation groups, and manufacturers of avian protection products. The committee works to understand the causes of bird/power line electrocutions and collisions and to develop ways of preventing bird mortalities and associated power outages (APLIC website: http://www.aplic.org/). The APLIC publishes avian protection guidelines, including a "Suggested Practices" manual. The most current (2006) version of the Suggested Practices manual recommends 60 inches (152 cm) of horizontal separation and 40 inches (102 cm) of vertical separation between energized and non-insulated phase conductors and grounded components for protection of birds up to the size of eagles. ESJ confirmed that its design will meet or exceed these separations.

As discussed in Section 3.1, APLIC's 2006 Suggested Practices indicates that, due to their larger wingspans, California condors require greater separations than eagles, but the report does not make specific recommendations on separation distances for condors. Transmission line structural drawings provided by the applicant and included in Appendix B indicate that the phase separation on the ESJ U.S. transmission towers/monopoles (i.e., the minimum horizontal and vertical distances between energized conductors, or between energized conductors and grounded equipment such as the tower or pole structure), will be well in excess of 72 inches (183 cm). In addition, electrical industry standards (e.g., California Public Utility Commission General Order 95) generally require such distances for the voltages that are proposed. Engineering drawings provided in Appendix B indicate the dimensions on the relevant portions of the transmission structures. Based on these application materials, the phase separation will be adequate to address potential condor electrocution impacts. As such, even with a conservative estimate of condor wingspan, the additional margin above APLIC recommendations for eagles is likely to be adequate to avoid electrocution of condors, should any condors pass through the project area.

Mitigation measures recommended by the CPUC and BLM for the ECO Substation 138 kV transmission lines would require that the project implement APLIC recommendations and development of Avian Protection Plans. Similar mitigations have been required for the Sunrise Powerlink project and other regional transmission line projects. These measures will greatly reduce the potential for avian electrocution; however, some risk of electrocution will remain for the life of these projects.

The presence of the proposed transmission lines and industrial facilities associated with multiple wind development projects in the region could also result in cumulative impacts on the Las Californias Binational Conservation Initiative. The Initiative's ongoing conservation efforts could be impacted to the extent that the presence of wind and other development projects, and associated impacts to native habitats and habitat linkages could reduce the conservation value of certain targeted conservation properties. Potential impacts include hindering the creation of new conservation properties or a reduction in the size of conservation lands by making land acquisition and consolidation more costly and difficult, and by reducing the attractiveness of some areas for inclusion in the conservation program.

5.3.2 Visual Resources

The ROI for analysis of cumulative visual impacts is relatively large and includes southeastern San Diego County and southwestern Imperial County. Within this ROI, the ESJ U.S. Transmission Line project, when considered in conjunction with the other wind energy, solar power, and transmission line projects considered in this analysis, could result in a substantial increase in industrial character, structure prominence, and view blockage.[15] The combined effect of the projects would result in a perceived increase in industrialization of the landscape, diminished visual quality, and an increase in visual contrast in eastern San Diego County and western Imperial County. As discussed further in Section 3.2 (Visual Resources), although there are numerous existing man-made features including the interstate highway and regional roads, existing transmission structures, and the international border fence, the ROI is currently largely rural in nature. Structures associated with the ESJ U.S. Transmission Line project; Sunrise Powerlink; ECO Substation switchyards and related components; Imperial Valley Solar; any future DOE solar projects (as identified in the Programmatic EIS); and several wind energy projects, including Campo, Tule, Ocotillo, Jewel Valley, Manzanita, and Kumeyaay Wind Energy projects, would all be visible to motorists traveling along I-8 and recreational users of surrounding open space areas (e.g., portions of Table Mountain ACEC and Anza Borrego Desert State Park). These structures would introduce additional industrial character wherever they are viewable. The combined size and character of the introduced structures, as well as the large number of turbines required for the respective wind projects, would result in considerable structure contrast, view blockages, and skylining in the region.

Since the visual analysis for this EIS was conducted, the intactness of the Sierra Juarez landscape has been compromised by the construction of the Parque Eólico La Rumorosa I wind energy project facility (unrelated to the ESJ Wind project). This wind project was undertaken and funded by the Mexican government and consists of five 2MW Gamesa G-87 wind turbines on approximately 256-foot (78-m) towers (similar tower heights as will be used by ESJ Wind), on land approximately 3 miles (5 km) from the southern extent of the ESJ Wind Project. Each of the five turbines has night lighting for aviation hazards (Sempra Generation 2011b). These turbines are currently visible from Old Highway 80, BLM lands, and the community of Jacumba. The presence of these turbines has compromised the intactness of the landscape and introduced new focal points on the silhouette of the Sierra Juarez Mountains, thus contributing to cumulative visual impacts, and in turn lowering the level of contrast created by the ES Wind Project. Other potential wind projects have been announced in the Sierra Juarez mountains of northern Baja, Mexico, such as Cannon Power Group and Gamesa's Aubanel wind project, which is planned to be constructed 15 miles (24 km) south of the U.S. Mexico border (see: http://www.cannonpowergroup.com/media/baja-news/baja-to-harness-wind-power/). These

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[15] In late 2009, five wind turbines of comparable size were installed near the border in Mexico as part of the La Rumorosa I project to supply power to the cities of Mexicali and Tijuana, Baja California, Mexico. These turbines were not yet installed at the time that the simulations for this EIS were developed. The existing turbines are not shown in this EIS, but are presently visible from certain vantage points in the Jacumba area.

and other projects have the potential to further diminish the intactness of the viewshed along the Sierra Juarez mountains, as viewed from the U.S.

Two development projects, the Golden Acorn Casino Expansion and the Boulevard Border Patrol Station, would be visible from I-8. These development projects, in addition to the proposed energy projects, would cumulatively cause permanent impacts to the existing visual character of the region.

The combined ESJ U.S. Transmission Line, ECO Substation, Sunrise Powerlink, and ESJ Wind projects would be visible from surrounding BLM recreational areas (Table Mountain ACEC to the north, and Jacumba Wilderness to the east) Figure 5-3 provides a simulated view from I-8, north of the project site (looking south from KOP 6) of the ESJ U.S. Transmission Line project in the U.S. and the ESJ Wind project turbines in Mexico. (This figure does not show the ESJ transmission line in Mexico, the ECO Substation facilities [i.e., switchyard and associated 138 kV power line] or the Sunrise Powerlink project. Figure 4-1 in Section 4 provides simulated view of the completed ECO Substation switchyards and SWPL loop-in, as viewed from Old Highway 80.) The Sunrise Powerlink Final EIR/EIS (Section E.1.3) finds that in the vicinity of the ESJ U.S. Transmission Line project, the Sunrise Powerlink transmission line would induce a visual change classified as “low-to-moderate,” and its structures would be prominent features in the landscape as the line passes south of Table Mountain ACEC and adjacent to Old Highway 80.” Both the Sunrise Powerlink Final EIR/EIS and the ECO Substation EIR/EIS characterize the visual impacts of the respective projects as “significant.” As noted in Section 3.4 (Visual Resources), the ESJ U.S. Transmission Line project structures in and of themselves would have minor to moderate impacts to visual resources (Table 3.2-3), and in combination with the related ESJ Wind project development would have small to high visual impact, depending on the observation point. The combination of these and other projects would result in major adverse impacts on the visual quality of the areas viewable from I-8, old Highway 80 and Table Mountain ACEC.

The County of San Diego has apopted guidelines for consideration of project impacts to dark skies (County of San Diego 2007c).[16] The County’s Light Pollution Code (LPC), also known as the Dark Sky Ordinance, was adopted “to minimize light pollution for the enjoyment and use of property and the night environment by the citizens of San Diego County and to protect the Palomar and Mount Laguna observatories from the effects of light pollution that have a detrimental effect on astronomical research by restricting the permitted use of outdoor light fixtures on private property” (Sec. 59.101). The LPC and other County general plan policies and zoning ordinance stipulations were established to limit harmful effects of outdoor lighting on communities and recreational areas in general, and on the Palomar and Mount Laguna Observatories in particular. The LPC designates all areas within a fifteen (15) mile (24.1 km) radius of each observatory as Zone A, with all other areas of the County designated as Zone B. Zone A has more stringent lighting restrictions, including limits on decorative lighting, so that night skies are dark enough for clear viewing through the telescopes at the observatories. The ESJ U.S. Transmission Line project and other projects considered in this cumulative analysis are greater than 15 miles (24.1 km) from the Palomar and Mount Laguna Observatories (Zone B).

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[16] Available online at: http://www.sdcounty.ca.gov/dplu/docs/Dark_Skies_Guidelines.pdf

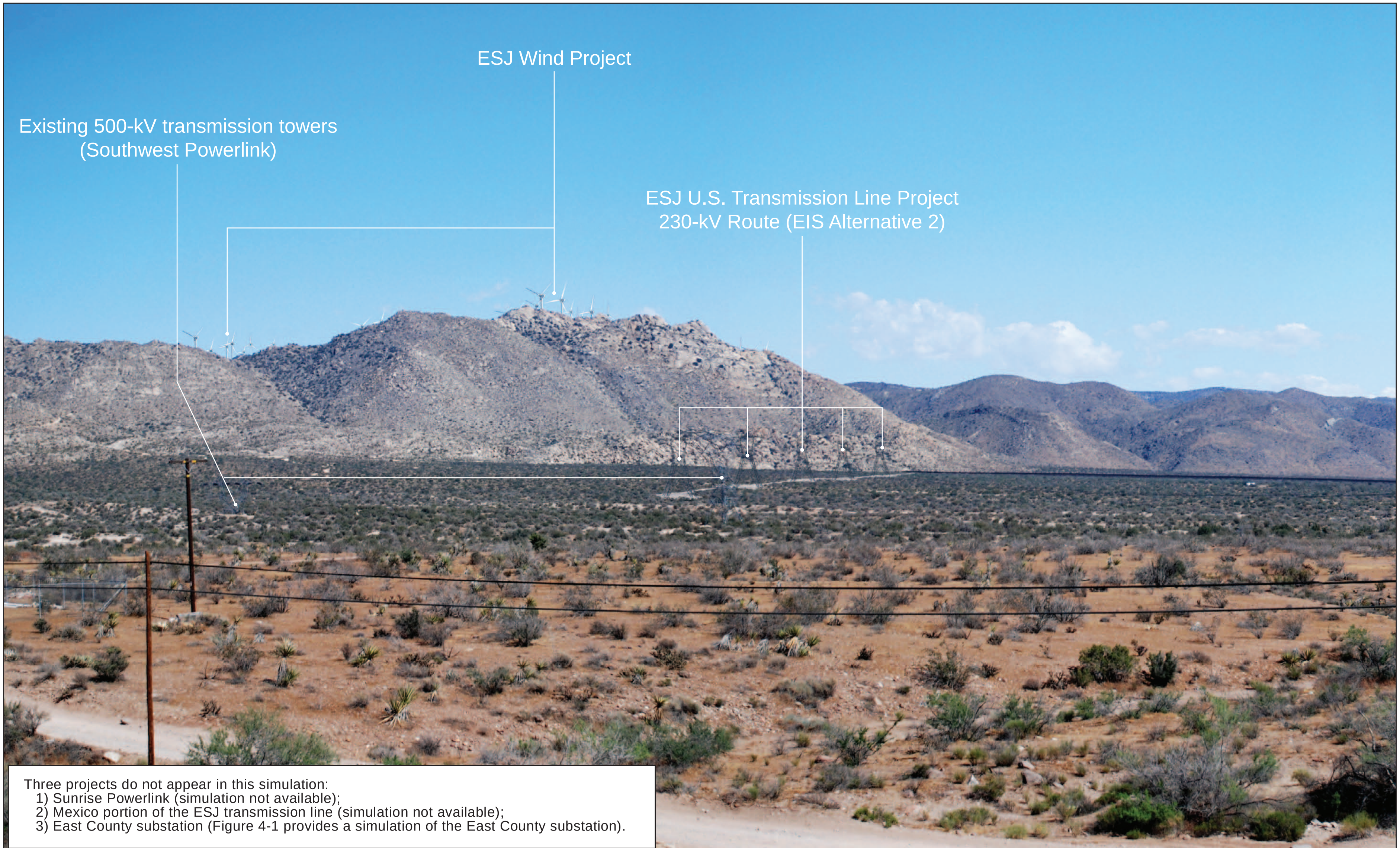
The proposed ESJ Wind Project is located in an area designated by the U.S. Air Force Defense Meteorological Satellite Program[17] as having low light pollution and a maximum 10 percent increase over natural skyglow. Certain projects considered in this cumulative analysis could have nightlighting, such as aviation safety lighting on the Tule Wind project wind turbines, perimeter security lighting at commercial and industrial facilities (e.g., ECO Substation, expanded Boulevard Substation, and various solar installations) and parking or security lighting at land use developments such as the Campo Casino expansion, U.S. Border Patrol station, and Ketchum Ranch residential development. As discussed in Section 4, the ECO Substation will have some level of night lighting for security and worker safety purposes. Both the FAA and U.S. Border Patrol have indicated that lighting of the ESJ transmission towers or monopoles is not necessary. It is not known whether the ESJ Wind project transmission towers or poles and substation in Mexico would have aviation safety lighting or security lighting; however, aviation safety lighting would likely be installed on the wind turbines in Mexico. The projects considered in this analysis are greater than 15 miles (24.1 km) from both the Palomar and Mount Laguna observatories and thus nightlighting would not affect these facilities. However, taken together, these new sources of night lighting would potentially diminish the enjoyment of the night environment by U.S. residents and visitors to San Diego County, and it could adversely affect amateur astronomical viewing from the U.S. at locations near the international border.

Overall, it is clear that this is an area of active renewable energy development (see the following websites: http://www.20percentwind.org/20percent_wind_energy_report_revOct08.pdf; http://solareis.anl.gov; http://windeis.anl.gov) where ongoing and reasonably foreseeable development is significantly adversely affecting the visual landscape. The ESJ U.S. Transmission Line project would be a relatively small contribution to the cumulative effect to visual resources.

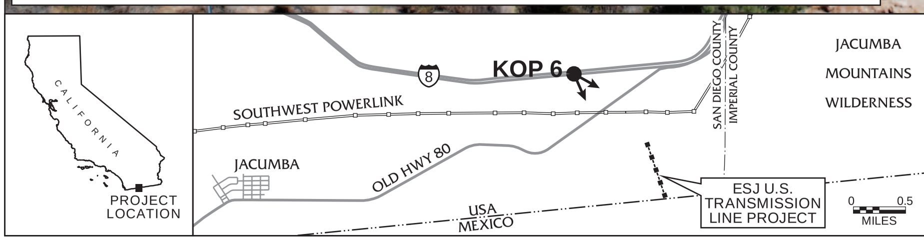
5.3.3 Land Use

The proposed and existing energy projects in eastern San Diego County would cumulatively increase the amount of industrial land uses in eastern San Diego County. This area of the county is designated Rural Lands (RL-80) by the current County of San Diego General Plan (adopted August 3, 2011). As discussed in Section 3.3 (Land Use), this land use designation is focused on maintaining and promoting the rural character of the local communities and open spaces.

17 http://www.ngdc.noaa.gov/dmsp/



Three projects do not appear in this simulation:
1) Sunrise Powerlink (simulation not available);
2) Mexico portion of the ESJ transmission line (simulation not available);
3) East County substation (Figure 4-1 provides a simulation of the East County substation).



Source: ICF Jones & Stokes 2010b.

ENERGIA SIERRA JUAREZ U.S. TRANSMISSION LINE EIS

FIGURE 5-3

VISUAL SIMULATION OF PROJECTS CONSIDERED IN CUMULATIVE IMPACT ANALYSIS (FROM KOP 6)

May 2012

(Sacramento) ..\Projects\Energia_Sierra_Juarez_EIS-32183001\ESJ_EIS_Figures\ Figure_5-3_VisualSimulationOfCumulative_11x8_v6.ai (04/05/2012, 04:15 pm) R. Wurgler/M. Schwartz/T. Murphy

Under this designation, the allowed residential land use density is one unit per 80 acres (32.4 ha). Each project would be required to obtain discretionary review and approval by the applicable local, state and federal agencies, prior to construction. The ESJ U.S. Transmission Line project's contribution to cumulative land use impacts, if any, is expected to be minor because the proposed transmission line would be located on private, undeveloped land, would not conflict with the existing or proposed land use designation, and would not be visible from residential areas. Similarly, in areas from which the ESJ U.S. Transmission Line project structures would be visible (e.g., I-8, Old Highway 80, and surrounding recreational lands), the structures in and of themselves would not substantially contribute to a cumulative change in the visual character of the landscape due to the tendency of transmission towers to blend with the surrounding desert landscape when viewed from a distance, and because the new towers would be substantially similar in appearance to the existing SWPL transmission towers. Many of the current and reasonably foreseeable projects in eastern San Diego County are also on private land, e.g., ECO substation; these projects either have been determined or are expected to be determined to be consistent with applicable federal, state, and local land use plans and policies, with the implementation of APMs and mitigation measures. Other current and reasonably foreseeable projects in eastern San Diego County are on tribal land, such as the Campo and Manzanita wind energy projects, and are, therefore, not subject to San Diego County land use regulations (except where associated roads and electrical distribution lines cross private lands). These projects are also expected to be determined to be consistent with federal, state, and local land use plans and policies, to the extent applicable, with the implementation of APMs and mitigation measures.

With regard to other applicable regional plans considered in this cumulative impacts analysis, the ESJ U.S. Transmission Line project would be located outside the planning area of the BLM's South Coast RMP and would not directly affect or be affected by the implementation of this plan. While the ESJ U.S. Transmission Line project would be within the planning area of the BLM's East County RMP, the ESJ U.S. Transmission Line project corridor is not owned or operated by the BLM and therefore the ESJ U.S. Transmission Line project would not affect, or be affected by, activities associated with this plan.

5.3.4 Recreation

Cumulative impacts to recreation would occur if the ESJ U.S. Transmission Line project, in conjunction with any of the other projects included in this analysis, resulted in either the temporary or permanent preclusion of access to recreational areas or changes in the character of recreational areas. Construction of the ESJ U.S. Transmission Line project would not result in direct impacts to recreation because the project would be located entirely on private land. Further, although the proposed conservation easement would be located in an area contiguous with BLM-managed recreational land, any existing recreational trails would remain accessible. Similarly, the ECO Substation switchyard facility, which would be constructed near the ESJ U.S. Transmission Line project, would also be on private land. The access roads and rights-of-way for these projects would not be fenced, and would not obstruct access to existing or planned recreational areas.

Short-term construction traffic along I-8 and Old Highway 80 could interfere with vehicles travelling to and from recreational areas, particularly if more than one project is under construction concurrently. However, given the existing low volume to capacity usage of these road segments (relative to County of San Diego thresholds for congestion); and considering the short-term nature of construction traffic, any such impacts would be minor and temporary, even if multiple projects were to be constructed concurrently.

To the extent that distant views of the surrounding landscape is a valuable component of recreational use of the project area, then any diminishment of this character would be considered an indirect and potentially major impact. Once operational, the ESJ U.S. Transmission Line project towers (or monopoles) and ESJ Wind project development, in combination with the ECO Substation Project facilities, the Sunrise Powerlink and other renewable energy projects (e.g., Tule, Campo, Jewel Valley, Manzanita, Ocotillo, and Kumeyaay Wind Energy Projects and Imperial Valley Solar Project), would have indirect impacts on the recreational use of trails within nearby BLM-managed lands due to their visibility from those lands, as discussed in Section 5.3.2. In addition, direct impacts would occur as a result of the Tule, Jewel Valley, and Ocotillo Wind projects' placement of wind turbines and related roads and infrastructure in BLM lands that are currently accessible to recreational users. The ESJ U.S. Transmission Line project and Phase 1 wind turbines, ECO Substation switchyards, and Sunrise Powerlink would be visible from surrounding BLM recreational areas (Table Mountain ACEC to the north, and Jacumba Wilderness to the east). As discussed in Section 3.4 (Visual Resources), although the ESJ U.S. Transmission Line project structures in and of themselves would not substantially change the character of views from these areas, the combination of the various developments would cause a significant cumulative impact on the experience of recreation users by significantly reducing the quality of views from certain areas (Section 5.3.2). The ESJ U.S. Transmission Line project would make a minor, permanent contribution to this cumulative impact.

5.3.5 Cultural Resources

The geographic scope for the analysis of cumulative impacts on cultural resources is all of Imperial and San Diego Counties. The proximity of cultural resources to the ESJ U.S. Transmission Line project would be of interest only to the extent that proximity would considerably affect the context or integrity of the resource. This wide geographic scope is appropriate because it is likely that cultural resources similar to those in the ESJ U.S. Transmission Line project's APE are present throughout this area. There are numerous projects in the planning or construction phase within Imperial and San Diego Counties that have the potential to adversely affect cultural and paleontological resources, including the specific projects listed in Table 5-1. However, the actual number and type of resources that could be adversely affected cannot be determined without a comprehensive inventory of the area within the geographic scope of the cumulative analysis. No such inventory is known to exist.

Typically, cultural resources are identified as part of the permitting process for individual undertakings, and often are discovered only during ground disturbing activities. Applicable laws and regulations afford specific protections to discovered resources. The project could contribute to cumulative impacts to cultural resources if construction activities affected unanticipated Native American sites. As discussed in Section 3.5 (Cultural Resources), with the implementation of applicant-proposed measures and the additional mitigation measures identified, the ESJ U.S. Transmission Line project would not be expected to have impact on cultural resources. Similarly, other projects in the region are expected to implement mitigation measures that would minimize potential impacts to cultural resources. Therefore, the ESJ U.S. Transmission Line project would not contribute to any significant cumulative impacts to cultural resources.

The Quechan Tribe, in their letter dated March 9, 2009 (Appendix D), indicated a concern that the EIS analysis should consider the cultural landscape. As discussed in Section 3.5 (Cultural Resources), no impacts to the cultural landscape are identified. In the context of cumulative impacts, it is noted that multiple wind development projects in southeast San Diego County and northern Baja could be considered an adverse impact on cultural values landscapes in the region. Since the ESJ U.S. Transmission Line project is not identified as having an impact to the cultural landscape, it would not contribute to this cumulative impact.

5.3.6 Noise

Cumulative construction noise impacts in the area are expected to be minor due to the lack of sensitive receptors in the project area, and the distances between the individual projects. In the event that the SDG&E ECO Substation Project and/or the Sunrise Powerlink project construction occurs concurrently with the ESJ U.S. Transmission Line project, the cumulative effect of construction activities would elevate ambient noise levels in the area; however, noise levels would not exceed the County of San Diego's threshold (75 dBA) as measured at the location of the nearest occupied residence. Therefore, cumulative noise impacts would be minimal during construction. During project operation, corona noise from the ESJ U.S. Transmission Line project and other proposed transmission lines (Sunrise Powerlink, ECO Substation and associated 138-kV Transmission Line) could result in occasional adverse cumulative impacts to residential receptors during wet weather. However, ESJ has committed to selecting a conductor configuration that would not exceed the County of San Diego's noise threshold at the property line. Therefore, the ESJ U.S. Transmission Line project's contribution to long-term cumulative noise increases would be minor.

5.3.7 Transportation and Traffic

No foreseeable transportation improvement projects are proposed that would affect existing project area traffic and transportation conditions in the area of the projects considered in this analysis. Cumulative impacts to existing traffic conditions could occur if the ESJ U.S. Transmission Line project were constructed at the same time as any of the other projects considered in this analysis, particularly the SDG&E ECO Substation Project or other proposed wind projects (due to the addition of commuters and over-sized trucks transporting construction materials on I-8 traveling to the area from the City of San Diego or cities in Imperial County). The timing of construction of the individual projects is difficult to predict. Based on recent project status reports, the Sunrise Powerlink, Jewel Valley Wind, and Imperial Valley Solar projects may be constructed concurrent to construction of the ESJ U.S. Transmission Line project. Similarly the ECO Substation and the Tule Wind projects could be built concurrently with the ESJ U.S. Transmission Line project, as could the Ocotillo Wind Energy Project and the Boulevard Border Patrol Station. The number of daily vehicle trips associated with ESJ U.S. Transmission Line project would be less than 0.1 percent of the existing average daily traffic on I-8 and one percent of existing traffic on Old Highway 80. With implementation of applicant-proposed measures described in Section 3.7, ESJ U.S. Transmission Line project contributions to cumulative transportation impacts during construction are expected to be minimal. Following completion of construction activity, the ESJ U.S. Transmission Line project would not contribute to cumulative transportation impacts; therefore no long-term cumulative transportation and traffic impacts are indicated.

5.3.8 Public Health and Safety

During construction, the ESJ U.S. Transmission Line project would handle hazardous materials and potentially contaminated soils in accordance with all applicable regulations; therefore, construction of the ESJ U.S. Transmission Line project would not contribute to any cumulative public health and safety issues.

Once operational, the electromagnetic fields associated with the ESJ U.S. Transmission Line project may be of sufficient magnitude to impact the operation of pacemakers but would not combine with the impacts of other projects because the impact would only occur in the immediate area of the ESJ U.S. Transmission Line project. The addition of other new lines (e.g., Sunrise Powerlink, SDG&E 138-kV Transmission Line) would not change the level of effect at any specific location. Similarly, impacts associated with EMF exposure from transmission lines would only occur in the immediate vicinity of the line. The ESJ U.S. Transmission Line project would not contribute to any cumulative public health impacts associated with EMF due to its distance away from any potential receptors.

5.3.9 Fire and Fuels Management

As shown in Table 5-1, numerous construction activities are planned in the vicinity of the ESJ U.S. Transmission Line project and nearby wildland areas in eastern San Diego County and western Imperial County. These projects increase the cumulative level of human influence adjacent to wildlands and could potentially increase the number of human-caused wildfire ignitions. Potential for wildfire ignitions during construction could be reduced but not eliminated, through potential additional mitigation measures described in Section 3.9.3. The ESJ U.S. Transmission Line project's contribution to increased probability of human-caused wildfire ignitions would be minor based on the short duration of construction activity and the scale of construction compared to other projects considered in this analysis (e.g., Sunrise Powerlink, SDG&E ECO Substation Project, solar and wind development projects, and related infrastructure).

As stated in Section 3.9 (Fire and Fuels Management), the presence of the overhead transmission line would create an ongoing source of potential wildfire ignitions for the life of the ESJ U.S. Transmission Line project. Line faults can be caused by such unpredictable events as conductor contact by floating debris, gun shots, and helicopter collisions. These events are rare but would be unavoidable. When considered in combination with other planned projects in the surrounding area, the potential for wildfire ignitions is cumulatively significant. Implementation of the ESJ-proposed Fire Protection Plan and the potential additional mitigation measures described in Section 3.9.3 could reduce the probability of igniting a wildfire and reduce the impacts of fires when they occur; however, the potential for ignition would remain. Therefore, this potential for ignition is considered a major and unavoidable cumulative impact. No additional mitigation measures are available to reduce the ESJ U.S. Transmission Line project's contribution to the potential for ignition to less than considerable.

5.3.10 Air Quality and Climate Change

Criteria Pollutants

Cumulative impacts were assessed by determining if the ESJ U.S. Transmission Line project, in conjunction with other projects, would have the potential to contribute to a long-term impact on air quality. As demonstrated in Section 3.10 (Air Quality and Climate Change), emissions associated with construction, operation, and maintenance of the ESJ U.S. Transmission Line Project would be below SDAPCD thresholds. With implementation of mitigations measures and APMs and by remaining consistent with SDAPCD Rule 55 for Fugitive Dust Control (as described in section 3.10) the ESJ U.S. Transmission Line project impacts on air quality would not be cumulatively considerable and would be temporary and minor. With regard to the current and reasonably foreseeable projects in the ESJ U.S. Transmission Line project area, emissions from construction of the ECO Substation may exceed SDAPCD thresholds, and combined with the ESJ U.S. Transmission Line project and other energy and development projects, could result in cumulative impacts if built concurrently. Construction could result in a temporary addition of pollutants to the local air shed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling construction materials depending on their physical proximity and construction timelines. However, specific time schedules for individual projects within the cumulative study area have not yet been established by their respective applicants. In the event of simultaneous construction, the nearest projects to the ESJ U.S. Transmission Line Project considered in this analysis are the SDG&E ECO Substation Project (located adjacent), and Ketchum Ranch expansion project, located approximate 2.5 miles (4 km) west of ESJ U.S. Transmission Line, Jewel Valley, located approximately 8 miles (12.8 km) to the west. In addition, the energy projects included in this analysis would be subject to federal, state, and local regulations, including County of San Diego and SDAPCD permitting, which would result in project design changes or mitigation measures that would serve to reduce construction and operational emissions below applicable thresholds.

Climate Change

As discussed in Section 3.10 (Air Quality and Climate Change), construction and operation of the ESJ U.S. Transmission Line project would result in minor emissions of GHG. These emissions would contribute incrementally to cumulative GHG emissions and associated global climate change. Implementation of potential mitigation measures described in Section 3.10 would reduce ESJ U.S. Transmission Line project emissions of GHG. As discussed in Section 3.10, GHG emissions from the ESJ U.S. Transmission Line project would likely be more than offset by the indirect net decrease in GHG and other emissions from fossil-fueled power plants. Any such net reduction of GHG emissions is considered a beneficial impact. This is also the case for the other renewable energy projects considered in this analysis (Sunrise Powerlink Transmission Line project, SDG&E ECO Substation Project, Tule Wind Energy project, Jewel Valley Wind project, Ocotillo Wind Energy project, Campo Wind Energy project, Imperial Valley Solar project, and La Rumorosa I project; see Section 5.2 for complete descriptions of these projects). Thus, the cumulative impacts of these projects on climate change would be positive.

5.3.11 Water Resources

Surface water features near the alternative corridors are isolated and do not connect to other surface waters. Therefore, no cumulative effects related surface water impacts are indicated. Water required for construction uses, such as dust control would be trucked onsite from an existing brackish well near Jacumba. As discussed in Section 3.11 (Water Resources), the amount of water required for short-term construction use is small relative to groundwater availability in the vicinity of the ESJ U.S. Transmission Line project. Furthermore, a groundwater analysis performed by the County of San Diego of the proposed well for groundwater extraction during construction concludes that "cumulative impacts are considered less than significant since the water levels do not show any indications of an overdraft condition and the amount of additional drawdown for the groundwater pumping for the ESJ U.S. Transmission Line project would have a less than significant effect on the surrounding offsite wells" (Bennett 2010).

Construction of current and reasonably foreseeable energy and development projects in the area will each require a reliable water source during their respective construction periods for dust suppression, foundation construction, and various other construction activities. Water demands and sources will vary for each project. For example, SDG&E proposes to obtain approximately 30 million gallons of water for construction, the majority of which would be obtained from a source in Imperial County, well to the east of Jacumba. SDG&E has received confirmation that the Sweetwater Authority in Chula Vista has sufficient water capacity to provide 25-million gallons of water to the ECO Substation Project during project construction (AECOM 2010b; page D.12-27).

The Tule Wind project applicant proposes to obtain an estimated 19,000,000 gallons of water for construction from two existing wells on Rough Acres Ranch in McCain Valley, located several miles northwest of Jacumba, near Boulevard, and from a third well on the Ewiiaapaayp Reservation, northwest of Boulevard, which is also several miles from Jacumba. Maximum daily use would be up to 250,000 gallons of water per day, with continuous pumping of 124 gallons per minute to support the water needs of the project for dust suppression and concrete mixing (AECOM 2010b; page D.12-29) In as much as the SDCWA reports a total water supply of 709,940 acre-feet, or 231 billion gallons (see section 3.11.1.3), the total water consumption of less than 200 million gallons by the several projects in the ESJ U.S. Transmission Line project area would not constitute a major cumulative impact on regional water supply. Given the Jacumba Valley Groundwater Basin recharge rate (~2,600 acre-feet per year), even if all water for the ECO Substation, Tule Wind and ESJ U.S. Transmission projects were extracted from the basin in a single year, the total withdrawal (less than 150 acre-feet) would not have a significant cumulative effect on the supply of groundwater in the basin.

One or more of these and other projects considered in this cumulative analysis, such as the Manzanita Wind, Jewel Valley, and Ocotillo Express projects, possibly could be constructed at the same time as the ESJ U.S. Transmission Line project. The timing of construction for individual projects is not known, and water needs for construction purposes would be temporary; thus construction of the projects in this analysis may conceivably overlap. The Sunrise Powerlink project, for example, is already under construction and is projected by SDG&E to be completed by mid-2012, such that construction in east San Diego County could occur simultaneously with the beginnings of construction of the ESJ U.S. Transmission Line project and ECO Substation project (assuming, of course, that they receive all of their required permits). Nonetheless, if construction of more than one project (or project component) occurs concurrently, then the ability of local water sources to deliver water supplies could be temporarily stressed. However, given the short-term nature of the water demand for construction of the cumulative projects, and the County of San Diego's conclusion that cumulative impacts related to the ESJ U.S. Transmission Line project construction water use are considered less than significant, the ESJ U.S. Transmission Line project would not contribute to significant cumulative effects on local water supply.

5.3.12 Geology and Soils

The ESJ U.S. Transmission Line project would create a minor potential for erosion due to construction grading and disturbance; and during long-term maintenance activities (e.g., due to vehicle usage of the access roads). The adjacent ECO Substation switchyard facility would add to this potential for erosion in the vicinity of both projects. Both projects are located in gently sloping topography; and both projects propose to implement erosion control BMPs during construction and operations. Therefore, no significant cumulative impacts related to erosion are anticipated. Cumulative impacts related to seismic activity or other geologic hazards are not anticipated because the ESJ U.S. Transmission Line project, as well as the ECO Substation switchyard facility would be located in an area that is not in close proximity to active faults or susceptible to liquefaction; and both projects would be designed to meet applicable seismic and geotechnical design standards. Other projects may be susceptible to site-specific erosion or other geologic hazards (e.g., wind farm development on steep slopes); however, these developments would also be required to meet various design standards and are distant from the ESJ U.S. Transmission Line project. Therefore, no cumulative impacts related to geology and soils are expected.

5.3.13 Socioeconomics

The projects considered in this analysis would cumulatively increase employment in the trade, transportation, and utilities sectors, and in manufacturing sectors in San Diego and Imperial Counties. During construction of the ESJ U.S. Transmission Line project, employment would increase temporarily; however, no new long-term jobs would be created to operate the transmission lines. Therefore, the ESJ U.S. Transmission Line project would not contribute to cumulative long-term in-migration or population impacts in either San Diego or Imperial County. Further, although the projects in this analysis would cumulatively generate government revenues through tax revenues, wage and salary expenditures, and material procurement, the socioeconomic impacts resulting from the ESJ U.S. Transmission Line project would be temporary and would not contribute to significant beneficial or adverse cumulative impacts in San Diego or Imperial Counties.

Another issue that was presented during the scoping and public comment period for the project is the cumulative impact of the energy projects in this analysis on property values and tourism in the area. As discussed in Section 3.13.2.3, the effects of high voltage transmission lines and of wind farms on property values are small to non-existent. Similarly, the ECO substation EIR/EIS concludes that the combination of the project (including the ESJ U.S. Transmission Line project) and the Sunrise Powerlink Transmission Line would not result in adverse impacts to property values (CPUC/BLM 2011a; see page F-206). Thus, the ESJ U.S. Transmission Line project would not contribute to significant cumulative adverse impacts on property values. As discussed in Section 3.13 (Socioeconomics), numerous studies cited in the Sunrise Powerlink RDEIR/SDEIS (CPUC/BLM 2008b) as well as other literature reviewed have concluded that the actual effects of industrial projects on property values and tourism is generally smaller than anticipated and that impacts diminish over time due to diminished sensitivity to the features. Therefore, although it is likely that property values and tourism are adversely affected by the cumulative change in landscape character, the anticipated impacts are moderate.

5.3.14 Environmental Justice

As discussed in Section 3.14 (Environmental Justice), no disproportionately high or adverse impacts to minority or low-income populations directly adjacent to the alternative corridors or surrounding areas (including the communities of Jacumba and Boulevard in eastern San Diego County and unincorporated areas in western Imperial County) have been identified as a result of the ESJ U.S. Transmission Line project. Although the ESJ U.S. Transmission Line project, in combination with the other projects considered in this analysis, could result in cumulatively substantial impacts to visual resources, such impacts would not disproportionately affect low-income or minority populations in comparison to impacts to the general public. As discussed in Section 5.3.13, ongoing and foreseeable projects in the region, including the Border Patrol Station in Boulevard, U.S.-Mexico Border Fence, Truck Haven Geo-Thermal project, and numerous planned solar projects on BLM land, are not expected to result in cumulative adverse impacts to socioeconomic resources, thus minority and low-income populations in the area would not be disproportionately affected by adverse socioeconomic impacts. Therefore, cumulative environmental justice impacts are not expected.

5.3.15 Services and Utilities

The cumulative effects of the energy projects considered in this analysis are expected to be beneficial and provide additional sources of electrical energy to San Diego County and Imperial County. Construction activities associated with the projects in this analysis may result in increased demand on existing resources (for example, increased Border Patrol operations due to the increased activity near the border); however, the ESJ U.S. Transmission Line project contribution to this impact would be temporary and minimal based on the scale of the ESJ U.S. Transmission Line project. In addition, because operation of the ESJ U.S. Transmission Line project would not require the hiring of any new employees, the ESJ U.S. Transmission Line project would not contribute to any cumulative demands for schools, libraries, or other public facilities.

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SECTION 6

IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

This section describes irreversible and irretrievable commitments of resources associated with the implementation of the action alternatives analyzed in this EIS. A resource commitment is considered irreversible when primary or secondary impacts from its use limit future use options. Irreversible commitment applies primarily to nonrenewable resources, such as minerals or cultural resources, and to those resources that are renewable only over long time spans, such as soil productivity. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for use by future generations. Irretrievable commitment applies to the loss of production, harvest, or natural resources.

6.1 LAND

The construction and operation of the proposed transmission line would require the commitment of land for the placement of 3 to 5 lattice towers (or monopoles), and a new access road. This commitment would be irreversible for the life of the transmission line. While it is possible that these structures and roads could be removed and the natural landscape renewed, this is unlikely in the foreseeable future. The action alternatives would involve the same kind of irreversible land use but would vary slightly in the amount of land permanently disturbed. The 230-kV Route alternative would result in the permanent disturbance of 9.35 acres (3.78 hectares) while the 500-kV Route alternative would permanently disturb 10.40 acres (4.21 hectares).

6.2 WATER

Limited amounts of water would be irretrievably consumed in the construction of the proposed transmission line and access road. ESJ estimates that 780,000 gallons (2.4 acre-feet or 2,950 cubic m) of water would be required during construction of the 230-kV Route for dust abatement, cleaning construction equipment, and concrete production for tower foundations. Based on the estimated volume of water (2.4 acre-feet or 2,950 cubic m) that would be required during short-term construction of the transmission line in comparison to the annual recharge, the County of San Diego has determined that the project would not impact the locally available water supply.

6.3 CONSTRUCTION MATERIALS

Construction of the transmission line would also result in both the irreversible and irretrievable use of common construction materials. The materials used for constructing the towers (or monopoles) and the concrete for their anchors are ultimately recyclable but would remain an irreversible commitment of resources for the life of the transmission line. Both the 230-kV Route alternative and 500-kV Route alternative would require the construction of 3 to 5 steel lattice towers or steel monopoles.

Small quantities of fossil fuels would also be irretrievably consumed during the construction and maintenance of the transmission line. Diesel fuel and gasoline would be consumed by construction and maintenance equipment along the transmission line; however, the consumption of fuel during the construction phase would be of relatively short duration. These procedures would require the consumption of a relatively small amount of fuel that would not constitute a long-term drain on local resources.

6.4 BIOLOGICAL AND CULTURAL RESOURCES

The construction and operation of the transmission lines would result in limited irreversible and irretrievable commitments of natural and cultural resources. The areas occupied by the footings or anchors for towers or monopoles, as well as the access road, would be irreversibly removed from natural habitat for the life of the transmission lines. In addition, some of the desert soil surfaces disturbed in areas of temporary construction activity, such as work areas, pull sites, lay-down areas, and trenches, could result in changes that would be irreversible over the long-term. Although some sensitive species might be disturbed by construction (e.g., by temporary increases in ambient noise), it is unlikely that threatened or endangered species would be harmed since biological surveys did not observe the presence of any such species within the proposed rights-of-way.

Cultural resources, such as archaeological sites, are nonrenewable resources. Their loss is irreversible. A cultural survey of the alternative corridors resulted in the discovery of nine sites and seven isolates, none of which had been previously recorded. The project has been designed to avoid impacts to these sites; therefore, no impacts are anticipated.

SECTION 7

SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

This section discusses the short-term use of the environment and the maintenance of its long-term productivity. A more detailed discussion of impacts and resource utilization associated with the ESJ U.S. Transmission Line project is presented in Section 3. For this EIS, *short-term* refers to impacts that would occur during the period of construction and require two to five years to recover, depending on the resource. *Long-term* refers to those impacts that would last for the life of the transmission line but would recover following removal of the ESJ U.S. Transmission Line project components.

The area subject to short-term use would be limited to the alternative corridors rights-of-way and the main and transmission line access roads. Work areas and pull sites would be needed during the erection of towers or monopoles and during the stringing of the conductors. The alternative corridors would be located on undeveloped private land that is not currently in use. The alternative corridors would not be located on or near any cultivated land; thus, no agricultural lands would be taken out of production. In addition, construction activities would not occur in any designated open space or recreational areas and the alternative corridors are not included in the designated critical habitat of any proposed or listed threatened or endangered species. Land clearing and construction activities would disperse any wildlife present on the site and temporarily eliminate some habitat; however, mitigation measures would prevent the loss of individual organisms belonging to species of concern.

The transmission line and associated access roads would have only limited effects on the long-term productivity of the natural environment, because of the relatively small area that would be occupied and the limited use of the area by maintenance and monitoring personnel. Long-term reductions in biological productivity are possible in some temporary work areas, since the effects of disturbance tend to be more pronounced in arid lands, such as the alternative corridors area, where biological communities tend to recover slowly. The permanent removal of vegetation and habitat due to the placement of towers (or monopoles) and a new access road would be the only long-term effect of occupancy by the ESJ U.S. Transmission Line project; however, the proposed conservation easement would offset such impacts.

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SECTION 8

APPLICABLE LAWS, REGULATIONS, PERMITS, AND EXECUTIVE ORDERS

Permits and approvals are required before construction of the proposed transmission line. Permits regulate many aspects of facility construction and operations, including the quality of construction, fugitive dust control requirements, and discharges of effluents to the environment. These permits, listed in Table 8-1, would be obtained, as required, from the appropriate federal, state, and local agencies.

The major federal laws, regulations, Executive Orders, and other compliance actions that apply to the ESJ U.S. Transmission Line project are identified in Table 8-2. A number of federal environmental statutes address environmental protection, compliance, or consultation. In addition, certain environmental requirements have been delegated to state authorities for enforcement and implementation. ESJ would conduct its operations in an environmentally safe manner and in compliance with all applicable statutes, regulations, and standards. Although this chapter does not address pending legislation or future regulations, it is recognized that the regulatory environment is subject to change, and that the construction and operation of the projects must be conducted in compliance with all applicable regulations and standards.

Table 8-1
List of Potentially Required Permits/Approvals

Agency	Permit/Approval
U.S. Department of Energy	Presidential permit
International Boundary and Water Commission	International Boundary and Water Commission permit
California Office of Historic Preservation	Section 106 Consultation
Regional Water Quality Control Board Colorado River Region	General Construction Storm Water permit
County of San Diego Department of Planning and Land Use	Major Use permits Right-of-Way permits
County of San Diego Department of Public Works	Grading permit Water Well permit
County of San Diego Rural Fire Districts	Fire District approval

Table 8-2
Federal Environmental Statutes, Regulations, and Orders

Resource Category	Statute / Regulation / Order	Citation	Administering Agency	Permits, Approvals, Consultations, and Notifications
Biological Resources	ESA	16 U.S.C. 1531 et seq.	USFWS	Requires consultation to identify endangered or threatened species and their habitats, assess impacts thereon, obtain necessary biological opinions, and, if necessary, develop mitigation measures to reduce or eliminate adverse effects of construction or operations. Applicability: Applicable.
	Migratory Bird Treaty Act	16 U.S.C. 703 et seq.	USFWS	Requires consultation to determine if there are any impacts on migrating bird populations due to construction or operation of project facilities. If so, the applicant will develop mitigation measures to avoid adverse effects. Applicability: Applicable.
	E.O. 13112: Invasive Species	64 FR 6183 February 8, 1999	Federal Agencies	Requires agencies, to the extent practicable and permitted by law, to prevent the introduction of invasive species; to provide for their control; and to minimize the economic, ecological, and human health impacts that invasive species cause. Applicability: Applicable.
	Bald and Golden Eagle Protection Act	16 U.S.C. 668 et seq.	USFWS	Consultations should be conducted to determine if any protected birds are found to inhabit the area. If so, the Applicant must obtain a permit prior to moving any nests due to construction or operation of project facilities. Applicability: Applicable.
Visual Resources	Environmental Quality Improvement Act	42 USC Sec 4371-4375	CEQ	Requires each Federal agency conducting or supporting public works activities affecting the environment to implement policies established under existing law that provide for enhancement of environmental quality. Applicability: Applicable.

Table 8-2
Federal Environmental Statutes, Regulations, and Orders

Resource Category	Statute / Regulation / Order	Citation	Administering Agency	Permits, Approvals, Consultations, and Notifications
Cultural Resources	National Historic Preservation Act	16 U.S.C. 470 et seq.	DOE	Requires consultation with the SHPO, land management agencies, and in certain cases, the Advisory Council on Historic Preservation prior to construction to ensure that no significant historical properties (i.e., National Register of Historic Places-eligible properties, as defined in the NHPA) would be affected. Applicability: Applicable.
	Archaeological and Historical Preservation Act	16 U.S.C. 469 et seq.	DOI	Requires DOE to obtain permits for any disturbances of archaeological resources. Applicability: Applicable.
	Antiquities Act	16 U.S.C. 431-437	DOI	Requires DOE to comply with all applicable sections of the Act. Applicability: Applicable.
	American Indian Religious Freedom Act	42 U.S.C. 1996	DOI	Requires DOE to consult with local Native American Indian tribes prior to construction to ensure that their religious customs, traditions, and freedoms are preserved. Applicability: Applicable.
	Native American Graves Protection and Repatriation Act	25 U.S.C. 3001	DOI	Requires DOE to return certain Native American cultural items — human remains, funerary objects, sacred objects, and objects of cultural patrimony — to culturally affiliated Native American tribes and organizations. Applicability: Applicable.
	E.O. 13007: Protection and Accommodation of Access to “Indian Sacred Sites”	61 FR 26771 May 29, 1996	DOI	Requires DOE to consider the potential impact of its actions on Native American sacred sites, access to sacred sites, or use of sacred sites. Applicability: Applicable.

Table 8-2
Federal Environmental Statutes, Regulations, and Orders

Resource Category	Statute / Regulation / Order	Citation	Administering Agency	Permits, Approvals, Consultations, and Notifications
Cultural Resources (continued)	E.O. 13175: Consultation and Coordination with Indian Tribal Governments	63 FR 67249 November 9, 2000	DOI	Requires DOE to consult on a government-to-government basis with tribes and nations. Applicability: Applicable.
Noise	Noise Control Act	42 U.S.C. Sec 4901 et seq.	USEPA	Requires facilities to maintain noise levels that do not jeopardize the health and safety of the public. Applicability: Applicable to construction noise.
Public Health and Safety	Occupational Safety and Health Act	5 U.S.C. Sec 5108	OSHA	Requires agencies to comply with all applicable work safety and health legislation (including guidelines of 29 CFR 1960) and prepare, or have available, Material Safety Data Sheets. Applicability: Applicable.
	Hazard Communication Standard	29 C.F.R. 1910-1200	OSHA	Requires DOE to ensure that workers are informed of, and trained to handle all chemical hazards in the DOE workplace. Applicability: Applicable.
	Toxic Substances Control Act	42 U.S.C. 2011	USEPA	Requires the Applicant to comply with inventory reporting requirements and chemical control provisions of TSCA to protect the public from the risks of exposure to chemicals. TSCA imposes strict limitations on the use and disposal of polychlorinated biphenyl-contaminated equipment. Applicability: Applicable primarily to the construction phase.
	Hazardous Materials Transportation Act	49 U.S.C. 1801 et seq.	DOT	Requires the Applicant to comply with the requirements governing hazardous materials and waste transportation. Applicability: Applicable primarily to the construction phase.

Table 8-2
Federal Environmental Statutes, Regulations, and Orders

Resource Category	Statute / Regulation / Order	Citation	Administering Agency	Permits, Approvals, Consultations, and Notifications
Public Health and Safety (continued)	Emergency Planning and Community Right-to-Know Act	42 U.S.C. 11001 et seq.	USEPA	Requires the development of emergency response plans and reporting requirements for chemical spills and other emergency releases, and imposes right-to-know reporting requirements covering the storage and use of chemicals that are reported in toxic chemical release forms. Applicability: Applicable primarily to the construction phase.
	Pollution Prevention Act	42 U.S.C. 11001-11050	USEPA	Establishes a national policy that pollution should be reduced at the source and requires a toxic chemical source reduction and recycling report for an owner or operator of a facility required to file an annual toxic chemical release form under Section 313 of the Superfund Amendments and Reauthorization Act. Applicability: Potentially applicable.
Air Quality and Climate Change	Clean Air Act	42 U.S.C. Sec 7401 et seq.	USEPA	Requires sources to meet standards and obtain permits to satisfy: National Ambient Air Quality Standards (NAAQS), State Implementation Plans (SIPs), New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAPs), and New Source Review (NSR). Applicability: No major source permit required under NESHAPs or NSR. No NSPS requirements. SIP requirements may apply.
	Clean Air Act: NAAQS SIP	42 U.S.C. Sec 7409 et seq.	USEPA, San Diego APCD	Requires compliance with primary and secondary ambient air quality standards governing sulfur dioxide, nitrogen oxide, carbon monoxide, ozone, lead, and particulate matter, and emission limits/reduction measures as designated in each state's implementation plan. Applicability: SIP requirements may apply.
	Interim NEPA/309 Diesel Emissions Guidance		USEPA/CEQ	Provides guidance on appropriate level of analysis for properly disclosing diesel emissions impacts and possible mitigation measures. Applicability: Not applicable. Project does not qualify for guidance list of "major/large issue" projects.

Table 8-2
Federal Environmental Statutes, Regulations, and Orders

Resource Category	Statute / Regulation / Order	Citation	Administering Agency	Permits, Approvals, Consultations, and Notifications
Hydrology and Water Quality	Clean Water Act	33 U.S.C. Sec 1251 et seq. (Section 401 and 404)	CRRWQCB/USACE	Requires permit for discharge of dredge or fill material into waters of the United States and certification of water quality. Applicability: Applicable.
	Clean Water Act	33 U.S.C. Sec 1313 (Section 402)	SWRCB/CRRWQCB	Requires EPA or state-issued permits, National Pollutant Discharge Elimination System (NPDES) permits and compliance with provisions of permits regarding discharge of effluents to surface waters and additional wetland protection requirements. Applicability: Would be required to obtain coverage under the General Construction Permit.
Environmental Justice	E.O. 12898: Federal Action to Address Environmental Justice in Minority Population and Low-Income Population	59 FR 7629 February 16, 1994	USEPA	Requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Applicability: Minimal applicability since the land crossed by the proposed project is uninhabited.
Other	NEPA	42 U.S.C. 4321 et seq. 40 C.F.R. 1500-1508	CEQ	Directs all Federal agencies in the implementation of NEPA. DOE NEPA regulations are in 10 CFR Part 1021. Applicability: Applicable.
	Executive Orders 10485 and 12038		DOE	Issuance of a Presidential permit must be found to be consistent with the public interest and DOE must obtain concurrence of the Secretary of State and Secretary of Defense before permit can be issued. Applicability: Applicable

Table 8-2
Federal Environmental Statutes, Regulations, and Orders

Resource Category	Statute / Regulation / Order	Citation	Administering Agency	Permits, Approvals, Consultations, and Notifications
Other (continued)	Radio Frequency Device Kit	47 C.F.R. 1525	FCC	Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement. Applicability: Applicable.
	Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space	FAA Advisory Circular (AC) No. 70/460-2H	FAA	This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA. Applicability: Not Applicable.
	Obstruction Marking and Lighting	FAA AC No. 70/460-1G	FAA	This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR. Applicability: Not Applicable.

APCD = Air Pollution Control District
CEQ = Council on Environmental Quality
DOE = Department of Energy
DOI = Department of Interior
E.O. = Executive Order
ESA = Endangered Species Act
FAA = Federal aviation Administration
FCC = Federal Communication Commission
NAAQS = National Ambient Air Quality Standards
NESHAP = National Emission Standards for Hazardous Air Pollutants
NPDES = National Pollutant Discharge Elimination System
NSPS = New Source Performance Standards
NSR = new source review
OSHA = Office Safety and Health Administration
SHPO = State Historic Preservation Office
SIP = State Implementation Plan
SWRCB = State Water Resources Control Board
TSCA = Toxic Substances Control Act
USACE = United States Army Corps of Engineers
USEPA = United States Environmental Protection Agency
USFWS = United States Fish and Wildlife Service

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SECTION 9

CONSULTATION AND COORDINATION

Certain statutes and regulations require DOE to consider consultations with federal and state agencies and federally recognized Native American groups regarding the potential for the ESJ U.S. Transmission Line project to disturb sensitive resources. The consultations are generally required before any land disturbance can begin. Most of these consultations are related to biological, cultural, and Native American resources. Biological resource consultations generally pertain to the potential for activities to disturb sensitive species or habitats. Cultural resource consultations pertain to the potential for destruction of important cultural or archaeological sites. Native American consultations are concerned with identifying Tribal concerns and issues related to the proposed project, including the potential for disturbance of Native American ancestral sites or traditional practices or resources.

DOE has initiated consultations with federal and state agencies as well as federally recognized Native American groups regarding the potential of the action alternatives to disturb sensitive resources.[1] Table 9-1 summarizes the consultation activities conducted by DOE with agencies and Native American groups. Table 9-2 lists additional agency correspondence during preparation of the EIS. Appendices C.6, D.1, and G contain copies of the consultation letters and correspondence listed in Table 9-1. Information provided in the responses from the agencies and Native American groups is incorporated into Section 3 of this document, as appropriate.

Table 9-1
Summary of Consultation Letters and Coordination Meetings

Subject	Agency	To/From	Date	Appendix
Request to Consult on Proposed Project	Quechan Indian Tribe	To: Jerry Pell, Principal NEPA Document Manager From: Bridget R. Nash-Chrabascz, Quechan Tribe Historic Preservation Officer	March 10, 2009	D.1
Sacred Lands File Search Request	NAHC	To: Dave Singleton, Program Analyst From: Cheryl Bowden-Renna, Archaeologist (EDAW)	March 19, 2009	Not Available

1 In some instances, DOE has authorized ESJ or the ESJ consultant to initiate consultation on its behalf. These consultations are also included in Table 9-1.

Table 9-1
Summary of Consultation Letters and Coordination Meetings

Subject	Agency	To/From	Date	Appendix
Comments on the NOI to Prepare an EIS	USFWS, Carlsbad Fish and Wildlife Office	To: Jerry Pell, Principal NEPA Document Manager From: Karen A. Goebel, Assistant Field Supervisor	March 26, 2009	C.6
Sacred Lands File Search Results	NAHC	To: Cheryl Bowden-Renna, Archaeologist (EDAW) From: Dave Singleton, Program Analyst	March 27, 2009	D.1
Invitation to Consult on Proposed Project	Quechan Tribal Council	To: Mike Jackson, Sr., President From: Anthony J. Como, Acting Deputy Assistant Secretary	April 14, 2009	D.1
Invitation to Consult on Proposed Project	Ah-Mut-Pipa Foundation	To: Preston J. Arrow-weed From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Barona Group of the Capitan Grande	To: Edwin Romero, Chairperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Campo Kumeyaay Nation	To: Monique LaChappa, Chairperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Ewiiaapaayp Tribal Office	To: Will Micklin, Executive Director From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Kumeyaay Cultural Historic Committee	To: Ron Christman From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Kumeyaay Cultural Repatriation Committee	To: Steve Banegas, Spokesperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28,2009	D.1
Invitation to Consult on Proposed Project	Kwaaymii Laguna Band of Mission Indians	To: Carmen Lucas From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	La Posta Band of Mission Indians	To: Gwendolyn Parada, Chairperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1

Table 9-1
Summary of Consultation Letters and Coordination Meetings

Subject	Agency	To/From	Date	Appendix
Invitation to Consult on Proposed Project	Manzanita Band of Kumeyaay Nation	To: Leroy J. Elliott, Chairperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Mesa Grande Band of Mission Indians	To: Mark Romero, Chairperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	San Pasqual Band of Mission Indians	To: Allen E. Lawson, Chairperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Santa Ysabel Band of Diegueno Indians	To: Johnny Hernandez, Spokesperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Sycuan Band of Kumeyaay Nation	To: Danny Tucker, Chairperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Viejas Band of Mission Indians	To: Bobby L. Barrett, Chairperson From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Invitation to Consult on Proposed Project	Kumeyaay Cultural Heritage Preservation	To: Paul Cuero From: Anthony J. Como, Acting Deputy Assistant Secretary	May 28, 2009	D.1
Request for a Consultation Meeting Between the Campo Band and DOE	Campo Environmental Protection Agency	To: Jerry Pell, Principal NEPA Document Manager From: Lisa N. Gover, Director	June 29, 2009	D.1
Consultation Meeting Summary Between the Campo Band and DOE	Campo Kumeyaay Nation Cardno ENTRIX, DOE's Environmental Contractor	Participants: Monique LaChappa, Chairperson; John A. Nadolski, Cultural Resources Specialist	September 16, 2009	D.1
Determination of No Hazard to Air Navigation	FAA	To: Joan Heredia From: Karen McDonald, Specialist	November 10, 2009	G
Invitation to Consult on Proposed Project	Department of Homeland Security, USM/OCAO/Occupational Safety and Environmental Programs	To: David Reese From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G

Table 9-1
Summary of Consultation Letters and Coordination Meetings

Subject	Agency	To/From	Date	Appendix
Invitation to Consult on Proposed Project	Department of State, Office of Environmental Policy: OES/ENV, Bureau of Oceans and International Environmental and Scientific Affairs	To: Elizabeth Orlando From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	FAA	To: Thomas Cuddy From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	FERC, Office of Energy Projects	To: Jeff C. Wright, Director From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	International Boundary and Water Commission, U.S. Section	To: Alfredo J. Riera From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	USACE	To: Harold Hartman From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	U.S. Border Patrol	To: Henry Soule From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	BLM, El Centro Field Office	To: Vicky Wood From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	U.S. Department of the Interior, Oakland Regional Office	To: Patricia S. Port, Regional Environmental Officer From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	U.S. Department of the Interior, Office of Environmental Policy and Compliance	To: Willie R. Taylor, Director From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	USEPA Environmental Review Office	To: Ann McPherson, DOE Reviewer From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G

Table 9-1
Summary of Consultation Letters and Coordination Meetings

Subject	Agency	To/From	Date	Appendix
Invitation to Consult on Proposed Project	USEPA Office of Federal Activities	To: Susan Bromm, Director From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	CDFG, San Diego Office	To: Ed Pert From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	California Department of Parks and Recreation, Office of Historic Preservation	To: Milford Wayne Donaldson, SHPO From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	California State Parks, Colorado Desert District	To: California State Parks, Colorado Desert District From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	California State Parks, Ocotillo Wells District	To: California State Parks, Ocotillo Wells District From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	California State Parks, San Diego Coast District	To: California State Parks, San Diego Coast District From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Invitation to Consult on Proposed Project	Western Interstate Energy Board	To: Doug Larson, Executive Director From: Jerry Pell, Principal NEPA Document Manager	November 17, 2009	G
Acceptance to Consult on Proposed Project	FAA	To: Jerry Pell, Principal NEPA Document Manager From: Thomas W. Cuddy	November 30, 2009	G
Deferral to Consult on Proposed Project	Quechan Indian Tribe	To: Jerry Pell, Principal NEPA Document Manager From: Bridget R. Nash-Chrabascz, Quechan Tribe Historic Preservation Officer	November 30, 2009	D.1
Acceptance to Consult on Proposed Project	California State Parks, Colorado Desert District	To: Jerry Pell, Principal NEPA Document Manager From: Gail Sevrens, District Services Manager	December 3, 2009	G

Table 9-1
Summary of Consultation Letters and Coordination Meetings

Subject	Agency	To/From	Date	Appendix
Acceptance to Consult on Proposed Project	International Boundary and Water Commission, U.S. Section	To: Jerry Pell, Principal NEPA Document Manager From: John Merino, Principal Engineer	December 15, 2009	G
Acceptance to Consult on Proposed Project	U.S. Border Patrol	To: Jerry Pell, Principal NEPA Document Manager From: Henry S. Soule, Deputy Commander	December 17, 2009	G
Request to Participate as a Cooperating Agency	BLM, El Centro Field Office	To: Jerry Pell, Principal NEPA Document Manager From: Daniel Steward, Acting Field Manager	December 21, 2009	G
Acceptance to Consult on Proposed Project	CDFG, San Diego Office	To: Jerry Pell, Principal NEPA Document Manager From: Erinn Wilson, Staff Environmental Scientist	December 30, 2009	G
Acceptance to Consult on Proposed Project	U.S. Border Patrol, Customs and Border Protection, Air and Marine, San Diego Branch, Brown Field Air Unit	To: Jerry Pell, Principal NEPA Document Manager From: Richard Villa, Air Interdiction Agency	January 6, 2010	G
Initiation of Informal Consultation	USFWS, Carlsbad Fish and Wildlife Office	To: Karen Goebel, Assistant Field Supervisor From: Jerry Pell, Principal NEPA Document Manager	February 23, 2010	C.7
Request for Informal Section 7 Consultation	USFWS, Carlsbad Fish and Wildlife Office	To: Rick Williams, Senior Consultant (Cardno ENTRIX) From: Karen Goebel, Assistant Field Supervisor	March 24, 2010	C.8
Cultural Resources Section 106 Consultation	California State Historic Preservation Office	To: Milford Donaldson, State Historic Preservation Officer, Office of Historic Preservation From: Brian Mills, Deputy Assistant Secretary	April 18, 2012	C.8

Table 9-2
Additional Agency Communications[2]

Subject	Agency	By/With	Date
Groundwater at JCSD Well #6	San Diego County Department of Planning and Land Use	By: Ms. Megan Schwartz, Cardno ENTRIX With: J. Bennet, Groundwater Hydrologist	May 20, 2009
Border Patrol Use of Project Access Roads	U.S. Border Patrol, Boulevard Station	By: Ms. Lorraine Woodman, Cardno ENTRIX With: K. Good, Assistant Chief Patrol Agent and H. Soule, Special Operations Director	June 24, 2009
Traffic statistics	Caltrans	By: Letter With: C. Gary, Branch Chief, Traffic Operations Planning and Engineering Support	June 24, 2009
Interference with Airport Radio Signals	San Diego County	By: Ms. Megan Schwartz, Cardno ENTRIX With: E. Nelson, Engineers of Airports	June 24, 2009
Fire Fighting Services	San Diego Rural Fire Protection District	By: Ms. Megan Schwartz, Cardno ENTRIX With: K. Custeau, Fire Captain	June 29, 2009
BLM Recreation Areas	BLM, El Centro Office	By: Ms. Lorraine Woodman, Cardno ENTRIX With: J. Johnson, Wilderness Coordinator	July 10, 2009
Impacts to Roadway Conditions	County of San Diego County Department of Public Works	By: Ms. Megan Schwartz, Cardno ENTRIX With: R. Vidales, Civil Engineer	November 18, 2009
Cumulative projects	BLM Palm Springs, South Coast Field Office	By: Ms. Megan Schwartz, Cardno ENTRIX With: G. Hill, Planning Director	February 24, 2010
Nighttime Lighting on Towers	U.S. Border Patrol, Boulevard Station	By: Ms. Megan Schwartz, Cardno ENTRIX With: H. Soule, Operations Director	October 17, 2011

[2] Full citations for these communications are also listed in Section 10, References.

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SECTION 10

REFERENCES

Note to Reader: This list of references identifies website pages and associated URLs where reference data were obtained. It is likely that at the time of publication of this EIS, some of these website pages may no longer be available or their URL addresses may have changed. Thus, DOE has maintained hard copies of the information and data obtained from the referenced pages. DOE has also maintained hard copies of all other references which are not available on the Internet.

10 News.com. 2006. Old Highway 80 Gets Historic Route Status. Published August 31, 2006. Available online at: http://www.10news.com/news/9769306/detail.html

AECOM. 2009. Phase I Environmental Site Assessment of 360 Acres of Vacant Land in Support of the Energia Sierra Juarez Project, Near Old Highway 80, Unincorporated San Diego County, California. April. (This document is provided in Appendix B of this EIS.) Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/TechStudies/ESJ_MUP_PhaseIESA.pdf

AECOM. 2010a. Conceptual Resource Management Plan. Energia Sierra Juarez U.S. Gen-Tie Line Project, Community of Jacumba, Mountain Empire Community Planning Area, San Diego County. March.

AECOM. 2010b. Energia Sierra Juarez (ESJ) U.S. Transmission Gen-Tie Project San Diego County Major Use Permit Application Amended Project Description Project Number: MUP 09-008 / Env Log Number: 09-22-001. May.

AECOM. 2011a. Biological Technical Report for the "Energia Sierra Juarez (ESJ) Well Access Road – Project Number 09-0107420." Letter report from P. Jacks and V. Novik (AECOM) to P. Brown (County of San Diego Department of Planning and Land Use). February 2011. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/B%5C02STALOC_03.04.11_County%20of%20SD%20Attach%20G-ESJWaterpermBio.pdf

AECOM. 2011b. Draft Archaeological and Historical Investigations for the Energia Sierra Juarez U.S. Major Use Water Extraction Permit (MUP) Application Jacumba, California. MUP 10-014, KIVA Project 3300-10-014. Prepared for the County of San Diego Department of Planning and Land Use by AECOM. San Diego, California: AECOM. February 2011. (This document is included in Appendix D of this EIS.)

American Meteorological Society. 2009. Glossary of Meteorology. Available online at: http://amsglossary.allenpress.com/glossary/search?id=climate-change1

Avian Power Line Interaction Committee (APLIC). 2005. Avian Protection Plan (APP) Guidelines. A Joint Document Prepared by The Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) and U.S. Fish and Wildlife Service (USFWS). April. Available online at: http://www.aplic.org/uploads/files/2634/APPguidelines_final-draft_Aprl2005.pdf

APLIC. 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA. Available online at: http://www.dodpif.org/downloads/APLIC_2006_SuggestedPractices.pdf

Baerwald, E.F., G.H. D'Amours, B.J. Klug, and R. M. Barclay. 2008. Barotrauma is a significant cause of bat fatalities at wind turbines. Current Biology, 18(16): R695-R696. Available online at: http://phsgirard.org/Primarylit/BaerwaldetalCurrentBiology2008.pdf

Bennett, J. 2009. Personal communication via telephone with Ms. Megan Schwartz, ENTRIX, Inc. May 20, 2009. Groundwater Hydrologist, San Diego County Department of Planning and Land Use.

Bennett, J. 2010. Memorandum from Jim Bennett, County Groundwater Geologist, to Patrick Brown, County Project Planner, Regarding Groundwater Supply Options; Project Number P09-008. March 4. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/TechStudies/ESJ_GW-08-WellAnalysis.pdf

Bioacoustics Research Team. 1997. Environmental effects of transportation noise, a case study: noise criteria for the protection of endangered passerine birds. U.C. Davis, Transportation Noise Control Center Technical Report 97-001.

Birdlife International. 2010. California Condor (Gymnogyps californianus). Available online at: http://www.birdlife.org/datazone/speciesfactsheet.php?id=3821

Birnbaum, C. 1994. Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes. Preservation Briefs Number 36. National Park Service, Heritage preservation Services Division, U.S. Government Printing Office: Washington, D.C. Available online at: http://www.nps.gov/hps/tps/briefs/brief36.htm

BLM (See U.S. Bureau of Land Management).

Brooks, B., and E. Roberts. 2003. Geology of the Elsinore Fault Zone, Area Geology map of the Jacumba Quadrangle, San Diego Region, map insert. In: *San* Diego Association of Geologists and South Coast Geologic Society (SDAG/SCGS), Geology of the Elsinore Fault Zone in the San Diego Region, Volume 31.

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell). 2009a. Audible Noise Performance for the Construction Activities Associated with the Energia Sierra Juarez U.S. Gen-Tie Project. October.

Burns & McDonnell. 2009b. Preliminary Grading Plans for the Energia Sierra Juarez Gen-Tie Line Project, San Diego County, California. Drawings C01 – C08 Revision 1. June. (This document is provided in Appendix B of this EIS).

Burns & McDonnell. 2009c. Preliminary Plot Plans for the Energia Sierra Juarez Gen-Tie Line Project, San Diego County, California. Drawings P01 – P10 Revision 1. June. (This document is provided in Appendix B of this EIS).

Burns and McDonnell, Inc. 2010a. Audible Noise Performance for the Construction Activities Associated with the Energia Sierra Juarez U.S. Gen-Tie Alternative Project in San Diego County, California. Application No. MUP 09-008; KIVA 09-0107420. Prepared for Energia Sierra Juarez U.S. Transmission LLC. May. (This document is provided in Appendix B of this EIS.)

Burns & McDonnell. 2010b. Preliminary Grading Plans for the Energia Sierra Juarez Gen-Tie Line Project, San Diego County, California. Drawings C09 – C018 Revision 1. June. (This document is provided in Appendix B of this EIS).

Burns & McDonnell. 2010c. Preliminary Plot Plans for the Energia Sierra Juarez Gen-Tie Line Project, San Diego County, California. Drawings P11 – P18 Revision 1. June. (This document is provided in Appendix B of this EIS).

Cable Consulting International Ltd. 2010. Feasibility Study for 500 kV Underground Cables for use in the Edmonton Region of Alberta, Canada. Available online at: http://www.aeso.ca/downloads/CCI_Feasibility_Study_for_500_kV_AC_Underground_Cables.pdf

California Air Pollution Control Officers Association (CAPCOA). 2008. CEQA and Climate Change. Available online at: http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA-White-Paper.pdf

California Air Resources Board (CARB). 2005. Characterization of Ambient PM_{10} and $PM_{2.5}$ in California. Available online at: http://www.arb.ca.gov/pm/pmmeasures/pmch05/stateover05.pdf

CARB. 2008. Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act. Available online at: http://www.arb.ca.gov/cc/localgov/ceqa/meetings/102708/prelimdraftproposal102408.pdf

CARB. 2009. Greenhouse Gas Inventory for 2000-2006 - Summary by IPCC Category. Available online at: http://www.arb.ca.gov/cc/inventory/data/data.htm

CARB. 2010. Ambient Air Quality Standards (CAAQS). Available online at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

California Department of Fish and Game (CDFG). 1995. San Diego Gas & Electric Subregional Natural Community Conservation Planning Plan. Available online at: http://www.dfg.ca.gov/habcon/nccp/status/SanDiegoGE/

CDFG. 2007. Commonly Asked Questions About Mountain Lions. Available online at: http://www.dfg.ca.gov/news/issues/lion/lion_faq.html

CDFG. 2009a. California Natural Diversity Data Base (CNDDB). Biogeographic Data Branch. California Department of Fish and Game, Sacramento. Version date August 30, 2009. Database query for listed plants and animals in the Jacumba, In-ko-pah Gorge, Coyote Wells, Sweeney Pass, Carrizo Mountain, and Painted Gorge quads. Last accessed March 2009. Available online at: http://www.dfg.ca.gov/biogeodata/cnddb/

CDFG. 2009b. Special Animals. July. Available online at: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf

CDFG 2009c. Walker Canyon Ecological Reserve [map]. June. Available online at: http://www.dfg.ca.gov/lands/er/region5/docs/WalkerCanyonER.pdf

CDFG. 2010a. State and Federally Listed Endangered and Threatened Animals of California. Available online at: http://www.dfg.ca.gov/wildlife/nongame/

CDFG. 2010b. Hierarchical List of Natural Communities with Holland Types. September. Available online at: http://www.dfg.ca.gov/biogeodata/vegcamp/natural_comm_list.asp

California Department of Forestry and Fire Protection (CAL FIRE). 2007, 2008. Fire hazard severity ranking maps. Available online at: http://www.fire.ca.gov/fire_prevention/fhsz_maps/fhsz_maps_sandiego.php

CAL FIRE. 2009. Fire Protection. Available on line at: http://www.fire.ca.gov/fire_protection/fire_protection.php

California Department of Resources Recycling and Recovery. 2009a. Solid Waste Facility Information. Active Landfills Profile for Allied Imperial Landfill (13-AA-0019). Available online at: http://www.calrecycle.ca.gov/profiles/Facility/Landfill/LFProfile1.asp?COID=13&FACID=13-AA-0019

California Department of Resources Recycling and Recovery. 2009b. Solid Waste Facility Information. Active Landfills Profile for Imperial Solid Waste Site (13-AA-0001). Available online at: http://www.calrecycle.ca.gov/profiles/Facility/Landfill/LFProfile1.asp?COID=13&FACID=13-AA-0001

California Department of Transportation (Caltrans). 2007. California Scenic Highway Mapping System. Available online at: http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm

Caltrans. 2008a. 2007 Annual Average Daily Truck Traffic on the California State Highway System. September. Available online at: http://traffic-counts.dot.ca.gov/truck2007final.pdf

Caltrans. 2008b. 2007 State Highway Congestion Monitoring Program (HICOMP) Annual Data Compilation. June. Available online at: http://www.dot.ca.gov/hq/traffops/sysmgtpl/HICOMP/pdfs/2007HICOMP.pdf

Caltrans. 2008c. Caltrans, Traffic Operations Program – Traffic and Vehicle Data Systems. Available online at: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2008all/r007-10i.htm

California Department of Water Resources (CDWR). 2004. California's Groundwater-Bulletin 118 Update 2004 – Jacumba Valley Groundwater Basin. Available online at: http://www.water.ca.gov/groundwater/bulletin118/update2003.cfm

California Employment Development Department. 2009. California Labor Market Information. Available online at: http://www.labormarketinfo.edd.ca.gov/

California Energy Commission (CEC). 2007a. California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development. Commission Final Report. California Energy Commission, Renewables Committee, and Energy Facilities Siting Division, and California Department of Fish and Game, Resources Management and Policy Division. CEC-700-2007-008-CMF. Available online at: http://www.energy.ca.gov/2007publications/CEC-700-2007-008/CEC-700-2007-008-CMF.PDF

CEC. 2007b. Scenario Analyses of California's Electricity System: Preliminary Results for the 2007 Integrated Energy Policy Report, CEC-200-2007-010-SD. September. Available online at: http://www.energy.ca.gov/2007publications/CEC-200-2007-010/CEC-200-2007-010-SD.PDF

CEC. 2008. Publication number: CEC-600-2008-008. Available online at: http://www.energy.ca.gov/2008publications/CEC-600-2008-008/CEC-600-2008-008.PDF

California Geological Survey. 2007. Probabilistic Seismic Hazards Assessment. Available online at: http://www.conservation.ca.gov/cgs/rghm/psha/Pages/Index.aspx

California Native Plant Society (CNPS). 2009. Inventory of Rare and Endangered Plants of California (online edition, v7-10b 4-21-10). Available online at: http://www.cnps.org/inventory

California Public Utilities Commission (CPUC). 2006. Decision 06-01-042: Opinion on Commission Policies Addressing Electromagnetic Fields Emanating from Regulated Utility Facilities. January 26. Available online at: http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/53181.pdf

CPUC. 2009. General Order 95: Rules for Overhead Electric Line Construction. Available online at: http://162.15.7.24/PUBLISHED/Graphics/93038.PDF

CPUC and U.S. Bureau of Land Management (CPUC/BLM). 2008a. San Diego Gas & Electric Company's Sunrise Powerlink Project Final Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment. October. Available online at: http://www.cpuc.ca.gov/environment/info/aspen/sunrise/toc-feir.htm

CPUC/BLM. 2008b. San Diego Gas & Electric Company's Sunrise Powerlink Project Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS). July. Available online at: http://www.cpuc.ca.gov/Environment/info/aspen/sunrise/toc-rdeir.htm

CPUC/BLM. 2010. San Diego Gas & Electric East County Substation Project Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS). December. Available Online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/ECO_Draft_EIR.htm

CPUC/BLM. 2011a. Final Environmental Impact Report / Environmental Impact Statement East County Substation/Tule Wind/Energia Sierra Juarez Gen-Tie Projects. October. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/ECO_Final_EIR-EIS.htm

CPUC/BLM 2011b. Location of East County Substation, Tule Wind, and ESJ Gen-Tie Projects [map]. October. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/ProjectLocationMap_Updated.pdf

CPUC and U.S. Department of Agriculture Forest Service (USFS). 2009. Final Environmental Impact Report/Statement, Southern California Edison's Application for the Tehachapi Renewable Transmission Project. Appendix B – Avian Risk Assessment. SCH No. 2007081156. October. Available online at: http://docs.cpuc.ca.gov/environ/tehachapi_renewables/finalEIR.htm

Carrico, Richard L.1983. A Brief Glance at the Kumeyaay Past: An interview with Tom Lucas Kuwaaymii of Laguna Ranch. Journal of San Diego History. 29.2:115-39. Available online at: http://www.sandiegohistory.org/journal/83spring/kumeyaay.htm

CH2M Hill and Power Engineers. 2006. Undergrounding of Dominion Virginia Power Transmission Lines, for Agency Coordination Group – Four Mile Run Restoration Project, (City of Alexandria, Arlington County), March 3. Available online at: http://www.novaregion.org/DocumentView.aspx?DID=145

Chace, Paul G. 1980. A Cultural Resources Assessment of Jacumba. Report prepared by Paul G. Chace & Associates for JoJoba Limited and Jacumba Associates, San Diego.

Colby, D. W., R. Dobie, G. Leventhall, D. Lipscomb, R. McCunney, M. Seilo, and B. Søndergaard. 2009. Wind Turbine Sound and Health Effects - An Expert Panel Review. Prepared for the American Wind Energy Association and Canadian Wind Energy Association. December. Available online at: http://www.awea.org/learnabout/publications/loader.cfm?csModule=security/getfile&PageID=5728

Colorado River Regional Water Quality Control Board. 2006. Water Quality Control Plan Colorado River Basin – Region 7. June. Available online at: http://www.swrcb.ca.gov/rwqcb7/publications_forms/publications/docs/basinplan_2006.pdf

Congressional Research Service. 2009. Border Security: Barriers along the U.S. International Border. Prepared by Chad C. Haddal, Y. Kim, and M. J. Garcia. March 16. Available online at: http://www.fas.org/sgp/crs/homesec/RL33659.pdf

Conservation Biology Institute. 2010. Maintaining a Landscape Linkage for Peninsular Bighorn Sheep. Available online at: http://static.consbio.org/media/reports/files/BHS-Baja.pdf

Cook, John R., and Michael Baksh, and Stephen R. Van Wormer. 1997. Jacumba Valley Ranch Cultural Resources Inventory and Evaluation (Appendix F Cultural Resources Draft Environmental Impact Report for Jacumba Valley Ranch Specific Plan [SP91-003, P91-012, Log #89-22-3]). Report prepared by Mooney & Associates for Jacumba Valley Ranch, San Diego.

Council on Environmental Quality (CEQ). 1997a. Considering Cumulative Effects Under the National Environmental Policy Act. Washington, D.C. Available online at: http://ceq.hss.doe.gov/nepa/ccenepa/ccenepa.htm

CEQ. 1997b. Environmental Justice: Guidance under the National Environmental Policy Act. Available online at: http://ceq.hss.doe.gov/nepa/regs/ej/justice.pdf

County of San Diego. 1982. Code of Regulatory Ordinances. Chapter 4. Noise Abatement and Control. Available online at: http://www.amlegal.com/nxt/gateway.dll?f=templates&fn=default.htm&vid=amlegal:sandiegoco_ca_mc

County of San Diego. 1986. Part VI Scenic Highway Element, San Diego County General Plan. Adopted January 9, 1975 and Amended December 10, 1986. Available online at: http://www.sdcounty.ca.gov/dplu/docs/existgp/scenichwy.pdf

County of San Diego. 1995. Mountain Empire Subregional Plan. January 11. Department of Planning and Land Use.

County of San Diego. 1998. San Diego County Multiple Species Conservation Plan. Available online at: http://www.co.san-diego.ca.us/dplu/mscp/sc.html

County of San Diego. 1999. County of San Diego General Plan: Mobility Element. Available online at: http://www.sdcounty.ca.gov/dplu/gpupdate/docs/bos_oct2010/B1_03_mobility.pdf

County of San Diego. 2003. Part II, Regional Land Use Element, San Diego County General Plan. Adopted January 3, 1979 and Amended December 10, 2003. Available online at: http://www.sdcounty.ca.gov/dplu/docs/existgp/landuse.pdf

County of San Diego. 2007a. Guidelines for Determining Significance and Report Format and Content Requirements, Air Quality. March 19, 2007. Available online at: http://www.sdcounty.ca.gov/dplu/docs/AQ-Guidelines.pdf

County of San Diego. 2007b. Guidelines for Determining Significance, Cultural Resources: Archaeological and Historic Resources. December 5, 2007. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Cultural_Guidelines.pdf

County of San Diego. 2007c. Guidelines for Determining Significance and Report Format and Content Requirements, Dark Skies and Glare. July 30, 2007. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Dark_Skies_Guidelines.pdf

County of San Diego. 2007d. Guidelines for Determining Significance, Emergency Response Plans. July 30, 2007. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Emergency_Response_Guidelines.pdf

County of San Diego. 2007e. Guidelines for Determining Significance, Geologic Hazards. July 30, 2007. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Geologic_Hazards_Guidelines.pdf

County of San Diego. 2007f. Guidelines for Determining Significance, Groundwater Resources. March 19, 2007. Available online at: http://www.sdcounty.ca.gov/dplu/docs/GRWTR-Guidelines.pdf

County of San Diego. 2007g. Guidelines for Determining Significance , Hazardous Materials and Existing Contamination. July 30, 2007. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Hazardous_Guidelines.pdf

County of San Diego. 2007h. Guidelines for Determining Significance, Hydrology. July 30, 2007. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Hydrology_Guidelines.pdf

County of San Diego. 2007i. Guidelines for Determining Significance and Report Format and Content Requirements, Visual Resources. July 30, 2007. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Visual_Guidelines.pdf

County of San Diego. 2007j. Resource Protection Ordinance. Ordinance 9842. Available online at: www.sdcounty.ca.gov/cob/ordinances/ord9842.doc

County of San Diego. 2008. East County Multiple Species Conservation Program Working Draft Focused Conservation Areas. December. Available online at: http://www.sdcounty.ca.gov/dplu/mscp/docs/east_mscp_csa2_2_8x11.pdf

County of San Diego. 2009a. East County Multiple Species Conservation Program homepage. Available online at: http://www.sdcounty.ca.gov/dplu/mscp/ec.html

County of San Diego. 2009b. Guidelines for Determining Significance, Noise. January 27, 2009. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Noise-Guidelines.pdf

County of San Diego. 2009c. Guidelines for Determining Significance, Paleontological Resources. Modified January 15, 2009. Accessed online at: http://www.sdcounty.ca.gov/dplu/docs/Paleo-Guidelines.pdf

County of San Diego. 2010a. County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements, Biological Resources. Fourth Revision, September 15, 2010. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Biological_Guidelines.pdf

County of San Diego. 2010b. County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements, Wildland Fire and Fire Protection. August 31, 2010. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Fire-Guidelines.pdf

County of San Diego. 2010c. Multi-Jurisdictional Hazard Mitigation Plan: San Diego County, California. Draft 2010 Update. February 2010.

County of San Diego. 2011a. Department of Planning and Land Use Process Guide. Available online at: http://www.sdcounty.ca.gov/dplu/procguid.html

County of San Diego. 2011b. Guidelines for Determining Significance, Transportation and Traffic. August 24, 2011. Available online at: http://www.sdcounty.ca.gov/dplu/docs/Traffic_Guidelines.pdf

County of San Diego. 2011c. Mountain Empire Subregional Plan, San Diego County General Plan. Adopted January 3, 1979 and Amended August 3, 2011. Available online at: http://www.sdcounty.ca.gov/dplu/gpupdate/docs/BOS_Aug2011/C.2_10_MTN_EMPIRE__08_03_11.pdf

County of San Diego. 2011d. San Diego County General Plan – A Plan for Growth, Conservation, and Sustainability. Adopted August 3, 2011. Available Online at: http://www.sdcounty.ca.gov/dplu/generalplan.html

County of San Diego Air Pollution Control District (SDAPCD). 1998. Regulation II - Permits, Rule 20.1 et seq. – New Source Review. Available online at: http://www.sdapcd.org/rules/Reg2pdf/R20-1.pdf

SDAPCD. 2008. Attainment Status Fact Sheet. Available online at: http://www.sdapcd.org/info/facts/attain.pdf

SDAPCD. 2009. Frequently Asked Questions. Available online at: http://www.sdapcd.org/info/facts/faqs.pdf

SDAPCD. 2010. Five Year Air Quality Summary. Available online at: http://www.sdapcd.org/info/reports/5-year-summary.pdf

County of San Diego Department of Public Works. 1999. Public Road Standards. Available online at: http://www.sdcounty.ca.gov/dpw/docs/pbrdstds.pdf

Craig, D. and P. L. Williams. 1998. Willow Flycatcher (*Empidonax traillii*). California Partners in Flight Riparian Bird Conservation Plan. Available online at: http://www.prbo.org/calpif/htmldocs/species/riparian/willow_flycatcher.htm

Custeau, K. 2009. Personal communication via telephone with Ms. Megan Schwartz, ENTRIX, Inc. Fire Captain, San Diego Rural Fire Protection District. June 29, 2009.

DOE (see U.S. Department of Energy)

Dooling, R.J. and A. Popper. 2007. The Effect of Highway Noise on Birds. Prepared for Caltrans. Available online at: http://www.dot.ca.gov/hq/env/bio/files/caltrans_birds_10-7-2007b.pdf

Ecology & Environment, Inc. (E&E). 2009a. Energia Sierra Juarez U.S. Gen-Tie Project Cultural Resources Investigations for Energia Sierra Juarez Gen-Tie Project, Jacumba, California. Prepared for Energia Sierra Juarez U.S. Transmission, LLC. February.

E&E. 2009b. Energia Sierra Juarez U.S. Gen-Tie Project Habitat Assessment Report. Prepared for Energia Sierra Juarez U.S. February.

EDAW, Inc. 2009a. Draft Jurisdictional Waters and Wetlands Report. Prepared for Sempra Utilities. April.

EDAW, Inc. 2009b. Energía Sierra Juárez (ESJ) U.S. Transmission Gen-Tie Project San Diego County Major Use Permit Application Amended Project Description.

EDAW, Inc. 2010a. Archaeological and Historical Investigations for the Energia Sierra Juarez U.S. Gen-Tie Line Project Jacumba, California. Final Report. May. (This document is provided in Appendix B of this EIS.)

EDAW, Inc. 2010b. Biological Resource Report for the Proposed Energia Sierra Juarez U.S. Gen-Tie Line Project; Community of Jacumba, Mountain Empire Community Planning Area, County of San Diego (MUP 09-008). Prepared for County of San Diego Department of Planning and Land Use and Energia Sierra Juarez U.S. Transmission, LLC. May. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/TechStudies/ESJ_AltAlign_BTR.pdf

Eldred, K. M. 1975. Assessment of Community Noise. Journal of Sound and Vibration 43:2 pages 137-146.

Eldred, Cynthia L. 2010. Applicant Sierra Juarez U.S. Transmission Line Project DOE/EIS-0414 Comments on Draft Environmental Impact Statement for the Applicant Sierra Juarez U.S. Transmission Line dated August 2010. Letter from Cynthia Eldred to Jerry Pell (NEPA Document Manager).

Electric Power Research Institute (EPRI). 1985. Evaluation of the Effects of Electric Fields on Implanted Cardiac Pacemakers, EA-3917.

EPRI. 2004. Electromagnetic Interference with Implanted Medical Devices 1997-2003.

ENEL (ENEL Green Power, North America). 2011. "Jewel Valley's Comments on Joint DEIR/EIS for ECO Substation, Tule Wind, and Energia Sierra Juarez Gen-Tie Projects." Comment letter from J. Purczynski (Enel Green Power) to I. Fisher (California Public Utilities Commission) and G. Thomsen (Bureau of Land Management). February 28, 2011.Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/ECO_Final_EIR-EIS.htm#VOLUME 4: Comment Letters Received

Executive Order 12898: "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." February 11, 1994. Available online at: http://portal.hud.gov/hudportal/HUD?src=/program_offices/fair_housing_equal_opp/FHLaws/EXO12898

Federal Aviation Administration (FAA). 2007. Advisory Circular 70/7460-1K Obstruction Marking and Lighting. Available online at: http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/B993DCDFC37FCDC486257251005C4E21/$FILE/AC70_7460_1K.pdf

FAA. 2009. Determination of No Hazard to Air Navigation. Aeronautical Study No. 2009-AWP-4974-OE. Issued to Sempra Global on November 10, 2009. (This document is provided in Appendix B of this EIS.)

Federal Emergency Management Agency (FEMA). 1997. Flood Insurance Rate Map. Panel ID 06073C2100F. Effective Date June 19, 1997. Available online at: http://msc.fema.gov/webapp/wcs/stores/servlet/CategoryDisplay?catalogId=10001&storeId=10001&categoryId=12001&langId=-1&userType=null&type=1&dfirmCatId=12009

Federal Highway Administration (FHWA). 1981. Visual Impact Assessment for Highway Projects. Publication No. FHWA-HI-88-054. Available online at: http://www.dot.ca.gov/ser/downloads/visual/FHWAVisualImpactAssmt.pdf

FHWA. 1996. Measurement of Highway-Related Noise. Available online at: http://www.fhwa.dot.gov/environment/noise/measure/toc.htm

Geller, K. C. 2009. Email communication to Ms. Donna Tisdale regarding bighorn sheep sightings in the Jacumba Mountains by U.S. Border Patrol personnel. March 19, 2009. Letter on file at Cardno ENTRIX.

Georgia Transmission Corporation. 2011a. Underground Construction. Available online at: http://www.gatrans.com/InformationCenter/UndergroundConstruction/index.htm

Georgia Transmission Corporation. 2011b. FAQ 9: Would burying the line reduce exposure to electric and magnetic fields (EMFs)? Available online at: http://www.gatrans.com/FAQs/FAQ_9_ANSWER

Good, K., and H. Soule. 2009. Personal communication via telephone with Ms. Lorraine Woodman, ENTRIX. Assistant Chief Patrol Agent and Special Operations Director, U.S. Border Patrol, Boulevard Station. June 24, 2009.

Good. 2010. Personal communication via telephone with Ms. Meagan Schwartz, ENTRIX. Assistant Chief Patrol Agent, U.S. Border Patrol, Boulevard Station. January 6, 2010.

Good, R.E., R.M. Nielson, H.H. Sawyer, L.L. McDonald. 2004. Population level survey of Golden eagles in the Western United States (USFWS, Arlington, VA). Available online at: http://www.fws.gov/mountain-prairie/species/birds/golden_eagle/Final_Golden_Eagle_Report_8_30_04.pdf

Gray, C. 2009. Personal communication via letter. P.E., Branch Chief, Traffic Operations Planning and Engineering Support, Caltrans. May 28, 2009.

Hall, E. R. 1981. The Mammals of North America, 2 Volumes. 2nd ed. John Wiley & Sons. New York.

Haughton, J., D. Giuffre, J. Barrett, and D. G. Tuerck. 2004. An Economic Analysis of a Wind Farm in Nantucket Sound. Available online at: http://www.beaconhill.org/BHIStudies/Windmills2004/WindFarmArmyCorps.pdf

Hedges, K. 1975. Notes on the Kumeyaay: A Problem of Identification. Journal of California Anthropology 2.1: 71-83.

Hill, G. 2010. Personal communication via telephone with Ms. Megan Schwartz, ENTRIX. Planning Director, BLM Palm Springs – South Coast Field Office. February 24, 2010.

Historic U.S. Highways. 2005. Historic California U.S. Highways. Available online at: http://gbcnet.com/ushighways/#legal

Holland, R. F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. CDFG, Sacramento, CA.

Hunt, G. 2002. Golden eagles in a perilous landscape: predicting the effects of mitigation for wind turbine blade-strike mortality. Consultant Report to California Energy Commission, Sacramento, California, USA. Available online at: http://www.energy.ca.gov/reports/2002-11-04_500-02-043F.PDF

Hunt, W. G., R. E. Jackman, T. L. Hunt, D. E. Driscoll, and L. Culp. 1999. A population study of golden eagles in the Altamont Pass Wind Resource Area: population trend analysis 1997. National Renewable Energy Laboratory NREL/SR-500-26092, Golden, Colorado, USA. Available online at: http://www.nrel.gov/wind/pdfs/26092.pdf

Hunt Research Corporation. 2009. Short Form Fire Protection Plan: Letter Report to San Diego Rural Fire Protection District and County of San Diego Department of Planning and Land Use. September. (This document is provided in Appendix B of this EIS).

ICF Consulting, Ltd. 2003. Overview of the Potential for Undergrounding the Electricity Networks in Europe. Prepared for the DG TREN/European Commission. Final Report. February. Available online at: http://ec.europa.eu/energy/gas_electricity/studies/doc/electricity/2003_02_underground_cables_icf.pdf

ICF Jones and Stokes. 2010a. Land Use and Community Character Analysis. March. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/TechStudies/ESJ_MUP_LandUse_Analysis.pdf

ICF Jones and Stokes. 2010b. Visual Resources Report Energia Sierra Juarez U.S. Transmission Line, LLC Generation-Tie Line Project. Prepared on behalf of Sempra Global for San Diego County. May.

Institute of Electrical and Electronics Engineers (IEEE). 2005. Standard 693-2005: IEEE Recommended Practices for Seismic Design of Substations.

IEEE. 2006. National Electric Safety Code. 2007 Edition. The Institute of Electrical and Electronics Engineers, Inc. New York.

IEEE. 2009. Operational Impacts of Wind Generation on California Power Systems. May. Available online at: http://www.caiso.com/23ec/23ecd8894a6e0.pdf

Imperial County 1994. Imperial County Ocotillo/ Nomirage Community Area Plan, 1994. Available online at: http://www.icpds.com/CMS/Media/Ocotillo-Nomirage-Community-Area-Plan.pdf

Imperial County Air Pollution Control District (ICAPCD). 2007. CEQA Air Quality Handbook. Available online at: http://www.co.imperial.ca.us/AirPollution/Forms%20&%20Documents/CEQA/CEQA%20Handbk%20Nov%202007.pdf

Imperial County Planning and Development Services. 2011. Ocotillo Wind Energy Facility. Draft Environmental Impact Statement. Available online at: http://www.icpds.com/?pid=2843

Insignia Environmental 2010a. Revised East County Substation Footprint Project Description. April. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/TechStudies/ECO_Rev_FootprintPD.pdf

Insignia Environmental 2010b. Revised East County Substation Footprint Vegetation and Drainage Impacts. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/TechStudies/ECO_Rev_138kVImpacts.pdf

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate change 2007: Working group I: The physical science basis. Available online at: http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science_basis.htm

Johnson, J. 2009. Personal communication via telephone with Ms. Lorraine Woodman, ENTRIX. Wilderness Coordinator, BLM El Centro Office. July 10, 2009.

Knoll, C., and T. Priestly. 1992. The Effects of Overhead Transmission Lines on Property Values: A Review and Analysis of the Literature. Available online at: http://staff.haas.berkeley.edu/kroll/pubs/tranline.pdf

Kochert, M.N. and K. Steenhof. 2002. Golden eagles of the U.S. and Canada; Status, trends, and conservation challenges. Journal of Raptor Research 36(S1): 32-40. Available online at: http://fresc.usgs.gov/products/papers/1092_Kochert.pdf

Korinek, David; DeMetro, James; Puga, Nicolas. 2008. Current Status, Plans, and Constraints Related to Expansion of Natural Gas – Fired Power Plants, Pipelines and Bulk Electric Transmission in the California/Mexico Border Region.

Kroeber, A. L. 1925. Handbook of the Indians of California. Bureau of American Ethnology Bulletin 78. Smithsonian Institute, Washington, D.C.

Kunz, et. al. 2007. Assessing Impacts of Wind-Energy Development on Nocturnally Active Birds and Bats: A Guidance Document. Journal of Wildlife Management 71(8): 2449-2486. Available online at: http://www.fws.gov/windenergy/docs/Bat_Bird_Methods_Metrics.pdf

Kus, B. 2002. Least Bell's Vireo (*Vireo bellii pusillus*). *In* The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. Available online at: http://www.prbo.org/calpif/htmldocs/species/riparian/least_bell_vireo.htm

Ladastida, R., and D. Caldeira. 1995. *The Kumeyaay Indians*. San Diego County Office of Education, San Diego, CA.

Latin American Wind Energy Association. 2009. Mexico – Turbopower Services begins construction of "La Rumorosa I" wind farm. Available online at: http://www.windfair.net/press/6094.html

Luomala, K. 1978. Tipai and Ipai. In: Handbook of North American Indians, California, Volume 8, *592-609*. Robert F. Heizer, ed. Smithsonian Institution, Washington, D.C.

McClelland, L. F., J. T. Keller, G. P. Keller, and R. Z. Melnick. 1999. National Register Bulletin 30, Guidelines for Evaluating and Documenting Rural Historic Landscapes. U.S. Department of the Interior, National Park Service. U.S. Government Printing Office, Washington, D.C. Available online at: http://www.nps.gov/history/nr/publications/bulletins/pdfs/nrb30.pdf

National Energy Renewable Laboratory (NREL). 2010. Western Wind and Solar Integration Study, prepared by GE Energy for the National Renewable Energy Laboratory. May. Available online at: http://www.nrel.gov/wind/systemsintegration/pdfs/2010/wwsis_executive_summary.pdf

National Institute of Environmental Health Sciences (NIEHS). 1999. Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. June. Available online at: http://www.niehs.nih.gov/health/assets/docs_f_o/health_effects_from_exposure_to_powerline_frequency_electric_and_magnetic_fields.pdf

National Oceanic and Atmospheric Administration (NOAA). 2002. Average Wind Speed Data. Available online at: http://lwf.ncdc.noaa.gov/oa/climate/online/ccd/avgwind.html

Nelson, E. 2009. Personal communication with Ms. Megan Schwartz, ENTRIX, Inc. San Diego County Engineer of Airports. June 24, 2009.

Noise Pollution Clearinghouse. Undated. "Good neighbors keep their noise to themselves." Noise Pollution Clearinghouse. Fact Sheet - Noise Effects on Wildlife. Available online at: http://www.nonoise.org/library/fctsheet/wildlife.htm

NIOSH (see U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health).

Northrup, Lisa. 2007. Case Study: Kumeyaay Wind Energy Facility Environmental Compliance. Presented at DOE Tribal Business Development and Project Financing Worskop. Denver, CO, October 8-11, 2007.

NRCS (see USDA Natural Resources Conservation Service)

Oberbauer, T. 1996. Terrestrial Vegetation Communities in County of San Diego Based on Holland's Descriptions.

Office of Planning and Research (OPR). 2008. CEQA and Climate Change: Addressing Climate Change through CEQA Review. June. Available online at: http://opr.ca.gov/index.php?a=ceqa/index.html

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Eagle Management and Permit Issuance (Division of Migratory Bird Management, USFWS, Arlington, VA), pp. 5-9. Available online at: http://steinadlerschutz.lbv.de/fileadmin/www.steinadlerschutz.de/terimGoldenEagleTechnicalGuidanceProtocols25March2010_1_.pdf

Rocks Biological Consulting (RBC). 2008. Year 2008 45-Day Report for Quino Checkerspot Butterfly Surveys at the Baja Wind Transmission Line Project Site in Jacumba, CA. (This report is provided in Appendix C of this EIS.)

RBC. 2009. Year 2009 45-Day Report for Quino Checkerspot Butterfly Surveys at the Proposed Energia Sierra Juarez Gen-Tie Project Site near Jacumba, CA. (This report is provided in Appendix C of this EIS.)

Rodriguez-Estrella, Ricardo. 2005. Terrestrial Birds and Conservation Priorities in Baja California Peninsula. USDA Forest Service Gen. Tech. Rep. PSW-GTR-191, pages 115-120. Available online at: http://www.fs.fed.us/psw/publications/documents/psw_gtr191/Asilomar/pdfs/115-120.pdf

San Diego Association of Governments (SANDAG). 2007a. 2030 San Diego Regional Transportation Plan: Pathways for the Future. November. Available online at: http://www.sandag.org/index.asp?projectid=292&fuseaction=projects.detail

SANDAG. 2007b. Average Daily Traffic Volumes. Available online at: http://www.sandag.cog.ca.us/resources/demographics_and_other_data/transportation/adtv/index.asp

SANDAG. 2008. Profile Warehouse. Available online at: http://profilewarehouse.sandag.org/

SANDAG. 2009. SANDAG Data Warehouse. Available online at: http://datawarehouse.sandag.org/

SDAPCD (See County of San Diego Air Pollution Control District)

SANDAG/SourcePoint 2002. Publication: SANDAG “INFO” Volume 3. September 2002.

San Diego County Regional Airport Authority. 2006. Jacumba Airport Land Use Compatibility Plan. Adopted: December. Available online at: http://www.san.org/sdcraa/airport_initiatives/land_use/adopted_docs.aspx

San Diego County Water Authority (SDCWA). 2008. Annual Report 2008. Available online at: http://www.sdcwa.org/sites/default/files/files/publications/annual_2008.pdf

San Diego Gas & Electric Company (SDG&E). 2009a. Application of San Diego Gas & Electric Company (U 902 E) for a Permit to Construct the East County Substation Project (Volume I of II). Application number A.09-08-003. Available online at: http://sdge.com/sites/default/files/regulatory/ECOAppPermittoConstruct.pdf

SDG&E. 2009b. East County Substation Project, Proponent's Environmental Assessment. Submitted to CPUC. August. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ECOSUB/PEA_ECOSUB.htm

SDG&E. 2009c. Press Release: The Campo Band of Mission Indians of the Kumeyaay Nation, Invenergy and SDG&E to Develop Wind Energy Project on Tribal Lands. June 11, 2009.

SDG&E 2011. East County Substation Project. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/ecosub.htm

San Diego Natural History Museum. 2010. Arroyo Toad *(Bufo californicus)*. Available Online at: http://www.sdnhm.org/archive/fieldguide/herps/bufo-cal.html

San Diego Union Tribune. 2007. N. America's largest bird is coming back. Available online at: http://legacy.utsandiego.com/news/science/20070407-9999-1m7condor.html

San Diego Union Tribune. 2011. Judge dismisses Sunrise Powerlink suit. July 1. Available Online at: http://www.signonsandiego.com/news/2011/jul/01/judge-dismisses-sunrise-powerlink-suit/

San Diego Zoo. 2011a. Effects of Wind Turbines on California Condor in Baja and Beyond. available online at: http://www.sandiegozooglobal.org/what_we_do_preserving_wildlife/birds/the_rise_of_the_california_condor_to_baja_and_beyond/

San Diego Zoo. 2011b. What's in a name? online article regarding mountain lions, available online at: http://www.sandiegozoo.org/animalbytes/t-puma.html

San Diego Zoo. 2012. Institute for Conservation Research Executive Summary regarding ongoing investigation of spatial ecology and habitat utilization of the California condor reintroduced to Baja California, Mexico and the golden eagle. January. Available on at: http://www.esjprojecteis.org/docs/San_Diego_Zoo_2012_ICR_Executive_Summary_2012-01-31.pdf

SanGIS 2011. SanGIS/SANDAG GIS Data Warehouse [website]. Available online at: http://rdw.sandag.org/Default.aspx

Scottish Energy Market. 2010. Beauly to Denny Power Line Environmental Statement –Tourism and Recreation Chapter. Available online at: http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Infrastructure/Energy-Consents/Beauly-Denny-Index/Environmental-Statement

Sempra. 2007. Sempra Utilities Wildland Fire Prevention and Fire Safety Guide. Available online at: http://www.cpuc.ca.gov/Environment/info/aspen/sunrise/feir/apps/App%203D4%20SDGE%20WFP-FS%20Guide.pdf

Sempra Generation 2008. Submittal of Addendum for Baja Wind U.S. Transmission, LLC Application for Presidential Permit, PP-334, March 19, 2008. Available online at: http://www.esjprojecteis.org/docs/334_sup_ap.pdf

Sempra Generation 2010. ESJ Project geospatial data [shapefiles]. May and Nov 2010. Received via email.

Sempra Generation. 2011a. SDG&E, Sempra Generation sign wind-power contract. Press release. Available Online at: http://public.sempra.com/newsreleases/viewpr.cfm?PR_ID=2599&Co_Short_Nm=SE

Sempra Generation. 2011b. Sempra Generation comments on Draft Environmental Impact Report (DEIR) and Draft Environmental Impact Statement (DEIS) for ECO Substation, Tule Wind Project and ESJ U.S. Gen-Tie Line Project. March 4. Available online at: http://www.cpuc.ca.gov/environment/info/dudek/ecosub/Final_EIR/03_E_ApplicantsRTCs.pdf

Shipek, F. C. 1991. Delfina Cuero: Her Autobiography, An Account of her Last Years and Her Ethnobotanic Contributions. Ballena Press, Menlo Park, CA.

Siemens Energy. 2009. Technical specification for a typical wind turbine. Available online at: http://www.usa.siemens.com/en/windpower/framework/_resources/pdf/Siemens-SWT-2.3-101_Print.pdf

Sign on San Diego. 2010. Judge blocks Imperial Valley solar project: Quechan tribe said project would damage ancient sites. Available online at: http://www.signonsandiego.com/news/2010/dec/17/judge-blocks-imperial-valley-solar-project/

Skagen, S. K., C. P. Melcher, and R. Hazlewood. 2004. Migration stopover ecology of western avian populations: A southwestern migration workshop. U.S. Geological Survey, Biological Resources Discipline, Open-File Report 2004-1425, 28 pp. Available online at: http://www.fort.usgs.gov/Products/Publications/pub_abstract.asp?PubID=21409

Smallwood, K. S. 2007. Estimating wind turbine-caused bird mortality. Journal of Wildlife Management 71:2781-2791. Available online at; https://www.ewt.org.za/Portals/0/ewt/workgroups/WEP/Sharingweek2011/Smallwood%20Estimating%20Bird%20Mortality.pdf

Soule, H. 2011. Personal communication via telephone with Ms. Megan Schwartz, ENTRIX, Inc. Henry Soule, Chief of Boulevard Station. October 17, 2011.

South Coast Air Quality Management District (SCAQMD). 1993, with updates in 2008. CEQA Air Quality Handbook. Available online at: http://www.aqmd.gov/ceqa/hdbk.html

State Park and Recreation Commission. 2005. Anza Borrego Desert State Park Final General Plan and Environmental Impact Report. February. Available online at: http://www.parks.ca.gov/default.asp?page_id=21314

State Water Resources Control Board. 2009. GeoTracker Website. Available online at: http://geotracker.waterboards.ca.gov/

Stebbins, R. C. 2003. A Field Guide to Western Reptiles and Amphibians. 3rd ed. Houghton Mifflin Co. Boston.

Sterzinger, G., F. Beck, and D. Kostiuk. 2003. The Effect of Wind Development on Local Property Values. Available online at: http://www.repp.org/articles/static/1/binaries/wind_online_final.pdf

Stone, Richard. 2008. *Ecosystems: Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle?* Published in Science, 13 June 2008. Vol. 320. no. 5882, pp. 1409 – 1410 DOI: 10.1126/science.320.5882.1409. Available online at: http://www.ecostudies.org/press/Schlesinger_Science_13_June_2008.pdf

The Climate Registry (TCR). 2008. General Reporting Protocol, Version 1.1. Available online at: http://www.theclimateregistry.org/downloads/GRP.pdf

The Nature Conservancy. 2011. California Dual Citizenship: Protecting Mountain Lions Across Borders. Available online at: http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/california/explore/dual-citizenship-protecting-mountain-lions-across-borders.xml

Transportation Research Board. 2000. Highway Capacity Manual. National Research Council, Washington, D.C.

Underwood, J. and C. Gregory. 2006. Cultural Resources Survey of La Posta Mountain Warfare Training Facility San Diego, California. Unpublished report on file at the South Coastal Information Center, San Diego, CA.

Unitt, Phillip. 2004. San Diego Breeding Bird Atlas.

Unitt, Philip. 2007. Collection Manager, Department of Birds and Mammals, San Diego Natural History Museum. E-mailed communications to Helix, related to the Sunrise Powerlink EIS, May 29 and June 6.

United Nations Framework Convention on Climate Change (UNFCCC). 2009. Glossary of Climate Change Acronyms. Available online at: http://unfccc.int/essential_background/glossary/items/3666.php

U.S. Bureau of Land Management (BLM). n.d. Manual 8400 – Visual Resource Management. Available online at: http://www.blm.gov/nstc/VRM/8400.html

BLM. 1981. Eastern San Diego County Management Framework Plan. Available online at: http://www.blm.gov/pgdata/etc/medialib//blm/ca/pdf/pdfs/elcentro_pdfs/esandiegoplan.Par.bbe11475.File.pdf/ESDC_MFP.pdf

BLM 1994. "Carrizo Gorge Wilderness" and "Jacumba Mountains Wilderness" [maps and legal descriptions]. October. Available online at: http://www.blm.gov/ca/st/en/prog/wilderness/wa/list_wa.html

BLM. 2007a. Eastern San Diego County Proposed Resource Management Plan and Final Environmental Impact Statement. November. Available online at: http://www.blm.gov/ca/st/en/fo/elcentro/esdrmp.html

BLM. 2007b. McCain Valley. El Centro Field Office. Available online at: http://www.blm.gov/ca/st/en/fo/elcentro/recreation/mccain.html

BLM. 2008a. Eastern San Diego County Resource Management Plan and Record of Decision. October. Available online at: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/elcentro/planning/2007/fesdrmp.Par.29969.File.dat/ESDC_RMP26ROD.pdf

BLM. 2008b. Finding of No Significant Impact and Decision Record for the Proposed Geotechnical Investigation for the Stirling Energy Systems Solar Two Site, Imperial County, California. August. Available online at: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/elcentro/nepa/2007/ea.Par.81817.File.dat/FONSI_DR_SES_Geotechnical.pdf

BLM. 2008c. South Coast Resource Management Plan Revision website. Available online at: http://www.blm.gov/ca/st/en/fo/palmsprings/SCRMP_Revision.html

BLM. 2009a. Carrizo Gorge Wilderness Study Area. El Centro Field Office. Available online at: http://www.blm.gov/ca/st/en/prog/wilderness/wa/areas/carrizo_gorge.html

BLM. 2009b. El Centro Field Office District Advisory Council Report. August. Available online at: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/caso/advisory_councils/dac.Par.50151.File.dat/ElCentro_DAC%20Report%20August%202009.doc

BLM. 2009c. Elliot Mine. El Centro Field Office. Available online at: http://www.blm.gov/ca/st/en/fo/elcentro/recreation/elliot_mine_final.html

BLM. 2009d. GeoCommunicator – National Integrated Land System website. Available online at: http://www.geocommunicator.gov/GeoComm/index.shtm

BLM. 2009e. Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Tule Wind Project and the Proposed East County Substation Project, San Diego County, California. December. Available online at: http://www.blm.gov/ca/st/en/info/fed_reg_archives/2009/december/tule_wind_noi.html

BLM. 2009f. Record of Decision for the Sunrise Powerlink Transmission Project and the Associated Amendment to the Eastern San Diego County Resource Management Plan. Available online at: http://www.cpuc.ca.gov/Environment/info/aspen/sunrise/rod.pdf

BLM 2009g. Airport Mesa Shooting Closure Order. September 23, 2009. Available online at: http://www.blm.gov/ca/st/en/info/newsroom/2009/september/CDD0971_airportmesashoot.html

BLM. 2010. Draft Environmental Study Available for Stirling Energy Solar Two Project. February. Available online at: http://www.blm.gov/ca/st/en/info/newsroom/2010/february/CDD1035_solarII_deis.html

BLM. 2011a. BLM California Pending Wind Applications. (updated monthly). Available online at: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy.Par.5556.File.dat/wind%20apps%20summary%20for%20web%2012.7.10.pdf

BLM. 2011b. Ocotillo Wind Energy Project. July. Available online at: http://www.blm.gov/ca/st/en/fo/elcentro/nepa/ocotillo_express_wind.html

BLM 2011c. GeoSpatial Data Downloads [website]. Available online at: http://www.blm.gov/ca/gis/

U.S. Census Bureau. 2000. Quick Facts – San Diego County. Available online at: http://quickfacts.census.gov/qfd/states/06/06073.html

U.S. Census Bureau. 2010. 2005-2009 American Community Survey 5-Year Estimates – Imperial County, California. Available online at: http://factfinder2.census.gov/

U.S. Census Bureau. 2011. U.S. Census Bureau 10 Year Estimates. Available online at: http://factfinder2.census.gov/

USDA Natural Resources Conservation Service (NRCS). 2007. Soil Survey for San Diego County Area, California (CA 638). Available online at: http://websoilsurvey.nrcs.usda.gov

U.S. Department of Energy (DOE). 2004. DOE/EIS-0365: Final Environmental Impact Statement for the Imperial Valley-Mexicali 230-kV Transmission Lines. December. Available online at: http://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/EIS-0365-FEIS-01-2004.pdf

DOE. 2005. DOE/EIS-0372: Final Environmental Impact Statement for the Bangor Hydro-Electric Company Northeast Reliability Interconnect. November. Available online at: http://energy.gov/nepa/downloads/eis-0372-final-environmental-impact-statement

DOE. 2008a. 20% Wind Energy by 2030 – Increasing Wind Energy Contribution to U.S. Electricity Supply. July. Available online at: http://www.20percentwind.org/20percent_wind_energy_report_revOct08.pdf

DOE. 2008b. DOE/EA-1586: Environmental Assessment, Interconnection Request for the Happy Jack Wind Project Laramie County, Wyoming. January.

DOE/BLM. 2010. Notice of Availability of the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States and Notice of Public Meetings. December. Available online at: http://solareis.anl.gov/documents/docs/Solar_DPEIS_NOA.pdf

DOE/BLM. 2011. DOE/EIS 0403D-S. Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. October. Available online at: http://solareis.anl.gov/documents/supp/Supplement_to_the_Draft_Solar_PEIS.pdf

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH). 2002. Fire Fighters Exposed to Electrical Hazards During Wildland Fire Operations. Available online at: http://www.cdc.gov/niosh/docs/2002-112/

U.S. Department of Homeland Security. 2007. San Diego Sector Campo Station. Available online at: http://www.cbp.gov/xp/cgov/border_security/border_patrol/border_patrol_sectors/sandiego_sector_ca/stations/sandiego_campo.xml

U.S. Environmental Protection Agency (USEPA). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Available online at: http://www.nonoise.org/library/levels74/levels74.htm

USEPA. 1994. Water Quality Control Plan, Colorado River Basin – Region 7. California Regional Water Quality Control Board, State Water Resources Control Board. Available online at http://water.epa.gov/scitech/swguidance/standards/upload/2001_04_05_standards_wqslibrary_ca_ca_9_region7.pdf

USEPA. 2006. Compilation of Air Pollution Emission Factors (AP-42), Fifth Edition (1995-2006). Available online at: http://www.epa.gov/ttn/chief/ap42/

USEPA. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007. Available online at: http://epa.gov/climatechange/emissions/downloads09/GHG2007entire_report-508.pdf

USEPA. 2010. National Ambient Air Quality Standards (NAAQS). Available online at: http://www.epa.gov/air/criteria.html

USEPA. 2011. Notice of Intent To Prepare an Environmental Impact Statement for the Proposed Campo Wind Energy Project, San Diego County, CA. Federal Register 76(99): 29261-29263. Available online at: https://federalregister.gov/a/2011-12416

U.S. Fish and Wildlife Service (USFWS). 2000. *Recovery Plan for Bighorn Sheep in the Peninsular Ranges, California*. Available online at: http://ecos.fws.gov/docs/recovery_plan/001025.pdf

USFWS. 2002. Quino Checkerspot Butterfly (*Euphydryas editha quino*) Survey Protocol Information. February. Available online at: http://www.fws.gov/pacific/ecoservices/endangered/recovery/documents/QuinoCheckerspotButterfly2002Protocol.pdf

USFWS. 2005. Avian Protection Plan (APP) Guidelines. A Joint Document Prepared By The Edison Electric Institute’s Avian Power Line Interaction Committee (APLIC) and U.S. Fish and Wildlife Service (USFWS). April. Available online at: http://www.aplic.org/uploads/files/2634/APPguidelines_final-draft_Aprl2005.pdf

USFWS. 2008. San Diego Gas & Electric – Quino Checkerspot Butterfly Low-Effect Habitat Conservation Plan. Available online at: http://ecos.fws.gov/conserv_plans/servlet/gov.doi.hcp.servlets.PlanReport?plan_id=4069&region=8&type=HCP&rtype=1

USFWS. 2009a. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Peninsular Bighorn Sheep and Determination of a Distinct Population Segment of Desert Bighorn Sheep (*Ovis canadensis nelsoni*); Final Rule. Federal Register 74:17288-17365. April. Available online at: http://www.fws.gov/policy/library/2009/E9-7767.pdf

USFWS. 2009b. National Wetlands Inventory website. Available online at: http://www.fws.gov/wetlands

USFWS. 2009c. Quino Checkerspot Butterfly (*Euphydryas editha quino*) 2009 Monitoring Information. Available online at: http://www.fws.gov/carlsbad/TEspecies/Documents/QuinoDocs/QuinoMonRef/QuinoDocuments_2009MonRef.pdf

USFWS. 2010. USFWS Comments to the Oregon Department of Energy on the Application for Site Certificate for the proposed Summit Ridge Wind project, Wasco County, Oregon. September. Available online at: http://www.windaction.org/documents/29420

U.S. Forest Service (USFS). 1987. National Forest Landscape Management: Volume 2, Chapter 8: Recreation. Agriculture Handbook 666. Washington, DC: U.S. Department of Agriculture; 86 pages. Available online at: http://naldc.nal.usda.gov/download/CAT88898219/PDF

U.S.Geological Survey (USGS). 1975. In-Ko-Pah Gorge and Jacumba quadrangles [maps]. 1:24,000 7.5 Minute Series. 1959 rev. 1975. Washington, D.C. Available online at: http://store.usgs.gov/b2c_usgs/usgs/maplocator/(ctype=areaDetails&xcm=r3standardpitrex_prd&carea=%24ROOT&layout=6_1_61_75&uiarea=2)/.do

USGS 1979. El Cajon, California quadrangle [map]. 30x60-minute series. 1957 rev. 1979. Washington, D.C. Available online at: http://store.usgs.gov/b2c_usgs/usgs/maplocator/(ctype=areaDetails&xcm=r3standardpitrex_prd&carea=%24ROOT&layout=6_1_61_75&uiarea=2)/.do

USGS 1998. Jacumba SE, Jacumba OE S NE, In-Ko-Pah Gorge SW, In-Ko-Pah Gorge OE S NW [GeoTIFF DOQQs]. 1:12000. Downloaded from Cal-Atlas Geospatial Clearinghouse [website]. Available online at: http://atlas.ca.gov/

USGS 2006. National Elevation Dataset (NED) shaded relief [1 arc second]. Last accessed July 2009. Available online at: http://seamless.usgs.gov/ned1.php

USGS. 2010a. Earthquake summary. Available online at: http://earthquake.usgs.gov/earthquakes/eqinthenews/2010/ci14607652/#summary

USGS. 2010b. Shakemap sc14607652. Available online at: http://earthquake.usgs.gov/earthquakes/shakemap/sc/shake/14607652/#Instrumental_Intensity

USGS. 2010c. Shakemap sc14745580. Available online at: http://earthquake.usgs.gov/earthquakes/shakemap/sc/shake/14745580/

University of San Diego. 2008. San Diego County Greenhouse Gas Inventory: An Analysis of Regional Emission and Strategies to Achieve AB 32 Targets. Available online at: http://www.fypower.org/pdf/SanDiegoCounty_GHGinventory.pdf

Varin, Elizabeth. 2011. Ocotillo wind farm to provide power to SDG&E, if approved. *Imperial Valley Press.* Available online at: http://articles.ivpressonline.com/2011-02-04/ocotillo-wind-farm_27102695

Vidales, R. 2009. Personal communication via email with Ms. Megan Schwartz, ENTRIX, Inc. Civil Engineer, County of San Diego County Department of Public Works. November 18, 2009.

Walawender, M. J., and B. B. Hanan, eds. 1991. Geological Excursions in Southern California and Mexico. Department of Geological Sciences, San Diego State University: San Diego, CA.

Western Region Climate Center. 2003. Boulevard, California (041009). Available online at: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca1009

World Health Organization (WHO). 2002. What are Electromagnetic Fields? Available online at: http://www.who.int/peh-emf/about/WhatisEMF/en/

WHO. 2007. Electromagnetic Fields and Public Health: Exposure to Extremely Low Frequency Fields. Fact sheet No. 322. June. Available online at: http://www.who.int/mediacentre/factsheets/fs322/en/index.html

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SECTION 11

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SECTION 12

Glossary

Acre-foot: The volume of water that covers 1 acre (43,560 sf) to a depth of 1 foot (0.30 meters).

Advisory Council on Historic Preservation: A body appointed to advise the President and Congress in the coordination of actions by Federal agencies on matters relating to historic preservation. This organization participates in NHPA Section 106 consultations that are controversial or precedent setting.

Aesthetics: Referring to the perception of beauty.

Affected environment: Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.

Air pollutant: An airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare.

Air quality standards: The level of pollutants prescribed by regulation that may not be exceeded during a specified time in a defined area.

Air shed: An area where emitted pollutants may interact or increase in concentration. The delineation of an air shed may be influenced by topographic features such as a land-water interface.

Alluvium: Earth, sand, gravel, and other materials carried and deposited by moving surface water.

Alquist-Priolo Earthquake Fault Zoning Act (1972): California's Alquist-Priolo Act prohibits the building of most types of structures across the traces of active faults and strictly regulates construction in the corridors along active faults. It also defines criteria for identifying active faults.

Ambient air: Any unconfined portion of the atmosphere; open air, surrounding air. That portion of the atmosphere, external to buildings, to which the general public has access.

American Indian Religious Freedom Act of 1978: This act requires federal agencies to consult with Tribal officials to ensure protection of traditional religious and cultural rights and practices.

Amperes: Measure of the flow of electric current; source of a magnetic field.

Aquifer: A body of rock or sediment in a formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Archaeological sites (resources): Any location where humans have altered the terrain or discarded artifacts during either prehistoric or historic times.

Archaeology: A scientific approach to the study of human ecology, cultural history, and cultural process.

Artifact: An object produced or shaped by human workmanship of archaeological or historical interest.

Attainment area: An area which the USEPA has designated as being in compliance with one or more of the NAAQS for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. Any area may be in attainment for some pollutants but not for others.

Atmospheric dispersion: The dispersion of particulates or gaseous species (such as air pollutants) into the troposphere. It is a function of wind and atmospheric stability.

Background noise: The total acoustical and electrical noise from all sources in a measurement system that may interfere with the production, transmission, time averaging, measurement, or recording of an acoustical signal.

Batholith: A large body of intrusive igneous rock formed from cooled magma in the earth's crust. Includes rock-types such as granite, quartz, and diorite.

Blading: The use of a steel blade or steel fork attachment on a tracked or rubber-tired vehicle that removes vegetation through a combination of pushing and/uplifting motions.

Candidate species: Plants and animals for which the USFWS has sufficient information on biological vulnerability and threats to justify proposing to add them to the threatened and endangered species list, but cannot do so immediately because other species have a higher priority for listing.

Capacity: The load for which a generator, turbine, transformer, transmission circuit, apparatus, station, or system is rated. Capacity is also used synonymously with capability.

Carbon monoxide (CO): A colorless, odorless gas that is toxic if breathed in high concentrations over a period of time. It is formed as the product of the incomplete combustion of hydrocarbons (fuel).

Class I, II, and III Areas: Area classifications, defined by the Clean Air Act, for which there are established limits to the annual amount of air pollution increase. Class I areas include international parks and certain national parks and wilderness areas; allowable increases in air pollution are very limited. Air pollution increases in Class II areas are less limited and are least limited in Class III areas. Areas not designated as Class I start out as Class II and may be reclassified up or down by the state, subject to Federal requirements. Specified Federal lands, including certain national parks and wilderness areas, are mandatory. Class I areas and may not be redesignated to another classification. All other prevention of significant deterioration areas of the country are designated Class II areas. Currently there are no Class III areas.

Clean Air Act: (42 USC 7401 et seq.) Establishes (1) national air quality criteria and control techniques (Section 7408); (2) National ambient air quality standards (Section 7409 defines the highest allowable levels of certain pollutants in the ambient air. Because the USEPA must establish the criteria for setting these standards, the regulated pollutants are called criteria pollutants); (3) state implementation plan requirements (Section 4710); (4) federal performance standards for stationary sources (Section 4711); (5) national emission standards for hazardous air pollutants

(Section 7412); (6) applicability of CAA to Federal facilities (Section 7418), (federal agency must comply with federal, state, and local requirements respecting control and abatement of air pollution, including permit and other procedural requirements, to the same extent as any person); (7) federal new motor vehicle emission standards (Section 7521); (8) regulations for fuel (Section 7545); (9) aircraft emission standards (Section 7571).

Clean Air Act Conformity Requirement: Section 176 (c) of the Clean Air Act requires Federal agencies to ensure that their actions conform to applicable implementation plans (in most cases, the SIP) for achieving and maintaining the NAAQS for criteria pollutants.

Clean Water Act: (33 U.S. Code 1251 et seq.) Establishes requirements for (1) technology-based effluent limitations (Section 301); (2) water quality-based effluent limitations (Section 302); (3) individual control strategies for toxic pollutants (Section 304[l]); (4) new source performance standards (Section 306); (5) regulation of toxics (Section 307); (6) federal facilities' pollution control (provisions for presidential exception) (Section 313); (7) thermal discharges (Section 316); (8) permits under the NPDES (Section 402); (9) permits for the discharge or dredged or fill materials into navigable waters (Section 404).

Climatology: The science that deals with climates and investigates their phenomena and causes.

Code of Federal Regulations (CFR): All Federal regulations in force are published in codified form in the Code of Federal Regulations.

Community (biotic): All plants and animals occupying a specific area under relatively similar conditions.

Conductor: Transmission line wire strung between transmission line structures to transmit electricity from one location to another.

Corona effect: Electrical breakdown of air into charged particles. It is caused by the electric field at the surface of conductors.

Council on Environmental Quality (CEQ): Established by NEPA CEQ regulations (40 CFR Parts 1500-1508) describe the process for implementing NEPA, including preparation of environmental assessments and EISs, and the timing and extent of public participation.

Criteria pollutant: An air pollutant that is regulated by the NAAQS. The USEPA must describe the characteristics and potential health and welfare effects that form the basis for setting or revising the standard for each regulated pollutant. Criteria pollutants are sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter.

Critical habitat: Habitat essential to the conservation of an endangered or threatened species that has been designated as critical by the USFWS following the procedures outlined in the *Endangered Species Act* and its implementing regulations (50 CFR 424). See endangered species and threatened species.

Cultural resources: Districts, sites, structures, and objects and evidence of some importance to a culture, a subculture, or a community for scientific, traditional, religious, and other reasons. These resources and relevant environmental data are important for describing and reconstructing past lifeways, for interpreting human behavior, and for predicting future courses of cultural development.

Cumulative impact: The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.17).

Current: Flow of electrical charge.

Decibel (dB): A unit for expressing the relative intensity of sounds on a logarithmic scale from zero for the average least perceptible sound to about 130 for the average level at which sound causes pain to humans. For traffic and industrial noise measurements, the dBA, a frequency-weighted noise unit, is widely used. The A-weighted decibel scale corresponds approximately to the frequency response of the human ear and thus correlates well with loudness.

Deposition: In geology, the laying down of potential rock-forming materials; sedimentation. In atmospheric transport, the settling out on ground and building surfaces of atmospheric aerosols and particles ("dry deposition") or their removal from the air to the ground by precipitation ("wet deposition" or "rainout").

Direct embedment: Type of pole installation that requires excavation of a shaft wider than the pole using a caisson-drilling rig and then subsequent backfilling around the pole.

Direct impacts: Impacts that are caused by the action and occur at the same time and place.

Distance zones: The relative visibility from travel routes or observation points.

Double-circuit: Two sets of lines (circuits) on a single tower (a single circuit consists of three conductors).

Drinking water standards: The prescribed level of constituents or characteristics in a drinking water supply that cannot be legally exceeded.

Ecology: A branch of science dealing with the interrelationships of living organisms with one another and with their nonliving environment.

Ecosystem: A community of organisms and their physical environment interacting as an ecological unit.

Effects: As used in NEPA documentation, the terms effects and impacts are synonymous. Effects can be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health; effects can be direct, indirect, or cumulative. Effects include both beneficial and detrimental impacts.

Elevation: Height above sea level.

Eligible cultural resource: A cultural resource that has been evaluated and reviewed by an agency and the SHPO and recommended as eligible for inclusion in the NRHP, based on the criteria of significance. The criteria of significance consider American history, architecture, archeology, engineering, and culture. The criteria require integrity and association with lives or events, distinctiveness for any of a variety of reasons, or importance because of information the property does or could hold.

Electromagnetic field: A physical field produced by electrically charged objects that may surround a transmission line or other electrical equipment (e.g., conductors) and affects the behavior of charged objects in the vicinity of the field.

Embedment: See direct embedment.

Emissions: Pollution discharged into the atmosphere from smoke stacks, other vents, and surface areas of commercial or industrial facilities, residential chimneys, and vehicle exhausts.

Emission standards: Requirements established by a State, local government, or the USEPA Administrator that limit the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.

Endangered species: Plants or animals that are in danger of extinction throughout all or a significant portion of their ranges and that have been listed as endangered by the USFWS or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act and its implementing regulations (50 CFR Part 424). Some states also list species as endangered.

Endangered Species Act: (16 U.S. Code 1531 et seq.) Provides for the listing and protection of animal and plant species identified as in danger, or likely to be in danger, of extinction throughout all or a significant portion of their range. Section 7 places strict requirements on federal agencies to protect listed species.

Environmental impact statement (EIS): The detailed written statement that is required by section 102(2)(C) of the NEPA for a proposed major Federal action significantly affecting the quality of the human environment. A DOE EIS is prepared in accordance with applicable requirements of the CEQ NEPA regulations in 40 CFR Parts 1500-1508 and DOE NEPA regulations in 10 CFR Part 1021. The statement includes, among other information, discussions of the environmental impacts of the proposed action and all reasonable alternatives, adverse environmental effects that cannot be avoided should the proposal be implemented, the relationship between short-term uses of the human environment and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources.

Environmental justice: An identification of potential disproportionately high and adverse impacts on low-income and/or minority populations that may result from proposed federal actions (required by E.O. 12898).

Energy: That which does or is capable of doing work. It is measured in terms of the work it is capable of doing; electric energy is usually measured in kilowatt-hours.

Ephemeral stream: A stream that flows only after a period of heavy precipitation.

Erosion: Wearing away of soil and rock by weathering and the actions of surface water, wind, and underground water.

Ethnographic: Information about cultural beliefs and practices.

Fault: A fracture or a zone of fractures within a rock formation along which vertical, horizontal, or transverse slippage has occurred.

Federal Land Policy and Management Act: Requires the Secretary of the Interior to issue regulations to manage public lands and the property located thereon for the long term.

Field effect: Induced currents and voltages as well as related effects that might occur as a result of electric and magnetic fields at ground level.

Fireshed: A regional landscape delineated using an array of fire behavior models and GIS operations based on fire history and regime, vegetation, topography, and potential future wildfire behavior that is used as an assessment tool to identify high fire risk areas and predict fire behavior in order to better reduce fire risk and protect communities.

Floodplain: The lowlands adjoining inland and coastal waters and relatively flat areas, including at a minimum that area inundated by a 1% or greater chance flood in any given year. The base floodplain is defined as the 100-year (1%) floodplain. The critical action floodplain is defined as the 500-year (0.2%) floodplain.

Flow: The volume of water passing a given point per unit of time. Same as streamflow.

Formation: In geology, the primary unit of formal stratigraphic mapping or description. Most formations possess certain distinctive features.

Generation: The act or process of producing electricity from other forms of energy.

Generator: A machine that converts mechanical energy into electrical energy.

Global warming potential (GWP). A relative measure of how much heat a greenhouse gas traps in the atmosphere. A GWP is calculated over a specific time interval, commonly 20, 100 or 500 years. GWP is expressed as a factor of carbon dioxide (whose GWP is standardized to 1). For example, the 20 year GWP of methane is 72, which means that if the same mass of methane and carbon dioxide were introduced into the atmosphere, methane will trap 72 times more heat than the carbon dioxide over the next 20 years.

Groundborne vibration: Rapidly fluctuating motions within the ground that have an average motion of zero.

Groundwater: Water within the earth that supplies wells and springs.

Groundwater basin: Subsurface structure having the character of a basin with respect to collection, retention, and outflow of water.

Hazardous air pollutants (HAPs): Air pollutants that are not covered by ambient air quality standards, but that may present a threat of adverse human health effects or adverse environmental effects. They are regulated under Section 112 of the Clean air Act.

Hazardous waste: A category of waste regulated under Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20 through 261.24 (i.e., ignitability, corrosivity, reactivity, or toxicity) or be specifically listed by the USEPA in 40 CFR 261.31 through 261.33.

Heavy metals: Metallic elements with high atomic weights (e.g., mercury, arsenic, and lead). They can damage living things at low concentrations and tend to accumulate in the food chain.

Historic properties: Under the NHPA, these are properties of national, State, or local significance in American history, architecture, archaeology, engineering, or culture that are worthy of preservation.

Igneous: Rocks produced under conditions involving intense heat, including those of volcanic origin or crystallized from molten magma.

Impacts (effects): In this EIS, as well as in the CEQ regulations, the word impact is used synonymously with the word effect. See effects.

Indirect impacts: Effects that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Infrastructure: The basic installations and facilities on which the continuance and growth of a community or state (e.g., roads, schools, power plants, transportation, communication systems) are based.

Intensity (of an earthquake): A measure of the effects (due to ground shaking) of an earthquake at a particular location, based on observed damage to structures built by humans, changes in the earth's surface, and reports of how people felt the earthquake. Earthquake intensity is measured in numerical units on the Modified Mercalli scale.

Interested parties: Those groups or individuals that are interested, for whatever reason, in the project and its progress. Interested parties include, but are not limited to, private individuals, public agencies, organizations, customers, and potential customers.

Intertie: A transmission line that links two or more regional electric power systems.

Invasive species: An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. "Alien species" means, with respect to a particular ecosystem, any species, including its seed, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

Invertebrate: Animals characterized by not having a backbone or spinal column, including a wide variety of organisms such as insects, spiders, worms, clams, and crayfish.

Isolated occurrence: A grouping of less than 10 archaeological artifacts or a single undatable feature. These often consist of redeposited material of questionable locational context that are not related to nearby archaeological sites.

Kilovolt (kV): The electrical unit of power that equals 1,000 volts.

Landscape: An area composed of interacting ecosystems that are repeated because of geology, land, soils, climate, biota, and human influences throughout the area. Landscapes are generally of a size, shape, and pattern that is determined by interacting ecosystems.

Level of service: A measure of the vehicular capacity of a roadway based on speed, travel time, traffic interruptions or restrictions, freedom to maneuver, safety, driver comfort, convenience, and economy

Liquefaction: A phenomenon in which the strength and stiffness of soil is reduced by earthquake shaking or other rapid loading; occurs in saturated soils.

Load: The amount of electric power required at a given point on a system.

Low-income population: A population that is classified by the U.S. Bureau of the Census 2000 as having an aggregated mean 1999 income level for a family less than $17,463. This level is adjusted through the poverty index using a standard of living percentage change where applicable.

Magnitude (of an earthquake): A quantity characteristic of the total energy released by an earthquake, as contrasted to "intensity," which describes its effects at a particular place. Magnitude is calculated using common logarithms (base 10) of the largest ground motion. A one-unit increase in magnitude (e.g., from magnitude 6 to magnitude 7) represents a 30-fold increase in the amount of energy released. Three common types of magnitude are Richter (or local) (ML), P body wave (mb), and surface wave (Ms).

Maintenance area: Area redesignated as attainment within the last 10 years under the Clean Air Act. See attainment area.

Major source: Any stationary source or group of stationary sources in which all of the pollutant-emitting activities emit, or have the potential to emit, 100 or more tons per year of any regulated air pollutant, 10 tons per year of a single hazardous air pollutant (HAP), or combined HAP emissions exceeding 25 tons per year.

Mammal: Animals in the class *Mammalia* that are distinguished by having self-regulating body temperature, hair, and in females, milk-producing mammary glands to feed their young.

Management Indicator Species (MIS): Species selected by the USFWS for monitoring and analysis because their population changes are believed to indicate the effects of management activities.

Megawatt (MW): The electrical unit of power that equals 1 million watts or 1,000 kilowatts.

Mesa: An isolated relatively flat-topped natural elevation.

Meteorology: The science dealing with the dynamics of the atmosphere and its phenomena, especially relating to weather.

Mineral: Naturally occurring inorganic element or compound.

Minority Population: Individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic are minorities. The CEQ identifies these groups as minority populations when either (1) the minority population of the affected area exceeds 50%, or (2) the minority population percentage in the affected area is meaningfully greater than the minority population percentage in the general population or appropriate unit of geographical analysis.

Mitigation: The alleviation of adverse impacts on environmental resources by avoidance through project redesign or project relocation, by protection, or by adequate scientific study. Mitigation includes (1) avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of an action; or (5) compensating for an impact by replacing or providing substitute resources or environments.

National Ambient Air Quality Standards (NAAQS): Standards defining the highest allowable levels of certain pollutants in the ambient air. Because the USEPA must establish the criteria for setting these standards, the regulated pollutants are called criteria pollutants. The criteria pollutants are sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. See *Clean Air Act.*

National Environmental Policy Act (NEPA): (42 USC 4341, passed by Congress in 1969) NEPA established a national policy designed to encourage consideration of the influences of human activities (e.g., population growth, high-density urbanization, industrial development) on the natural environment. NEPA also established the CEQ. NEPA procedures require that environmental information be made available to the public before decisions are made. Information contained in NEPA documents must focus on the relevant issues in order to facilitate the decision-making process.

National Historic Preservation Act (NHPA): (16 USC 470) Provides for an expanded NRHP to register districts, sites, buildings, structures, and objects significant to American history, architecture, archaeology, and culture. Section 106 requires that the President's Advisory Council on Historic Preservation be afforded an opportunity to comment on any undertaking that adversely affects properties listed in the NRHP.

National Pollutant Discharge Elimination System (NPDES) Permit: Federal regulation (40 CFR Parts 122 and 125) that requires permits for the discharge of pollutants from any point source into the waters of the United States regulated through the Clean Water Act.

National Register of Historic Places (NRHP): A list maintained by the Secretary of the Interior of districts, sites, buildings, structures, and objects of prehistoric or historic local, state, or national significance. The list is expanded as authorized by Section 2(b) of the Historic Sites Act of 1935 (16 U.S.C. 462) and Section 101(a)(1)(A) of the National Historic Preservation Act.

Native American: Person culturally identified with a Tribe that is indigenous to the United States and who belongs to a federally-recognized Tribe.

Native American Graves Protection and Repatriation Act: This act provides requirements for the treatment, repatriation, determination of ownership, and control of human remains and cultural items on federal or Tribal lands.

Native vegetation: Plant life that occurs naturally in an area without agricultural or cultivation efforts. It does not include species that have been introduced from other geographical areas and have become naturalized.

Noise: Unwanted or undesirable sound, usually characterized as being so loud as to interfere with, or be inappropriate to, normal activities such as communication, sleep, or study. (See background noise.)

Nonattainment area: An area that the USEPA has designated as not meeting one or more of the NAAQS for criteria pollutants. An area may be in attainment for some pollutants but not others.

Noxious weed: Invasive plant species regulated under federal or state law. See invasive species.

Obligate species: Plant species that almost always occur in wetlands (i.e., greater than 99% of the time).

Offsets: The concept whereby emissions from a proposed facility that may be a new source of air pollution are balanced by reductions from existing sources to stabilize total emissions in a particular area.

Ozone (O_3): The triatomic form of oxygen. In the upper atmosphere, ozone protects the earth from the sun's ultraviolet rays, but in the lower levels of the atmosphere, ozone is considered an air pollutant. In the lower atmosphere, ozone is formed primarily from a photochemical reaction between nitrogen oxides and volatile organic compounds. Small amounts of ozone can be formed from corona effects on transmission lines.

Particulate Matter: Any finely divided solid or liquid material, other than uncombined pure water.

Peak capacity: The maximum capacity of a system to meet loads.

Peak demand: The highest demand for power during a stated period of time.

Peak hour: The hour of day that observes the highest traffic volumes.

Permeability: The ability of rock or soil to transmit a fluid.

pH: A measure of the relative acidity or alkalinity of a solution, expressed on a scale from 0 to 14, with the neutral point at 7.0. Acid solutions have pH values lower than 7.0, and basic (i.e., alkaline) solutions have pH values higher than 7.0. Because pH is the negative logarithm of the hydrogen ion (H+) concentration, each unit increase in pH value expresses a change of state of 10 times the preceding state. Thus, pH 5 is 10 times more acidic than pH 6, and pH 9 is 10 times more alkaline than pH 8.

$PM_{2.5}$: Airborne particulate matter with a mean aerodynamic diameter less than or equal to 2.5 μm; regulated under the NAAQS.

PM_{10}: Airborne particulate matter with a mean aerodynamic diameter less than or equal to 10 μm; regulated under the NAAQS.

Prehistoric: Of, relating to, or existing in times antedating written history. Prehistoric cultural resources are those that antedate written records of the human cultures that produced them.

Present value: The worth of future returns or costs in terms of their current value. To obtain a present value, an interest rate is used to discount these future returns and costs.

Prevention of Significant Deterioration (of air quality) (PSD): Regulations established to prevent significant deterioration of air quality in areas that already meet the NAAQS. Among other provisions, cumulative increases in sulfur dioxide, nitrogen dioxide, and PM_{10} (particulate matter with mean aerodynamic diameter of 10 μm or less) levels after specified baseline dates; must not exceed specified maximum allowable amounts.

Prime farmland: Soil types with a combination of characteristics that make them particularly productive for agriculture.

Public Involvement Plan: Methodology used by the agency to encourage public participation.

Quaternary: A subdivision of geological time (the Quaternary period), including roughly the last two million years up to the present.

Raptor: Birds of prey, including various types of hawks, falcons, eagles, vultures, and owls.

Record of Decision (ROD): A concise public document that records a Federal agency's decision concerning a proposed action for which the agency has prepared an EIS. The ROD is prepared in accordance with the requirements of the CEQ NEPA regulations (40 CFR 1505.2). A ROD identifies the alternatives considered in reaching the decision, the environmentally preferable alternatives, factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why they were not.

Recognized environmental condition (REC): A condition indicating the presence or likely presence of any hazardous substances or petroleum products on a property that may be the result an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

Region of influence (ROI): The geographical region that would be expected to affect a specific resource in some way by the proposed action and/or alternative(s).

Reliability: The ability of the power system to provide customers uninterrupted electric service. Includes generation, transmission, and distribution reliability.

Resource Conservation and Recovery Act: Regulates the storage, treatment, and disposal of hazardous and nonhazardous wastes.

Right-of-way: An easement for a certain purpose over the land of another, such as a strip of land used for a transmission line, roadway, or pipeline.

Rill: A small channel (usually only a few inches deep) eroded into the soil by surface runoff.

Riparian: Of or pertaining to the bank of a river, stream, lake, or other water bodies.

Runoff: The portion of rainfall, melted snow, or irrigation water that flows across the ground surface and may eventually enter streams.

Saturated zone: The zone in which the voids in the rock or soil are filled with water at a pressure greater than atmospheric pressure. The water table is the top of the saturated zone in an unconfined aquifer.

Scoping: An early, open part of the NEPA process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

Section 106 process: A NHPA (16 U.S.C. §470 et seq.) review process used to identify, evaluate, and protect cultural resources eligible for nomination to the NRHP that may be affected by Federal actions or undertakings.

Sedges: Grasslike plants.

Seismic: Pertaining to any earth vibration, especially an earthquake.

Sensitive receptors: Those populations that are more susceptible to the effects of air pollution, noise pollution, and other potentially hazardous effects of a proposed project that are located in close proximity to the project site. Sensitive receptors can include long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, parks and recreations centers, and athletic facilities.

Sensitive species: Those plants and animals identified by the USFWS Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trend in populations or density and significant or predicted downward trend in habitat capability.

Socioeconomics: The social and economic condition in the study area.

Soil association: A natural grouping of soil types based on similarities in climatic or physiographic factors and soil parent materials. It may include a number of soil associates provided that they are all present in significant proportions.

Solid waste: In general, solid wastes are nonliquid, nonsoluble discarded materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes include sewage sludge, agricultural refuse, demolition wastes, and mining residues.

Sound: Mechanical energy transmitted by pressure waves in a compressible medium such as air.

State Historic Preservation Officer (SHPO): The official within each state, authorized by the state at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the NHPA.

State Implementation Plan (SIP): A plan developed at the State level and enforceable by the USEPA, in which the State explains how it will comply with air quality standards.

Stratigraphic: Of, relating to, or determined by stratigraphy; the superposition of layers (soil, rock, and other materials) often observed at archaeological sites.

Substation: Facility with transformers where voltage on transmission lines changes from one level to another.

Surface water: All bodies of water on the surface of the earth that are open to the atmosphere, such as rivers, lakes, reservoirs, ponds, seas, and estuaries.

Switchyard: Facility with circuit breakers and automatic switches to turn power on and off on different transmission lines.

Tap: To tie a substation into an existing transmission line through a connection.

Tap point: The point where two transmission lines interconnect.

Threatened species: Any plants or animals that are likely to become endangered species within the foreseeable future throughout all or a significant portion of their ranges and which have been listed as threatened by the USFWS or the National Marine Fisheries Service following the procedures set out in the *Endangered Species Act* and its implementing regulations (50 CFR Part 424).

Traditional cultural property/use area: Areas of significance to the beliefs, customs, and practices of a community of people that have been passed down through generations.

Transformer: A device for transferring energy from one circuit to another in an alternating current system. Its most frequent use in power systems is for changing voltage levels.

Transmission line: The structures, insulators, conductors, and other equipment used to transfer electrical power from one point to another.

Tribe: A Federally recognized American Indian political entity.

U.S. Environmental Protection Agency (USEPA): The independent federal agency, established in 1970, that regulates federal environmental matters and oversees the implementation of Federal environmental laws.

Vertebrate: Animals that are members of the subphylum Vertebrata, including the fishes, amphibians, reptiles, birds, and mammals, all of which are characterized by having a segmented bony or cartilaginous spinal column.

Volatile Organic Compounds (VOCs): A broad range of organic compounds that produce vapors at relatively low temperatures, such as gasoline and solvents.

Volt: The unit of voltage or potential difference. It is the electromotive force which, if steadily applied to a circuit having a resistance of one ohm, will produce a current of one ampere.

Voltage: Potential for an electric charge to do work; source of an electric field.

Water rights: Permits or licenses issued by the State Water Resources Control Board.

Watershed: The land area that drains into a stream. The geographic region within which water drains into a particular river or body of water.

Watt: The absolute meter-kilogram-second unit of power equal to the work done at the rate of one joule per second or to the power produced by a current of one ampere across a potential difference of one volt.

Wetland: An area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas.

Yield: A measure of the availability of water to meet authorized purposes, sometimes defined in terms of the ability to meet project needs within specific time periods.

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